FOR EXAMINATIONS TO BE HELD IN DECEMBER, 2010 ONWARDS
UNIVERSITY OF JAMMU, JAMMU

COURSE OF STUDY FOR BE IST SEMESTER ENGINEERING
BRANCH: COMMON TO ALL BRANCHES

Course No.	Course Name	Lecture	Tutorial	Pract.	**Marks**			
					Theory	Sessional	Practical	Total
MTH -101	Engg. Math-1	3	2	-	100	25	-	125
PHY -102	Engg. Phy-I	3	1		100	25	-	125
CHM -103	Engg. Chem-I	3	1		100	25	-	125
M -104	Engg. Mech	3	1		100	25	-	125
HUM -105	Comm. Skills	3	1	-	100	25	-	125
M-106	Engg. Graphics	1	-	3	100	-	50	150
PHY -107	Engg. Physics Lab.	-	-	2	-	-	50	50
CHM -108	Engg. Chemistry Lab	-	-	2	-	-	50	50
M -109	Engg. Mech. Lab.	-	-	2	-	-	50	50
M -110	WS Technology	1	-	3	-	-	75	75
Total		17	6	12	600	125	275	1000

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

CLASS : B.E. IST SEMESTER
BRANCH: COMMON FOR ALL BRANCHES
COURSE TITLE: ENGINEERING MATHEMATICS-I
COURSE NO.MTH-101
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS		
3	2	0	**Theory**	Sessional	**Practical**
			100	25	**0**

SECTION-A

1. Differential Calculus**: Successive differentiation, Leibnitz theorem (without proof), Partial differentiation with errors and approximations, Eular's theorem on homogeneous functions, Taylor's and Maclaurin's series of two variables, Maxima and Minima of functions of two variables, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms.**

2. Integral Calculus**:- Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.**

SECTION-B

1. Complex Trignometry**: Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarthmic function of a complex variable, Summation of series by C+ iS method.**
2. **Ordinary Differential Equations: Differential equations of first order and first degree: Exact and non-exact differential equations, Linear and Bernoulli's differential equations. Higher order linear differential equations: Complementary solution, particular integral and general solution of these equations, variation of parameters technique to find particular integral of second order differential equations, Cauchy's and Lagrange's differential equations. Applications of Ordinary Differential Equations to simple Electrical and Mechanical Engg. problems.**
3. **Solid Geometry: Sphere, Intersection of sphere and plane, tangent plane property, cone and cylinder, related problems to right circular cone and cylinder.**

Books Recommended

1. **Engineering Mathematics by B.S. Grewal, Khanna Publications, New Delhi**
2. **Calculus and Analytic Geometry by Thomas and Finney, Addision Weslay, Narosa.**
3. **Differential Calculus by S. Narayan, New Delhi**
4. **Integral Calculus by S. Narayan, New Delhi.**

NOTE**: There shall be total eight questions, four from each section. Each question carry 20 marks. Five questions will have to be attempted, selecting atleast two from each section. Use of calculator is allowed.**

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

B.E Ist Semester (Common Course) Maximum Marks:125

Subject: Engineering Physics-I	**L**	**T**	**P**	Theory	Sessional
Course No.PHY-102	**3**	**1**	**2**	**100**	**25**

Duration of Exam: 03 hours

SECTION-A

UNIT-1	**MATHEMATICAL PHYSICS**	**NO. OF LECTURES**	**WEIGHTAGE**
	Review of Vector Algebra, Scalar and Vector fields, Gradient of a Scalar field, Divergence and curl of a vector field and their physical significance, solenoidal fields, Guass Divergence theorm, Stokes theorem and their applications, Vector Identities	10	25%
UNIT-II	**ELECTROMAGNETIC FIELDS AND WAVES**		
	Guass's law in vector notation (differential and integral forms), Applications of Guass's law to find electric fields due to a long straight charged wire, Cylindrical and Spherical charge distributions. Derivation of Ampere's Circuital law, Application of Ampere's circuital law to find magnetic intensity due to long cylindrical wire, due to a long solenoid. Differential & Integral form of Faraday's law of electromagnetic induction, Equation of continuity, Displacement current and its significance, Maxwell's field equations (differential and integral forms), Betaron, Electromagnetic wave propagation in free space (e.m wave equations for $\xrightarrow[E]{}$ & $\xrightarrow[B]{}$ fields for free space and their solutions (plane wave solution), velocity of e.m. waves, Relation between E_o & B_o . Definition of Poynting Vetor, Poynting theorem.	16	25%
	SECTION-B		
UNIT-III	**APPLIED OPTICS**		
	Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wave length and refractive index of monochromatic light by Newton's theory. Fraunhoffer & Fresnel's diffractions Fresnel's half period zones and rectilinear propagation of light, Fraunhoffer diffraction due to a single slit, plane diffraction grating & its theory for secondary maxima and minima. Unpolarized and polarized light, Nicol Prism, Mathematical representation of polarization of different types, Quarter & half wave plates.	12	20%
UNIT-IV	**OSCILLATIONS**		
	Free damped and forced oscillations and their differential equations, Logarithmic decrement, power dissipation & Quality factor, ultrasonic waves and their production by Piezoelectric method and applications (General)	05	15%
UNIT-V	**FIBRE OPTICS**		
	Propagation of light in fibres, numerical aperture, Single mode and multimode fibres, General applications	05	15%

TUTORIALS

S.NO.	TOPICS	UNIT NO.
T-1	Numerical problems based on vector analysis	I
T-2	Numerical problems on Gradient of Scalar fields	I
T-3	Numerical problems on Divergence of Vector fields	I
T-4	Numerical problems on Curl of vector fields	I
T-5	Numerical problems based on Guass divergence theorem and Stokes Theorem	I
T-6	Numerical problems based on the applications of Guass's Law	II
T-7	Numerical problems based on the applications of Ampere's law	II
T-8	Numerical problems pertaining to the applications of Faraday's law	II
T-9	Numerical problems pertaining to the applications of Interference phenomenon, Formation of Newton's rings	III
T-10	Numerical problems pertaining to the applications of diffraction and polarization phenomenon	III
T-11	Numerical problems based on the applications of SHM, damped and forced motion of bodies and applications of ultrasonic	IV
T-12	Numerical problems based on the applications of Fibre optics	V

NOTE: SETTING OF QUESTION PAPER (Instructions for examiners)

i) The question paper will consist of two sections\
   a) Section-1
   &
   b) Section-II

ii) Section-I Comprises of Unit-I and Unit-II
Section-II Comprises of Unit-III, Unit-IV and Unit-V

iii) Number of questions to be set in the paper =8 (eight)
(Four from each section) as per weightage

iv) Number of questions to be attempted =5 (five)
(Selecting at least two from each section)

BOOKS RECOMMENDED

S.NO.	TITLE	AUTHOR
1.	Vector Analysis	Spiegal
2.	Mathematical Physics	Rajput & Gupta
3.	Physics	Reisnick & Hatliday
4.	Optics	Brijlal & Subramaniam
5.	Sound	Subramaniam
6.	Sound	Khanna & Bedi
7.	Fibre Optics	Ghatak, Tyagrajan

UNIVERSITY OF JAMMU
FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

CLASS : B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGG. CHEMISTRY
COURSE NO.:CHM-103
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS		
3	1	2	**Theory**	Sessional	**Practical**
			100	25	**50**

SECTION - A

1. SPECTROSCOPY

UV Spectroscopy – Electronic transitions, spectrum, shift of bonds with solvents for double bonds, carbonyl compounds and aromatic compounds.
IR-Spectroscopy – Introduction, brief idea about instrumentation, applications and interpretation of IR Spectra, characterization of functional groups and frequency shift associated with structural changes.
'H-NMR Spectroscopy – Theory of 'H-NMR Spectroscopy, equivalent and non-equivalent protons, chemical shift, spin-spin coupling, spin-spin splitting, H'-NMR spectrum of a few organic compounds.

2. EXPLOSIVES
Introduction, classification and types of explosives, requirement for good explosives, preparation and uses of following explosives – Nitrocellulose, TNT, Dinitrobenzene, Picric Acid, Nitroglycerine and Dynamite, Gun Power, RDX, Tetracene.

SECTION - B

1. STEREOCHEMISTRY:-
Optical isomerism, recemerization, asymmetric synthesis, methods for resolution of racemic mixture, enantiomerism and diasteroisomerism.

2. ALLOYS
Introduction, purpose of making alloys, preparation of alloys, classification of alloys. (Ferrous and non-ferrous alloys), alloy steels & copper alloys.

3. LUBRICANTS
Definitions, functions of lubricants, mechanism of lubrication, classification of lubricants (Lubricating oils, semi solid lubricants, solid lubricants) synthetic lubricants, flash and fire points, oiliness, cloud and pour points.

4. DYES AND DRUGS
Classification of dyes and its applications. Define drug and give the applications of following drugs.
a) Narcotics b) Tranquilizers c) Antipyretics d) Antibiotics

FORMAT OF QUESTION PAPER
Total No. of Questions = 08
Questions to be attempted = 05
(Minimum Two from Each Section A & B)

Books Recommended :

1. **Engineering Chemistry — Jain & Jain**
2. **Engineering Chemistry — Sharma, B.K.**
3. **Engineering Chemistry — Dara, S.S.**
4. **Organic Chemistry — Bahl, B.S.**
5. **Organic Chemistry — Soni, P.L.**
6. **Organic Chemistry — Jain, M.K.**
7. **Spectroscopy of Organic Compounds — Silverstain**
8. **Spectroscopy of Organic Compounds — Kalsi, P.S.**

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

CLASS : B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGINEERING MECHANICS
COURSE NO.M-104
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS		
3	1	2	**Theory**	Sessional	**Practical**
			100	25	**50**

SECTION-A (STATICS)

Scope and basic concepts (Rigid body, force, units, etc), concept of free body diagram, Resultant of Co-planar concurrent forces in a plane and space, moment of force, Principle of Moments, Coplanar and spatial applications. Virtual work method and its applications.

Equilibrium and its equations for a planar and spatial systems, Analysis of trusses, Method of joints and sections.

Theory of friction, its laws and applications (inclined plane). Square threaded screws, Bolt friction, Centroids and center of gravity, centroids of lines and composite areas, centroids determined by integration.

Moment of inertia, Area M.O.I, Transfer theorems, Polar M.O.I, Product of inertia, Principal M.O.I, Mohr's circle for area M.O.I, Transfer theorems and axes M.O.I of composite bodies.

SECTION-B (DYNAMICS)

Kinematics of a particle rectilinear motion, motion curves, Rectangular components of curvilinear motion, Flight of Projectile, Normal and tangential components of acceleration, Radial and transverse components, Newton's Laws. D'Alembert's Principle.

Kinematics of rigid bodies: Types of rigid body motion, Angular motion, fixed axis rotation, Analysis of plane motion and its applications, Instantaneous center and Instantaneous axis of rotation.

Kinetics of Particle: Translation, Analysis of a particle as a rigid body.

Kinetics of rigid bodies: Equations of plane motion, fixed axis rotation, Rolling bodies, General plane motion, Impulse and momentum in plane motion, Angular momentum.

RECOMMENDED BOOKS

1.	**Engineering Mechanics (Statics & Dynamics)**	**Beer and Johnson**
2.	**Engineering Mechanics (Statics & Dynamics)**	**Mariam and Kraige**
3.	**Engineering Mechanics (Statics and Dynamics)**	**Timoshenko and Young**
4.	**Engineering Mechanics (Statics and Dynamics)**	**Ferdinand L Singer.**

NOTE : There shall be total eight questions, four from each section. Five questions will have to be attempted selecting atleast two from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

B.E IST SEMESTER
BRANCH: COMMON TO ALL
TITLE: COMMUNICATION SKILLS
COURSE NO: HUM-105
DURATION: 3 HOURS

L	T	P	MARKS
3	1	-	THEORY: 100
			SESSIONALS: 25

Exercises in comprehension, grammar vocabulary, usage, pronunciation, spelling and composition based on the following texts:

i. Contemporary English Prose
Edited by Menon
Oxford University Press

ii. Developing English Skills
Edited by Thanker, Desai and Purani
Oxford University Press

Or

English through Reading-II
Edited by Bhasker and Prabhu

Note: Test-I carries 50% weightage in the question paper and Text-II carries 50% weightage
Question Paper:

1. Six short answer questions on comprehension to be set from Text-I. Students expected to answer any three in about 150 words each (30 marks)
2. Phrases and idioms from text I to be used in sentences. Hundred percent choices to be given (20 marks)
3. Completing a paragraph of which the first two or three short Sentences are given (10 marks)
4. Exercise on tenses from Text II (5 marks)
5. Exercises on active/passive transformation from Text-II (5 marks)
6. Forming verbs or adjectives or nouns from the given words-text-II (5 marks)
7. Propositions from text-II (5 marks)
8. Matching words and their meanings Text-II (5 marks)
9. Forming words ending in-ify,-ize,-tion, ec. From Text-II (5 marks)
10. Filling in the blanks with a given set of words in brackets-Text-II (5 marks)
11. Questions on miscellaneous exercises from Text-II such as Question tags - articles etc.

or

Marking Stress or Syllable in given words. (5 marks)

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

CLASS: B.E. IST SEMESTER
BRANCH: COMMON TO ALL
COURSE TITLE: ENGINEERING GRAPHICS
COURSE NO.Eng-106
DURATION OF EXAM: 3 HOURS

L	T	P	**MARKS**		
1	0	3	**Theory**	Sessional	**Practical**
			100	0	**50**

UNIT-1

Introduction: Conventional lines and signs used in Engineering Drawing, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices, Locus of a point on simple mechanisms.

Theory and practice of Orthographic projections.

Projection of points and Lines: Projections of points and lines in different quadrants w.r.t principle reference planes, Finding of true length, True inclinations and traces of lines.
Projection of Planes: Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method. Space relation of a plane and a line. To locate a point on a plane given its projections. Parallel relation of lines and planes. Shortest distance between a line and a plane.

UNIT-2

Projection of Solids: Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (1) Rotation Method, and (II) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions.

Sectioning of Solids: Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions.

UNIT-3

Interpenetration of Solids and Intersection of Surface: Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.
Development of Surfaces: Classification of surfaces, Methods of development-Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces. To draw projections from given development.

UNIT-4

Isometric Projection: Isometric scale, Isometric axes and Isometric planes, Isometric projection of solids and simple machine blocks.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection.

RECOMMENDED BOOKS

1.	**Engineering Drawing**	**N.D Bhatt**
2.	**Practical Geometry**	**V. Laxminarayan & GEV**
3.	**Engineering Graphics**	**K.L. Narayanan & P. Kamaish**
4.	**Principles of Engineering Graphics**	**P.E Giesecks**
5.	**Engineering Graphics**	**Frederic & Michelle.**

NOTE **At least two questions to be attempted from Unit-I and at least one question from each of the Units-II, III and IV in the theory examination paper.**

B.E Ist Semester	Maximum Marks
Subject: Engineering Physics Lab-I	Sessional
Course No.: PHY-107	50

S.No.	Experiment No.	Title of Experiment
1.	**Exp-I**	To plot a graph between the distance of the knife edges from the center of gravity and the time period of a compound pendulum. From the graph, find **a) Acceleration due to gravity** **b) Radius of gyration and the moment of inertia of the bar about an axis through the center of gravity.**
2.	**Exp-II**	To find the dispersive power of a given prism using a spectrometer.
3.	**Exp-III**	To find the refractive index of a given liquid using a hollow prism
4.	**Exp-IV**	To find the focal lengths of a convex mirror and a concave lens using a convex lens and a concave mirror respectively.
5.	**Exp-V**	To find the frequency of A.C mains using an electrical vibrator.
6.	**Exp-VI**	To draw the V-I characteristics of a forward and reverse bias P-N junction diode.
7.	**Exp-VII**	To study the common base characteristics of PNP junction transistor.
8.	**Exp-VIII**	To study the common emitter characteristics of PNP junction transistor.
9.	**Exp-IX**	To study the common base characteristics of NPN junction transistor.
10.	**Exp-X**	To study the common Emitter characteristics of NPN junction transistor.
11.	**Exp-XI**	To evaluate the value of Planck's constant.
12	**Exp-XII**	To study the characteristics of a Solar Cell.

NOTE: A minimum of six experiments is to be performed in a semester.

BOOKS RECOMMENDED

	TITLE	**AUTHOR**
1.	**Practical Physics**	Warsnop & Flint
2.	**Practical Physics**	Chauhan & Singh (Vol. I & Vol. II)
3.	**B.Sc. Practical Physics**	C.L Arora

UNIVERSITY OF JAMMU

FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

COURSE NO. CHM – 108

CHEMISTRY PRACTICAL :

1. **Determine the percentage of $CaCO_3$ in precipitated chalk. You are provided with IN HCl and 0.IN NaOH.**
2. **To analyse the given antacid tablets.**
3. **Determine Volumetrically the %age purity of given sample of Ferrous sulphate, x gms of which have been dissolved per litre provided N/10 $KMnO_4$**
4. **Determine Volumetrically the number of molecules of water of crystallization present in the given sample of Mohr's salt, x gms. of which have been dissolved per litre provided N/10 $K_2Cr_2O_7$ (using an external indicator).**
5. **Determine Volumetrically the percentage of Cu in a sample of $CuSO_4$ crystals, Z gms of which have been dissolved per litre, provided 0.IN $Na_2S_20_3$.**
6. **To determine the coefficient of viscosity of an unknown liquid using Ostwald Viscometer.**
7. **Determine the surface tension of a unknown liquid using Stalagmometer.**
8. **To prepare a pure and dry sample of Aspirin**
9. **To prepare a pure and dry sample of Glucosazone**
10. **Determine the method of purification of organic compounds by coloumn chromatography.**
11. **Determine the aniline point of a given lubricating oil.**

Books Recommended :

1. **Experimental Engineering Chemistry Shashi Chawla**
2. **Lab. Manual on Engg. Chemistry Basin, S K & Sudha Rani**

UNIVERSITY OF JAMMU
FOR EXAMINATIONS TO BE HELD IN DECEMBER 2010 ONWARDS

COURSE NO. M-109

Engg. Mechanics Lab

Lab work shall be based on theory course of Engineering Mechanics Paper

CLASS : B.E. IST SEMESTER
BRANCH: COMPUTER ENGG., CIVIL ENGG., MECH. ENGG., ELECTRICAL ENGG., ELECTRONICS & COMM. ENGG.
COURSE TITLE: WORKSHOP TECHNOLOGY
COURSE NO.WS-110

L	T	P	MARKS		
1	0	3	**Theory**	Sessional	**Practical**
			0	0	**75**

Course Content:

Introduction to workshop as a fabrication unit. Information regarding various material of construction i.e Ferrous and Non-Ferrous, wood, plastics, etc. Basic fabrication process i.e castings, Mechanical working, welding and machining.

Wood working and pattern making practice, Information about working hand and wood working machines, various methods of joining of wooden parts for the fabrication of patterns, Pattern materials and allowances, pattern construction procedures, preservation of patterns.

Moulding and casting practice. Sand Moulding, Natural foundry sands and synthetic sands, preparation of moulding sands, mould making procedure, cast iron and aluminum and pouring, melting crucible process, Extraction of Castings.

Cold and hot working processes, basic tolls and equipment used in mechanical working. Forging furnace operation, Smith forgoing operations.

Books**:**

1. **Manufacturing process and materials by Campbell.**
2. **Manufacturing Process by P.N. Rao**
3. **Workshop Technology by Hajra and Chowdhary Vol.I**

Shop Practice:

Unit-1 Pattern Making:
- **i) Baring block pattern**
- **ii) Split pattern of "bench Vice" (Sliding Jaw).**

Unit-II Moulding and Casting
Moulding and Castings of Patterns at Unit I.

Unit-III Hand forging of:

- **i) Haxagonal headed bolt from a cylindrical rod.**
- **ii) Cubical Block from a Cylindrical section.**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS
COURSE OF STUDY FOR BE 2ND SEMESTER ENGINEERING
BRANCH: COMMON TO ALL BRANCHES

Course No.	Course Name	Lecture	Tutorial	Pract	**Marks**			
					Theory	Sess.	Pract	Total
MTH –201	Engineering Math-1I	4	2	-	100	25	-	125
PHY -202	Engineering Phy-II	3	1	-	100	25	-	125
CHM -203	Engineering Chem-II	3	1	-	100	25	-	125
COM -204	Computer Programming	3	1	-	100	25	-	125
HUM-205	Engineering Economics	3	1	-	100	25	-	125
M -206	Machine Drawing-I	1	-	3	100	25	-	125
M -207	Workshop Technology-II	1	-	3	-	-	75	75
PHY –208	Engineering Physics II Lab	-	-	2	-	-	50	50
CHM –209	Engineering Chemistry II Lab	-	-	2	-	-	50	50
COM –210	Computer Programming Lab	-	-	2	-	-	75	75
Total		18	6	12	600	150	250	1000

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks:125

Course No: MTH-201	**L**	**T**	Theory	Sessional
Course Title: Engg. Math-II	**4**	**2**	**100**	**25**

Branch : Common to all branches
Duration of Exam: 3 hours

SECTION-A

1. Introduction to infinite series & sequences:- Convergence and divergence of a series, Leibnitz test, p-test, comparison test, Cauchy's root test, D' Alembert Ratio Test, Raabe's Test, Logarithmic test, alternating series..
2. Fourier Series: Introduction, Euler's formulae, sufficient conditions for a Fourier expansion, functions having points of discontinuity, change of intervals. Odd and even functions, Fourier expansion of Odd and even periodic functions, half range series, typical wave forms, Parseval's formula, complex form of Fourier -series.
3. Power Series Solutions of Second order O.d.e: Analytic function, ordinary point, singular point, regular and irregular singular points of o.d.e. $Y'' + P(x)Y' + Q(x)Y=0$, Series solution of such differential equations about an ordinary point, Frobenius series solution about a regular singular point.

SECTION-B

2. First Order partial differential equations:-
   Formation of p.d.e, First order linear p.d.e, Non-Linear p.d.e. of Ist order, solution by Charpit's method, Four Standard forms of non-linear p.d.e with reference to Charpit's technique.

3. Higher Order Linear p.d.e: Homogenous and Non-homogenous higher order linear partial differential with constant coefficient inverse operator I/f (D,D'), Rules for finding P.I and C.F, Non-Linear equations of 2nd order. Application of p.d.e, method of separation of variables to solve equations of vibrations of strings (or one dim wave equation), one dim and two dim heat flow equations, Laplace equations, transmission line).

4. Matrices & determinants: Introduction, Rank of matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Vector spaces, Linear dependence and independence of vectors, consistency of linear system of equations, linear and orthogonal transformations, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Reduction to diagonal form, Reduction of quadratic form to canonical form, complex matrices.

