A.Y. 2019-20

Regulations: R14

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

B.Tech.(III Semester)(R14) Supplementary Examinations, November 2020

TIME TABLE

TIME : 10.00 AM to 1.00 PM

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
02-11-2020 (Monday)	S134 - Applied Mathematics – III	S134 - Applied Mathematics - III	S134 - Applied Mathematics - III	S309 - Mathematics-III	S134 - Applied Mathematics-III	S134 - Applied Mathematics – III	S134 - Applied Mathematics - III	S134 - Applied Mathematics-III
03-11-2020 (Tuesday)	S408 - Thermodynamics	S304 - Mechanics of Fluids	S197 - Discrete Mathematics	S126 - Analog Electronic Circuits	S301 - Measurement and Instrumentation	S126 - Analog Electronic Circuits	S197 - Discrete Mathematics	S408 - Thermodynamics
04-11-2020 (Wednesday)	S233 - Engineering Fluid Mechanics	S391 - Strength of Materials - I	S169- Computer Organization	S189 - Digital Electronic Circuits	S216 - Electrical Machines – I	S189 - Digital Electronic Circuits	S290 - Linux Programming	S309 - Metallurgy and Material Science
05-11-2020 (Thursday)	S390 - Strength of Materials	S396 - Surveying	S324 - Object Oriented Programming through C++	S361 - Pulse and Switching Circuits	S210 - Electrical Circuits - II	S220- Electrical Technology	S325 - Object Oriented Programming using Java	S305 - Mechanics of Materials
06-11-2020 (Friday)	S225 - Elements of Aerospace Engineering	S208 - Electrical and Electronics Engineering	S253- Free Open Source Software	S428 - Random Variables and Stochastic Processes	S206 - Electric and Magnetic Fields	S206 - Electric and Magnetic Fields	S191 - Digital Logic Design	S208 - Electrical and Electronics Engineering
07-11-2020 (Saturday)	S143 - Basic Electrical Engineering	S171 - Concrete Technology	S295- Managerial Economics and Financial Analysis	S378 - Signals and Systems	S144 - Basic Electronic Devices and Circuits	S378 - Signals and Systems	S327 - Operating Systems	S293 - Machine Drawing
09-11-2020 (Monday)	S243 - Environmental Studies	S243 - Environmental Studies	S243 - Environmental Studies	S355 - Professional Ethics and Human Values	S355 - Professional Ethics and Human Values	S355 - Professional Ethics and Human Values	S243 - Environmental Studies	S243 - Environmental Studies

NOTE:
(i) Any omissions or clashes in this time table may please be informed to the Controller of Examinations immediately.
(ii) Even if government/JNTUK/College declares holiday on any of the above dates, the examinations shall be conducted as notified only.
(iii) For any clarification in respect of the above examinations, please contact the Controller of Examinations.

Date: 12-10-2020

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to: 1. All H.o.Ds for N.A.,
2. All Notice Boards,

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
'L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.
B.Tech. (III Semester) Supplementary Examinations
S134-APPLIED MATHEMATICS-III
(AE,CE,CSE,EEE,EIE,IT&ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Obtain the interval in which one of the root of equation $x^4 - x + 9 = 0$ is lies.	1M
(b)	Verify the relation $\nabla = 1 - E^{-1}$	1M
(c)	Calculate y_1, if $y_0 = 2, y'_0 = 0, y''_0 = 2, y'''_0 = 0, y''''_0 = 6$ by Taylor's series formula with h = 0.2.	1M
(d)	Find the gradient of $f = x^2 yz^3$ at (2,1,-1).	1M
(e)	Verify the force field $\overline{f} = x\overline{i} + y\overline{j} + z\overline{k}$ is conservative.	1M
(f)	Find first approximation value of $xe^x = 2$	2M
(g)	The value of $\Delta \log f(x)$.	2M
(h)	Write the iterative formula of Euler's method for solving $y' = f(x,y), y(x_0) = y_0$	2M
(i)	Interpret mathematically the term " Irrotational vector".	2M
(j)	If R is the projection of a surface S in xz - plane then write ds	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Find a root of the equation $xe^x = 2$ by using Regula-Falsi method.	8M
(b)	Using Simpson's 3/8 rule evaluate $\int_0^6 \frac{1}{1+x^2} dx$, by taking 6 ordinates. Also compare it with actual value.	7M

3(a) Find f(0.12) by using Newton's forward difference table for the given data.   7M

x	0.10	0.15	0.20	0.25	0.30
f(x)	0.65	0.52	0.41	0.32	0.24

(b) Using Gauss backward interpolation formula estimate the sales in the year 1936 (where sales are given in lakhs) .   8M

Year	1940	1950	1960	1970	1980	1990
sales	17	20	27	32	36	38

4(a)	Using modified Euler's method find y (0.2) when $y' = x + \sin y$ with $y(0) = 1$	7M
(b)	Given that $y' = 2y + 3e^x$, y(0)=0, find an approximate value of y at x=0.2 using Taylor's series method.	8M
5(a)	Find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point $P(1,2,3)$ in the direction of the line PQ where Q is the point $(5,0,4)$.	8M
(b)	Prove that $\nabla^2 (r^n) = n(n+1)r^{n-2}$	7M
6.	Verify by Green's theorem $\int_c (x^2 - \cosh y)dx + (y + \sin x)dy$ where c is the rectangle with vertices $(0,0),(\pi,0)(\pi,1)$ and (0, 1)	15M
7(a)	Find a unit normal vector to the given surface $x^2+y^2 = z$ at the point (-1, -2, 5).	8M
(b)	If $\vec{f} = e^{x+y+z}(\vec{i}+\vec{j}+\vec{k})$ then find $curl\,\vec{f}$.	7M

8(a) Fit a polynomial for the following data by using Newton's backward difference table.   7M

x	1	2	3	4
f(X)	2	5	16	41

(b) Fit a polynomial for the following data by using Lagrange's interpolation.   8M

x	1	4	5	7
f(X)	2	5	11	13

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B.Tech. (III Semester) Supplementary Examinations