BOOKS RECOMMENDED

1. Advanced Engineering Mathematics by R.K. Jain, S.R.K Iyenger, 2nd edition, Narosa, New Delhi.
2. Higher Engineering Mathematics by Dr. B.S. Grewal
3. Engineering Mathematics by Dr. Bhopinder Singh
4. Engineering Mathematics by B.S. Grewal Khanna Publication, New Delhi.
5. Partial differential equations by Singhania

Note : There shall be total eight questions, four from each section. Each question carry 20 marks. Five questions will have to be attempted, selecting atleast two from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E IInd Semester (Common Course) Maximum Marks:125

Course No. PHY-202	**L**	**T**	Theory	Sessional
Course Title : Engineering Physics-II	**3**	**1**	**100**	**25**

Branch : Common to all branches
Duration of Exam: 3 hours

UNIT-1	RELATIVISTIC DYNAMICS	**NO. OF LECTURES**	**WEIGHTAGE**
	Concept of Relativity, Frames of reference, Galilean Transformations, Michelson and Morley's experiment, Postulates of Special Theory of relativity, lorentz transformations, Length Contraction, Time dilation, variation of mass with velocity (Velocity addition), mass energy equivalence ($E^2=P^2c^2+m_o^2c^4$).	10	25%
UNIT-II	WAVE-PARTICLE DUALITY		
	Black Body radiation spectrum (Characteristics & Energy distribution), Wien's laws, Rayleigh Jeans Law excluding mathematical derivations, ultraviolet Catastrophe, Planck's hypothesis and Planck's radiation law, Explanation of black body radiation characteristics on the basis of Planck's law, photon concept. Compton effect, derivation of the direction of emission and the change in wavelength of scattered photons, direction of recoil electron and discussion of observed results. Debroglie's hypothesis, concept of matter waves, Davisson & Germer's experiment, wavepacket, Phase and Group velocity, Heisenberg's uncertainty principle. Experimental illustration of uncertainty principle using single slit.	12	25%
UNIT –III	QUANTUM MECHANICS		
	Wave function definition, interpretation and significance of wave function, Schrodinger's wave equations (Steady-State and time dependent) for 1-dim case, concept of operators and expectation values, Applications of Schrodinger's equation (Time independent) to a) Particle in a 1-dimensional box of infinite height, b) single step potential barrier, c) Tunnel effect, d) Quantum Mechanical harmonic oscillator with concept of Zero point energy.	14	25%
UNIT-IV	SOLID STATE PHYSICS		
	Intrinsic & extrinsic semi-conductors, Fermi & impurity levels, Impurity compensation, charge neutrality equation and semi-conductor conductivity. Einstein's relation, drift and diffusion current. Introductory concepts of advanced materials viz; conducting polymers dielectric materials, Nanomaterials, Smart materials and High T_c materials.	7	15%
UNIT-V	LASERS		
	Principle of Laser action, population Inversion, Einstein's Coefficients, He-Ne & Ruby Lasers, Holography	5	10%

TUTORIALS

B.E IInd Semester
Subject: Engg: Physics-II
Course No.Phy-202

S.NO.	TOPICS	UNIT NO.
T-1	Numerical problems based on Length contraction & time dilation	I
T-2	Numerical problems based on variation of mass, energy mass equivalence etc.	I
T-3	Numerical problems pertaining to energy spectrum of Black body radiations, Wien's displacement/R-J laws, Planck's law	II
T-4	Numerical problems based on photo-electric effect, work functions	II
T-5	Numerical problems based on Compton effect, recoil energy of electron etc.	II
T-6	Numerical problems based on the characteristics of De-broglie waves, Davisson-Germer's Expt.	II
T-7	Numerical problems related to Heisenberg's uncertainty principle	II
T-8	Numerical problems based on Schrodinger's wave equation, expectation values of certain physical quantities and operators	III
T-9	Numerical problems to find the Eigen function and eigen values for particle in a box	III
T-10	Numerical problems to find the reflection and transmission co-efficients for a particle penetrating a potential barrier	III
T-11	Simple numerical problems based on finding the bandgaps in semi-conductor materials etc.	IV
T-12	Simple numerical problems based on finding the energy level difference in Lasers etc.	V

NOTE: SETTING OF QUESTION PAPER (Instructions for Examiners)

i) The question paper will consist of two sections

a) Section-I
&
b) Section-II

ii) Section-I Comprises of Unit-I and Unit-II
Section-II Comprises of Unit-III, Unit-IV and Unit-V

iii) Number of questions to be set in the paper =8 (eight)
(Four from each section as per weightage)

iv) Number of questions to be attempted =5 (five)
(Selecting at least two from each section)

BOOKS RECOMMENDED

	TITLE	**AUTHOR**
1)	Modern Physics	Beiser
2)	Modern Physics	Blatt
3)	Modern Physics	Gupta & Gupta
4)	Basic Electronics	Millman & Halkias
5)	Material Science	S.L. Kakani, Amit Kakani

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks:125

Course No: CHM-203	**L**	**T**	Theory	Sessional
Course Title: Engg. Chem-II	**3**	**1**	**100**	**25**

Branch : Common to all branches
Duration of Exam: 3 hours

SECTION-A

1. **ENVIRONMENTAL CHEMISTRY :**
Concept of Environmental chemistry, segments of environment (a brief idea about atmoshphere, hydrosphere and lithosphere)

AIR POLLUTION – Introduction, Types of air pollution and control of air pollution.

WATER POLLUTION : Introduction, Sources of water pollution and methods of controlling water pollution.

CHEMICALS AND METAL TOXICOLOGY (Biochemical effects of Pb, Hg, As, Zn, Cd, Ni, Se, CN, O_3 and pesticides in brief on man).

2. **INORGANIC CEMENTING MATERIALS** :
Cement and Lime – Introduction, classification of lime, manufacture and properties of lime, setting and hardening of lime.

Cement, types of cement, manufacture of Portland cement, setting and hardening of cement.

3. **WATER TREATMENT**
Introduction, types of water, softening of water by different processes, chemical methods and sterilization, priming and foaming, sludge and scale formation, determination of hardness of water by soap titration method and EDTA method. Radioactivity of water, numericals on hardness and softening of water.

SECTION-B

1. **PLASTICS:**
Introduction, importance of plastics and uses, classification of plastics, moulding constituents of a plastic, moulding of plastics into articles (compression moulding, injection moulding, transfer moulding and extrusion moulding) Preparation , properties and uses of following plastic materials:
a) Polymethyl methacrylate b) Epoxy resins c) Alkyd resins.

2. **RUBBER**
Introduction , types of rubber, treatment of latex, vulcanization of rubber, preparation, properties and uses of following synthetic rubber: Buna-S, Buna-N & Butyl rubber.

3. **PAINTS**

Introduction, requisites of a good paint, constituents of a paint, manufacture of a paint, properties and uses of important white pigments such as white lead, Zinc oxide and Lithophone.

BOOKS RECOMMENDED :

1.	Engineering Chemistry	Jain & Jain
2.	Engineering Chemistry	Sharma, B.K.
3.	Engineering Chemistry	Dara, S.S.
4.	Engineering Chemistry	Shashi, Chawla
5.	Organic Chemistry	Bahl, B.S.
6.	Environmental Chemistry	De, A.K.
7.	Textbook of Environmental Chemistry	Tyagi & Mehra
8.	Polymer Science	Gowrikar, V.R. etal.

Note : There shall be total eight questions, four from each section. Each question carry 20 marks. Five questions will have to be attempted, selecting atleast two from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU

FOR EXAMINATION TO BE HELD IN JUNE 2011 ONWARDS

CLASS: B.E 2nd SEMESTER
BRANCH: COMMON FOR ALL BRANCHES
COURSE TITLE: COMPUTER PROGRAMMING USING C
COURSE NO: COM –204
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			Theory	Sessionals
3	1	-	100	25

SECTION-A

1. Basic structure of Computer, Stored Program Concept, Binary Arithmetic – Addition, Subtraction, Multiplication, Data Representation – Fixed and Floating Point, Semiconductor Memories.

2. Introduction to C, Data Types, Constants, Variables, Expressions, Statements, Operators, Data Input and Output.

3. Control Statements, Arrays, Recursion, Storage Classes, Library Functions.

SECTION-B

4. Functions, User Defined Data Types, Structures, Unions, Passing Structure to Functions.

5. Pointers, Operation on Pointers, Passing Pointers to Functions, Data Files – Opening, Closing, Creating Data Files

Books Recommended:-

1. Programming With C - Byron Gottfried.
2. Programming With C - E. Balaguruswamy.
3. C The Complete Referance – Herbert Schildt.
4. Let us C - Yashwant Kanitkar.
5. Digital Computer Fundamentals - Thomas C. Bartee.
6. Digital Computer Design - V . Rajaraman.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E. 2nd Semester Maximum Marks: 125
Course No. HUM-205 Theory Sessional
Course Title: Engineering Economics **L T** **100** **25**
Branch: Common to all branches **3 1**
Duration of Exam : 3 Hours

SECTION-A

UNIT-1

	Definitions of Economics
	a) Science of Wealth
	b) Science of Material Welfare
	c) Science of Scarcity
	Economic System
	a) Features of Capitalism
	b) Features of Socialism
	c) Features of Mixed Economy
UNIT-II	
	Consumer Behaviour
	a) Cardinal Utility Analysis: The Concept and Utility Maximisation: Laws of Diminishing Marginal Utility and Equi-Marginal Utility.
	b) Ordinal Utility Analysis: Meaning and Properties of Indifference Curves and Utility Maximization.
	Demand Theory:
	a) Meaning of Demand and law of Demand
	b) Factors Affecting Demand
	c) Elasticity of Demand (Price Elasticity, Income Elasticity and Cross Elasticity)
	d) Demand Forescasting
	SECTION-B
UNIT-III	
	Theory of Production:
	a) Factorsof Production and Production Function.
	b) Isoquants : Meaning & Properties
	c) Law of Variable Proportions & Returns to scale
	Costs and Cost Analysis
	a) The Concept of Marginal, Average, Fixed and Variable Costs.
	b) The Shape of Fixed, Average and Marginal Cost Curves (short run)
	Market and Market Structures
	a) Meaning and Feature of Perfect Competition, Monopolistic Competition, Oligopoly and Monopoly.
	b) Price Determination Under Perfect competition and monopoly.
UNIT-IV	
	Some commonly used Economic Concepts
	a) Meaning, Types and Methods to Control Inflation.
	b) Concept of Stock Market

	c) Meaning & Concept of National Income	
	d) Functions of Commercial Bank & Central Bank	
	e) Features of Development and Under Development	
	f) Meaning & Phases of Trade/Business Cycle	
	g) Index Number : Construction and difficulties in measurement of Index Number.	
BOOKS RECOMMENDED		
1.	K.K.Dewett	: Modern Economic Theory
2.	H.L Ahuja	: Advanced Economic Theory
3.	M.L. Jhingan	: Macro Economics
4.	P.N Chopra	: Business Economics/Advanced Eco. Theory

Note: There shall be total eight questions, four from each section. Each question carry 20 marks. Five questions will have to be attempted, selecting atleast two from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E. 2nd Semester			Maximum Marks: 125	
Course No. M-206			Theory	Sessional
Course Title: Machine Drawing-I	**L**	**P**	**100**	**25**
Branch: Common to all branches	**1**	**3**		
Duration of Exam : 3 Hours				

SECTION-A

1. I.S. Code for Machine Drawing.
2. Types of Sections and Recommended Scale, Dimensioning and Sectioning of Machine elements.
3. Drawing and sketching of machine elements in Orthographic Projections.
4. Different types of Joints: Riveted joints, Threaded fasteners, Knuckle joint, Cotter Joints: Gib and Cotter, Sleeve and Spigot.
5. Stud assembly, Pipe joints including expansion joint.
6. Shaft pulley, cone pulley, Fast and loose pulley, etc.

SECTION-B

1. Simple assemblies: Shaft couplings and Clutches, Muff Coupling, Split muff, Flange Couplings: Solid and Flexible, Protected and Unprotected, Universal Coupling.
2. Bearings: Pedestal bearing including Hanger bearings, Pivot bearing and Swivel bearing.

RECOMMENDED BOOKS:-

1.	Machine Drawing	P.S. Gill
2.	Machine Drawing	Sidheshwar and Kannaih
3.	Machine Drawing	N.D. Bhatt

NOTE:-

1. There will be Six questions in all, five from **Section- A** (each of 15 marks) and one Compulsory question of 55 marks from **Section - B.**

2. Students are required to attempt Four questions in all, three form Section-A and one compulsory question involving assembly from **Sections–B**.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks : 75

Course No: M-207	**L**	**P**	Prac/Lab
Course Title: Workshop Technology-II	**1**	**3**	**75**

Branch : Common to all branches
Duration of Exam : 3 Hours

WELDING SHOP

1. Introduction to Welding as a fabrication process, Welding application and general safety precautions.
2. Introduction to Gas and Arc welding processes.
3. Preparation of single V-butt joint by Gas and Arc welding processes.
4. Preparation of double V-butt joint, Lap joint, Tee joint and Corner joint by Gas and Arc welding processes.

FITTING SHOP

1. Assembly of Snap fitting of flat pieces (Male, Female).
2. Assembly and fitting of two L-shaped rectangular flat pieces.

SHEET METAL SHOP

1. Introduction to sheet metal tools.
2. Practice of making regular geometrical and traditional shapes in sheet metal, which includes:
    a) Square elbow
    b) Tee joint
    c) Funnel making
    d) Tray and riveted handle.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks : 50
Course No: PHY-208 **P** Prac/Lab
Course Title: Engineering Physics Lab-II **2** **50**
Branch : Common to all branches
Duration of Exam : 3 Hours

S.NO.	EXPERIMENT NO.	TITLE OF EXPERIMENT
1.	Exp-1	To determine the wavelength of sodium light using a plane diffraction grating.
2.	Exp-II	To find the wavelength of a monochromatic source of light using Fresnel's Biprism.
3.	Exp-III	To determine the specific rotation of sugar using laurent's half shade polarimeter.
4.	Exp-IV	Verification of Faraday's laws.
5.	Exp-V	To find the wavelength of monochromatic light using Newton's rings Apparatus.
6.	Exp-VI	To find the co-efficient of self-induction of a coil by Anderson's bridge using head phone.
7.	Exp-VII	To determine the value of e/m for electron by a long solenoid (Helical method).
8.	Exp-VIII	To find the impedance of LCR series and parallel circuits.
9.	Exp-IX	To study the Zener diode characteristics.
10.	Exp-X	To find the specific resistance of given wire by using carry Foster's Bridge.
11.	Exp-XI	To find the wavelength of He-Ne gas laser.
12.	Exp-XII	To find the diameter of a thin wire using He-Ne gas laser.

NOTE: AT LEAST A MINIMUM OF SIX EXPERIMENTS IS TO BE PERFORMED IN A SEMESTER.

BOOKS RECOMMENDED

	TITLE	AUTHOR
1.	B.Sc Practical physics	C.L. Arora
2.	Practical Physics	Worsnop & Flint
3.	Practical Physics	Chauhan & Singh (Vol.I & Vol. II)

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks : 50
Course No: CHM-209 **P** Prac/Lab
Course Title: Engineering Chemistry Lab-II **2** **50**
Branch : Common to all branches
Duration of Exam : 3 Hours

EXPERIMENTS

1. Determine the total hardness of a sample of water by complexometric method (using EDTA).
2. Determine the chloride content in supplied water sample using Mohr's method (Argentometric method).
3. Determine dissolved oxygen in the given sample of water (winkler's method).
4. Determine the free chlorine in the given sample of water.
5. Determine the acidity of a given water sample.
6. Determine the alkalinity of a given water sample.
7. Determine the percentage of calcium oxide in cement.
8. Organic Analysis: Identify the following organic compounds (preparation of at least one derivative).
    a) Carboxylic acids
    b) Compounds containing alcoholic and phenolic OH groups
    c) Aldehydes & Ketones
    d) Carbohydrates
    e) Amides, amines, anilides and nitro compounds
    f) Hydrocarbons
    g) Compounds containing sulphur or halogen

LIST OF BOOKS RECOMMENDED

1. Experimental Engineering Chemistry — Shashi Chawla
2. Lab. Manual on Engineering Chemistry — Basin, S K & Sudha Rani
3. A Manual of Practical Engineering Chemistry — Dr. Rajinder Kumar

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATIONS TO BE HELD IN JUNE, 2011 ONWARDS

B.E 2ND Semester Maximum Marks : 75

Course No: COM-210 **P** Prac/Lab

Course Title: Computer Programming Using C Lab. **2** **75**

Branch : Common to all branches

Duration of Exam : 3 Hours

The practicals will be based on the topics covered under Theory Syllabus. The Students are required to perform at least 15 Programs.

UNIVERSITY OF JAMMU, JAMMU.

COURSE SCHEME

FOR B.E 3RD SEMESTER APPLIED ELECTRONICS & INSTRUMENTATION

FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-301	Electronics Devices & Circuits-I	3	2	0	100	50	--	150
EE-315	Electrical Measurements	3	2	0	100	50	--	150
MTH-311	Engineering Mathematics-III	3	2	0	100	50	--	150
M-314	Thermal Engineering	3	2	0	100	50	--	150
EE-301	Principle of Electrical Engg.	3	2	0	100	50	--	150
EE-302	Network Analysis	3	2	0	100	50	--	150
EE-308	Electrical/Electronics Workshop	0	0	2	---	--	30	30
EE-309	Basic Electrical Engg. Lab	0	0	2	---	--	30	30
EE-316	Electrical Measurement Lab.	0	0	2	---	--	40	40
	Total	**18**	**12**	**06**	**600**	**300**	**100**	**1000**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	0	100	50

CLASS: BE 3RD SEMESTER
BRANCH: E&C, EE, AEI
COURSE NO: ECE-301
COURSE TITLE: ELECTRONIC DEVICES & CIRCUITS-1
DURATION OF EXAM: 3 HOURS.

SECTION - I

SEMICONDUCTOR PHYSICS:

Structure of atoms, Energy band diagram, Metal, insulator and semiconductor, Intrinsic & extrinsic semiconductors, Direct & indirect semiconductors, Bond in semiconductor & effect of temperature on semiconductors, Hole & Electron description, Charge densities in semiconductor, Generation & recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Mass action law, Current density, Drift & diffusion currents, Hall effect, Hall coefficient & its applications. Continuity equation, Fermi level in intrinsic and extrinsic semi conductors, Numerical problems.

SEMICONDUCTOR DIODES:

Introduction to P-N junction diodes, Equivalent circuit & symbol, P-N junction as rectifier, Ohmic contact & rectifier rectifying contact, Short circuit & open circuit P-N junction diodes, Current components in P-N junction diode & law of junction, Volt ampere characteristics, Temperature dependence of V-1 characteristics, Diode capacitances, Static & dynamic resistances, Concept of load line, Zener diode and its break down phenomena, Tunnel diode, Schottky diode, LED, photo diode, varactor diodes.

SECTION - II

RECTIFIERS & FILTERS:

Half wave, Full wave & bridge rectifiers with necessary derivations, Voltage regulation ,Capacitor filter, Inductor filter, L-C filter with necessary derivation for ripple factor, Bleeder resistor, Numerical problems.

DIODE CLIPPER & CLAMPER CIRCUITS:

Diode series & shunt clippers, Clipping at two dependent levels, Diode comparator circuit, Clamping circuits, Clamping at certain voltage level, steady state output waveform for a Sq. wave input, Clamping circuit theorem, Diode sampling gates.

LINEAR WAVE SHAPING CIRCUITS:

RC (both high pass & low pass), RLC circuits & their response to various waveform such as sinusoidal step Voltage, Pulse, Square wave, Ramp etc. RC circuit as differentiation & integration.

BOOKS RECOMMENDED:

01.	Integrated Electronics	By Millman Halkias
02.	Electronics Devices	By Bolystead
03.	Electronics Devices	By Malvino Leach
04.	Pulse, Digital & Switching Wavefrom	By Millman & Taub
05.	Pulse Circuits	By D.A. Bell
06	Solid state electronics devices	By B.G.streetman

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

CLASS: B.E 3RD SEMESTER
BRANCH: COMPUTER & AEI ENGINEERING
COURSE TITLE: ELECTRICAL MEASUREMENT
COURSE NO.: EE- 315
DURATION OF EXAM: 3 HOURS

L	T	P	MARKS	
			Theory	Sessionals
3	1	-	100	40

SECTION-A

Measurement & Error: - Measurement, significance of measurement, Methods of measurements, Instrumentation & their classifications, Sensitivity, resolution, accuracy, precision, significant figures, absolute and relative errors, types of errors, limiting errors, linearity & probability of errors.

Analog & Digital Instruments: - Analog multimeter as voltmeter, ammeter & ohmmeter, Electronic multimeter, voltmeters & ammeters for measurement of a.c. currents & voltages, thermo instruments, True RMS responding voltmeter.

Digital multimeter as voltmeter, ammeter & ohmmeter, Digital L.C.R measurements, Digital frequency meter, ratio measurement, period measurement, Time Interval measurement.

SECTION-B

Bridge Measurements :- Wheatstone bridge, Kelvin bridge, AC bridges, Maxwell, Hays Bridge, Schering bridge, Wagner Ground connection, Wein bridge

Oscilloscopes:-Block diagram ,CRT, probes, deflection amplifiers & delay line, source & coupling for trigger generator, automatic time base, Dual trace oscilloscope, sweepmode measurements of voltage, phase, frequency , dual beam oscilloscopes

Transducers & data acquisition systems:- Classification of transducers, selecting a transducer, strain guages, Displacement ,temperature measurements, photosensitive devices Introduction, Block diagram representation, Recorders, necessity of recorders, Recording requirements, classification of recorders.

References:

1. A Course in Electrical & Electronic Measurement & Instrument.(Dhanpati) – A.K. Sawhney.
2. Electrical Measurement & Measuring Instruments (ELBs) – F.W. Golding.
3. A course in Electrical & Electronic Measurement & Instrumentation – J.B. Gupta.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

L	T	MARKS	
3	*2*	*Theory*	*Sessionals*
		100	**50**

CLASS: B.E 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: ENGINEERING MATHEMATICS – III
COURSE No. MTH-311
DURATION OF EXAM: 3 HOURS

SECTION - I

LAPLACE TRANSFORMS:
Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms, LT of unit step function, Impulse function, Periodic function, Initial value theorem, Final value theorem, Convolution theorem, Application of LT to solve linear differential equations and convolution type integral equations.

INTEGRAL TRANSFORMS AND FOURIER INTEGRALS:
Integral transforms and Fourier Integrals Fourier integral theorem, Fourier sine and cosine Integrals, and their inverses.

SECTION - II

SPECIAL FUNCTIONS**:**
Special Functions Legendre polynomials, Rodgrigue's formula, Recurrence formulae, generating function, Orthogonality of Legendre polynomials, Bessel function of Ist kind. Recurrence formulae, generating function, Orthoganality of Bessel function.

BOOLEAN ALGEBRAS:
Boolean Algebras, Lattices, Finite Boolean algebra, C.N.F and D.N.F, Application of Boolean algebra to switching theory.

Books Recommended:-

01. Higher Engineering Mathematics — B.S. Grewal
02. Boolean Lattices — V.K. Khanna
03. Engineering Mathematics-III — Bhopinder Singh

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**0**	**100**	**50**

CLASS: B.E. 3RD SEMESTER

BRANCH : APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: : THERMAL ENGINEERING
COURSE NO.: M-314
DURATION OF EXAMINATION: 3 HOURS.

UNIT-1

Thermodynamics: Dimensions and units, Basic concepts, Zeroth Law, Temperature scale. First Law of Thermodynamics for closed system and open system, applications, general energy equation for steady flow.

Second Law of Thermodynamics, Reversible and Irreversible processes, Carnot cycle, Clausius theorem, Entropy, entropy change, Clausius inequality, Principle of increase of entropy.

Ideal gases and process calculations.

UNIT-2

Principles of Refrigeration, Vapour compression cycle, Components of Vapour compression systems, COP and related calculations

UNIT-3

BOILERS: Fire tube and Water tube boilers- description and special features, fields of application.

UNIT-4

Properties of steam and process calculations.

Vapour Power Cycles: Carnot's cycle, Rankine cycle, and elementary cycle calculations.

Nozzles: Types, Nozzle efficiency, Critical pressure ratio, Throat and exit areas.

RECOMMENDED BOOKS:-

1.	Heat Engineering	Vasandani & Kumar	--Metropolitan Book Co.
2.	Engineering Thermodynamics	Gupta & Prakash	--Nek Cahnd
3.	Engineering Thermodynamics	PK Nag	--Tata McGraw Hill

NOTE: There shall be total Eight questions, Two from each Unit. Five questions have to be attempted selecting at least One from from each Unit. Use of Steam tables, Mollier diagram, Refrigeration tables & charts and a scientific calculator will be allowed in the examination hall.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**-**	**100**	**50**

CLASS: B.E. 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: PRINCIPLES OF ELECTRICAL ENGINEERING
COURSE NO.: EE-301
DURATION OF EXAMINATION: 3 HOURS.

SECTION - I

Electric Circuit Laws and D.C. Circuits, loop and Nodal methods Superposition Principle, Series Parallel transformation. Star-Delta Transformation. Thevinin's Theorem. Norton's Theorem. Maximum Power Transfer Theorem. A.C circuits: - Basic definition vector and complex number representation. Solution of sinusoidally excited R.L.C Circuits. Concept of Active and Reactive Power.

SECTION - II

Steady state A.C three phase's circuits. Measurement of power in three phase balance circuits. Single phase transformers; no load and on load vector diagrams; regulation and efficiency.

BOOKS RECOMMENDED:

1. **Principle of Electrical Engineering by Del Toro**
2. **Electrical Technology by H. Cotton**
3. **Basic Electrical Engineering by Higgin Bootham et al.**
4. **Electrical Technology by E. Hughes**
5. **Elements of Electrical Engineering by M.M.Louis**
6. **Electric Circuit Theory by J.A. Edminister**

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**-**	**100**	**50**

CLASS: B.E. 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: NETWORK ANALYSIS
COURSE NO.: EE - 302
DURATION OF EXAMINATION: 3 HOURS.

SECTION - I

Network elements and circuits, Topological description of network. Formulation of network equation. Laplace transforms technique. Network functions for one-port and two-port network.

SECTION II

Pole zero configurations. Parameters of two-port networks. Response of networks for step and sinusoidal inputs, Filters. Foster's reactance theorem and Cauer forms: response analysis.

BOOKS RECOMMENDED:

1. Networking Analysis and Synthesis by Kuo
2. Network Analysis by Van Valkenburg
3. Network Fields and lines by Ryder

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**30**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-308
COURSE TITLE: ELECTRICAL & ELECTRONICS WORKSHOP

Unit-I

Study of Wires & Cables: Study of various type of wiring, Cost estimation for wiring of a single storied building having light & power circuits, Method of earthing & measurement of earth resistance, Electrical shock precautions & treatment, jointing of wires & cables, Soldering of joints, Wiring practices in PVC, Conduit system of wiring, Control of fluorescent lamp circuit power & ordinary circuits suitable for domestic wiring.

Unit-II

Familiarization with Various Electronic Components: Resistor, Capacitors, Transistors, Diodes IC's, Transformer, Assembly of signal phase, Full wave rectifier circuit with capacitor filter, Assembling the common emitter amplifier circuit, Assembling the following circuit comprising of IC's on a bread board, Like timer circuit using IC 555 & Fabrication on General purpose PCB (to get familiar with soldering techniques).

BOOK RECOMMENDED:

01. Electrical Wiring & Estimation By S.I. Uppal

NOTE: The Electronic circuit diagram may be provided to the students. The operation of the circuit need to be explained. The purpose of the exercise is to familiarize the student to assemble a given Electronic circuits & to solder the joints

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**30**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-309
COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB.

1) Verification of Kirchoff's Laws.
2) Verification of Superposition Theorem.

3) Verification of Thevinin's Theorem.

4) Verification of Reciprocity Theorem.

5) Verification of Maximum Power Transfer Theorem.

6) Measurement of current in various branches of RLC series-parallel circuit.

7) Single phase power measuring by using a Wattmeter.

8) Study of three-phase A.C Circuits with Star and Delta connected Load.

9) Study of single phase transformers. Determination of voltage Ratio, Turns Ratio and Polarity Test. Open circuit and short circuit test of given single phase transformer. Determination of regulation and efficiency.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2011 ONWARDS

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**40**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-316
COURSE TITLE: ELECTRICAL MEAUSREMENT LAB.

1. Measurement of R. L. & C by using RLC bridge instruments.
2. Measurements of Resistance by using
    a) Wheatstone bridge.
    b) Kelvin's Double Bridge.
3. Study of various types of Multimeters.
4. Demonstration of M.C., M.I. and Dynometer type instruments.
5. Measurement of self inductance, mutual inductance and coupling coefficient of
    a) Transformer windings and
    b) Air-cored coils.
6. Extension of the range of Ammeter, Voltmeter, and Wattmeter, using Shunt/series resistance and instrument transformers.
7. Calibration of single phase energy meter by
    a) Direct loading
    b) Phantom loading at various points.
8. Calibration of three phase energy meter using standard Wattmeter.
9. Measurement of Capacitance using Schering Bridge.

10. a) Measurement of Power factor at Consumers terminals.

b) Measurement of Maximum KVA demand of a consumer.

Measurement of A.C. Potentials using A.C. Potentiometer.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME

FOR B.E. 4TH SEM. APPLIED ELECTRONICS & INSTRUMENTATION
FOR EXAMINATIONS TO BE HELD IN JUNE 2010, 2011 & 2012

Course No.	Course Name	Hours/ Weeks			Marks			
		L	T	P	Thry.	Sess.	Pract.	Total
ECE-401	**ELECTRONICS DEVICES AND CIRCUITS - II**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
ECE-415	**E.M. THEORY**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
AEI-401	**TRANSDUCER ENGINEERING**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
AEI-402	**ELECTRONIC MEASUREMENT & INSTRUMENTATION**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
EE-411	**ELECTRICAL MACHINES**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
COM-411	**OOAD WITH C++**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
ECE-410	**ELECTRONICS DEVICES AND CIRCUITS LAB.**	**..**	**..**	**2**	**..**	**..**	**40**	**40**
EE-412	**ELECTRICAL MACHINES LAB.**	**..**	**..**	**2/2.**	**..**	**..**	**40**	**40**
AEI-403	**TRANSDUCER ENGINEERING LAB.**			**2/2.**	**..**	**..**	**40**	**40**
COM-412	**OOAD WITH C++ LAB.**			**2**			**40**	**40**
	TOTAL	18	12	6	600	240	160	1000

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: ECE-401
COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS-II
DURATION OF EXAM: 3 HOURS

SECTION - I

BIPOLAR JUNCTION TRANSISTOR: Introduction, Transistor basics (unbiased & biased transistor), Generalized transistor equation, Transistor current components, Early effect, Ebber-Moll Model,Transistor configurations & characteristics, Reach through & avalanche phenomena, numerical problems.

TRANSISTOR BIASING: Introduction, Need for Biasing, Type of biasing circuits with necessary derivations, Load line concept t (AC & DC), Bias stabilization (S, S' S"), Thermal runway, Bias Compensation Techniques.

FIELD EFFECT TRANSISTOR: Introduction, Construction of JFET, Operation, Symbol, JFET- Characteristics, JFET Parameters and their relationship, Biasing methods of FET, with necessary derivations. Comparison between JFET and BJT & MOSFET, FET small signal model, Frequency response of FET amplifier, Low frequency model of Common Source & Common drain Amplifiers & their analysis. MOSFET (Depletion & enhancement), Characteristics, Symbol and Operation.

SECTION - II

HYBRID PARAMETERS: Introduction, Two port network, hybrid model for CE, CB, & CC configuration with necessary derivations, Analysis of transistor CE amplifier with & without emitter resistance, Determination of h-parameters from characteristics, Miller theorem, approximation model of h- Parameter, Amplifiers and their analysis using h-parameters.

SINGLE & MULTISTAGE AMPLIFIERS: Need for cascading, Two stage cascade amplifiers, N-stage cascade amplifiers, Gain of multistage amplifiers in decibels, Techniques for improving input resistance (Darlington transistor, Bootstrap emitter follower, Cascode amplifiers), Method of coupling multistage amplifiers (RC coupling, DC coupling, transformer coupling), Frequency response of an amplifiers, Effect of emitter & bypass capacitors on the bandwidth & frequency response of a cascaded amplifiers, Square wave testing of an amplifier, Bandwidth of multistage amplifiers.

BOOKS RECOMMENDED:

01. Integrated Electronics By Millman Halkais
02. Electronics Devices By Bolystead
03. Electronics Devices By Malvino Leach

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: ECE-415
COURSE TITLE: E. M. THEORY
DURATION OF EXAM: 3 HOURS

SECTION -I

Electrostatics: **Revision of vector analysis with to Cartesian, Spherical and polar coordinates, Coulomb's law, Electric field, Electric flux density, Gauss's law, Divergence theorem. Electrostatics potential, Potential gradient, Gradient operator, Conductors, Method of images, Energy density in electrostatics field, Electric field in dielectric media, Capacitance, Solution of Electrostatic problems using Posson's & Laplace equation.**

Magnetostatics: **Biot-Savart's & Ampere's circuital laws, & their applications, Stocks theorem, Magnetic flux & Flux density, Magnetic potential, Force on a moving charge, Torque on a closed circuit, Energy density in the magnetic field.**

SECTION -II

Time Varying Field & Maxwell Equation: **Faraday's laws, Displacement current, Maxwell equation in point & integral form, Application of Maxwell equations to circuits, Resonant cavity, & Radiation antennas, Rotating magnetic field theory.**

Uniform Plane Wave: **Wave motion in free space, & in perfect dielectric, Plan wave in lossy dielectric, Poynting vector, Propagation in good conduction, Skin effect, Reflection of uniform plane wave, Standing wave ratio, Polarization.**

Book Recommended:

01. Engineering Electromagnetic By Jseph A. Edminister
02. Introduction to Electromagnetic By Griffith
03. Foundation Electromagnetic By Reitz et al
04. Engineering Electromagnetic By Jr. Hyat

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

L	T	P	MARKS THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: AEI-401
COURSE TITLE: TRANSDUCER ENGINEERING
DURATION OF EXAM: 3 HOURS

SECTION -I

Transducer & its Characteristics

Transducer / Sensors : Definition & Principle, Classification & selection of transducer
Characteristics : Static characteristics:- Accuracy, Precision, Sensitivity, Linearity, Hysteresis.
Mathematical Model : Zero, Fist & second order transducer response to different input of Transducers.

Type of Transducers

Resistive Transducers : Resistive potentiometer, Hot wire resistance transducer.
Capacitive Transducer : Variable type area, Variable distance type, Variable dielectric constant. (Variable permittivity).
Inductive Transducers : LVDT, Eddy current type, Inductive potentiometer.
Piezoelectric Transducers : Piezoelectric phenomenon, Piezoelectric force & torque transducer, Piezoelectric strain transducer.
Strain Gauge : Bounded type, Unbounded type, Wire type & semiconductor type.

SECTION -II

Temperature Transducer

Temperature scales (^{0}C, ^{0}F, ^{0}K), Resistance thermometer (RTD), P-N Junction thermister, Glass thermometer, couples, Errors in temperature measurement.

Radiation / Photo Transducers

Introduction, Basic characteristics, Type – Photoemissive cell, Photo multiplier, Photo conductive cell, Photovoltaic cell, Photo resistors & Photo transistors, Hall effect transducer.

REFERENCE:-

01. A course in Electrical & Electronic Measurement & Instrumentation A.K. Sawhney
02. Instrumentation Measurement & Analysis B.C. Nakra & K.K. Chaudary

03. Transducers & Instrumentation D.V.S. Muethy
04. Handbook of Transducers H.N. Norton

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: AEI-402
COURSE TITLE: ELECTRONICS MEASUREMENTS & INSTR.
DURATION OF EXAM: 3 HOURS

SECTION -I

Measurement & Errors: **Sensitivity, Resolution, Accuracy & precision, Significant figures, Absolute & relative errors, Type of errors, Probability of errors and limiting errors, Linearity.**

Analog & Digital Instruments:
Analog Instruments:- Multimeter, A.C Voltmeters using rectifiers, Wave analyzer, Harmonic distortion analyzers.

Digital Instruments:- **Digital Voltmeter, Digital Multimeter, Digital LCR Measurements, Digital frequency meters & its applications.**

SECTION -II

Oscilloscopes: **Block diagram, CRT, Deflection amplifier & Delay time, Source & coupling of trigger generator, Automatic time base, Dual trace Oscilloscopes, Sweep modes, Measurement of voltages, Frequency & phase, Pulse measurements.**

a) Special Oscilloscopes: **CRT storage Target characteristic, Sampling Oscilloscopes, Digital storage Oscilloscopes, Spectrum analyzer.**

b) HF Techniques: **Shielding & Grounding, Q – Meter, Vector Impedance Meter.**

Books Recommended:
01. Electronic Instrument & Measurement Technique : Cooper W.D. & Helfrick A.D.
02. Electronic Instrument & Measurement : Bell D.A.
03. Electronic Measurement & Measuring Instrument : A.K. Sawhney

04. Electronic Instrumentation & Measurement : Oliver B.M & Cage J.M.
05. Electronic Instrumentation : H.S. Kalsi

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-411
COURSE TITLE: ELECTRICAL MACHINES
DURATION OF EXAM: 3 HOURS

SECTION -I

D.C. GENERATORS:**- Operating principle, constructional features, E.M.F equation, Armature reaction and commutation, operating characteristics losses and efficiency.**

D.C. MOTORS:**- Operating principle, back EMF, Torque equation, Starters, speed control, operating characteristics, and their applications.**

TRANSFORMERS:**- Principle of operation, Vector diagram, Regulation efficiency parallel operation tap changing auto transformer.**

SECTION -II

SYNCHRONOUS GENERATORS: **- Principle of operation, E.M.F equation, Leakage reactance, Vector diagram, Voltage regulation by EMF and MMF method.**

SYNCHRONOUS MOTORS: **- Principle of operation, Vector diagram, V-curves and inverted V-curves, method of starting, Applications.**

INDUCTION MOTORS:**- Principle of operation, TYPES OF MOTORS, Equivalent circuits, Torque and power calculations, No load and blocked rotor test, speed control, Method of starting, Applications.**

SPECIAL A.C. MACHINES: **- Repulsion motors, A.C series motors, Universal motor, single phase induction motor, application.**

BOOKS RECOMMENDED:

1) A.Langsdrof Theory of A.C Machines
2) Clayson and Hancock Principles of D.C. Machines
3) M.G. Say Performance and design of A.C Machines
4) H.A. Cotton Advanced Electrical Technology

NOTE : There shall be a total of eight questions. Five questions have to be attempted by selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS: B.E 4TH SEMESTER
BRANCH: APPLLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: OOAD WITH C++
COURSE NO. COM –411
DURATION OF EXAM: 3 HOURS

SECTION - I

1. Review of Pointers: Passing parameters, Array of Pointers, Character Pointers. Programming Techniques: Unstructured, Procedural, Modular. Introduction to objects, object & cohesion. (30)

2. Overview of C++, Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments.
Classes, Metaclass, Abstract class, Public and private variables, Constructor and Destructor Functions, Constructors taking parameters, Object pointers, In-Line Functions, Automatic Inlining, Friend Functions, This Pointer, New & Delete, Array of Objects. (50)

SECTION-II

1. Function Overloading, Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & logical Operators. (30)
2. Inheritance, Using Protected Members, multiple inheritance, Virtual Base Classes, Introduction to Virtual Functions. (30)
3. C++, I/O Basics, Ifstream, Ofstream, Fstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read(), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp(). (20)

BOOKS RECOMMENDED:

1. Turbo C++ by Robert Lafore**.**

REFERENCE BOOKS:

1. Programming in C++ by Balaguruswamy.
2. C++ the Complete Referance by Herbert Schildt.
3. Mastering C++ by K.R. Venugopal & T. Ravishankar & Raj Kumar**.**

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU
For Examination to be held in June 2010, 2011 & 2012

MARKS

P	PRACTICAL
2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION
Course No: ECE-410
Course Title: Electronics Devices & Circuits Lab
DURATION OF EXAM: 3 HOURS

List of Practicals

1. **To study the operation characteristics of the P.N. junction, Ge/Si (Forward & Reverse Characteristics).**
2. **To study the operation characteristics of Zener diode (Forward & Reverse Characteristics).**
3. **Half wave Rectifier.**
4. **Full wave / Bridge Rectifier.**
5. **To study the operation characteristics (Input / Output) of PNP / NPN Transistor (Common Emitter / Common Base).**
6. **To study the frequency response of signal amplifier (CE/CB).**
7. **To study the characteristics of FET.**
8. **Determination of h parameter from transistor characteristics.**
9. **Design of self Bias circuits using BJT.**
10. **Design of self Bias circuits using FET.**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2/2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION

Course No: EE-412
Course Title: ELECTRICAL MACHINES LAB
Duration of Exam: 3 Hours

1. **To study the magnetic characteristics of a D.C. Machines at various operating speeds and finds the operating point of D.C. shunt machine from the same.**
2. **To determine the load characteristics of a D.C. Shunt generator and find its overall efficiency.**
3. **To determine the Torque speed characteristics of a D.C. Shunt motor and compound motor (Short & long shunt). Also study of these using armature control and field control.**
4. **To study the torque/speed characteristics of a D.C. series motor using various field tapings.**
5. **To find the efficiency and study various losses of D.C. Machines using Hopkinson test.**
6. **To study a single phase transformer, its Voltage ratio and turns ratio relationship. Perform open & short circuit test to determine losses, efficiency and voltage regulation and also its various parameters.**
7. **To perform polarity test on single phase transformers for parallel operation and study the load sharing of two parallel operated transformers.**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2/2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION
Course No: AEI-403
Course Title: TRANSDUCER ENGINEERING LAB.
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. **To study the strain gauge characteristics.**
2. **To study the characteristics and weight measurement by load cell.**
3. **To study the constructional details of LVDT and its application in thickness measurement.**
4. **To study the flow measurement by differential pressure type transducer.**
5. **To study the characteristics of LDR, thermostat and thermocouples.**
6. **To study the testing and calibration of T,J,K,R and S thermocouples.**
7. **To study the voltage –intensity characteristics of a photo-transistor.**
8. **To study the ramp response characteristics of filled in system thermometer.**
9. **To study step response of RTD and thermocouple.**

10. **To study force and torque transducers.**
11. **To study the characteristics of photoelectric tachometer.**
12. **To study the working details of electrical pressure probes.**
13. **To study Hall Effect Transducer.**
14. **To study the characteristics of Accelerometer Model.**
15. **To study the characteristics of Angular Potentiometer Transducer Model.**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2	40

CLASS: B.E 4TH SEMESTER
BRANCH: APPLLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: OOAD WITH C++ LAB.
COURSE NO. COM-412
DURATION OF EXAM: 3 HOURS

The Practical's will be based on Computer Languages Theory Syllabus. The students are required to submit at least 10 Programs covering at least 2 programs from each unit.

DETAILED SYLLABUS FOR THE B.E 5th SEMESTER
APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING

S.No.	Course No.	Course Name	Lecture L	Tutorial T	Practical P	Marks			Total
						Theory	Tutorial	Practical	
1	ECE-501	Electronics devices & circuits - III	3	2	-	100	40	-	140
2	ECE-503	Digital Electronics	3	2	-	100	40	-	140

3	ECE-504	Linear Integrated Circuit	3	2	-	100	40	-	140
4	AEI-503	Industrial Intrumentation1	3	2	-	100	40	-	140
5	AEI-504	Linear Control Systems	3	2	-	100	40	-	140
6	ECE-509	Communication Engineering	3	2	-	100	40	-	140
7	ECE-511	Electronics devices & circuits -lab	-	-	2/2	-	-	40	40
8	ECE-512	Digital Electronics Lab	-	-	2/2	-	-	40	40
9	AEI-507	Linear Integrated Circuit(LIC)			2	-	-	40	40
10	AEI-508	Linear Control System lab			2	-	-	40	40
		Total	**18**	**12**	**6**	**600**	**240**	**160**	**1000**

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-501**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Electronics Devices & Circuits – III**	**3**	**2**	**0**	**100**	**40**

Section-A

Transistor at High Frequencies: Introduction, Hybrid (Pie) model, Relation between hybrid pie & h-parameters, Validity of hybrid-pie-model, Variation of hybrid-pie-parameters, Current gain with & without resistive load, Gain bandwidth product, Single stage CE transistor amplifiers response, Emitter Follower at high frequency, Common Drain amplifier at high frequency.

Feedback Amplifier: Classification of amplifiers, Limitation of basic amplifier, Distortion in amplifier, need for feedback, Feedback concept, Advantages of negative feedback, Ways of introducing negative feedback in amplifiers, Gain with & without feedback, Effect of negative feedback on input – output resistance & bandwidth amplifiers, Their respective analysis for

feedback amplifiers, Procedure for analysis of feedback amplifiers, Analysis of different Topologies.

Oscillators: Introduction, Necessity of oscillator, Gain with feedback, Barkhausein criteria, Types of oscillators, Requirements of oscillator, RC oscillators & phase shift oscillators, Wien bridge oscillators, LC oscillators, with necessary derivations to determine gain required for oscillation & frequency of oscillation, Amplitude & frequency stability of oscillators, Crystal oscillators, Multivibrators: Monostable, Astable, Bistable, (with necessary derivations), using transistors.

Section-B

Power Amplifiers: Introduction, General features of power transistor, Difference between power transistor & a voltage amplifier, Need for power amplifier, Classification of power amplifiers with necessary load lines concept & derivations (Efficiency, power dissipation), Class A, B & AB amplifier, their types & analysis, Cross over distortion & its remedy, Determination of harmonic distortion, Heat sinking for power transistor, Monolithic power amplifier, Tuned amplifier – Introduction, Classification of tuned amplifiers (single tuned & double tuned) with respective analysis.

Voltage Regulator: Introduction & necessarily of voltage regulators, Difference between unregulated & regulated power supply, Factor affecting unregulated power supply, Stabilization, Basic representation of voltage regulators Type of voltage regulators-series & shunt voltage regulators, Series voltage regulators using emitter follower & its expressions for Sv & Ro, Preregulators, Short circuit protection-simple & fold back current limiting, Zener regulators, & its analysis, Monolithic regulators.

Note: There shall be total eight questions of 20 marks each , four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Books Recommended:

01. Integrated Electronics By Millman Halkias
02. Electronics Devices By Boylstead
03. Electronics Devices By Malvino Leach

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

		L	T	P	Theory	Sessional
Course No.	**: ECE-503**					
Course Title	**: Digital Electronics**	**3**	**2**	**0**	**100**	**40**

Section-A

Number System, Radix conversion, Arithmetic with base other than ten, Data representation – fixed & floating points, Binary codes – weighted/Non weighted codes, Error detecting & correcting code (Hamming code), Alphanumeric code, Subtraction of signed/unsigned number.

Logic Gates, Boolean algebra, Simplification of Boolean expressions, Minimization techniques, Karnaugh map (up to five variables), Simplification of Logic families – RTL, DTL, TTL, ECE & MOS families and their characteristics.