S408-THERMODYNAMICS
(ASE&ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	What is a thermodynamic system.	1M
(b)	State first law of thermodynamics.	1M
(c)	When a process is said to be reversible?	1M
(d)	Define number of moles.	1M
(e)	What are the four basic components of steam power plant.	1M
(f)	Justify the need of continuum	2M
(g)	State the limitations of first law of thermodynamics.	2M
(h)	Discus the nature of a cycle based on the Clausius inequality.	2M
(i)	Define mass fraction and mole fraction.	2M
(j)	Compare the heat addition process of Otto cycle, Diesel cycle and Dual cycle.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	What do you understand by the flow work? Is it different from displacement work.	7M
(b)	A gas expands from an initial state where the pressure is 340 kPa and the volume is 0.0425 m³ to a final pressure of 136 kPa. The relationship between the pressure and volume of the gas is $PV^2 = C$. Determine the work for the process.	8M
3(a)	Apply first law of thermodynamics and prove that energy is a property of system.	7M
(b)	A piston and cylinder assembly contains 5 Kg of steam. The steam having an internal energy of 2709 kJ/Kg, expands to a state where the internal energy is 2659.6 kJ/Kg. During the process there is a heat transfer of 80 kJ to the steam and also a paddle-wheel work transfer if 18.5 kJ. Neglecting the kinetic energy and potential energy of the steam, determine the amount of energy transfer by work from the steam to piston and decrease in energy of the system.	8M
4(a)	Derive the isentropic relations for ideal gas.	7M
(b)	Two kg of water at 800C is mixed adiabatically with 3 kg of water at 300C in a constant pressure process at 1 atm. Find the increase in entropy of the total mass of water due to the mixing process. Take C_p of water as 4.187 kJ/kg K.	8M
5(a)	Show that for a reversible adiabatic process executed by an ideal gas, the following reasons holds good: (i) $pv^\gamma = constant$ (ii) $Tv^{\gamma-1} = constant$.	7M
(b)	Find out the mass and mole fraction of the mixture that consists of 3 kg of O_2 and 5 kg of N_2 and 12 kg of CH_4.	8M
6(a)	Illustrate the working of Diesel cycle with help of P-V and T-S diagrams.	7M
(b)	An ideal Diesel cycle with air as the working fluid has a compression ratio of 18 and a cut-off ratio of 2. At the beginning of compression, the air is at 100 kPa, 27°c and 1917cm³.Determine (i) the pressure of air at each point (ii) the net work and the thermal efficiency.	8M
7(a)	Show that enthalpy of a fluid before throttling is equal to that after throttling.	7M
(b)	A reciprocating air compressor takes in 2 m³/min at 0.11 MPa, 20°C which it delivers at 1.5 MPa, 111°C to an aftercooler where the air is cooled at constant pressure to 25°C. The power absorbed by the compressor is 4.15 kW. Determine the heat transfer in (i) The compressor (ii) The cooler State your assumptions.	8M
8(a)	Discuss the phase change process of pure substance by using h-s (specific enthalpy- specific entropy) diagram.	7M
(b)	Find the specific volume, enthalpy, entropy and internal energy of steam at 2 MPa, 400⁰C.	8M

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S233-ENGINEERING FLUID MECHANICS
(AE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a) Define Density, Specific weight, Specific gravity & viscosity. [1M]

(b) Define the steady and unsteady flow. [1M]

(c) Define the term TEL and write the equation for Head losses. [1M]

(d) Find the force exerted by a jet of water of diameter 70mm on a stationary flat plate, normally with a velocity of 25m/s. [1M]

(e) Define the terms, Slip and Negative slip in reciprocating pumps. [1M]

(f) Calculate the bulk modulus of elasticity of a liquid , if the pressure of the liquid is increased from $70N/cm^2$. The volume of the liquid decreased by 0.15 percent. [2M]

(g) Derive continuity equation from principle of conservation of mass. [2M]

(h) Derive an expression for head losses for equivalent pipes. [2M]

(i) Differentiate between impulse and reaction turbine. [2M]

(j) Differentiate between centrifugal pump and reciprocating pump. [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) In a Brahma press, the plunger and cylinder are having areas of 50 and 5000 sq.cms. respectively. A weight of 4500 kg is kept on cylinder. The vessel and passages connecting plunger and cylinder is filled with oil of sp.gr 0.85. What force on the plunger is required for equilibrium. [7M]

(b) A fan delivers 4 m3 of air per second at 200C and 1.25 bar. Assuming molecular weight of air as 28.97, calculate the mass of air delivered. Also determine the density, specific volume and specific weight of the air being delivered. [8M]

3(a) Calculate the total pressure on a circular plate of diameter 1.5m which is placed vertically in water in such a way that the centre of the plate is 3m below the free surface of water. Find the position of centre of pressure also. [7M]

(b) The following cases represent the two velocity components; determine the third Component of velocity such that they satisfy the continuity equation:
(i) $u=x^2+y^2+z^2$; $v=xy^2-yz^2+xy$ (ii) $v=2y^2, w=2xyz$ [8M]

4(a) A pipe line of 0.6 m diameter is 1.5 km long. To increase the discharge, another line of the same diameter is introduced parallel to the first half of the length. Neglecting minor losses. Determine the increase in discharge if 4f=0.04. the head at inlet is 300mm [7M]

(b) A pipe line is 15cm in diameter and it is at an elevation of 100m at section A. At section B it is at elevation of 107m and has diameter of 30cm. when a discharge of 50 lit/sec of water is passed through this pipeline, pressure at A is 35 kPa. The energy loss in pipe is 2m of water. Determine pressure at B if flow is from A to B.
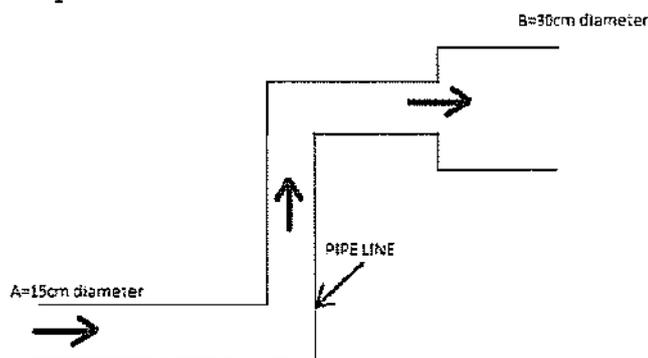
[8M]

5(a) A 7.5 cm diameter of jet having a velocity of 30m/s strikes a flat plate, the normal of which is inclined at 450 to the axis of the jet. Find normal pressure on the plate, when (i) the plate is stationary and (ii) when the plate is moving with a velocity of 15m/s. determine the power and efficiency of the jet when plate is moving. [7M]

(b) A Kaplan turbine produces 80 MW under a head of 30 m with an efficiency of 85%. Taking the value of speed ratio Ku as 1.6, flow ratio as 0.55 and hub diameter as 0.4 times the outer diameter; find the diameter and speed of turbine. [8M]

6(a) A centrifugal pump is to discharge 0.118m3 / sec at a speed of 1450 rpm against a head of 25m. The impeller diameter at outlet is 250mm and its width at outlet is 50mm and manometric efficiency is 75%. Determine vane angle at outer periphery of the impeller. [7M]

(b) Find the power required to drive a centrifugal pump, which delivers 50 liters of water per sec to a height of 25 m through 125 mm diameter and 100 m long pipe line. The overall efficiency of pump is 80% and frictional coefficient f = 0.07 for the pipe line. Assume the inlet losses in suction pipe equal to 0.4 m. [8M]

7(a) In a steady flow, two points A and B are 0.5 m apart on a straight stream line. If the velocity of flow varies linearly between A and B, What is the acceleration at each point, if the velocity at 'A' is 3 m/sec and velocity at 'B' is 8 m/sec. [7M]

(b) Derive Darcy weisbach equation. [8M]

8(a) Derive Bernoulli's equation for incompressible fluids and mention its limitations. [7M]

(b) A compound piping system consists of 2000 m of 0.6 diameter, 1000 m of 0.5 m diameter, 800 m of 0.4 m diameter, with new cast-iron pipes connected in series. Convert this system to i) an equivalent length of pipe of 0.4 m. diameter ii) an equivalent size of 4000 m. long. [8M]

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations
### S390-STRENGTH OF MATERIALS
(AE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Define resilience.	[1M]
(b)	What are the different types of beams?	[1M]
(c)	Define the term polar modulus.	[1M]
(d)	Draw stress notation for a biaxial loaded system.	[1M]
(e)	What is the difference between thin and thick cylinder?	[1M]
(f)	Draw stress – strain diagram for Brittle materials.	[2M]
(g)	What are the sign conventions for shear force and bending moment in general?	[2M]
(h)	What do you mean by section modulus? Find an expression for section modulus for hollow circular cross section.	[2M]
(i)	State maximum principal strain theory. Explain.	[2M]
(j)	Explain the procedure to find the deflection of beam by using moment area method.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)   The composite bar shown in Figure is rigidly fixed at the ends A and B. Determine the reaction developed at ends when the temperature is raised by 18°C. Given E_a = 70 kN/mm², E_s = 200 kN/mm², α_a = 11 × 10⁻⁶/°C, α_s = 12 × 10⁻⁶/°C.

                                                                        [7M]
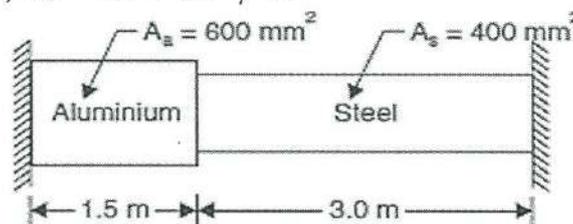
(b)   A concrete column is reinforced with steel bars comprising 6 percent of the gross area of column section. What is the fraction of the compressive load sustained by steel bars, if the ratio of Young's modulii of steel and concrete is 12.5?   [8M]

3(a)   Calculate the reactions at the support A and B of the beam as shown in fig.Draw S.F and B.M diagrams. Determine also the contra-flexure with the span AB and Show their positions on the Bending moment Diagram.

                                                                        [8M]
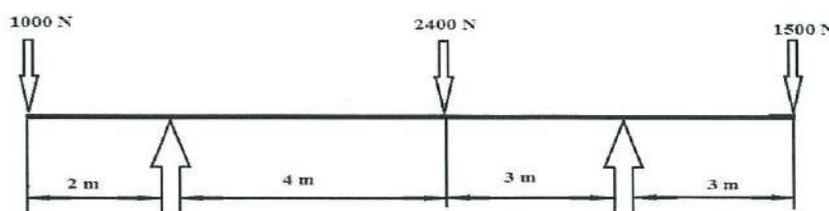
(b) A simply supported beam is carrying a uniformly distributed load of 2kN /m over a length of 3m from the right end. The length of the beam is 6m. Draw the S.F and B.M diagrams for the beam. [7M]

4(a) A cast iron beam has an I-section with top flange 100mm x 40mm, web 140mm X 20mm and bottom flange 180mm x 40mm. If tensile stress is not to exceed 35MPa and compressive stress 95MPa, what is the maximum uniformly distributed load the beam can carry over a simply supported span of 6.5m if the larger flange is in tension. [8M]

(b) A shaft to transmit a torque of 30KNm. The maximum shear stress is not to exceed 100MPa and the angle of twist is not to exceed 1°/m length. G=80GPa. Design the shaft according to the given specifications if it is a hollow shaft of internal diameter 90% of the external diameter. [7M]

5(a) The direct stresses at a point in the strained material are 120 N/mm^2 compressive and 80 N/mm^2 tensile as shown in Figure (below). There is no shear stress. Find the normal and tangential stresses on the plane AC. Also find the resultant stress on AC.
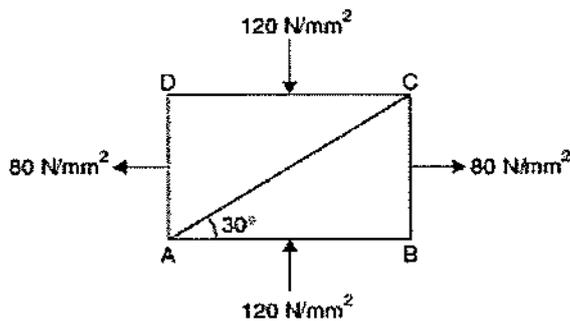
[8M]

(b) A wooden beam 100 mm wide and 150 mm deep supports a uniformly distributed load over a span of 2 meters. If the safe stresses are 28 N/mm^2 longitudinally and 2 N/mm^2 in transverse shear calculate the maximum load which can be supported by the beam. [7M]

6(a) A simply supported beam of span 4 m is carrying a uniformly distributed load of 2 KN/m over the entire span. Find the maximum slope and deflection of the beam. Take EI for the beam as 80x10^{9}N-mm^2 [8M]

(b) A cylindrical shell 3 m long, 0.6 m in diameter is made up of 15 mm thick plate. Determine the change in volume, when the shell is subjected to an internal pressure of 50N/mm2. [7M]

7. A cantilever beam of length 2 m carries the point load as shown in figure. Draw shear force and bending moment diagrams for the cantilever beam.
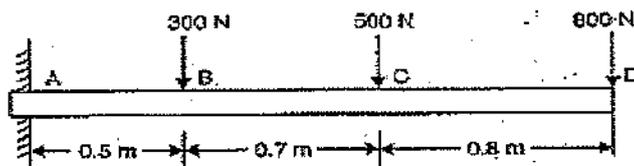
[15M]