Section-B

Combinational logic circuits: Half and Full adders, Subtractors, BCD Adder, Comparators,

Multiplexer, Realization of function using MUX, Demultiplexer, Decder, Encoder, Code converters, General problems, PLA, Design of combinational circuit using PLA & PAL.

Introduction to sequential logic circuits, Synchronous and Asynchronous operation, Flip-Flops – R-S, J-K, D, T & Master-Slave flip-flop, Conversion of flip-flops, Shift registers, Analysis of asynchronous & synchronous sequential counter, Design of sequential logic circuits, Problem formulations, State minimization techniques.

Books Recommended:

01.	Digital Electronics	By R.P Jain
02.	Digital Electronics & Microcomputer	By R.K. Gaur
03.	Computer System Architecture	By M.M. Mano
04.	Digital Electronics	By Jamini & K.M. Backward

Note: There shall be total eight questions of 20 marks each , four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-504**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Linear Integrated Circuits**	**3**	**2**	**0**	**100**	**40**

Section-A

Basic Operational Amplifier: Basic differential amplifiers, Its working & types, Transfer characteristics, small signal analysis of differential amplifier, Using h-parameter, Differential gain & common – mode gain, Constant current basic circuit, Constant current source/current mirror circuit, Level shifting techniques active load, Output stage.

Ideal & Practical Op-Amp & their Characteristics: Ideal voltage transfer curve, Open – loop Op-amp configurations, Op-amp as inverting, Non-inverting amplifier, Differential amplifiers using one and two Op-amp, Op-amp Characteristics, Measurement of Op-amp parameters, Offset voltage compensating n/w, Frequency response of internally compensating Op-amp, High frequency Op-amp equivalent circuit, Open loop & close loop frequency response, Circuit stability, Slew rate its cause.

Section-B

Op-Amp & its Applications, DC & AC Amplifier, AC amplifier with single power supply, Peaking amplifier, Summing, Scaling & Averaging amplifiers, Differential input / Differential output amplifier, High input impedance circuit, Active filters, Integrator, Differentiator, Instrumentation amplifier,

Waveform generators Sq. wave, Triangular, save tooth, Sine wave generator, Op-amp, as clipper, Clamper & comparator circuits, Sample / hold circuit, Comparator characteristics, Voltage limiter, Zero crossing detector, Digital & analog converter, Binary weighted resistor, R-2R

resistor type D/A converters, A/D converters & its types-successive approximation type,

Phase-Locked Loops & Timers: Block diagram, Operation & applications

Books Recommended:

01.	Op-Amp & Linear Integrated Circuit	By Ramakant A. Gayakwad
02.	Linear Integrated Circuit	By Wixer
03.	Linear Integrated Circuit	By Tobey Graeme & Huelsomen
04.	Op-Amp Design Application	By Dailey
05.	Design with Op-Amp	By Franco

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

. Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: AEI-503**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Industrial Instrumentation-1**	**3**	**2**	**0**	**100**	**40**

Duration of Exam: 3 Hours

SECTION-A

1) MEASUREMENT OF FORCE, TORQUE, VELOCITY

Electric Balance or Force Measurement, Different types of load cells, Pneumatic & Hydraulic Load Cells, Elastic Load Cells **,**Strain-gauge Load Cells, Different types of Torque Measurements, Strain-gauge Torque Meters, Inductive Torque Transducer, Digital Methods, Speed Measurement: Linear Velocity Measuremen -Moving coil type ,Moving magnet type, Angular Velocity measurement,D.C. & A.C. Tachogenerators, Drag-Cup Tachogenerators, Shaft Speed Measurement, Stroboscope & Strobotron.

2) Measurement of Acceleration, Vibration, & Density

Accelerometers,LVDT Accelerometers, Piezoelectric Accelerometers, Potentiometer-type Accelerometers, Strain-Gauge Type Accelerometer, Variable Reluctance Type Accelerometers, Mechanical Type Vibration Instruments, Seismic Instrument as an Accelerometers & Vibrometer Vibration PICK-UPS, Calibration of Vibration Pick-Ups, Constant acceleration method, Sinusoidal motion method, Transient Motion Method, Definitions & Units of Density, Specific Gravity & Viscosity Used In Industries, Baume Scale & API Scale, Densitometers, Pressure-Head Type Densitometer, Float-Type Densitometer, Ultrasonic Densitometers, Bridge Type Gas Densitometers.

SECTION-B

1) Pressure Measurements

Introduction, Units of Pressure, Low Pressure Measurement, Manometers & Its Types, U-Tube, Well Type, Inclined Type, ring balance & micro-manometer, Elastic Type Pressure Gauges, Bourdon Tube C-Type, Spiral, & Helix, Bellows, Diaphragms, Electrical Methods of Pressure Measurement, Strain-Gauge Pressure Transducer, Capacitive Pressure Transducer, Resonant Wire Pressure Transducer, Piezoelectric Pressure Transducer, LVDT Pressure Transducer, Vacuum Pressure Measurement, Mcleod Gauges, Thermal Conductivity Gauges, Thermocouple Gauges, Pirani Gauges, Ionization Gauges, Cold Cathode & Hot Cathode Gauges, Testing & Calibration of Pressure Gauges, Dead Weight Tester.

2) Temperature Measurement

Definitions & Standards, Calibration of Thermometers, Filled-In System Thermometers, Liquid Filled System, Vapour Pressure Thermometers, Gas Thermometers, Mercury Filled Thermometers Sources of Filled-In Systems & Their Compensation, Bimetallic Thermometer, Electrical Methods of, Temperature

Measurement, RTD - Characteristics, Construction, Material Used, & 3-Lead & 4-Lead Arrangements Of RTD's.

3) Thermocouple Measurement

Thermocouple, Laws of Thermocouple, Multiple Thermocouple Configurations, Response of Thermocouple, Material Used For Thermocouple, Commercial Circuits for Cold Junction Compensation, Special Techniques for Measuring High Temperature Using Thermocouple

Radiation Pyrometers, Principle, Total Radiation Pyrometer & Partial (selective) Radiation Pyrometer Total Radiation Pyrometers, Optical Pyrometers, Disappearing Filament Type.

Books Recommended:-

1 Principle of Industrial Instrumentation : D Patranabis
2 Mechanical and Industrial Measurements : R.K Jain
3 A Course in Electrical and Electronics Measurements : A.K Sawhney
4 Instrumentation Measurements AND Analysis : B.C Nakra and K.K Chaudary
5 Mechanical Measurements & Instrumentation : A.K Sawhney, Puneet Sawhney

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No. : AEI-504	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title : Linear Control Systems	**3**	**2**	**0**	**100**	**40**

Duration of Exam: 3 Hours

SECTION-A

1) Introduction

Concepts Plant, Systems Servomechanism, regulating systems, disturbances, Open loop control system, closed loop systems, linear and non-linear systems, time variant & invariant, continuous and sampled data control systems, Block diagrams, some illustrative examples.

2) Modelling

Formulation of equation of Linear electrical, mechanical, thermal Pneugmatic andhydraulic system, electrical, Mechanical analogies. Use of Laplace transforms, Transfer function, concepts of state variable modelling. Block diagram representation signal flow graphs and associated algebra, characteristics equation.

3) Time Domain Analysis

Typical test - input signal, Transient response of the first and second order systems. Time domain specifications, Dominant closed loop poles of higher order systems. Steady state error and coefficients. Pole-zero location and stability. Routh-Hurwitz Criterion.

SECTION-B

1) Root Locus Technique:

The extreme points of the root loci for positive gain. Asympotes to the loci, breakway points, intersection with imaginary axis, location of roots with given gain & sketch of the root locus plot.

2) Frequency Domain Analysis:

Closed loop frequency response, bodeplots, stability and loop transfer function. Frequency response specification relative stability, relation between time and frequency response for second order systems. M and N-circles, Log. Magnitude versus phase angle plot. Nyquist stability criterion and Polar Plots.

3) Control Components:

Error detectors- potentiometers and synchronous, servo motor A.C. and D.C. technogenerators, Magnetic amplifiers.

Books Recommended

1. Modern Control Engg. by K. Ogata, Prentice Hall, New Delhi.
2. Control System Components by J.F. Gibsen, Mcgraw Hill.
3. Automatic Control System by B.C. Kuo, Prentice Hall, 3rd Ed.
4. Control System Engineering by I.J. Nagrath & Gopal, Wiley Eastern Ltd., New Delhi.
5. Automatic Control System : B.S. Manke

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-509**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Communication Engg.**	**3**	**2**	**0**	**100**	**40**

SECTION-A

Introduction to Elect. Comm. System, Concept & need for modulation, Definition of signal to noise ratio & noise figure, Representation of signal & system, periodic non-periodic etc. Spectral analysis of signal (Fourier series & Fourier Transforms), Representation of AM. Frequency spectrum of AM wave, Power relation in AM wave, Modulation & demodulation of AM, SSB techniques, Balanced modulator, Type of SSB, Modulation & demodulation of SSB signals.

Theory of FM, Representation & frequency spectrum of FM, Pre-Emphasis, De-Emphasis, Wide band & narrow band FM, Generation & detection of FM signal, Comparison with PM & AM.

SECTION-B

Pulse modulation techniques, Sampling & sampling theorem, Natural & flat top sampling principle generation & detection of PAM, PWM, PCM, DM, ADM, Time division multiplexing, Frequency division multiplexing, Introduction of Digital Modulation Techniques.

Information Theory: Information rate, Entropy, Source-coding & coding Efficiency, Shannon-Fano coding, Huff-man coding, Channel capacity theorem.

Books Recommended:

01, Electronics Comm. System By G. Kennedy
02. Principles of Comm. System By. Taub & Schilling

Reference Book

01. Communication System By Simon Haykins

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-511**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Electronics Devices & Circuits Lab - III**	**-**	**-**	**2/2**	**-**	**40**

List of Practical

01. Determination of voltage gain, Input / output resistance of amplifiers using with & without feedback.

02. Determination of Distortion output power incase of push pull class-B amplifier.

03. Determination of frequency response of class-C tuned amplifier.

04. Study of signal stage class-A power amplifier & determine output power & efficiency.

05. Study of complimentary symmetry pushpull amplifier.

06. Design & determination of stability factor series of zener shunt Regulator / IC Regulator.

07. Design of voltage regulator using series pass transistor.

08. Study of Collpitt, Clapp, Hartley, Weinbridge, Phase regulator & Determine the frequency of output waveform.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-512**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Digital Electronics Lab**	**-**	**-**	**2/2**	**-**	**40**

List of Practical

01. Verification of truth tables of logical gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, gates.

02. Implementation of Boolean expression using AND, OR, NOT, NAND, & NOR logic.

03. Implementation of Decoder, Encoder using IC's & gates.

04. To implement half adder, half subtractor, full adder, full subtractor using different IC's & gates.

05. Implementation of multiplexer, Demultiplexer using IC's & gates.

06. Design of BCD to seven segment display using logical gates & IC's.

07. To design & verification of truth table of SR, JK, MS-JK Flip Flops.

08. To design various asynchronous counters using flip flops, gates & IC's.

09. To design various synchronous counters using flip flops, gates & IC's.

10. To design & Verify the Truth tables of shift Registers.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: AEI-507**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Linear Integrated Circuit Lab**	**-**	**-**	**2**	**-**	**40**

LIST OF EXPERIMENTS

1. Study of Opamp as differentiator / integrator.
2. Study of Opamp as Comparator.
3. Study of Opamp as Schmitt Trigger.
4. Study of Opamp as triangular wave generator.
5. Study of Opamp as D/A Converter.
6. Study of Opamp as A/D Converter.
7. Study of Opamp as Clipper.
8. Study of Opamp as a Rectifier.
9. Design of Monostable Multivibrator using 555 chip.
10. Design of Astable Multivibrator using 555 Chip.
11. Study of op-amp as clamper ckt.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: AEI-508**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Linear Control Systems Lab**	**-**	**-**	**2**	**-**	**40**

LIST OF EXPERIMENTS

At least eight of the following experiments are to be performed:

1. To study input- output characteristics of a potentiometer and to use two potentiometers as an error detector.
2. To study transmitter- receiver characteristics of a synchro set to use the set as controlcomponent.
3. To study the operation of a d-c positional servo system and to investigate the effect of damping and supply voltage on its response.
4. To study the operation of an AC position servo-system and to obtain effects of supply voltage and system parameter on its transient response.
5. To design different compensation network for the given cut off frequencies and to plot frequency response of these networks.
6. To use operational amplifiers as multiplier, summer, inverter and integrator.
7. To simulate a servo-system and obtain its characteristics with the use of controllers.
8. To study control action of light control device.
9. To study details of a magnetic amplifier and to obtain input-output characterization of this amplifier.

10. To study details of a two winding AC servometer and to obtain its T-N characteristics.
11. To study PID- controller and to obtain the effect of proportional, integral and derivative control action.
12. To study details of an analog computer and solve a given second order differential equation using it.
13. To generate a sine-wave using a given analog computer with specified amplifier and frequency.
14. To study a stepper motor and control its direction speed and number of steps with the held of a microprocessor.
15. To obtain dynamic characteristics of a given solar cell array and to obtain the point of operation for maximum power transfer to the load.
16. To obtain T.F. of a field controlled DC. servometer and to show its pole-zero configuration.
17. To obtain T.F. of an armature controlled DC. servometer and to obtain its pole zero configuration.
18. To design, fabricate and to obtain characteristics of a high pass T type filter.
19. To design, fabricate and to obtain characteristics of low pass T type filter.

UNIVERSITY OF JAMMU.

COURSE SCHEME

FOR B.E 6TH SEMESTER APPLIED ELECTRONICS & INSTRUMENTATION ENGG.

FOR EXAMINATION TO BE HELD IN JUNE-2011 ONWARDS

S.No.	Course No.	Course Name	Lecture	Tutorial	Practical	Marks			Total
			L	T	P	Theory	Tutorial	Practical	
1	ECE-601	Microprocessors	3	2	-	100	40	-	140

2	**ECE-602**	Digital signal processing	3	2	-	100	40	-	140
3	**AEI-603**	Industrial Instrumentation-II	3	2	-	100	40	-	140
4	**EE-603**	Power Electronics - I	3	2	-	100	40	-	140
5	**EE-604**	Control System-II	3	2	-	100	40	-	140
6	**HUM-602**	Industrial Management	3	2	-	100	50	-	150
7	**ECE-606**	Microprocessors Lab	-	-	2	-	-	50	50
8	**AEI-608**	Industrial Instrumentation Lab	-	-	2	-	-	50	50
9	**EE-606**	Power Electronics Lab	-	-	2	-	-	50	50
Total			**18**	**12**	**6**	**600**	**250**	**150**	**1000**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class :BE 6th Semester
Branch: ECE/AEI/EE
Course No: ECE-601
Course Title: Microprocessor
Duration of Exam: 3 Hours

			Marks	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**0**	**100**	**40**

Section-A

1. Microprocessor 8085 pin diagram, Architecture, Addressing modes, Instruction set, Instruction format, Timing diagram, Programming techniques with additional instructions, looping, Counting design of counters & time delays, debugging & memory mapping.

2. Stack & Subroutines, Advanced subroutines concept, Call & Ret instructions, Advanced programming (Code conversions, BCD addition/subtraction, Multiplication etc), 8085 interrupts & process….

Section-B

1. Interfacing I/O devices, Basic interfacing concept, Interfacing with scanned multiplexed displays & LCD's, Interfacing output displays, Interfacing i/p devices, Memory mapped i/o design, Memory wait states & access time.

2. Serial I/O data communication, Basic concepts in serial I/O, 8085 serial I/O lines – SID & SOD, Synchronous & asynchronous data communication, Software controlled asynchronous serial I/O.

3. Interfacing to 8085 Microprocessor: PPI – 8155 I/O & timer, PPI – 8255 (mode-0, 1, 2 & BSR), PID 8279 keyboard/display interface, PIC 8259, DMA controller 8257/8237.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Books Recommended:

01.	Microprocessor Architecture Programming & App.	By Ramesh Gaonkar
02.	Introduction to Microprocessor	By Aditya P. Mathur
03.	The Intel Microprocessor	By Brey
04.	Fundamental of Microprocessor & Microcomputers	By B. Ram
05.	Microprocessor and Interfacing	By D.V. Hall

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester				**Marks**	
Branch: ECE/AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: ECE-602	**3**	**2**	**0**	**100**	**40**
Course Title: Digital Signal Processing					
Duration of Exam: 3 Hours					

Section-A

1. **Discrete Time Signal & System:-**

Introduction, Classification of discrete time signal, Discrete time system, Frequency domain representation, Analysis of linear time Invariant system, Properties of LTI system, System described by difference equations, Correlation of discrete time system, Recursive & Non-recursive structures, Realization of Digital linear systems.

2. **The Z-Transform:-**

Introduction, Defination,Properties of Z-Transform, Evaluation of the Inverse Z-Transform, Realisation of Digital Linear Systems.

Section-B

3. **Discrete & Fast Fourier Transform:-**

Introduction, Properties of DFT, Linear convolution using DFT, Circular convolution, Discrete time Fourier transform (DTFT), Fast fourier transform (FFT), FFT Algorithms – Decimation in time FFT algorithms & decimation in frequency algorithms, Computational consideration.

4. **Digital Filter Design:-**

Generation consideration, Design of FIR filter, Design of IIR filter-Impulse Invariant

method, Bilinear transformation Application of DSP, Radar, Image processing.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Books Recommended:-

01. Digital Signal Processing by S. Salivaharan
02. Digital Signal Processing by John G. Proakes
03. Digital Signal Processing by O.P. Verma

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

				Marks	
Class: BE 6th Semester					
Branch: AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: AEI-603	**3**	**2**	**0**	**100**	**40**

Course Title: Industrial Instrumentation - II
Duration of Exam: 3 Hours

SECTION-A

1. **MEASUREMENT OF VISCOSITY, HUMIDITY AND MOISTURE**
   Viscosity terms – say bolt viscometer – rotameter type viscometer – industrial consistency meters – humidity terms – dry and wet bulb psychrometers – hot wire electrode type hygrometer – dew cell – electrolysis type hygrometer – commercial type dew point meter – moisture terms – different methods of moisture measurement – moisture measurement in granular materials, solid penetrable materials like wood, web type material.
2. **MECHANICAL TYPE FLOWMETERS**
   Theory of fixed restriction variable head type flow meters – orifice plate – venture tube – flow nozzle – dall tube – installation of head flow meters – piping arrangement for different fluids – pilot tube.
3. **ELECTRICAL TYPE FLOW METER**
   Principle and constructional details of electromagnetic flow meter – different types of excitation – schemes used – different types of ultrasonic flow meters – laser Doppler anemometer systems – rortex shedding flow meter – target flow meter – solid flow rate measurement – guidelines for selection of flow meter.

SECTION-B

1. **QUANTITY METERS, AREA FLOW METERS AND MASS FLOW METER**
   Positive displacement flow meters – constructional details and theory of operation of mutating disc, reciprocation piston, oval gear and helix type flow meters – inferential meter – turbine flow meter – rota meter – theory and installation – angular momentum mass flow meter – coriolis mass flow meters – thermal mass flow meter – volume flow meter plus density measurement – calibration of flow meters – dynamic weighing method.
2. **LEVEL MEASURMENT**
   Gauge glass technique coupled with photo electric readout system – float type level indication – different schemes – level switches level measurement using displacer and torque tube – bubbler system. Boiler drum level measurement – differential pressure

method – hydra step systems – electrical types of level gauges using resistance, capacitance, nuclear radiation and ultrasonic sensors.

REFERENCES :

1. Ernest O.Doebelin, Measurement systems application and design international student Edition, Tata McGraw Hill Publishing Co., New Delhi, 199.
2. D.Patranabis, Principles of Industrial Instrumentation Tata McGraw Hill Publishing Co., New Delhi, 1999.
3. R.K. Jain, Mechanical and Industrial Measurements, Khanna Publishers, Delhi 1999.
4. A.K. Sawhney, A course in Electrical and Electronic Measurement and Instrumentation – Dhanpat Rai and Sons, New Delhi 1999.
5. Eckman D.P. Industrial Instrumentation – Wiley Eastern Limited, 1990.
6. Liptak B.G. Instrument Engineers Handbook (Measurement), Chilton Book Co., 1994.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section.

UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD IN MAY, 2010 ONWARDS

Class: B.E. 6th Semester
Branch: E.E./E.C.E/AEI

Course No: EE-603	**L**	**T**	**P**		
Course Name: Power Electronics-I	**3**	**2**	**0**		
Duration of Exam.: 3 Hours			**Marks**		
			Theory	**Sessional**	
			100	**40**	

SECTION: A

I) SCR: Basic theory of Operation, Characteristics : Static & Dynamic, ratings, protection, series and parallel operation, Family of SCR: TRIAC, LASCR, SUS, GTO firing circuits: R, R-C, UJT

II) Line commutated converters: Single and three phase, half and full wave with R L E loads with / without freewheeling diode. Methods of forced commutations: (Class A-F)

SECTION: B

I) AC phase control: Operation of Single phase, Half and Full wave AC controller with R & R-L Load, Integral cycle control.

II) Choppers; principle and basic chopper circuits. Steady–state Analysis of chopper circuits. Commutation in Chopper circuits

III) Inverters, series, parallel and bridge inverters and voltage control.

BOOKS RECOMMENDED:

1. M.Ramamoorty: “Power Electronics”
2 P.S. Bimbra “ Power Electronics”

NOTE: There will be eight questions of 20 marks each. Students are

required to attempt five questions selecting at least two question from each Section.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

				Marks	
Class: BE 6th Semester					
Branch: AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: EE-604	**3**	**2**	**0**	**100**	**40**
Course Title: Control System-II					
Duration of Exam: 3 Hours					

Section-A

1. State Variable representation of Control Systems:
Concepts of state space and state variables. State space representation of Systems described by scalar differential equations, solution of state equation; State Transition matrix. State Space representation of discrete systems. Controllability & observability of linear time invariant systems: conditions for C.C. and C.O.

2. Stability Analysis:-
Definition, first & second methods of Liapunov: stability analysis of linear system, Jury's Stability test, Bilinear Transformation

Section-B

1. Introduction to Multivariable control system, sampler, sampling process, signal reconstruction, difference equation Z transform, inverse Z transform, properties of Z-transformation, Z transform analysis of sampled Data system, Z-S domain relationship.

2. Non-linear systems:
Introduction: Common physical non-linearities: phase plane method system analysis by phase plane method: Describing functions: Stability analysis by describing function method, Study of stability by liapunov and popov methods.

.

BOOKS RECOMMENDED: -

1) Automatic control system by Noggrath & Gopal
2) K. Ogata: Modern Control Engg. PH1
3) C.H.Sec. & A.U. Mever: Modern Control Principles & Applications MGH
4) J.E.Gibson: Nonlinear Automatic Control MGH
5) D.P.Lindorf : theory of sampled data control systems. J.W.
6) Atherton D.P.: Non-linear control Engg.
6) B.C. Kuo: Analysis & Synthesis of S.D. Control Systems PH1

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester

Branch: AEI	**L**	**T**	**P**	**Theory Marks**	**Sessional**
Course No: HUM-602	**3**	**2**	**0**	**100**	**50**

Course Title: Industrial Management

Duration of Exam: 3 Hours

SECTION-A

1. Management

Concept and definition, functions of management, Approaches to management, Process of management, The manager's complex environment.