8. Derive the formula for the thickness of the thin cylindrical shell and solve the following problem. A thin cylindrical shell of 1 m diameter is subjected to an internal pressure of 1 N/sq. mm. Calculate the suitable thickness of the shell, if the tensile strength of the plate is 400 N/sq mm and factor of safety 4. [15M]

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S225-ELEMENTS OF AEROSPACE ENGINEERING
(AE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Classify the atmospheric altitude and their layers in brief.	[1M]
(b)	Name the condition when lift is equal to weight and drag is equal to thrust.	[1M]
(c)	Explain types of reciprocating engine and jet engines in short.	[1M]
(d)	Explain the wing geometry with a neat sketch.	[1M]
(e)	What is the main purpose of reusable space vehicle?	[1M]
(f)	Relate Geo potential altitude with Geometric altitude. With a neat sketch.	[2M]
(g)	Define high lift devices used in the symmetric maneuvers.	[2M]
(h)	Demonstrate the principal of ram jet engine. And its uses.	[2M]
(i)	Compare brittle and ductile materials with an examples.	[2M]
(j)	Define orbital equation in space flight.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Compare the works carried out by the German engineer Lilienthal and Scot engineer Percy Pilcher during 19th century in the area of building and experimenting gliders.	[7M]
(b)	Illustrate how the balloons and the dirigibles are used in the World War II.	[8M]
3(a)	Evaluate types of Drag and predict how to overcome those drag forces in maneuvers.	[7M]
(b)	Differentiate between the working principle of turbojet and turbofan engine.	[8M]
4(a)	Determine composite materials which were used in the aerospace industry.	[7M]
(b)	Examine components of aircraft structure used to construct the fuselage design.	[8M]
5(a)	Describe about Extra vehicular activity. Also explain the life support systems given in a space suit.	[7M]
(b)	Demonstrate the temperature distribution of standard atmosphere with graph.	[8M]
6(a)	Differentiate between the working of the propulsion station keeping subsystem and the thermal protection subsystem.	[7M]
(b)	Determine the performance parameters of the aircraft in accelerated flight.	[8M]
7(a)	Illustrate how the balloons and the dirigibles are used in the World War II.	[7M]
(b)	Discuss shortly on the effects of various controls available on an airplane to control the roll, pitch, and yaw motions of the aircraft.	[8M]
8(a)	Differentiate between the working principle of turbojet and turbofan engine.	[7M]
(b)	Elaborate rocket staging with a schematic sketch.	[8M]

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B.Tech. (III Semester) Supplementary Examinations

S143-BASIC ELECTRICAL ENGINEERING
(ASE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Write the formula for energy stored in the inductor.	1M
(b)	What is the function of motor?	1M
(c)	What is the average value of sine wave over one full cycle?	1M
(d)	Which type of induction motor used in high staring torque applications?	1M
(e)	Which type of damping method is efficient in measuring instruments?	1M
(f)	What is voltage division rule?	2M
(g)	Identify the types of D.C generators.	2M
(h)	How hysteresis and the eddy current losses can be minimized in a transformer?	2M
(i)	Express the formula for emf induced in alternator.	2M
(j)	Draw the diagram for spring control.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Distinguish the series and parallel circuits.	8M
(b)	Three equal resistances of value R ohms are connected in delta fashion. if this is reduced by an equivalent Y-connected resistances R1,R2 and R3 .what are the values of R1,R2,R3 in terms of R.	7M
3(a)	Develop the circuit diagram for shunt and series generators write the necessary equations.	8M
(b)	What is back emf? Explain its significance.	7M
4(a)	Define reactance, susceptance and conductance.	7M
(b)	Evaluate the Average value for full wave rectifier.	8M
5(a)	Differentiate between salient and non salient pole rotors of an alternator.	8M
(b)	Draw the torque slip characteristics of induction motor.	7M
6(a)	Distinguish between the MI and MC instrument.	7M
(b)	Examine the differences between various methods of producing controlling torques.	8M
7(a)	Describe various losses and efficiency of a D.C Machine.	8M
(b)	A 10kw D.C shunt generator has the following losses at full load iron loss is 0.2kw and copper loss is 1kw determine the efficiency of the machine.	7M
8(a)	Write short notes on following (i)deflecting torque (ii) controlling torque (iii) damping Torque.	7M
(b)	Distinguish the MC and MI instruments.	8M

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S243-ENVIRONMENTAL STUDIES

Time : 3 hours   (ASE, CE, CSE, IT & ME)   Max. Marks : 75

PART-A
(Answer all questions)

1(a)	Can you give any four consequences of deforestation?	[1M]
(b)	Define ecosystem.	[1M]
(c)	What the three 'R's indicate in solid waste management?	[1M]
(d)	How does ozone layer protect us?	[1M]
(e)	Identify any two reasons for population explosion.	[1M]
(f)	Justify any two benefits of constructing dams.	[2M]
(g)	What is meant by extinction of species?	[2M]
(h)	Name any two primary air pollutants.	[2M]
(i)	Briefly list out any two methods for water conservation.	[2M]
(j)	Name two IT contribution in environmental management.	[2M]

PART-B
(Answer any FOUR questions)

2(a)	Discuss the advantages, disadvantages and controversies surrounding large dams and reservoirs.	[7M]
(b)	Can you suggest some measures needed to be taken for conserving forest resources?	[8M]
3(a)	Discuss the structure and functions of an ecosystem.	[7M]
(b)	Identify and explain the present day major threats to the biodiversity of India.	[8M]
4(a)	List out the sources and effects of air pollution and suggest some methods for control of air pollution.	[7M]
(b)	What are the various alternatives adapted in municipal solid waste management?	[8M]
5(a)	Write about the phenomenon of global warming.	[7M]
(b)	List out the effects and control measures for global warming.	[8M]
6(a)	Explain the effects of population explosion.	[7M]
(b)	How can, the better education to female can improve the general prosperity and welfare of a household? Explain.	[8M]
7(a)	Briefly discuss the salient features of Environmental Protection Act.	[7M]
(b)	Justify the significance of IT in the medical advances in terms of human health.	[8M]
8(a)	Discuss the major causes of wastage and degradation of our fresh-water resources. What can be done to conserve them?	[7M]
(b)	Discuss in detail about world food problems.	[8M]