2. Organization

Meaning, Various forms of organization, line, Line & staff, Functional committee organization, Formal and Informal organization.

Delegation: Meaning and importance. Barriers to effective delegation.

SECTION-B

3. Entrepreneurship

Concept, Functions of entrepreneur, Qualities of good entrepreneur.

Legal forms of industrial organization, Single proprietorship, Partnership, Joint stock companies, Public sector undertaking.

4. Leadership

Concept, Kinds of leaders, Theories of leadership, Motivation-Concept, meaning definition, Theories of motivation, Industrial accidents- Causes and prevention.

BOOKS RECOMMENDED: -

1) George R. Terry and Stephen G. Franklin,	Principles of Management	A.I.T.B.S Publishers
2) Koontz, Harold O Donnel, Cyril and Weihnich, Heinz	Management	Mcgraw Hill
3) S.S. Khanka	Enterpreneurial Development	S. Chand & company
4) Laurie J. Mullins	Managemaent & Organisational Behaviour	Pearson Education
5) M.C. Shukla	Bussiness & Industrial Organisation	
6) Tara Chand	Industrial Organisation and Management	

NOTE:- There shall be total 8 questions of 20 marks each, four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester **Marks**

Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: ECE-606	**-**	**-**	**2**	**50**

Course Title: Microprocessor Lab
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. To add two numbers stored at memory location 4040H & 4041H and store result in 4042H.
2. To subtract two numbers stored at mem. Location 4040H & 4041H and store result in 4042H.
3. Addition of two numbers using immediate addressing mode.
4. Subtraction of two numbers using immediate addressing mode.
5. To add a data array.
6. To multiply two 8-bit numbers.
7. To divide two 8-bit numbers.
8. To find largest no. in an array.
9. To find smallest no. in array.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester
Marks

Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: AEI-608	**-**	**-**	**2**	**50**

Course Title: Industrial Instrumentation Lab
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. Discharge coefficient of orifice plate.
2. Calibration of pressure gauge.
3. Calibration of thermocouple.
4. Calibration of RTD.
5. UV-Visible Spectrophotometer.
6. IR Spectrophotometer.
7. Level transmitter.
8. pH meter standardization and measurement pH values of solutions.
9. Conductivity meter calibration and measurements of conductivity of test solutions.
10. EM flowmeter and ultrasonic flowmeter.
11. Ratio control in cokmbustion laboratory unit.
12. AC/DC meter calibrator.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester
Marks

Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: EE-606	**-**	**-**	**2**	**50**

Course Title: Power Electronics Lab
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. SCR triggering Circuits.
2. Forced commutation Circuits
3. SCR pulse Control Circuits
4. Triac Phase Control Circuits.
5. Fully Controlled Single Phase Thyristors Bridge.
6. SCR DC circuit Breaker.
7. Zero Voltage switching.
8. Voltage Commutated DC Chopper.
9. Current Commutated DC Chopper.
10. Microprocessor based three Phase Thyristors Bridge.
11. Series Connected Single Phase Converters.,
12. Series Inverter.
13. Inverter Fed Drive.
14. Copper Fed Drive.

UNIVERSITY OF JAMMU, JAMMU.

COURSE SCHEME

FOR B.E 3RD SEMESTER APPLIED ELECTRONICS & INSTRUMENTATION

FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010, & 2011

Course		Curriculum Hrs/Week			Marks			
Course No.	**Course Name**	**L**	**T**	**P**	**Theory**	**Sessional**	**Practical**	**Total**
ECE-301	Electronics Devices & Circuits-I	3	2	0	100	50	--	150
EE-315	Electrical Measurements	3	2	0	100	50	--	150
MTH-311	Engineering Mathematics-III	3	2	0	100	50	--	150
M-314	Thermal Engineering	3	2	0	100	50	--	150
EE-301	Principle of Electrical Engg.	3	2	0	100	50	--	150
EE-302	Network Analysis	3	2	0	100	50	--	150
EE-308	Electrical/Electronics Workshop	0	0	2	---	--	30	30
EE-309	Basic Electrical Engg. Lab	0	0	2	---	--	30	30
EE-316	Electrical Measurement Lab.	0	0	2	---	--	40	40
	Total	**18**	**12**	**06**	**600**	**300**	**100**	**1000**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	0	100	50

CLASS: BE 3RD SEMESTER
BRANCH: E&C, EE, AEI
COURSE NO: ECE-301
COURSE TITLE: ELECTRONIC DEVICES & CIRCUITS-1
DURATION OF EXAM: 3 HOURS.

SECTION - I

SEMICONDUCTOR PHYSICS:

Structure of atoms, Energy band diagram, Metal, insulator and semiconductor, Intrinsic & extrinsic semiconductors, Direct & indirect semiconductors, Bond in semiconductor & effect of temperature on semiconductors, Hole & Electron description, Charge densities in semiconductor, Generation & recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Mass action law, Current density, Drift & diffusion currents, Hall effect, Hall coefficient & its applications. Continuity equation, Fermi level in intrinsic and extrinsic semi conductors, Numerical problems.

SEMICONDUCTOR DIODES:

Introduction to P-N junction diodes, Equivalent circuit & symbol, P-N junction as rectifier, Ohmic contact & rectifier rectifying contact, Short circuit & open circuit P-N junction diodes, Current components in P-N junction diode & law of junction, Volt ampere characteristics, Temperature dependence of V-1 characteristics, Diode capacitances, Static & dynamic resistances, Concept of load line, Zener diode and its break down phenomena, Tunnel diode, Schottky diode, LED, photo diode, varactor diodes.

SECTION - II

RECTIFIERS & FILTERS:

Half wave, Full wave & bridge rectifiers with necessary derivations, Voltage regulation ,Capacitor filter, Inductor filter, L-C filter with necessary derivation for ripple factor, Bleeder resistor, Numerical problems.

DIODE CLIPPER & CLAMPER CIRCUITS:

Diode series & shunt clippers, Clipping at two dependent levels, Diode comparator circuit, Clamping circuits, Clamping at certain voltage level, steady state output waveform for a Sq. wave input, Clamping circuit theorem, Diode sampling gates.

LINEAR WAVE SHAPING CIRCUITS:

RC (both high pass & low pass), RLC circuits & their response to various waveform such as sinusoidal step Voltage, Pulse, Square wave, Ramp etc. RC circuit as

differentiation & integration.

BOOKS RECOMMENDED:

01.	Integrated Electronics	By Millman Halkias
02.	Electronics Devices	By Bolystead
03.	Electronics Devices	By Malvino Leach
04.	Pulse, Digital & Switching Wavefrom	By Millman & Taub
05.	Pulse Circuits	By D.A. Bell
06	Solid state electronics devices	By B.G.streetman

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-315
COURSE TITLE: ELECTRICAL MEASUREMENTS
DURATION OF EXAM: 3 HOURS.

SECTION-A

Measurement & Error: - Measurement, significance of measurement, Methods of measurements, Instrumentation & their classifications, Sensitivity, resolution, accuracy, precision, significant figures, absolute and relative errors, types of errors, limiting errors, linearity & probability of errors.

Analog & Digital Instruments: - Analog multimeter as voltmeter, ammeter & ohmmeter, Electronic multimeter, voltmeters & ammeters for measurement of a.c. currents & voltages, thermo instruments, True RMS responding voltmeter.

Digital multimeter as voltmeter, ammeter & ohmmeter, Digital L.C.R measurements, Digital frequency meter, ratio measurement, period measurement, Time Interval measurement.

SECTION-B

Bridge Measurements :- Wheatstone bridge, Kelvin bridge, AC bridges, Maxwell, Hays Bridge, Schering bridge, Wagner Ground connection, Wein bridge

Oscilloscopes:-Block diagram ,CRT, probes, deflection amplifiers & delay line, source & coupling for trigger generator, automatic time base, Dual trace oscilloscope, sweepmode measurements of voltage, phase, frequency , dual beam oscilloscopes

Transducers & data acquisition systems:- Classification of transducers, selecting a transducer, strain guages, Displacement ,temperature measurements, photosensitive devices

Introduction, Block diagram representation, Recorders, necessity of recorders, Recording requirements, classification of recorders.

References:

4. A Course in Electrical & Electronic Measurement & Instrument.(Dhanpati) – A.K. Sawhney.
5. Electrical Measurement & Measuring Instruments (ELBs) – F.W. Golding.
6. A course in Electrical & Electronic Measurement & Instrumentation – J.B. Gupta.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

L	**T**		**MARKS**	
		3	***2***	
		Theory	***Sessionals***	
			100	**50**

CLASS: B.E 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: ENGINEERING MATHEMATICS – III
COURSE No. MTH-311
DURATION OF EXAM: 3 HOURS

SECTION - I

LAPLACE TRANSFORMS:
Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms, LT of unit step function, Impulse function, Periodic function, Initial value theorem, Final value theorem, Convolution theorem, Application of LT to solve linear differential equations and convolution type integral equations.

INTEGRAL TRANSFORMS AND FOURIER INTEGRALS:
Integral transforms and Fourier Integrals Fourier integral theorem, Fourier sine and cosine Integrals, and their inverses.

SECTION - II

SPECIAL FUNCTIONS**:**
Special Functions Legendre polynomials, Rodgrigue's formula, Recurrence formulae, generating function, Orthogonality of Legendre polynomials, Bessel function of Ist kind. Recurrence formulae, generating function, Orthoganality of Bessel function.

BOOLEAN ALGEBRAS:
Boolean Algebras, Lattices, Finite Boolean algebra, C.N.F and D.N.F, Application of Boolean algebra to switching theory.

Books Recommended:-

01.	Higher Engineering Mathematics	B.S. Grewal
02.	Boolean Lattices	V.K. Khanna
03.	Engineering Mathematics-III	Bhopinder Singh

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**0**	**100**	**50**

CLASS: B.E. 3RD SEMESTER
BRANCH : APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: : THERMAL ENGINEERING
COURSE NO.: M-314
DURATION OF EXAMINATION: 3 HOURS.

UNIT-1

Thermodynamics: Dimensions and units, Basic concepts, Zeroth Law, Temperature scale. First Law of Thermodynamics for closed system and open system, applications, general energy equation for steady flow.

Second Law of Thermodynamics, Reversible and Irreversible processes, Carnot cycle, Clausius theorem, Entropy, entropy change, Clausius inequality, Principle of increase of entropy.

Ideal gases and process calculations.

UNIT-2

Principles of Refrigeration, Vapour compression cycle, Components of Vapour compression systems, COP and related calculations

UNIT-3

BOILERS: Fire tube and Water tube boilers- description and special features, fields of application.

UNIT-4

Properties of steam and process calculations.

Vapour Power Cycles: Carnot's cycle, Rankine cycle, and elementary cycle calculations.

Nozzles: Types, Nozzle efficiency, Critical pressure ratio, Throat and exit areas.

RECOMMENDED BOOKS:-

1.	Heat Engineering	Vasandani & Kumar	--Metropolitan Book Co.
2.	Engineering Thermodynamics	Gupta & Prakash	--Nek Cahnd
3.	Engineering Thermodynamics	PK Nag	--Tata McGraw Hill

NOTE: There shall be total Eight questions, Two from each Unit. Five questions have to be attempted selecting at least One from from each Unit. Use of Steam tables, Mollier diagram, Refrigeration tables & charts and a scientific calculator will be allowed in the examination hall.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**-**	**100**	**50**

CLASS: B.E. 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: PRINCIPLES OF ELECTRICAL ENGINEERING
COURSE NO.: EE-301
DURATION OF EXAMINATION: 3 HOURS.

SECTION - I

Electric Circuit Laws and D.C. Circuits, loop and Nodal methods Superposition Principle, Series Parallel transformation. Star-Delta Transformation. Thevinin's Theorem. Norton's Theorem. Maximum Power Transfer Theorem. A.C circuits: - Basic definition vector and complex number representation. Solution of sinusoidally excited R.L.C Circuits. Concept of Active and Reactive Power.

SECTION - II

Steady state A.C three phase's circuits. Measurement of power in three phase balance circuits. Single phase transformers; no load and on load vector diagrams; regulation and efficiency.

BOOKS RECOMMENDED:

7. **Principle of Electrical Engineering by Del Toro**
8. **Electrical Technology by H. Cotton**
9. **Basic Electrical Engineering by Higgin Bootham et al.**
10. **Electrical Technology by E. Hughes**
11. **Elements of Electrical Engineering by M.M.Louis**
12. **Electric Circuit Theory by J.A. Edminister**

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			MARKS	
L	**T**	**P**	**Theory**	**Sessional**
3	**2**	**-**	**100**	**50**

CLASS: B.E. 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: NETWORK ANALYSIS
COURSE NO.: EE - 302
DURATION OF EXAMINATION: 3 HOURS.

SECTION - I

Network elements and circuits, Topological description of network. Formulation of network equation. Laplace transforms technique. Network functions for one-port and two-port network.

SECTION II

Pole zero configurations. Parameters of two-port networks. Response of networks for step and sinusoidal inputs, Filters. Foster's reactance theorem and Cauer forms: response analysis.

BOOKS RECOMMENDED:

4. Networking Analysis and Synthesis by Kuo
5. Network Analysis by Van Valkenburg
6. Network Fields and lines by Ryder

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**30**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-308
COURSE TITLE: ELECTRICAL & ELECTRONICS WORKSHOP

Unit-I

Study of Wires & Cables: Study of various type of wiring, Cost estimation for wiring of a single storied building having light & power circuits, Method of earthing & measurement of earth resistance, Electrical shock precautions & treatment, jointing of wires & cables, Soldering of joints, Wiring practices in PVC, Conduit system of wiring, Control of fluorescent lamp circuit power & ordinary circuits suitable for domestic wiring.

Unit-II

Familiarization with Various Electronic Components: Resistor, Capacitors, Transistors, Diodes IC's, Transformer, Assembly of signal phase, Full wave rectifier circuit with capacitor filter, Assembling the common emitter amplifier circuit, Assembling the following circuit comprising of IC's on a bread board, Like timer circuit using IC 555 & Fabrication on General purpose PCB (to get familiar with soldering techniques).

BOOK RECOMMENDED:

01. Electrical Wiring & Estimation By S.I. Uppal

NOTE: The Electronic circuit diagram may be provided to the students. The operation of the circuit need to be explained. The purpose of the exercise is to familiarize the student to assemble a given Electronic circuits & to solder the joints

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**30**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-309

COURSE TITLE: BASIC ELECTRICAL ENGINEERING LAB.

1) Verification of Kirchoff's Laws.
2) Verification of Superposition Theorem.
3) Verification of Thevinin's Theorem.
4) Verification of Reciprocity Theorem.
5) Verification of Maximum Power Transfer Theorem.
6) Measurement of current in various branches of RLC series-parallel circuit.
7) Single phase power measuring by using a Wattmeter.
8) Study of three-phase A.C Circuits with Star and Delta connected Load.
9) Study of single phase transformers. Determination of voltage Ratio, Turns Ratio and Polarity Test. Open circuit and short circuit test of given single phase transformer. Determination of regulation and efficiency.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER 2009, 2010 & 2011

HOURS / WEEK			
L	**T**	**P**	**MARKS**
-	**-**	**2**	**40**

CLASS: BE 3RD SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-316
COURSE TITLE: ELECTRICAL MEAUSREMENT LAB.

11. Measurement of R. L. & C by using RLC bridge instruments.
12. Measurements of Resistance by using
    a) Wheatstone bridge.
    b) Kelvin's Double Bridge.
13. Study of various types of Multimeters.
14. Demonstration of M.C., M.I. and Dynometer type instruments.
15. Measurement of self inductance, mutual inductance and coupling coefficient of

a) Transformer windings and

b) Air-cored coils.

16. Extension of the range of Ammeter, Voltmeter, and Wattmeter, using Shunt/series resistance and instrument transformers.

17. Calibration of single phase energy meter by

    a) Direct loading

    b) Phantom loading at various points.

18. Calibration of three phase energy meter using standard Wattmeter.

19. Measurement of Capacitance using Schering Bridge.

20. a) Measurement of Power factor at Consumers terminals.

    c) Measurement of Maximum KVA demand of a consumer.

Measurement of A.C. Potentials using A.C. Potentiometer.

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME

FOR B.E. 4TH SEM. APPLIED ELECTRONICS & INSTRUMENTATION
FOR EXAMINATIONS TO BE HELD IN JUNE 2010, 2011 & 2012

Course No.	Course Name	Hours/ Weeks			Marks			
		L	T	P	Thry.	Sess.	Pract.	Total
ECE-401	**ELECTRONICS DEVICES AND CIRCUITS - II**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
ECE-415	**E.M. THEORY**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
AEI-401	**TRANSDUCER ENGINEERING**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
AEI-402	**ELECTRONIC MEASUREMENT & INSTRUMENTATION**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
EE-411	**ELECTRICAL MACHINES**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
COM-411	**OOAD WITH C++**	**3**	**2**	**..**	**100**	**40**	**..**	**140**
ECE-410	**ELECTRONICS DEVICES AND CIRCUITS LAB.**	**..**	**..**	**2**	**..**	**..**	**40**	**40**

EE-412	**ELECTRICAL MACHINES LAB.**	**..**	**..**	**2/2.**	**..**	**..**	**40**	**40**
AEI-403	**TRANSDUCER ENGINEERING LAB.**			**2/2.**	**..**	**..**	**40**	**40**
COM-412	**OOAD WITH C++ LAB.**			**2**			**40**	**40**
	TOTAL	18	12	6	600	240	160	1000

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: ECE-401
COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS-II
DURATION OF EXAM: 3 HOURS

SECTION - I

BIPOLAR JUNCTION TRANSISTOR: Introduction, Transistor basics (unbiased & biased transistor), Generalized transistor equation, Transistor current components, Early effect, Ebber-Moll Model,Transistor configurations & characteristics, Reach through & avalanche phenomena, numerical problems.

TRANSISTOR BIASING: Introduction, Need for Biasing, Type of biasing circuits with necessary derivations, Load line concept t (AC & DC), Bias stabilization (S, S' S"), Thermal runway, Bias Compensation Techniques.

FIELD EFFECT TRANSISTOR: Introduction, Construction of JFET, Operation, Symbol, JFET- Characteristics, JFET Parameters and their relationship, Biasing methods of FET, with necessary derivations. Comparison between JFET and BJT & MOSFET, FET small signal model,

Frequency response of FET amplifier, Low frequency model of Common Source & Common drain Amplifiers & their analysis. MOSFET (Depletion & enhancement), Characteristics, Symbol and Operation.

SECTION - II

HYBRID PARAMETERS: Introduction, Two port network, hybrid model for CE, CB, & CC configuration with necessary derivations, Analysis of transistor CE amplifier with & without emitter resistance, Determination of h-parameters from characteristics, Miller theorem, approximation model of h-Parameter, Amplifiers and their analysis using h-parameters.

SINGLE & MULTISTAGE AMPLIFIERS: Need for cascading, Two stage cascade amplifiers, N-stage cascade amplifiers, Gain of multistage amplifiers in decibels, Techniques for improving input resistance (Darlington transistor, Bootstrap emitter follower, Cascode amplifiers), Method of coupling multistage amplifiers (RC coupling, DC coupling, transformer coupling), Frequency response of an amplifiers, Effect of emitter & bypass capacitors on the bandwidth & frequency response of a cascaded amplifiers, Square wave testing of an amplifier, Bandwidth of multistage amplifiers.

BOOKS RECOMMENDED:

01. Integrated Electronics By Millman Halkais
02. Electronics Devices By Bolystead
03. Electronics Devices By Malvino Leach

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: ECE-415
COURSE TITLE: E. M. THEORY
DURATION OF EXAM: 3 HOURS

SECTION -I

Electrostatics: Revision of vector analysis with to Cartesian, Spherical and polar coordinates, Coulomb's law, Electric field, Electric flux density, Gauss's law, Divergence theorem. Electrostatics potential, Potential gradient, Gradient operator, Conductors, Method of images, Energy density in electrostatics field, Electric field in dielectric media, Capacitance, Solution of Electrostatic problems using Posson's & Laplace equation.

Magnetostatics: Biot-Savart's & Ampere's circuital laws, & their applications, Stocks theorem, Magnetic flux & Flux density, Magnetic potential, Force on a moving charge, Torque on a closed circuit, Energy density in the magnetic field.

SECTION -II

Time Varying Field & Maxwell Equation: Faraday's laws, Displacement current, Maxwell equation in point & integral form, Application of Maxwell equations to circuits, Resonant cavity, & Radiation antennas, Rotating magnetic field theory.

Uniform Plane Wave: Wave motion in free space, & in perfect dielectric, Plan wave in lossy dielectric, Poynting vector, Propagation in good conduction, Skin effect, Reflection of uniform plane wave, Standing wave ratio, Polarization.

Book Recommended:

01.	Engineering Electromagnetic	By Jseph A. Edminister
02.	Introduction to Electromagnetic	By Griffith
03.	Foundation Electromagnetic	By Reitz et al
04.	Engineering Electromagnetic	By Jr. Hyat

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: AEI-401
COURSE TITLE: TRANSDUCER ENGINEERING
DURATION OF EXAM: 3 HOURS

SECTION -I

Transducer & its Characteristics

Transducer / Sensors: Definition & Principle, Classification & selection of transducer

Characteristics : Static characteristics:- Accuracy, Precision, Sensitivity, Linearity, Hysteresis.

Mathematical Model : Zero, Fist & second order transducer response to different input of Transducers.

Type of Transducers

Resistive Transducers :Resistive potentiometer, Hot wire resistance transducer.

Capacitive Transducer :Variable type area, Variable distance type, Variable dielectric constant. (Variable permittivity).

Inductive Transducers :LVDT, Eddy current type, Inductive potentiometer.

Piezoelectric Transducers : Piezoelectric phenomenon, Piezoelectric force & torque transducer, Piezoelectric strain transducer.

Strain Gauge :Bounded type, Unbounded type, Wire type & semiconductor type.

SECTION -II

Temperature Transducer

Temperature scales (^{0}C, ^{0}F, ^{0}K), Resistance thermometer (RTD), P-N Junction thermister, Glass thermometer, couples, Errors in temperature measurement.

Radiation / Photo Transducers

Introduction, Basic characteristics, Type – Photoemissive cell, Photo multiplier, Photo conductive cell, Photovoltaic cell, Photo resistors & Photo transistors, Hall effect transducer.

REFERENCE:-

01. A course in Electrical & Electronic Measurement & Instrumentation A.K. Sawhney

02. Instrumentation Measurement & Analysis B.C. Nakra & K.K. Chaudary

03. Transducers & Instrumentation D.V.S. Muethy

04. Handbook of Transducers H.N. Norton

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU

For Examination to be held in June 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER

BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION

COURSE NO: AEI-402
COURSE TITLE: ELECTRONICS MEASUREMENTS & INSTR.
DURATION OF EXAM: 3 HOURS

SECTION -I

Measurement & Errors: Sensitivity, Resolution, Accuracy & precision, Significant figures, Absolute & relative errors, Type of errors, Probability of errors and limiting errors, Linearity.

Analog & Digital Instruments:
Analog Instruments:- Multimeter, A.C Voltmeters using rectifiers, Wave analyzer, Harmonic distortion analyzers.

Digital Instruments:- Digital Voltmeter, Digital Multimeter, Digital LCR Measurements, Digital frequency meters & its applications.