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B.Tech. (III Semester) Supplementary Examinations
S304-MECHANICS OF FLUIDS
(CE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Define mass density.	1M
(b)	Define the Centre of pressure.	1M
(c)	Define the co-efficient of discharge.	1M
(d)	What do you understand by the term Major energy loss in pipes?	1M
(e)	Define Froude Model Law.	1M
(f)	What is a fluid?	2M
(g)	Define the term streak lines.	2M
(h)	Define an orifice and a mouthpiece.	2M
(i)	Define the term Pipes in parallel.	2M
(j)	Define laminar boundary layer.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	The pressure outside the droplet of water of diameter 0.04 mm is 10.32 N/cm² (atmospheric pressure). Calculate the pressure within the droplet if surface tension is given as 0.0725 N/m of water.	7M
(b)	What are the different types fluids? Explain each type.	8M
3(a)	A rectangular plane surface is 2 m wide and 3 m deep. It lies in vertical plane in water. Determine the total pressure and position of centre of pressure on the plane surface when its upper edge is horizontal and 2.5 m below the free water surface.	7M
(b)	Explain the terms (i) path line (ii) streak line (iii) stream line (iv) stream tube.	8M
4(a)	Determine the height of a rectangular weir of length 6 m to be built across a rectangular channel. The maximum depth of water on the upstream side of the weir is 1.8 m and discharge is 2000 litres/s. Take C_d = 0.6 and neglect end contractions.	7M
(b)	An orifice meter with orifice diameter 15 cm is inserted in a pipe of 25 cm diameter. The pressure gauges fitted upstream and downstream of the orifice meter give readings of 15 N/cm² and 10 N/cm² respectively. Find the rate of flow of water through the pipe in litres/s. Take C_d = 0.6.	8M
5(a)	Write the procedure for Hardy Cross Method to solve the pipe network problems.	7M
(b)	Determine the difference in the elevations between the water surfaces in the two tanks which are connected by a horizontal pipe of diameter 400 mm and length 500 m. The rate of flow of water through the pipe is 200 litres/s. Consider all losses and take the value of f = 0.009.	8M
6(a)	What do you mean by repeating variables? How are the repeating variables selected in dimensional analysis?	7M
(b)	In the model test of a spillway the discharge and velocity of flow over the model were 2 m³/s and 1.5 m/s respectively. Calculate the velocity and discharge over the prototype which is 36 times the model size.	8M
7(a)	A horizontal venturimeter with inlet diameter 200 mm and throat diameter 100 mm is employed to measure the flow of water. The reading of the differential manometer connected to the inlet is 180 mm of the mercury. If the co-efficient of discharge is 0.98 determine the rate of the flow.	7M
(b)	Find the discharge through a trapezoidal notch which is 1.2 m wide at the top and 0.50m at the bottom and is 0.40 m in height. The head of water on the notch is 0.30 m. Assume C_d for rectangular portion = 0.62 while for triangular portion = 0.60.	8M
8(a)	Explain the concept of boundary layer.	7M
(b)	Find the expression for the drag force on smooth sphere of diameter D, moving with a uniform velocity V in a fluid of density ρ and dynamic viscosity μ. (Use Rayleigh's method).	8M

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B.Tech. (III Semester) Supplementary Examinations

S391-STRENGTH OF MATERIALS-I
(CE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	State the relation among E,C and K.	1M
(b)	The rate of change of BM at any section is equal to what?	1M
(c)	What is the max value of shear stress in a rectangular cross-section?	1M
(d)	Find the deflection at the free end of a cantilever beam with point load at its free end.	1M
(e)	What is the expression for the circumferential stress variation in thick spherical shell?	1M
(f)	For a material having modulus of elasticity (E) = 208GPa and Poisson's ratio (1/m) = 0.3, find the modulus of rigidity (C).	2M
(g)	State the relations among intensity of loading, shear force and bending moment.	2M
(h)	A high strength beam of 90mm width and 0.5mm thickness runs over a pulley of 500mm diameter. E = 200GPa, find the maximum bending stress induced.	2M
(i)	A simply supported beam of span 6m carries udl 5kN/m run over the whole span. If EI = kN-m² (constant), find the central deflection.	2M
(j)	A thin cylindrical steel pressure vessel of diameter 50mm and wall thickness 2.5mm is subjected to an internal fluid pressure' p'. If the ultimate strength of steel is 350N/mm², find the bursting force.	2M
	PART-B	
	(Answer any FOUR questions. All questions carry equal marks)	
2(a)	Show that the relation among E,K and C is $E = \frac{9KC}{3K+C}$	8M
(b)	If E = 2.102x10⁵N/mm² and Poisson's ratio = 0.245 for a material, find the modulus of rigidity (C) and bulk modulus (K) for that material.	7M
3(a)	Explain the relation between the shear force, Bending moment and rate of loading.	7M
(b)	A beam AB = 6m is simply supported with equal overhangs of 2m on either side and subjected to a udl of 30kN/m over the whole span. Calculate the salient values of SF and BM and draw SFD and BMD.	8M
4(a)	State the assumptions made in the theory of simple bending.	7M
(b)	A simply supported beam of 4m span carries a central point load 300kN. Depth of the section is 1.5 times the width. If the max bending stress is limited to 20N/mm², find the dimensions of the cross-section.	8M
5(a)	Explain Macaulay's method to find slope and deflection in a beam.	7M

(b)	A cantilever beam of 10m span carries point loads of 10kN, 20kN and 30kN at distances of 5m, 7.5m and 10m from fixed end. Find the slope and deflection at its free ned.	8M

6(a)	Show that the longitudinal stress in a thin cylindrical shell under internal pressure is half of the circumferential stress.	7M
(b)	Calculate the increase in volume of spherical shell 1m diameter and 12mm thick when it is subjected to an internal pressure of 1.6N/mm². $E = 2.05 \times 10^5 N/mm^2$ and $\frac{1}{m} = 0.28$	8M

7(a)	Define the terms (i) strain energy (ii) proof resilience and (iii) modulus of resilience and state their units.	8M
(b)	A bronze specimen has a modulus of elasticity 120kN/mm² and a modulus of rigidity 47kN/mm². Determine the Poisson's ratio of the material.	7M

8.	A steel beam of I-section, 200mm deep and 160mm wide has 16mm thick flanges and 10mm thick web. The beam is subjected to a shear force of 200kN. Fins the shear stress values at salient points and Sketch its variation across the section.	15M

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B.Tech. III Semester Regular/Supplementary Examinations

S208-ELECTRICAL AND ELECTRONICS ENGINEERING
(CE & ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)   Convert the given source as shown in following fig. to voltage source.

                                                [1M]
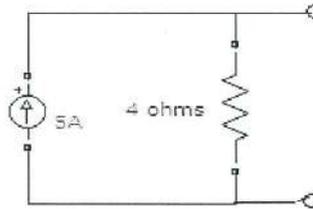
(b)   Why o.c and s.c tests are necessary in the transformer?   [1M]

(c)   Define slip.   [1M]

(d)   What is the most commonly used configuration of a transistor?   [1M]

(e)   List out any two merits of PMMC instruments.   [1M]

(f)   Define Ohm's law.   [2M]

(g)   Define voltage regulation and efficiency of a transformer.   [2M]

(h)   What is an alternator?   [2M]

(i)   How diode acts as a switch?   [2M]

(j)   What are the different methods of producing eddy damping torque?   [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)   A battery having an emf of 12V is connected across terminals AB of the circuit shown below. Find the total current flowing through the each resistance in the circuit and total power absorbed by the circuit.

                                                [7M]
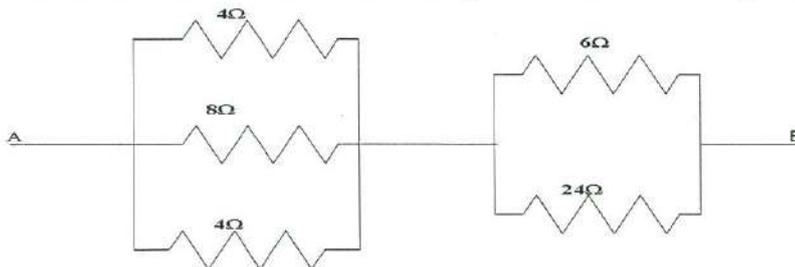
(b)   Discuss in detail about source transformation technique with necessary examples.   [8M]

3(a)   What is an ideal transformer? Draw its no load Phasor diagram.   [7M]

(b)   The primary winding of a 50HZ, single phase transformer has 480 turns and it is fed from a 6400V supply, the secondary winding has 20 turns. Compute the peak value of flux in the core and secondary voltage.   [8M]

4(a) Describe the construction of an alternator. [7M]

(b) Derive maximum running torque condition of 3-phase induction motor. [8M]

5(a) Describe the operation of full wave rectifier and obtain the expression for ripple factor, average, rms, form factor, peak factor of full wave rectifier circuit. [8M]

(b) Analyze V-I characteristics of pn junction diode. [7M]

6(a) Write short notes on following
(i) deflecting torque   (ii) controlling torque (iii) damping Torque. [7M]

(b) List out the various applications of CRO. [8M]

7(a) Discuss the torque-slip characteristic of a 3-phase induction motor. [7M]

(b) A 40KVA transformer has iron loss of 450W and full load copper loss of 850W if the power factor is 0.8 lagging, calculate the efficiency. [8M]

8(a) In the network shown in the figure find current flowing in the circuit, total resistance, and voltage across each resistor.

[7M]

(b) Analyze the operation of practical transformer under no-load condition. [8M]

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations
S197- DISCRETE MATHEMATICS
(CSE&IT)

Time : 3 hours   Max.Marks : 75

PART-A
(Answer all questions)   (1M x 5 + 2M x 5 = 15M)

1(a) What is principle of Duality?   [1M]
 (b) Define complement of a set?   [1M]
 (c) Define complement of a graph?   [1M]
 (d) What is right identity?   [1M]
 (e) If f(n) is a polynomial of degree q then what is the particular solution for the
     second order linear non homogeneous recurrence relation?   [1M]
 (f) What is Free and Bound variables?   [2M]
 (g) Let A={1,3,5} and B={2,3}. Find AXB?   [2M]
 (h) Define full binary tree?   [2M]
 (i) Let A,B,C be finite sets with
     $|A|=6, |B|=8, |C|=6, |AUBUC|=11, |A\cap B|=3, |A\cap C|=2$, and $|B\cap C|=5$. Find
     $|A\cap B\cap C|$?   [2M]
 (j) Find the generating function for the sequence 1, 2, 3, 4, ...?   [2M]

PART-B
(Answer any FOUR questions)   (4M x 15M = 60M)

2(a) Show that RVS follows logically from the following premises.
     CVD, (CVD) →¬H, ¬H→ (A∧¬B) and (A∧¬B) →(RVS)   [8M]
 (b) Show that SVR is tautologically implied by (PVQ) ∧(P →R)∧(Q→S). [7M]

3(a) Let U={1,2,3,4,5,6,7,8,9}, A={1,2,4,6,8} and B={2,4,5,9}, C={x| x is a positive
     integer and $x^2 \leq 16$}. Compute the following
     i)(AUB)-C   ii) (A-B)-C   iii) AU(B-C)   iv) (AUB)-(B∩C).   [8M]
 (b) Let A=B={a,b,c,d}, R={(a,a),(a,c),(b,c),(c,a),(d,b),(d,d)}and S={(a,b), (b,c), (c,a),
     (c,b),(d,c)}. Compute M(RUS),M(R^c) and M(S^c).   [7M]

4(a) For any simple graph G, prove that the number of edges of G is less than or
     equal to n(n-1) / 2, where n is the number of vertices of G.   [7M]
 (b) Explain about BFS and DFS algorithms.   [8M]

5(a) Find the number of committees of 5 that can be selected from 7 men and 5
     women. If the committee is to consist of at least 1 man and at least 1 woman. [7M]
 (b) Let S be the set of all ordered pairs (a,b) of real numbers for which a≠0 with
     respect to the operation * denoted by (a,b)*(c,d)=(ac, bc+d). Find <S,*> is an
     abelian group or not?   [8M]

6(a) Solve the recurrence relation $a_n+10a_{n-1}+25a_{n-2}=0$, n≥2, a_0=10, a1=-41   [7M]
 (b) Solve the recurrence relation $a_n-6a_{n-1}+9a_{n-2}=0$, n≥2, a_0=2, a_1=3 using
     generating functions.   [8M]

7(a) Let A={1,2,3,4} and R={(1,1),(1,2),(2,2),(2,4),(1,3),(3,3),(3,4), (1,4), (4,4)} verify
     that R is a partial order on A. also write down the Hasse diagram for R. [8M]
 (b) The functions f: R→R and g:R→R are defined by f(x)=3x+7, for all x∈R and
     g(x)=x(x3-1), for all x∈R. verify that f is one-to-one but g is not. [7M]

8.   Apply Kruskal's and Prim's algorithms to determine a minimal spanning tree
     for the weighted graph shown below
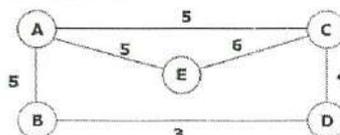
                                                                     [15M]

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B.Tech. (III Semester) Supplementary Examinations