SECTION -II

Oscilloscopes: Block diagram, CRT, Deflection amplifier & Delay time, Source & coupling of trigger generator, Automatic time base, Dual trace Oscilloscopes, Sweep modes, Measurement of voltages, Frequency & phase, Pulse measurements.

a) Special Oscilloscopes: CRT storage Target characteristic, Sampling Oscilloscopes, Digital storage Oscilloscopes, Spectrum analyzer.

b) HF Techniques: Shielding & Grounding, Q – Meter, Vector Impedance Meter.

Books Recommended:

01.	Electronic Instrument & Measurement Technique	: Cooper W.D. & Helfrick A.D.
02.	Electronic Instrument & Measurement	: Bell D.A.
03.	Electronic Measurement & Measuring Instrument	: A.K. Sawhney
04.	Electronic Instrumentation & Measurement	: Oliver B.M & Cage J.M.
05.	Electronic Instrumentation	: H.S. Kalsi

NOTE: There shall be total Eight questions of 20 Marks each, Four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS :BE 4TH SEMESTER
BRANCH: APPLIED ELECTRONICS & INSTRUMENTATION
COURSE NO: EE-411
COURSE TITLE: ELECTRICAL MACHINES
DURATION OF EXAM: 3 HOURS

SECTION -I

D.C. GENERATORS:- Operating principle, constructional features, E.M.F equation, Armature reaction and commutation, operating characteristics losses and efficiency.

D.C. MOTORS:- Operating principle, back EMF, Torque equation, Starters, speed control, operating characteristics, and their applications.

TRANSFORMERS:- Principle of operation, Vector diagram, Regulation efficiency parallel operation tap changing auto transformer.

SECTION -II

SYNCHRONOUS GENERATORS: - Principle of operation, E.M.F equation, Leakage reactance, Vector diagram, Voltage regulation by EMF and MMF method.

SYNCHRONOUS MOTORS: - Principle of operation, Vector diagram, V-curves and inverted V-curves, method of starting, Applications.

INDUCTION MOTORS:- Principle of operation, TYPES OF MOTORS, Equivalent circuits, Torque and power calculations, No load and blocked rotor test, speed control, Method of starting, Applications.

SPECIAL A.C. MACHINES: - Repulsion motors, A.C series motors, Universal motor, single phase induction motor, application.

BOOKS RECOMMENDED:

5) A.Langsdrof — Theory of A.C Machines
6) Clayson and Hancock — Principles of D.C. Machines
7) M.G. Say — Performance and design of A.C Machines
8) H.A. Cotton — Advanced Electrical Technology

NOTE : There shall be a total of eight questions. Five questions have to be attempted by selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	-	100	40

CLASS: B.E 4TH SEMESTER
BRANCH: APPLLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: OOAD WITH C++
COURSE NO. COM –411
DURATION OF EXAM: 3 HOURS

SECTION - I

1. Review of Pointers: Passing parameters, Array of Pointers, Character Pointers.
Programming Techniques: Unstructured, Procedural, Modular. Introduction to objects, object & cohesion. (30)

2. Overview of C++, Object Oriented programming, Encapsulation, Polymorphism, Inheritance, Console I/O, C++ Comments.
Classes, Metaclass, Abstract class, Public and private variables, Constructor and Destructor Functions, Constructors taking parameters, Object pointers, In-Line Functions, Automatic Inlining, Friend Functions, This Pointer, New & Delete, Array of Objects.
(50)

SECTION-II

1. Function Overloading, Overloading Constructor Functions, Operator overloading, Overloading Binary and Unary Operators, Overloading Relational & logical Operators. (30)
2. Inheritance, Using Protected Members, multiple inheritance, Virtual Base Classes, Introduction to Virtual Functions. (30)
3. C++, I/O Basics, Ifstream, Ofstream, Fstream, Open(), Close(), EOF(), Binary I/O, Get(), Put(), Read(), Write(), Random Access, Seekg(), Seekp(), Tellg(), Tellp(). (20)

BOOKS RECOMMENDED:

1. Turbo C++ by Robert Lafore**.**

REFERENCE BOOKS:

1. Programming in C++ by Balaguruswamy.
2. C++ the Complete Referance by Herbert Schildt.
3. Mastering C++ by K.R. Venugopal & T. Ravishankar & Raj Kumar**.**

NOTE: There shall be total Eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

UNIVERSITY OF JAMMU
For Examination to be held in June 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION
Course No: ECE-410
Course Title: Electronics Devices & Circuits Lab
DURATION OF EXAM: 3 HOURS

List of Practicals

1. To study the operation characteristics of the P.N. junction, Ge/Si (Forward & Reverse Characteristics).

2. To study the operation characteristics of Zener diode (Forward & Reverse Characteristics).

3. Half wave Rectifier.

4. Full wave / Bridge Rectifier.

5. To study the operation characteristics (Input / Output) of PNP / NPN Transistor (Common Emitter / Common Base).

6. To study the frequency response of signal amplifier (CE/CB).

7. To study the characteristics of FET.

8. Determination of h parameter from transistor characteristics.

9. Design of self Bias circuits using BJT.

10. Design of self Bias circuits using FET.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2/2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION
Course No: EE-412
Course Title: ELECTRICAL MACHINES LAB
Duration of Exam: 3 Hours

1. **To study the magnetic characteristics of a D.C. Machines at various operating speeds and finds the operating point of D.C. shunt machine from the same.**
2. **To determine the load characteristics of a D.C. Shunt generator and find its overall efficiency.**
3. **To determine the Torque speed characteristics of a D.C. Shunt motor and compound motor (Short & long shunt). Also study of these using armature control and field control.**
4. **To study the torque/speed characteristics of a D.C. series motor using various field tapings.**
5. **To find the efficiency and study various losses of D.C. Machines using Hopkinson test.**
6. **To study a single phase transformer, its Voltage ratio and turns ratio relationship. Perform open & short circuit test to determine losses, efficiency and voltage regulation and also its various parameters.**
7. **To perform polarity test on single phase transformers for parallel operation and study the load sharing of two parallel operated transformers.**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2/2	40

Class: BE 4th Semester
Branch: APPLLIED ELECTRONICS & INSTRUMENTATION
Course No: AEI-403
Course Title: TRANSDUCER ENGINEERING LAB.
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. To study the strain gauge characteristics.
2. To study the characteristics and weight measurement by load cell.
3. To study the constructional details of LVDT and its application in thickness measurement.
4. To study the flow measurement by differential pressure type transducer.
5. To study the characteristics of LDR, thermostat and thermocouples.
6. To study the testing and calibration of T,J,K,R and S thermocouples.
7. To study the voltage –intensity characteristics of a photo-transistor.
8. To study the ramp response characteristics of filled in system thermometer.
9. To study step response of RTD and thermocouple.
10. To study force and torque transducers.
11. To study the characteristics of photoelectric tachometer.
12. To study the working details of electrical pressure probes.
13. To study Hall Effect Transducer.
14. To study the characteristics of Accelerometer Model.
15. To study the characteristics of Angular Potentiometer Transducer Model.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE 2010, 2011 & 2012

	MARKS
P	PRACTICAL
2	40

CLASS: B.E 4TH SEMESTER
BRANCH: APPLLIED ELECTRONICS & INSTRUMENTATION
COURSE TITLE: OOAD WITH C++ LAB.
COURSE NO. COM-412
DURATION OF EXAM: 3 HOURS

The Practical's will be based on Computer Languages Theory Syllabus. The students are required to submit at least 10 Programs covering at least 2 programs from each unit.

DETAILED SYLLABUS FOR THE B.E 5th SEMESTER
APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING

S.No.	Course No.	Course Name	Lecture L	Tutorial T	Practical P	Marks			Total
						Theory	Tutorial	Practical	
1	ECE-501	Electronics devices & circuits - III	3	2	-	100	40	-	140
2	ECE-503	Digital Electronics	3	2	-	100	40	-	140
3	ECE-504	Linear Integrated Circuit	3	2	-	100	40	-	140
4	AEI-503	Industrial Intrumentation1	3	2	-	100	40	-	140
5	AEI-504	Linear Control Systems	3	2	-	100	40	-	140
6	ECE-509	Communication Engineering	3	2	-	100	40	-	140
7	ECE-511	Electronics devices & circuits -lab	-	-	2/2	-	-	40	40
8	ECE-512	Digital Electronics Lab	-	-	2/2	-	-	40	40
9	AEI-507	Linear Integrated Circuit(LIC)			2	-	-	40	40
10	AEI-508	Linear Control System lab			2	-	-	40	40
		Total	**18**	**12**	**6**	**600**	**240**	**160**	**1000**

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-501**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Electronics Devices & Circuits – III**	**3**	**2**	**0**	**100**	**40**

Section-A

Transistor at High Frequencies: Introduction, Hybrid (Pie) model, Relation between hybrid pie & h-parameters, Validity of hybrid-pie-model, Variation of hybrid-pie-parameters, Current gain with & without resistive load, Gain bandwidth product, Single stage CE transistor amplifiers response, Emitter Follower at high frequency, Common Drain amplifier at high frequency.

Feedback Amplifier: Classification of amplifiers, Limitation of basic amplifier, Distortion in amplifier, need for feedback, Feedback concept, Advantages of negative feedback, Ways of introducing negative feedback in amplifiers, Gain with & without feedback, Effect of negative feedback on input – output resistance & bandwidth amplifiers, Their respective analysis for feedback amplifiers, Procedure for analysis of feedback amplifiers, Analysis of different Topologies.

Oscillators: Introduction, Necessity of oscillator, Gain with feedback, Barkhausein criteria, Types of oscillators, Requirements of oscillator, RC oscillators & phase shift oscillators, Wien bridge oscillators, LC oscillators, with necessary derivations to determine gain required for

oscillation & frequency of oscillation, Amplitude & frequency stability of oscillators, Crystal oscillators, Multivibrators: Monostable, Astable, Bistable, (with necessary derivations), using transistors.

Section-B

Power Amplifiers: Introduction, General features of power transistor, Difference between power transistor & a voltage amplifier, Need for power amplifier, Classification of power amplifiers with necessary load lines concept & derivations (Efficiency, power dissipation), Class A, B & AB amplifier, their types & analysis, Cross over distortion & its remedy, Determination of harmonic distortion, Heat sinking for power transistor, Monolithic power amplifier, Tuned amplifier – Introduction, Classification of tuned amplifiers (single tuned & double tuned) with respective analysis.

Voltage Regulator: Introduction & necessarily of voltage regulators, Difference between unregulated & regulated power supply, Factor affecting unregulated power supply, Stabilization, Basic representation of voltage regulators Type of voltage regulators-series & shunt voltage regulators, Series voltage regulators using emitter follower & its expressions for Sv & Ro, Preregulators, Short circuit protection-simple & fold back current limiting, Zener regulators, & its analysis, Monolithic regulators.

Note: There shall be total eight questions of 20 marks each , four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Books Recommended:

01. Integrated Electronics By Millman Halkias
02. Electronics Devices By Boylstead
03. Electronics Devices By Malvino Leach

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

		L	T	P	Theory	Sessional
Course No.	**: ECE-503**					
Course Title	**: Digital Electronics**	**3**	**2**	**0**	**100**	**40**

Section-A

Number System, Radix conversion, Arithmetic with base other than ten, Data representation – fixed & floating points, Binary codes – weighted/Non weighted codes, Error detecting & correcting code (Hamming code), Alphanumeric code, Subtraction of signed/unsigned number.

Logic Gates, Boolean algebra, Simplification of Boolean expressions, Minimization techniques, Karnaugh map (up to five variables), Simplification of Logic families – RTL, DTL, TTL, ECE & MOS families and their characteristics.

Section-B

Combinational logic circuits: Half and Full adders, Subtractors, BCD Adder, Comparators, Multiplexer, Realization of function using MUX, Demultiplexer, Decder, Encoder, Code converters, General problems, PLA, Design of combinational circuit using PLA & PAL.

Introduction to sequential logic circuits, Synchronous and Asynchronous operation, Flip-Flops – R-S, J-K, D, T & Master-Slave flip-flop, Conversion of flip-flops, Shift registers, Analysis of asynchronous & synchronous sequential counter, Design of sequential logic circuits, Problem formulations, State minimization techniques.

Books Recommended:

01.	Digital Electronics	By R.P Jain
02.	Digital Electronics & Microcomputer	By R.K. Gaur
03.	Computer System Architecture	By M.M. Mano
04.	Digital Electronics	By Jamini & K.M. Backward

Note: There shall be total eight questions of 20 marks each , four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-504**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Linear Integrated Circuits**	**3**	**2**	**0**	**100**	**40**

Section-A

Basic Operational Amplifier: Basic differential amplifiers, Its working & types, Transfer

characteristics, small signal analysis of differential amplifier, Using h-parameter, Differential gain & common – mode gain, Constant current basic circuit, Constant current source/current mirror circuit, Level shifting techniques active load, Output stage.

Ideal & Practical Op-Amp & their Characteristics: Ideal voltage transfer curve, Open – loop Op-amp configurations, Op-amp as inverting, Non-inverting amplifier, Differential amplifiers using one and two Op-amp, Op-amp Characteristics, Measurement of Op-amp parameters, Offset voltage compensating n/w, Frequency response of internally compensating Op-amp, High frequency Op-amp equivalent circuit, Open loop & close loop frequency response, Circuit stability, Slew rate its cause.

Section-B

Op-Amp & its Applications, DC & AC Amplifier, AC amplifier with single power supply, Peaking amplifier, Summing, Scaling & Averaging amplifiers, Differential input / Differential output amplifier, High input impedance circuit, Active filters, Integrator, Differentiator, Instrumentation amplifier,

Waveform generators Sq. wave, Triangular, save tooth, Sine wave generator, Op-amp, as clipper, Clamper & comparator circuits, Sample / hold circuit, Comparator characteristics, Voltage limiter, Zero crossing detector, Digital & analog converter, Binary weighted resistor, R-2R resistor type D/A converters, A/D converters & its types-successive approximation type,

Phase-Locked Loops & Timers: Block diagram, Operation & applications

Books Recommended:

01.	Op-Amp & Linear Integrated Circuit	By Ramakant A. Gayakwad
02.	Linear Integrated Circuit	By Wixer
03.	Linear Integrated Circuit	By Tobey Graeme & Huelsomen
04.	Op-Amp Design Application	By Dailey
05.	Design with Op-Amp	By Franco

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

. Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.
Course No. : AEI-503 **L T P Theory Sessional**

Course Title : Industrial Instrumentation-1 **3 2 0** **100** **40**
Duration of Exam: 3 Hours

SECTION-A

3) MEASUREMENT OF FORCE, TORQUE, VELOCITY

Electric Balance or Force Measurement, Different types of load cells, Pneumatic & Hydraulic Load Cells, Elastic Load Cells ,Strain-gauge Load Cells, Different types of Torque Measurements, Strain-gauge Torque Meters, Inductive Torque Transducer, Digital Methods, Speed Measurement: Linear Velocity Measuremen -Moving coil type ,Moving magnet type, Angular Velocity measurement,D.C. & A.C. Tachogenerators, Drag-Cup Tachogenerators, Shaft Speed Measurement, Stroboscope & Strobotron.

4) Measurement of Acceleration, Vibration, & Density

Accelerometers,LVDT Accelerometers, Piezoelectric Accelerometers, Potentiometer-type Accelerometers, Strain-Gauge Type Accelerometer, Variable Reluctance Type Accelerometers, Mechanical Type Vibration Instruments, Seismic Instrument as an Accelerometers & Vibrometer Vibration PICK-UPS, Calibration of Vibration Pick-Ups, Constant acceleration method, Sinusoidal motion method, Transient Motion Method, Definitions & Units of Density, Specific Gravity & Viscosity Used In Industries, Baume Scale & API Scale, Densitometers, Pressure-Head Type Densitometer, Float-Type Densitometer, Ultrasonic Densitometers, Bridge Type Gas Densitometers.

SECTION-B

4) Pressure Measurements

Introduction, Units of Pressure, Low Pressure Measurement, Manometers & Its Types, U-Tube, Well Type, Inclined Type, ring balance & micro-manometer, Elastic Type Pressure Gauges, Bourdon Tube C-Type, Spiral, & Helix, Bellows, Diaphragms, Electrical Methods of Pressure Measurement, Strain-Gauge Pressure Transducer, Capacitive Pressure Transducer, Resonant Wire Pressure Transducer, Piezoelectric Pressure Transducer, LVDT Pressure Transducer, Vacuum Pressure Measurement, Mcleod Gauges, Thermal Conductivity Gauges, Thermocouple Gauges, Pirani Gauges, Ionization Gauges, Cold Cathode & Hot Cathode Gauges, Testing & Calibration of Pressure Gauges, Dead Weight Tester.

5) Temperature Measurement

Definitions & Standards, Calibration of Thermometers, Filled-In System Thermometers, Liquid Filled System, Vapour Pressure Thermometers, Gas Thermometers, Mercury Filled Thermometers Sources of Filled-In Systems & Their Compensation, Bimetallic Thermometer, Electrical Methods of, Temperature Measurement, RTD - Characteristics, Construction, Material Used, & 3-Lead & 4-Lead Arrangements Of RTD's.

6) Thermocouple Measurement

Thermocouple, Laws of Thermocouple, Multiple Thermocouple Configurations, Response of Thermocouple, Material Used For Thermocouple, Commercial Circuits for Cold Junction Compensation, Special Techniques for Measuring High Temperature Using Thermocouple
Radiation Pyrometers, Principle, Total Radiation Pyrometer & Partial (selective) Radiation Pyrometer Total Radiation Pyrometers, Optical Pyrometers, Disappearing Filament Type.

Books Recommended:-

1 Principle of Industrial Instrumentation : D Patranabis
2 Mechanical and Industrial Measurements : R.K Jain
3 A Course in Electrical and Electronics Measurements : A.K Sawhney
4 Instrumentation Measurements AND Analysis : B.C Nakra and K.K Chaudary
5 Mechanical Measurements & Instrumentation : A.K Sawhney, Puneet Sawhney

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: AEI-504**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Linear Control Systems**	**3**	**2**	**0**	**100**	**40**

Duration of Exam: 3 Hours

SECTION-A

4) Introduction

Concepts Plant, Systems Servomechanism, regulating systems, disturbances, Open loop control system, closed loop systems, linear and non-linear systems, time variant & invariant, continuous and sampled data control systems, Block diagrams, some illustrative examples.

5) Modelling

Formulation of equation of Linear electrical, mechanical, thermal Pneugmatic andhydraulic system, electrical, Mechanical analogies. Use of Laplace transforms, Transfer function, concepts of state variable modelling. Block diagram representation signal flow graphs and associated algebra, characteristics equation.

6) Time Domain Analysis

Typical test - input signal, Transient response of the first and second order systems. Time domain specifications, Dominant closed loop poles of higher order systems. Steady state error and coefficients. Pole-zero location and stability. Routh-Hurwitz Criterion.

SECTION-B

4) Root Locus Technique:

The extreme points of the root loci for positive gain. Asympotes to the loci, breakway points, intersection with imaginary axis, location of roots with given gain & sketch of the root locus plot.

5) Frequency Domain Analysis:

Closed loop frequency response, bodeplots, stability and loop transfer function. Frequency response specification relative stability, relation between time and frequency response for second order systems. M and N-circles, Log. Magnitude versus phase angle plot. Nyquist stability criterion and Polar Plots.

6) Control Components:

Error detectors- potentiometers and synchronous, servo motor A.C. and D.C. technogenerators, Magnetic amplifiers.

Books Recommended

1. Modern Control Engg. by K. Ogata, Prentice Hall, New Delhi.
2. Control System Components by J.F. Gibsen, Mcgraw Hill.
3. Automatic Control System by B.C. Kuo, Prentice Hall, 3rd Ed.
4. Control System Engineering by I.J. Nagrath & Gopal, Wiley Eastern Ltd., New Delhi.
5. Automatic Control System : B.S. Manke

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-509**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Communication Engg.**	**3**	**2**	**0**	**100**	**40**

SECTION-A

Introduction to Elect. Comm. System, Concept & need for modulation, Definition of signal to noise ratio & noise figure, Representation of signal & system, periodic non-periodic etc. Spectral analysis of signal (Fourier series & Fourier Transforms), Representation of AM. Frequency spectrum of AM wave, Power relation in AM wave, Modulation & demodulation of AM, SSB techniques, Balanced modulator, Type of SSB, Modulation & demodulation of SSB signals.

Theory of FM, Representation & frequency spectrum of FM, Pre-Emphasis, De-Emphasis, Wide band & narrow band FM, Generation & detection of FM signal, Comparison with PM & AM.

SECTION-B

Pulse modulation techniques, Sampling & sampling theorem, Natural & flat top sampling principle generation & detection of PAM, PWM, PCM, DM, ADM, Time division multiplexing, Frequency division multiplexing, Introduction of Digital Modulation Techniques.

Information Theory: Information rate, Entropy, Source-coding & coding Efficiency, Shannon-Fano coding, Huff-man coding, Channel capacity theorem.

Books Recommended:

01, Electronics Comm. System By G. Kennedy
02. Principles of Comm. System By. Taub & Schilling

Reference Book

02. Communication System By Simon Haykins

Note: There shall be total eight questions of 20 marks each, four from each section. The student will have to attempt five questions, selecting atleast two questions from each section.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

		L	T	P	Theory	Sessional
Course No.	**: ECE-511**					
Course Title	**: Electronics Devices & Circuits Lab - III**	**-**	**-**	**2/2**	**-**	**40**

List of Practical

1. Determination of voltage gain, Input / output resistance of amplifiers using with & without feedback.
2. Determination of Distortion output power incase of push pull class-B amplifier.
3. Determination of frequency response of class-C tuned amplifier.
4. Study of signal stage class-A power amplifier & determine output power & efficiency.
5. Study of complimentary symmetry pushpull amplifier.
6. Design & determination of stability factor series of zener shunt Regulator / IC Regulator.
09. Design of voltage regulator using series pass transistor.
10. Study of Collpitt, Clapp, Hartley, Weinbridge, Phase regulator & Determine the frequency of output waveform.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	**: ECE-512**	**L**	**T**	**P**	**Theory**	**Sessional**
Course Title	**: Digital Electronics Lab**	**-**	**-**	**2/2**	**-**	**40**

List of Practical

01. Verification of truth tables of logical gates AND / OR / NOT, NAND, NOR, EXOR, EXNOR, gates.

02. Implementation of Boolean expression using AND, OR, NOT, NAND, & NOR logic.

03. Implementation of Decoder, Encoder using IC's & gates.

04. To implement half adder, half subtractor, full adder, full subtractor using different IC's & gates.

05. Implementation of multiplexer, Demultiplexer using IC's & gates.

06. Design of BCD to seven segment display using logical gates & IC's.

07. To design & verification of truth table of SR, JK, MS-JK Flip Flops.

08. To design various asynchronous counters using flip flops, gates & IC's.

09. To design various synchronous counters using flip flops, gates & IC's.

10. To design & Verify the Truth tables of shift Registers.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	: AEI-507	L	T	P	Theory	Sessional
Course Title	: Linear Integrated Circuit Lab	-	-	2	-	40

LIST OF EXPERIMENTS

01. Study of Opamp as differentiator / integrator.
02. Study of Opamp as Comparator.
03. Study of Opamp as Schmitt Trigger.
04. Study of Opamp as triangular wave generator.
05. Study of Opamp as D/A Converter.
06. Study of Opamp as A/D Converter.
07. Study of Opamp as Clipper.
08. Study of Opamp as a Rectifier.
09. Design of Monostable Multivibrator using 555 chip.
10. Design of Astable Multivibrator using 555 Chip.
11. Study of op-amp as clamper ckt.