S169-COMPUTER ORGANIZATION

Time : 3 hours   (CSE)   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	What is the purpose of Program Counter?	1M
(b)	What are the two types of control unit designs?	1M
(c)	What is the concept of Parallel processing in a computer?	1M
(d)	Expand : PROM.	1M
(e)	What is isolated I/O?	1M
(f)	What is a stored program Concept?	2M
(g)	What are the operations performed on a STACK?	2M
(h)	What are the stages of RISC instruction pipeline?	2M
(i)	Distinguish between Static and Dynamic random access memories.	2M
(j)	Differentiate between serial and parallel transfer of data.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	How are interrupts handled by the basic computer? Explain the interrupt cycle with a flowchart.	8M
(b)	Describe the connections of registers and memory of the basic computer to a common bus system.	7M
3(a)	What is microinstruction address? Explain the procedure for mapping from instruction code to micro-instruction address.	7M
(b)	What is the purpose of each of the following in micro programmed control unit; (i) sequencer (ii) control address register.	8M
4(a)	Why 2's complement notation is more suitable for integer arithmetic? Explain in detail.	7M
(b)	What is parallel processing? What are the methods that can be used to achieve Parallelism with single CPU? Explain in detail.	8M
5(a)	Write short notes on the following (i) Magnetic disk (ii) Magnetic tapes	7M
(b)	Distinguish between static RAM and dynamic RAM.	8M
6(a)	What are the different modes of transfer? Give their relative advantages of using each of them.	7M
(b)	Explain the Programmed I/O data transfer mechanism between I/O device and CPU through an interface.	8M
7.	What is Flynn's classification of Computers? What is the main basis for the classification? Explain with suitable block diagrams.	15M
8.	How DMA is connected to CPU? What are the different communication signals used? Give the way the data transfer takes place between Memory and I/O.	15M

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S324-OBJECTED ORIENTED PROGRAMMING THROUGH C++
(CSE)

Time : 3 hours   Max.Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	What is main advantage of Data Encapsulation?	1M
(b)	How memory is allocated for objects?	1M
(c)	Define Data Abstraction.	1M
(d)	Define function overriding.	1M
(e)	List some stream classes for console operations.	1M
(f)	How does String type differ from a C-type string?	2M
(g)	How can we call class private member functions?	2M
(h)	What is the main advantage of inheritance?	2M
(i)	What is a virtual function?	2M
(j)	What is the difference between ios::ate and ios::app modes?	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	How do structures in C and C++ differ give examples.	8M
(b)	Illustrate with examples how manipulators work in C++.	7M
3(a)	Illustrates the use of arrays of objects with suitable example program.	8M
(b)	Distinguish between passing objects by value and passing objects by reference with a suitable example.	7M
4(a)	Explain about constructors in derived classes and illustrate how base class constructors are called by derived class constructors with suitable example.	8M
(b)	What do you mean by public derivation? What are the rules\restrictions govern in accessing base class members?	7M
5(a)	Discuss briefly about pure virtual functions and abstract class with an example.	8M
(b)	What is the difference between a class template and function template with suitable examples?	7M
6(a)	What is a file mode? Describe the various file modes available in C++.	8M
(b)	Develop a C++ program using all manipulators.	7M
7(a)	Discuss about various operators in C++.	8M
(b)	Develop a C++ program to find out nth Fibonacci number.	7M
8(a)	Explain how memory for objects and member functions is allocated with an example.	8M
(b)	Develop a C++ program to implement to find total and average of six subjects for an array of 60 students read, name, roll no as well.	7M

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H.T.No [ ][ ][ ][ ][ ][ ][ ][ ][ ]   R14

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S191-DIGITAL LOGIC DESIGN

Time : 3 hours   (CSE)   Max.Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	What are unused states in Excess-3 code?	1M
(b)	What is an irredundant sum-of-products expression?	1M
(c)	Explain Full Subtractor.	1M
(d)	What is the use of D flip-flop?	1M
(e)	What is Field Programmable Logic Array?	1M
(f)	What is standard form? What are different types of it?	2M
(g)	Draw six –variable K-Map.	2M
(h)	What is parity checker?	2M
(i)	Describe storage register.	2M
(j)	What are the types of ROM's?	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Convert the following. (i) $(AB)_{16}$ = ( ) $_{10}$, (ii) $(1234)_8$ = ( ) $_{10}$ (iii) $(10110011)_2$ = ( ) $_{10}$ (iv) $(772)_{10}$ = ( )$_{16}$	8M
(b)	Given a = 10101110 and b = 1001. Find (i) a+b (ii) a-b (iii) a.b (iv) b+a	7M
3(a)	Simplify the Boolean expression using K-map F= (ABC'D)+(A)+(AB 'D)+(D')(A'B 'C').	8M
(b)	Reduce the following function using K- map and identify the prime implicant and non prime implicant. F= Σm(2, 3, 6, 7, 10, 11, 12).	7M
4(a)	Implement a Full adder using decoder and logic gates.	8M
(b)	List the applications of Multiplexer and Demultiplexer.	7M
5(a)	Explain about 4-bit synchronous binary counter.	8M
(b)	Convert D flip flop in to T, JK and SR flip flop.	7M
6(a)	Generate a PLA program table to design a BCD to excess 3 code converter.	8M
(b)	Write in detail about types of Read only memories.	7M
7(a)	Write minterms and maxterms for three binary variables.	8M
(b)	Briefly describe on SOP and POS.	7M
8(a)	Implementation of NOT,AND, or OR operations with NAND gates.	8M
(b)	Implementation of NOT,AND, or OR operations with NOR gates.	7M

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B.Tech III Semester ~~Regular~~/Supplementary Examinations

S253 - FREE OPEN SOURCE SOFTWARE
(CSE)

Time : 3 hours   Max.Marks : 75

PART - A
(Answer all the questions)   (1M x 5 + 2M x 5 = 15M)

1 (a)	Mention the commands used for changing ownership, group of a file.	[1 M]
(b)	What does ls *.sh mean?	[1 M]
(c)	What is the use of sed command?	[1 M]
(d)	How can you access the code stored in other file into awk command?	[1 M]
(e)	Explain the syntax of 'foreach' loop.	[1 M]
(f)	What are the features of UNIX Operating System?	[2 M]
(g)	List various types of comparisons that could be performed with test statement.	[2 M]
(h)	What is the use of paste command?	[2 M]
(i)	What are the 2 special features of an awk variable?	[2 M]
(j)	Write any 4 Pre-Defined Matrix functions in Octave.	[2 M]

PART - B
(Answer any 4 questions)   (15M x 4 = 60M)