Class: B.E. 5th Semester
Branch: Applied Electronics & Instrumentation Engg.

Course No.	: AEI-508	L	T	P	Theory	Sessional

Course Title : Linear Control Systems Lab - - 2 - 40

LIST OF EXPERIMENTS

At least eight of the following experiments are to be performed:

01. To study input- output characteristics of a potentiometer and to use two potentiometers as an error detector.
02. To study transmitter- receiver characteristics of a synchro set to use the set as controlcomponent.
03. To study the operation of a d-c positional servo system and to investigate the effect of damping and supply voltage on its response.
04. To study the operation of an AC position servo-system and to obtain effects of supply voltage and system parameter on its transient response.
05. To design different compensation network for the given cut off frequencies and to plot frequency response of these networks.
06. To use operational amplifiers as multiplier, summer, inverter and integrator.
07. To simulate a servo-system and obtain its characteristics with the use of controllers.
08. To study control action of light control device.
09. To study details of a magnetic amplifier and to obtain input-output characterization of this amplifier.
10. To study details of a two winding AC servometer and to obtain its T-N characteristics.
11. To study PID- controller and to obtain the effect of proportional, integral and derivative control action.
12. To study details of an analog computer and solve a given second order differential equation using it.
13. To generate a sine-wave using a given analog computer with specified amplifier and frequency.
14. To study a stepper motor and control its direction speed and number of steps with the held of a microprocessor.
15. To obtain dynamic characteristics of a given solar cell array and to obtain the point of operation for maximum power transfer to the load.
16. To obtain T.F. of a field controlled DC. servometer and to show its pole-zero configuration.
17. To obtain T.F. of an armature controlled DC. servometer and to obtain its pole zero configuration.
18. To design, fabricate and to obtain characteristics of a high pass T type filter.
19. To design, fabricate and to obtain characteristics of low pass T type filter.

UNIVERSITY OF JAMMU.

COURSE SCHEME

FOR B.E 6TH SEMESTER APPLIED ELECTRONICS & INSTRUMENTATION ENGG.

FOR EXAMINATION TO BE HELD IN JUNE-2011 ONWARDS

S.No.	Course No.	Course Name	Lecture	Tutorial	Practical	Marks			Total
			L	T	P	Theory	Tutorial	Practical	

1	ECE-601	Microprocessors	3	2	-	100	40	-	140
2	**ECE-602**	Digital signal processing	3	2	-	100	40	-	140
3	**AEI-603**	Industrial Instrumentation-II	3	2	-	100	40	-	140
4	**EE-603**	Power Electronics - I	3	2	-	100	40	-	140
5	**EE-604**	Control System-II	3	2	-	100	40	-	140
6	**HUM-602**	Industrial Management	3	2	-	100	50	-	150
7	**ECE-606**	Microprocessors Lab	-	-	2	-	-	50	50
8	**AEI-608**	Industrial Instrumentation Lab	-	-	2	-	-	50	50
9	**EE-606**	Power Electronics Lab	-	-	2	-	-	50	50
Total			**18**	**12**	**6**	**600**	**250**	**150**	**1000**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class :BE 6th Semester **Marks**

Branch: ECE/AEI/EE	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: ECE-601	**3**	**2**	**0**	**100**	**40**

Course Title: Microprocessor
Duration of Exam: 3 Hours

Section-A

1. Microprocessor 8085 pin diagram, Architecture, Addressing modes, Instruction set, Instruction format, Timing diagram, Programming techniques with additional instructions, looping, Counting design of counters & time delays, debugging & memory mapping.

2. Stack & Subroutines, Advanced subroutines concept, Call & Ret instructions, Advanced programming (Code conversions, BCD addition/subtraction, Multiplication etc), 8085 interrupts & process….

Section-B

3.Interfacing I/O devices, Basic interfacing concept, Interfacing with scanned multiplexed displays & LCD's, Interfacing output displays, Interfacing i/p devices, Memory mapped i/o design, Memory wait states & access time.

4. Serial I/O data communication, Basic concepts in serial I/O, 8085 serial I/O lines – SID & SOD, Synchronous & asynchronous data communication, Software controlled asynchronous serial I/O.

5. Interfacing to 8085 Microprocessor: PPI – 8155 I/O & timer, PPI – 8255 (mode-0, 1, 2 & BSR), PID 8279 keyboard/display interface, PIC 8259, DMA controller 8257/8237.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Books Recommended:

01.	Microprocessor Architecture Programming & App.	By Ramesh Gaonkar
02.	Introduction to Microprocessor	By Aditya P. Mathur
03.	The Intel Microprocessor	By Brey
04.	Fundamental of Microprocessor & Microcomputers	By B. Ram
05.	Microprocessor and Interfacing	By D.V. Hall

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

				Marks	
Class: BE 6th Semester					
Branch: ECE/AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: ECE-602	**3**	**2**	**0**	**100**	**40**
Course Title: Digital Signal Processing					
Duration of Exam: 3 Hours					

Section-A

1. **Discrete Time Signal & System:-**

Introduction, Classification of discrete time signal, Discrete time system, Frequency domain representation, Analysis of linear time Invariant system, Properties of LTI system, System described by difference equations, Correlation of discrete time system, Recursive & Non-recursive structures, Realization of Digital linear systems.

2. **The Z-Transform:-**

Introduction, Defination,Properties of Z-Transform, Evaluation of the Inverse Z-Transform, Realisation of Digital Linear Systems.

Section-B

3. **Discrete & Fast Fourier Transform:-**

Introduction, Properties of DFT, Linear convolution using DFT, Circular convolution, Discrete time Fourier transform (DTFT), Fast fourier transform (FFT), FFT Algorithms – Decimation in time FFT algorithms & decimation in frequency algorithms, Computational consideration.

4. **Digital Filter Design:-**

Generation consideration, Design of FIR filter, Design of IIR filter-Impulse Invariant method, Bilinear transformation Application of DSP, Radar, Image processing.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

Books Recommended:-

01. Digital Signal Processing by S. Salivaharan
02. Digital Signal Processing by John G. Proakes
03. Digital Signal Processing by O.P. Verma

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

				Marks	
Class: BE 6th Semester					
Branch: AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: AEI-603	**3**	**2**	**0**	**100**	**40**

Course Title: Industrial Instrumentation - II

Duration of Exam: 3 Hours

SECTION-A

1. **MEASUREMENT OF VISCOSITY, HUMIDITY AND MOISTURE**
   Viscosity terms – say bolt viscometer – rotameter type viscometer – industrial consistency meters – humidity terms – dry and wet bulb psychrometers – hot wire electrode type hygrometer – dew cell – electrolysis type hygrometer – commercial type dew point meter – moisture terms – different methods of moisture measurement – moisture measurement in granular materials, solid penetrable materials like wood, web type material.
2. **MECHANICAL TYPE FLOWMETERS**
   Theory of fixed restriction variable head type flow meters – orifice plate – venture tube – flow nozzle – dall tube – installation of head flow meters – piping arrangement for different fluids – pilot tube.
3. **ELECTRICAL TYPE FLOW METER**
   Principle and constructional details of electromagnetic flow meter – different types of excitation – schemes used – different types of ultrasonic flow meters – laser Doppler anemometer systems – rortex shedding flow meter – target flow meter – solid flow rate measurement – guidelines for selection of flow meter.

SECTION-B

4. **QUANTITY METERS, AREA FLOW METERS AND MASS FLOW METER**
   Positive displacement flow meters – constructional details and theory of operation of mutating disc, reciprocation piston, oval gear and helix type flow meters – inferential meter – turbine flow meter – rota meter – theory and installation – angular momentum mass flow meter – coriolis mass flow meters – thermal mass flow meter – volume flow meter plus density measurement – calibration of flow meters – dynamic weighing method.
5. **LEVEL MEASURMENT**
   Gauge glass technique coupled with photo electric readout system – float type level indication – different schemes – level switches level measurement using displacer and torque tube – bubbler system. Boiler drum level measurement – differential pressure method – hydra step systems – electrical types of level gauges using resistance, capacitance, nuclear radiation and ultrasonic sensors.

REFERENCES :

1. Ernest O.Doebelin, Measurement systems application and design international student Edition, Tata McGraw Hill Publishing Co., New Delhi, 199.
2. D.Patranabis, Principles of Industrial Instrumentation Tata McGraw Hill Publishing Co., New Delhi, 1999.
3. R.K. Jain, Mechanical and Industrial Measurements, Khanna Publishers, Delhi 1999.
4. A.K. Sawhney, A course in Electrical and Electronic Measurement and Instrumentation – Dhanpat Rai and Sons, New Delhi 1999.
5. Eckman D.P. Industrial Instrumentation – Wiley Eastern Limited, 1990.
6. Liptak B.G. Instrument Engineers Handbook (Measurement), Chilton Book Co., 1994.

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section.

UNIVERSITY OF JAMMU
FOR EXAMINATION TO BE HELD IN MAY, 2010 ONWARDS

Class: B.E. 6th Semester
Branch: E.E./E.C.E/AEI

	L	T	P
Course No: EE-603			
Course Name: Power Electronics-I	**3**	**2**	**0**
Duration of Exam.: 3 Hours		**Marks**	
		Theory	**Sessional**
		100	**40**

SECTION: A

I. SCR: Basic theory of Operation, Characteristics : Static & Dynamic, ratings, protection, series and parallel operation, Family of SCR: TRIAC, LASCR, SUS, GTO firing circuits: R, R-C, UJT

II. Line commutated converters: Single and three phase, half and full wave with R L E loads with / without freewheeling diode. Methods of forced commutations: (Class A-F)

SECTION: B

III. AC phase control: Operation of Single phase, Half and Full wave AC controller with R & R-L Load, Integral cycle control.

IV. Choppers; principle and basic chopper circuits. Steady–state Analysis of chopper circuits. Commutation in Chopper circuits

V. Inverters, series, parallel and bridge inverters and voltage control.

BOOKS RECOMMENDED:

1. M.Ramamoorty: "Power Electronics"
2 P.S. Bimbra " Power Electronics"

NOTE: There will be eight questions of 20 marks each. Students are required to attempt five questions selecting at least two question from each Section.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

				Marks	
Class: BE 6th Semester					
Branch: AEI	**L**	**T**	**P**	**Theory**	**Sessional**
Course No: EE-604	**3**	**2**	**0**	**100**	**40**
Course Title: Control System-II					
Duration of Exam: 3 Hours					

Section-A

1. **State Variable representation of Control Systems:**

Concepts of state space and state variables. State space representation of Systems described by scalar differential equations, solution of state equation; State Transition matrix. State Space representation of discrete systems. Controllability & observability of linear time invariant systems: conditions for C.C. and C.O.

2. Stability Analysis:-

Definition, first & second methods of Liapunov: stability analysis of linear system, Jury's Stability test, Bilinear Transformation

Section-B

3. Introduction to Multivariable control system, sampler, sampling process, signal reconstruction difference equation Z transform, inverse Z transform, properties of Z-transformation, Z transform analysis of sampled Data system, Z-S domain relationship.
4. **Non-linear systems:**

Introduction: Common physical non-linearities: phase plane method system analysis by phase plane method: Describing functions: Stability analysis by describing function method, Study of stability by liapunov and popov methods.

.

BOOKS RECOMMENDED: -

1) Automatic control system by Noggrath & Gopal
2) K. Ogata: Modern Control Engg. PH1
3) C.H.Sec. & A.U. Mever: Modern Control Principles & Applications MGH
4) J.E.Gibson: Nonlinear Automatic Control MGH
5) D.P.Lindorf : theory of sampled data control systems. J.W.
6) Atherton D.P.: Non-linear control Engg.
6) B.C. Kuo: Analysis & Synthesis of S.D. Control Systems PH1

NOTE:- There shall be total 8 questions of 20 marks each four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester

				Marks	
Branch: AEI	**L**	**T**	**P**		**Theory**
Sessional					
Course No: HUM-602	**3**	**2**	**0**	**100**	
50					

Course Title: Industrial Management

Duration of Exam: 3 Hours

SECTION-A

5. Management

Concept and definition, functions of management, Approaches to management, Process of management, The manager's complex environment.

6. Organization

Meaning, Various forms of organization, line, Line & staff, Functional committee organization, Formal and Informal organization.

Delegation: Meaning and importance. Barriers to effective delegation.

SECTION-B

7. Entrepreneurship

Concept, Functions of entrepreneur, Qualities of good entrepreneur.

Legal forms of industrial organization, Single proprietorship, Partnership, Joint stock companies, Public sector undertaking.

8. Leadership

Concept, Kinds of leaders, Theories of leadership, Motivation-Concept, meaning definition, Theories of motivation, Industrial accidents- Causes and prevention.

BOOKS RECOMMENDED: -

1) George R. Terry and Stephen G. Franklin, Publishers	Principles of Management	A.I.T.B.S
2) Koontz, Harold O Donnel, Cyril and Weihnich, Heinz	Management	Mcgraw Hill
3) S.S. Khanka company	Enterpreneurial Development	S. Chand &
4) Laurie J. Mullins Education	Managemaent & Organisational Behaviour	Pearson
5) M.C. Shukla	Bussiness & Industrial Organisation	
6) Tara Chand	Industrial Organisation and Management	

NOTE:- There shall be total 8 questions of 20 marks each, four from each section. Five questions have to be attempted by the students selecting atleast two questions from each section**.**

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester

Marks				
Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: ECE-606	**-**	**-**	**2**	**50**

Course Title: Microprocessor Lab

Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

10. To add two numbers stored at memory location 4040H & 4041H and store result in 4042H.
11. To subtract two numbers stored at mem. Location 4040H & 4041H and store result in 4042H.
12. Addition of two numbers using immediate addressing mode.
13. Subtraction of two numbers using immediate addressing mode.
14. To add a data array.
15. To multiply two 8-bit numbers.
16. To divide two 8-bit numbers.
17. To find largest no. in an array.
18. To find smallest no. in array.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester
Marks

Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: AEI-608	**-**	**-**	**2**	**50**

Course Title: Industrial Instrumentation Lab
Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

1. Discharge coefficient of orifice plate.
2. Calibration of pressure gauge.
3. Calibration of thermocouple.
4. Calibration of RTD.
5. UV-Visible Spectrophotometer.
6. IR Spectrophotometer.
7. Level transmitter.
8. pH meter standardization and measurement pH values of solutions.
9. Conductivity meter calibration and measurements of conductivity of test solutions.
10. EM flowmeter and ultrasonic flowmeter.
11. Ratio control in cokmbustion laboratory unit.
12. AC/DC meter calibrator.

UNIVERSITY OF JAMMU.

For Examination to be held in June-2011 onwards

Class: BE 6th Semester

Marks				
Branch: AEI	**L**	**T**	**P**	**Practical**
Course No: EE-606	**-**	**-**	**2**	**50**

Course Title: Power Electronics Lab

Duration of Exam: 3 Hours

LIST OF EXPERIMENTS

15. SCR triggering Circuits.
16. Forced commutation Circuits
17. SCR pulse Control Circuits
18. Triac Phase Control Circuits.
19. Fully Controlled Single Phase Thyristors Bridge.
20. SCR DC circuit Breaker.
21. Zero Voltage switching.
22. Voltage Commutated DC Chopper.
23. Current Commutated DC Chopper.
24. Microprocessor based three Phase Thyristors Bridge.
25. Series Connected Single Phase Converters.,
26. Series Inverter.
27. Inverter Fed Drive.
28. Copper Fed Drive.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

COURSE SCHEMEFOR B.E 7TH SEMESTER
APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	p	Theory	Sessional	Practical	Total
ECE-701	Microprocessor-II	3	2	--	100	50	--	150
AEI-701	Bio-medical Instrumentation	3	2	--	100	50	--	150
Elective-I AEI-702	(A). Industrial Electronics (B)Power Plant Instrumentation (C) Fiber optics & Laser Instrumentation	3	2	--	100	50	--	150
Elective-II AEI-703	(A)Analytical Instrumentation (B)Process Control Instrumentation (C)Instrumentation for Agriculture & Food Processing	3	2	--	100	50	--	150
AEI-704	Minor Project	--	2	4	--	--	150	150
AEI-705	Seminar	--	3	--	--	--	100	100
AEI-706	Industrial Training	--	--	--	--	--	50	50
ECE-711	Microprocessor-II Lab	--	--	3	--	--	50	50
AEI-707	Bio-Medical Instrumentation Lab	--	--	3	--	--	50	50
Total		**12**	**13**	**10**	**400**	**200**	**400**	**1000**

Note: Students have to select one course each from Elective I and Elective-II.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

CLASS: BE 7TH SEMESTER
BRANCH: AEI & ECE ENGINEERING
COURSE NO: ECE-701
COURSE TITLE: MICROPROCESSOR-II
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	T	P	THEORY	SESSIONAL
3	2	0	100	50

Section-A

Microprocessor 8086 pin diagram, Architecture, Instruction format & set, Introduction to assembly language programming & techniques, 8086 string instructions & programming, Passing parameters using procedures & macros, Nested procedures & macros, Assembler directives.

8086 Timing diagrams, 8086 interrupts, 8086 in minimum & maximum mode configuration, Bus connection & its remedy, closely & loosely coupled configuration.

Section-B

8087 math coprocessor, Pin diagram, Architecture, Instruction set, Interfacing to 8086, Introduction to 8089 I/O processor, Pin diagram, Architecture, Instruction set, Interfacing with 8086, Data sharing through memory management.

Interfacing 8255 with 8086, Interfacing of 8279 with 8086, Interfacing of USART 8251 with 8086, Memory interfacing with 8086.

Introduction, Architecture, Pin diagram of Usart-8251, 80286, 80386, 80486 & Pentium processor, Use of RISC & CISC instructions.

Books Recommended:-

01. Microprocessor & Interfacing Programming by Douglas V Hall
02. Microprocessor Architecture & Programming by Ramesh Gaonkar
03. Microprocessor Systems by Liu Gibson
04. The Intel Microprocessor by Brey

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-701
COURSE TITLE: BIO-MEDICAL INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Introduction to Bio-Medical Instrumentation

Basic medical instrumentation system, sources of Bio-medical signals, origin of Bio electric potential, ECG, EEG, EMG, skin contact impedance and its measurement, electrodes of ECG-limb electrodes, floating electrodes, Pregelled disposable electrodes, electrodes of EEg & EMG.

Anatomy & Physiology

Anatomy of heart, Cardiovascular system (Physiology) , conduction system of heart, anatomy of brain, nervous system (Physiology)

Bio- Medical Records

ECG recorder (Basic and microprocessor based), EEG recorder (EEg machine & 10-20 electrode system) and EMG recorder , ECG lead configuration and electrode placement, Phonocardiography.

Section –B

Medical Imaging Instrumentation

X-rays introduction, generation of X-rays and X-rays machine
Ultrasounds- Introduction, basic pulse echo system, A scan-Echo encephalograph, Echo-ophthalmoscope, M-scan- Echo-cardiograph, B-scan linear, sector compound scan, biological effects of ultrasounds.

Therapeutic instruments

Cardiac pacemakers, need for pacemakers, external pacemakers (continuous and on demand), Voltage, Current, and current limited voltage pacemakers, implantable pacemakers i.e fixed rate, demand and its types.
Cardiac defibrillators, their need de defibrillators, implantable defibrillators, pacer-cardiovertor defibrillators.

Books Recommended:

1. Handbook of Biomedical inst. By R.S Khandpur
2. Biomedical instrumentation & measurement by Cronwell, PHI
3. Instrumentation to Bio medical Equipment technology by Cronwell & Brown

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-702-A (ELECTIVE-I)
COURSE TITLE: : INDUSTRIAL ELECTRONICS
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section A

Review of Power Electronic Devices:

Fast recovery diodes, Schottky diode, SCR, gate triggering circuits and commutation circuts, Diac, Triac, UJT, Power MOSFETS.Applications: SCR plane circuit by light / temperature, Emergency light using SCR, Automatic battery charger using SCR, Time delay relay circuit, SCR burglar alarm circuit, Battery operated inverter circuit using power transistor.

Dual Converters & Cyclo-converters.

1- □ operation and 3- □ operations.

Section B

Inverter and Chopper

Voltage driven, current driven, bridge, parallel, SCR versions, control of output voltage – PWM schemes, harmonic reduction.

Motor Control:

D.C. and A.C. motor control, reversible drives, closed loop control, commutator less d.c. motor control using solid state devices.

A.C. Voltage Controllers:

Types of AC Voltage Controllers, Integral cycle control, single phase voltage controller, Sequence control of AC voltage (Transformer tap changers) Basic generator regulator, Car alternator.

Books Recommended:

1. Indutrial electronics & control by S.K Bhatacharya
2. Power Electronics and Control - S.K. Dutta, Prentice Hall of India Pvt. Ltd.
3. Power electronics by P.S. Bhimbra
4. Power Electronics by P.C. Sen

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-702-B(ELECTIVE-I)
COURSE TITLE: POWER PLANT INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section A

OVERVIEW OF POWER GENERATION

Brief survey of methods of power generation-hydro, thermal, nuclear, solar and wind power – importance of instrumentation in power generation – thermal power plants – building blocks – details of boiler processes UP & I diagram of boiler – cogeneration.

MEASUREMENTS IN POWER PLANTS

Electrical measurements – current, voltage, power, frequency, power-factor etc. – non electrical parameters – flow of fedwater, fuel, air and steam with correction factor for temperature – steam pressure and steam temperature-drum level measurement – radiation detector – smoke density measurement – dust monitor.

Section B

ANALYZERS IN POWER PLANTS

Flue gas oxygen analyzer – analysis of impurities in feed water and steam – dissolved oxygen analyzer – chromatography – PH meter-fuel analyzer – pollution monitoring instruments.

CONTROL LOOPS IN BOILER

Combustion control – air/fuel ratio control – furnance draft control – drum level control – main steam and redheat steam temperature control – superheater control – attemperator – deaerator control – distributed control system in power plants – interlocks in boiler operation .

TURBINE – MONITORING AND CONTROL

Speed, vibration, shell temperature monitoring and control – steam pressure control – lubricant oil temperature control – cooling system.

BOOKS RECOMMENDED:-

1. Elonka, S.M. and Kohal A.L., Standard Boiler Operations, McGraw Hill, New Delhi.
2. Sam G.Dukelow, The control of Boilers, Instrument Society of America.
3. Modern Power Station Practice, Vol. 6, Instrumentation, Controls and testing, Pergamon Pres, Oxford.
4. R.K. Jain, Mechanical and Industrial Measuremtns, Khanna Publishers, Delhi,

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-702-C (ELECTIVE-I)
COURSE TITLE: FIBER OPTICS & LASER INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section A

OPTICAL FIBERS AND THEIR PROPERTIES

Principles of light propagation through a fiber – different types of fibers and their properties transmission characteristics of optical fiber – absorption losses – scattering losses – dispersion – optical fiber measurement – optical sources – optical detectors – LED-LD-PIN and APD.

INDUSTRIAL APPLICATION OF OPTICAL FIBERS

Fiber optic sensors – fiber optic instrumentation system – different types of modulators – detectors – application in instrumentation – interferometric method of measurement of length – moiré fringes – measurement of pressure, temperature, current, voltage, liquid level and strain – fiber optic gyroscope – polarization maintaining fibers.

Section B

LASER FUNDAMENTALS

Fundamental characteristics of Lasers – three level and four level lasers – properties of laser – laser modes – resonator configuration – switching and mode locking – cavity dumping – types of lasers, gas lasers, solid laser, liquid lasers & semi conductor lasers.

INDUSTRIAL APPLICATION OF LASERS

Laser for measurement of distance, length, velocity, acceleration, current, voltage and atmospheric effect – material processing – laser heating, welding melting and trimming of materials – removal and vaporization.

MEDICAL APPLICATION

Medical applications of laser; laser and tissue interaction – laser instruments for surgery, removal to tumors of vocal cords, brain surgery, plastic surgery, gynecology and oncology.

BOOKS RECOMMENDED:-

1. John and Harry, Industrial lasers and their applications, McGraw Hill,.
2. John F Ready, Industrial applications of lasers, Academic Press.
3. MonteRoss, Laser applications, McGraw Hill.

4. Jasprit Singh, Semi conductor Optoelectronics, McGraw Hill.
5. Ghatak A.K. and Thiagarajar K, Optical electronics foundation book, TMH, New Delhi.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-703-A (ELECTIVE-II)
COURSE TITLE: ANALYTICAL INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section A

pH CONDUCTIVITY & DISSOLVED COMPONENT ANALYSER

Sampling systems – ion selective electrodes – conductivity meters – pH meters – dissolved oxygen analyzer – sodium analyzer – silica analyzer – moisture measurement.

GAS ANALYSER

Oxygen analyzer – CO monitor – Nox analyzer – H_2S analyzer – dust and smoke measurement – thermal conductivity type – thermal analyzer – industrial analysers.

CHROMATOGRAPHY

Gas chromatography – liquid chromatography – principles, types and applications – high pressure liquid chromatography – detectors.

Section-B

SPECTRO PHOTOMETERS

Spectral methods of analysis – Beer's law UV – visible spectrophotometers – single beam and double beam instruments – sources and detectors – IR spectrophotometers – sources and detectors – FTIR spectrometers – atomic absorption spectrophotometer – flame emission spectrophotometers – sources of flame photometry – applications.

NUCLEAR MAGNETIC RASONANCE AND RADIATION TECHNIQUES

NMR – basic principle – NMR spectrometers – applications – introduction to mass spectrophotometers – nuclear radiation detectors – GM counter – proportional counter – solid state detectors – introduction to x-ray spectroscopy.

BOOKS RECOMMENDED:-

1. Hand book of Analytical Instrumention by R.S Khandpur
2. Skoog, D.A. and West D.M., principles of Instrumental Analysis, Holt Sounder Publication, Philadelphia.
3. Ewing G.W., Instrumental Methods of Analysis, McGraw Hill.

4. Liptak, B.G, Process Measurement and Analysis, Chilton Book company.
5. Willard, H.H., Merrit L.L, Dean J.A. Seattle F.L., 'Instrumental Methods of Analysis', CBS Publishing and Distribution.
6. Robert D.Braun, Introduction to Instrumental Analysis, McGraw-Hill, Singapore

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-703- B (ELECTIVE-II)
COURSE TITLE: PROCESS CONTROL INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Introduction,

- Review & limitations of single loop control, need for multi-loop system, P/I diagrams, standard instrumentation symbols for devices, signal types, representation & reading instrumentation scheme using P/I diagram.

Advanced process control techniques

- Principal, Analysis & applications of cascade , Ratio , feed forward, over side, split, range, selective & auctioneering control system with multi-loops, dead time compensation , adaptive control, inferential control.

Process characteristic

- Process Variables, mathematical modeling, liquid, gas , thermal, mechanical & chemical system, Linearizing techniques liquid level control in tank. Dynamics of manometer, response non-interacting & interacting Ist order elements series

Section –B

Design of control system for multivariable process

- Multivariable control system, interaction in multiple loops, RGA methods for minimizing interactions eg: distillation column. IAE, ISE, IATE criteria.

Automatic control & controller characteristic

- Dynamic behavior of feedback control process for different modes, characteristic of on-off, proportional integral, derivative modes & their combinations, tuning of controllers.

Books Recommended:

1. Chemical process control by G. Stephenopolous
2. Process Control by Curtis D Johnson
3. Principles & practice of automatic process control Carlos by A Smith.
4. Instrumentation for process measurement & control by N.A Anderson

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-703- C (ELECTIVE-II)
COURSE TITLE: INSTRUMENTATION FOR AGRICULTURE AND FOOD PROCESSING
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Introduction, necessity of Instrumentation and control for Food processing and Agriculture, Sensor Requirements; Remote sensing, Biosensors in agriculture, Standards for food quality.
Soil science and sensors; pH conductivity, resistivity, temperature, soil moisture and salinity, ion concentration, measurements, methods of soil analysis.
Instrumentation for environmental conditioning of seed germination and growth.

Flow Diagram of Sugar Plant. Sensors and Instrumentation set-up for it. Oil Extraction Oland and Instrumentation Set-up. Pesticides Manufacturing Process and Control.
Flow Diagram of Dairy and Confectionery industry and Instrumentation set-up, Juice Extraction control set-up.

Application of SCADA for Dam parameters and control. Water Distribution and Management Control, auto-drip Irrigation System. Irrigation Canal Management, upstream and downstream control concept, Supervisory control.

Section –B

Green Houses and Instrumentation; Ventilation Cooling and Heating, Wind speed, temp. And humidity, rain gauge, carbon and dioxide enrichment measurement and control.

Automation in Earth Moving Equipment and Farm Implements, Pneumatic, Hydraulic and Electronic Control Circuits in Harvesters, cotton pickers, tractor etc. Application of SCADA and PLC in packaging industry.

Leaf Area, length, Evapotranspiration, Temperature, wetness and respiration measurements and data logging. Electromagnetic, radiation, photosynthesis, infrared and UV, Biosensor method in agriculture. Agrometeorological Instrumentation Weather Stations.

Books Recommended:-

1) Industrial Instrumentation – Patranabis, TMH
2) Instrumentation Handbook – Process Control by B.G. Liptak
3) Process Control and Instrumentation Technology by C.D. Johnson.
4) Outline of Chemical Technology By M. Gopal Rao, Marshall sitting .

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: ECE-711
COURSE TITLE: MICROPROCESSOR (8086) LAB
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
0	**0**	**3**	**0**	**50**

List of Practical

01. Write a program to calculate the factorial of a number.
02. Write a program for the addition of two numbers.
03. Write program to find average of two numbers.
04. Write a program to find the sum of numbers in the array & store it in Register or Memory.
05. Write a program to find the greatest number from a given array.
06. Write a program find the smallest number from a given array.
07. Write a program for arranging numbers in ascending order.
08. Write a program for arranging numbers in descending order.
09. Write a program to search an element from a given array.
10. Write a program to convert BCD number into its binary equivalent number.
11. Write a program to move a string from one location to another.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

CLASS: BE 7TH SEMESTER
BRANCH- AE&IE
COURSE NO: AEI-707
COURSE TITLE: : BIO-MEDICAL INSTRUMENTATION LAB
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
0	**0**	**2**	**0**	**50**

Practical's:
Students are expected to perform minimum 8 experiments based on the topics of Biomedical Instrumentation.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-706
COURSE TITLE: INDUSTRIAL TRAINING

L	T	P	MARKS
0	**0**	**0**	**50**

Students are required to undertake a total of 4 to 6 weeks Practical Training during the summer vacations in the field of Applied Electronics & Instrumentation in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern HOD for evaluation.

Guidelines for evaluation of Practical Training:

The evaluation shall be done by the departmental committee by the end of 7th semester. The committee shall have a convener and atleast two member.

Distribution of Marks as per the University statues:

i) Report = 20 40%

ii)	Viva-Voce	= 15	30%
iii)	Miscellaneous Marks	= 15	30%

Due weightage will be given to those who have opted Industrial Training outside the State as well as keeping in view the profile of that Industry.

Award of the Marks:
Marks under (i), (ii) & (iii) will be awarded by the committee constituted for the purpose.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-705
COURSE TITLE: SEMINAR

L	T	P	MARKS
0	0	3	100

This will involve a detailed study of a topic of interest reproduced in the candidate's own style. For this, a student has to prepare a seminar by doing proper survey of literature, compilation of information so gathered and then presentation of the same followed by question-answer session. The report of which has to be submitted by the student well before the conduct of seminar. The handout submitted by the student will be in accordance with the standards of technical papers.

Guidelines and evaluation of Seminar in 7th semester:

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN DECEMBER, 2011 ONWARDS

The topic of the Seminar is to be finalized and approved by the departmental committee by the end of 6th Semester. The committee shall have a convener and at least two members.

Distribution of Marks as per the University statues:

Total Marks for Seminar Evaluation	= 100 marks		
1) Project Report	=	40 marks	40%
2) Presentation	=	30 marks	30%
3) Viva-Voce	=	30 marks	30%

Award of Marks:

- Marks under (1) will be awarded by the Seminar Incharge.
- Marks under (2) and (3) will be awarded by the Departmental committee constituted for the purpose.

CLASS: BE 7TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-704
COURSE TITLE: MINOR PROJECT

L	T	P	MARKS
0	0	7	150

The project will be assigned to the students towards the end of 6th semester and will start working on those projects at the commencement of their 7th semester. The topic of the project will be decided as per the developments taking place in the fields of Applied Electronics and Instrumentation Engineering.

This may require complete literature survey, design, fabrication,

simulation of some models and/or some preliminary laboratory experiments etc. The same project shall be extended to 8th semester.

Distribution of Marks as per University Statues:

Total Marks for End semester Evaluation	= 150 marks		
1) Presentation/ Demonstration	=	45 marks	30%
2) Viva-voce	=	45 marks	30%
3) Actual work done	=	60marks	40%

Award of Marks

- Marks under (1) and (2) will be awarded by the Departmental committee constituted comprises of convener and atleast two members.
- Marks under (3) will be awarded by the Project Guide/supervisor concern.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

COURSE SCHEME FOR B.E 8TH SEMESTER
APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING

Course No.	Name of the Course	Hours Per Week			Marks			
		L	T	P	Theory	Sessional	Practical	Total
AEI-801	Bio sensors and MEMS	3	2	--	100	50	---	150
AEI-802	Virtual Instrumentation	3	2	--	100	50	---	150
Elective-III AEI-803 ECE-803(C)	(A) PLC and SCADA (B) Pneumatic and Hydraulic Instrumentation Nanotechnology	3	2	--	100	50	---	150
Elective-IV ECE-801 ECE-804(B) AEI-804	Microcontroller & their Applications Neural Network & Fuzzy Logic Robotics & Automation	3	2	--	100	50	---	150
AEI-805	Major Project	--	--	16	--	--	400	400
Total		**12**	**08**	**16**	**400**	**200**	**400**	**1000**

Note: Students have to select one course each from Elective III and Elective-IV.

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

CLASS: BE 8TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-801
COURSE TITLE: BIO SENSORS & MEMS
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Overview of Bio sensors and their electrochemistry:

Molecular reorganization, enzymes, Antibodies and DNA, modification of bio recognition molecules for selectivity and sensitivity of fundamentals of surfaces and interfaces.

Bio instrumentation and Bio electronics devices:

Principles of potentiometry and potentiometric biosensors, Principles of amperometry and amperometric biosensors, optical biosensors, based on Fiber optics. FETs and Bio-MEMS, Introduction to Chemo metrics, Biosensors arrays, electronic nose and electronic tongue.

Section –B

MEMS Technology:

Introduction Nanotechnology and MEMS design and fabrication technology , Lithography, Etching , MEMS material, bulk micromachining , electrostatic actuation Micro- fluidcs.

MEMS types and their applications:

Mechanical MEMS, Strain and pressure sensors, accelerometers etc., Electromagnetic MEMS, Micromotors, Wireless and GPS MEMS etc. Magnetic MEMS, all effect sensors, SQUID magnetometers, optical MEMS, Micromachining fiber optic component optical sensors, Thermal MEMS, Thermo mechanical and thermo-electrical actuation.

Books Recommended:

1. Biosensors by Elizabeth A.H Hall
2. Biosensors –An introduction by Brain R. Eggins
3. Micro machined transducers source book by WCB Mc Graw Hill
4. Marc Madou- Fundamentals of Micro fabrication

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

BRANCH- AEI
COURSE NO: AEI-802
COURSE TITLE; VIRTUAL INSTRUMENTATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Basics of Virtual Instrumentation:

Historical Perspective, Need/ Advantages of VI, Defining VI, Block Diagram & architecture of VI, Data Flow Techniques, Graphical Programming in Data Flow. Comparison with conventional programming.

VI Programming Techniques:

VIs & Sub-VIs, Loops & Charts, Arrays, Clusters, Graphs, Case/Sequence Structures, Formula modes, Local & Global Variables, String & File Inputs.

Section -B

Data Acquisition Basics with VI:

ADC/DAC, DI/O, Counters/Timers, PC Hardware structures, timing interrupts, DMA, Software & Hardware Installations.

Use of Analysis Tools:

Fourier Transforms, Power spectrum, Corelation methods, Windowing & Filtering.

Applications of VI:

Applications in process control projects, major equipments like Oscilloscopes, Multimeter etc.

BOOKS RECOMMENDED:

1. Gary Johnson, LabVIEW Graphical Programming 2nd Edition, McGraw Hill NY,
2. Lisa K Wells & Jeffrey Travis, LabVIEW for everyone, Prentice Hall, NJ.
3. Sokodoff, Basic concepts of LabVIEW, Prentice Hall, NJ.
4. S.Gupta, JP Gupta, PC Interface for Data Acquisition & Process Control, 2nd Ed. Instrument Society of America, 1994.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-803-A (ELECTIVE-III)
COURSE TITLE: PLC AND SCADA

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section-A

Introduction to PLC

Process control, History of Process Control, Advantages, Applications, Building block of PLC, Functions of varios stocks, PLC concepts.

PLC Hardware

Various compounds & their functions, sustalling a PLC, Configuring a PLC, Understanding the difference between Logo type & Modular type PLC.

Instruction Set

Bit logic- NO, NC, Immediate contacts, coils, set, reset, SR, RS, P,N, compare instructions, Timers, Counters, Math instructions, Move instructions, special memory bits, Applications of PLC using sensors technology.

Section-B

Programming of PLC

Programming concepts, Addressing of CPU memory areas, Ladder programming, STL programming, FBD programming,
Commissioning & operational safety of a PLC, data transmission interface and communication in the field area
Guidelines & standards.

Introduction to DCS & SCADA

DCS configuration, Control console equipment, communication between compound, local control units , DCS flow sheet symbols, DCS I/O hardware & set point station, SCADA

Books Recommended:

1. Thomas E. Kissel- PLC
2. Job Dan Otter-P.H Internation INC, USA
3. S. Bran Moris-PLC
4. Collin Simson-PLC
5. Gay Dunning- Introduction of PLC
6. Module on PLCs & their Applications by Rajesh Kr. Nittr Cha.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-803- B (ELECTIVE-III)
COURSE TITLE: PNEUMATIC AND HYDRAULIC INSTRUMENTATION

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

Introduction: Basic requirement for Pneumatic System, Servicing compressed air: Air Compressors, air treatment stages, pressure regulation (FRL unit) Introduction to hydraulic system comparison of pneumatic & hydraulic system.

Pneumatic & hydraulic Actuators, cylinders Spring, spring less, spring with positioner piston & motor actuators, electro pneumatic actuators, cylinder lubrication, cylinder with sensors, Hydraulic actuators, control valves types of control valves, basic pneumatic circuits.

Section -B

Timing & sequence diagram: Cylinder sequencing hydraulic & pneumatic Accessories Pneumatic telemetry systems: Pneumatic temperature & pressure transmitters their working & applications, electrical control in pneumatic circuit.

Pneumatic & Hydraulic Controllers(P,PI,PID) ,P&ID diagrams, converters :I/P,P/I, Pneumatic Relay, Pneumatic Sensors Flapper nozzle assembly. Maintenance & troubleshooting of pneumatic & hydraulic systems. Introduction to Mechatronics & its approach.

Books Recommended:

1. Process Control Instrumentation Technology, C. D. Johnson ,PHI.
2. Computer based Industrial Control, Krishankant PHI.
3. Pneumatic & Hydraulic, Andrew Parr PHI.
4. Process Industrial Instruments & Control Handbook D.Considine , McGraw Hill.
5. Instrument Engineers Handbook ,B.G liptak ,BH Publication .

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI/ECE
COURSE NO: ECE-803- C (ELECTIVE-III)
COURSE TITLE: NANOTECHNOLOGY
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

Section-A

Introduction

Introduction to nanoscale science and technology, why nanoscience and nanotechnology? Length energy and time scales, nanostructure types and properties, electronic and optical properties of materials, top down approach to nanolithography. Spatial resolution of optical, deep ultraviolet, X-ray, electron beam and ion beam lithography.

Quantum Mechanics

Band gap engineering, Quantum confinement of electrons in semiconductor nano structures, One dimensional confinement (Quantum wires), Two dimensional confinement (Quantum wells), three dimensional confinement (Quantum dots) and Bottom up approach, Single electron transistors, coulomb blockade effects in ultra small metallic tunnel junctions.

Section-B

Molecular Techniques:

Molecular Electronics, Chemical self-assembly, carbon fullerenes and nanotubes, Self assembled mono layers, MWNT (Multiwalled nanotubes) Applications in biological and chemical detection.

Surface analytical instrumentation techniques for nanotechnology:

Atomic scale characterization techniques, scanning probe microscopy, scanning tunneling microscopy and atomic force microscopy.

Application: Introduction to Nanoelectronics, Nanobioteb

Books Recommended:

1. Beenaker and Van Houten "Quantum Transport in Semiconductor Nanostructures in Solid state Physics" Ehernreich and Turnbell, Academic press, 1991

References

1. David Ferry " Transport in Nano structures" Cambridge University press 2000
2. Y. Imry " Introduction to Mesoscopic Physics, Oxford University press 1997
3. S. Dutta " Electron Transport in Mesoscopic systems" Cambridge University press
4. H. Grabert and M. Devoret "Single charge Tunneling" Plenum press 1992

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI & ECE
COURSE NO: ECE-801 (ELECTIVE-IV)
COURSE TITLE: MICRO-CONTROLLER AND THEIR APPLICATIONS
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

Section – A

Role of Microcontrollers- 8 bit Microcontrollers, architecture of Intel 8031/8051/8751, hardware processing, instruction set-simple programs.

Peripheral interface: Interrupts, Applications, automobile turn Indicator, Small DC Motor Control.

16- Bit Microcontroller: Intel 8096, architecture, modes of Operations, Addressing modes, instruction set, simple programs.

Section- B

Peripheral Functions of 8096: Interrupt structure, Timers, High Speed Inputs and Outputs, analog Interface, PWM output, serial Ports, Port status and Control Resistors, Watch Dog Timer.

AVR Microcontroller Series: Architecture, Instruction set and assembly language programming, Advantage of using RISC Microcontroller, Architectural features of different variant, System Design based on PIC and AVR.

Books Recommended:-

01. The 8051 Microcontroller (architecture, Programming and Applications)
    By: Kenneth J. Ayala -----Penram International.

02. The 8051 Microcontroller and Embedded Systems-
    By: Muhammed Ali Mazidi & Janice Gillispie Mazdi.

03. Design with Microcontroller
    By: John B. Peatman (Tata McGraw Hill Publications)

04. ARM system development guide
    By: Andrew-n-sloss & Dominic Symes Publisher –Morgan Aausamann.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI /ECE
COURSE NO: AEI-804- B (ELECTIVE-IV)
COURSE TITLE: NEURAL NETWORKS & FUZZY SYSTEMS
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

Section-A

Neural Networks Characteristics: History of development in Neural Networks Principles, Artificial Neural Net terminology, Model of a neuron, Topology and types of learning supervised, Unsupervised.

Learning Rules: The perception, Linear reparability, Basic learning laws, Hebb's rule, Delta rule, Widrow & Hoff LMS learning rule, Correlation learning rule, Instars and out star learning rules. Unsupervised learning, Competitive learning, K-Meams clustering algorithm, Kohonen's feature maps.

Different Neural Networks: Basic learning laws in RBF nets, Back propagation algorithm, Feed forward networks, ART networks.

Section-B

Application of Neural Nets: Pattern recognition applications of BPN, Associative memories, Vector.

Fuzzy Logic: Basic concepts of Fuzzy Logic, Fuzzy vs Crisp set, Linguistic variables, Membership function, Operayion of Fuzzy sets, Fuzzy IF-THEN rules, Variable inference, Techniques, Defuzzication techniques, Basic fuzzy inference algorithm, Applications of fuzzy logic, Fuzzy system design, Implementation of fuzzy system.

Recommended Books

01. Artificial Neural Networks — Zurada
02. Artificial Neural Networks — Vegna Narayanan
03. Neural Networks — Simon Haykin

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-804 (ELECTIVE-IV)
COURSE TITLE: ROBOTICS & AUTOMATION
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
3	**2**	**0**	**100**	**50**

Section -A

BASIC CONCEPTS

Definition and origin of robotics – different types of robotics – various generation of robots-degrees of freedom Asimov's laws of robotics – dynamic stabilization of robots.

POWER SOURCES AND SENSORS

Hydraulic, pneumatic and electric drives – determination of HP of motor and gearing ratio – variable speed arrangements – path determination-micro machines in robotics – machine vision-ranging –laser-acoustic-magnetic, fiber optic and tactile sensors.

Section -B

MANIPULATORS, ACTUATORS AND GRIPPERS

Construction of manipulators – manipulator dynamics and force control – electronic and pneumatic manipulator control circuits – end effectors – U various types of grippers – design considerations.

KINEMATICS AND PATH PLANNING

Solution of inverse kinematics problem multiple solution jacobian work envelope – hill climbing techniques – robot programming languages.

CASE STUDIES:

Multiple robots-machine interface-robots in manufacturing and non-manufacturing applications-robot cell design – selection of a robot.

Books Recommended :

1. Artificial intelligence IIIrd edition by Patrick Hanry Winston
2. Ghosh, Control in Robotics and Automation : Sensor Based Integration, Allied Publishers, Chennai, 1998.
3. Asfahl C.R. Robots and Manufacturing Automation, John Wiley, USA 1992.
4. Klafter R.D. Chimielewski T.A. and Negin M. Robotic Engineering – An integrated approach, prentice Hall of India, New Delhi, 1994.
5. Deb. S.R. Robotics Technology and flexible Automation, John wiley, USA 1992.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting atleast two questions from each section. Use of Calculator is allowed.

CLASS: BE 8TH SEMESTER
BRANCH- AEI
COURSE NO: AEI-805
COURSE TITLE: MAJOR PROJECT
DURATION OF EXAM: 3 HOURS.

			MARKS	
L	**T**	**P**	**THEORY**	**SESSIONAL**
0	**0**	**16**	**0**	**400**

UNIVERSITY OF JAMMU, JAMMU
FOR EXAMINATION TO BE HELD IN JUNE, 2012 ONWARDS

The student will complete their assigned project work initated in 7th semester under course No.AEI-705 and submit a detailed project report individually to the Head of the department.

Guidelines for evaluation of Project work in 8th semester:

Sub-distribution of marks:

- For External Examiner : 150
- For Internal Examiner : 250

Sub distribution of internal Marks:

- Mark distribution of internal Project work as per the University statues shall be based on:

a.	Viva-Voce	=	75	30%
b.	Presentation	=	75	30%
c.	Report	=	100	40%
	Total	=	250	