2 (a)	Describe ls command.	[8 M]
(b)	Write short notes on wc command.	[7 M]
3 (a)	Write a shell program to print sum of first 10 natural numbers.	[8 M]
(b)	Write a shell script to print maximum of 3 numbers.	[7 M]
4 (a)	Give detailed description on cmp,sort and pr filters	[8 M]
(b)	Write about comm, diff and tr commands with examples.	[7 M]
5.	Write about Comparison and Logical operators in awk.	[15 M]
6 (a)	Plot a Graph in OCTAVE with X-Axis as a Column Vector and Y-Axis as a Row Vector.	[6 M]
(b)	Find the Inverse of a 3*3 Matrix, Transpose of a 4*4 Matrix and Determinant of a 2*2 Matrix in SCI LAB.	[9 M]
7 (a)	Assume any 2 Variables and Perform "Arithmetic and Logical Operations" using 'expr' command and Write its Output.	[10 M]
(b)	Define Wait and Sleep Command. Write the differences between Wait and Sleep with examples.	[5 M]
8 (a)	Write about types of Vectors in SCI Lab with examples.	[7 M]
(b)	Discuss about different Pre-Defined MATRIX functions in Octave.	[8 M]

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S300-MATHEMATICS-III
(ECE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a) Write the Cauchy-Riemann equations in cartesian form. [1M]

(b) Write the singular points of $\log z$. [1M]

(c) Write the region of convergence of the Taylor series expansion of

$f(z) = \dfrac{1}{z^2 - 2z}$ about.

$z = 3$. [1M]

(d) Find $\nabla \cdot (\vec{r})$. [1M]

(e) Write a MATLAB code for finding the eigen values of a matrix A. [1M]

(f) Find the derivative of $f(z)$ whose real part is $e^x \cos y + x$. [2M]

(g) Check whether $f(z) = \sinh z$ is bounded or not. Justify your answer. [2M]

(h) Find the residue of $f(z) = z^{10} e^{-\frac{1}{z}}$ at $z = 0$. [2M]

(i) Evaluate $\oiint\limits_{S}(z\,dxdy + x\,dydz + y\,dxdz)$ over the surface of the sphere

$x^2 + y^2 + z^2 = 1$. [2M]

(j) Write a MATLAB code for plotting the curve $y = x^2$. [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) Find the points at which the function $f(z) = e^{\bar{z}}$ is analytic. [7M]

(b) Find the conjugate harmonic function of $x^2 - y^2 - 2x$. [8M]

3(a) Evaluate $\displaystyle\int_{C}\frac{z}{(z^2 + 4)}\,dz$, where $C : |z| = \pi$. [8M]

(b) Find the real and imaginary parts of $e^{iz}, \sin iz, \cos z$. [7M]

4(a) Evaluate $\displaystyle\oint\limits_{C:\left|z+\frac{\pi}{4}\right|=\pi} \tan z\,dz$. [7M]

(b) Evaluate $\displaystyle\int_{0}^{2\pi}\frac{dx}{4 + 3\cos x}$ using contour integration. [8M]

5(a) Evaluate $\int\limits_{0}^{1}\int\limits_{x}^{1} e^{y^2}\, dy\, dx$. [7M]

(b) Evaluate $\oint\limits_{C}\left((y-\cos y)dx+(x\sin y)dy\right)$ along $C:(x-8)^2+(y)^2=4^2$. [8M]

6(a) Write a MATLAB program code for finding the solution to the initial value problem
$\dfrac{dy}{dx}=-y+x, y(0)=0.$ [7M]

(b) Write a MATLAB program code for finding the sum, product of two 3×3 matrices A, B and inverse of a matrix A. Explain. [8M]

7(a) Find an analytic function whose imaginary part is $2xy+\cos x\sinh y$. [8M]

(b) Show that $|\cosh z|\le\cosh x$, for any complex number $z=x+iy$. [7M]

8(a) Find the Taylor's series expansion of $f(z)=\log(z)$, about $z=1$. Also write the region of convergence of the series. [7M]

(b) Find the volume enclosed by the surface of the ellipsoid. [8M]

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S126-ANALOG ELECTRONIC CIRCUITS
(ECE & EIE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	What is transconductance?	[1M]
(b)	Define amplification factor of FET.	[1M]
(c)	List the boundaries of safe operating area of transistor.	[1M]
(d)	Is the input resistance of shunt input connection smaller or larger than that of the basic amplifier?	[1M]
(e)	What is meant by piezoelectric effect?	[1M]
(f)	Give the advantages of hybrid parameter model.	[2M]
(g)	Draw the simplified high frequency model of FET.	[2M]
(h)	Classify the power amplifiers based on the percent of time the transistors are conducting.	[2M]
(i)	What are advantages of negative feedback and disadvantages of positive feedback?	[2M]
(j)	What are the advantages of RC phase shift oscillators?	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Derive the expressions for the voltage and current gain of a CE amplifier configuration using simplified h-parameter equivalent method.	[7M]
(b)	Derive the expression for the short circuit current gain with hybrid- π model of CE transistor amplifier as a function of frequency.	[8M]
3(a)	Draw the small signal low frequency equivalent circuit for a common source FET amplifier.	[7M]
(b)	Explain the effect cascading amplifier stages on the overall frequency response of the amplifier.	[8M]
4(a)	Describe the operation of class AB output stage.	[7M]
(b)	Draw the circuit diagram of single tuned amplifier and its frequency response.	[8M]
5(a)	Draw a feedback amplifier in block diagram form. Identify each block and state its function.	[7M]
(b)	Prove that the negative feedback in amplifiers increases the bandwidth.	[8M]
6(a)	With the help of basic circuit diagram, briefly describe the operation of Hartley oscillator.	[7M]
(b)	Briefly outline the frequency stability criterion in case of oscillators.	[8M]
7(a)	What are the various types of distortion present in power amplifier? How do you graphically determine the second harmonic distortion?	[7M]
(b)	Differentiate between hybrid parameters for low frequency analysis and hybrid-π parameters for high frequency analysis.	[8M]
8(a)	What is Miller's effect? What influence does it have on high-frequency response of transistor amplifier?	[7M]
(b)	What are class C amplifiers? How do they differ from class A and class B amplifiers?	[8M]

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B.Tech. (III Semester) Supplementary Examinations

S189-DIGITAL ELECTRONIC CIRCUITS
(ECE&EIE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Obtain 9's complement of $(128)_{10}$	1M
(b)	Denote what is Essential prime implicant.	1M
(c)	Denote the PAL with neat diagram.	1M
(d)	State various types of triggering techniques.	1M
(e)	Write the output equation for Mealy machine.	1M
(f)	Translate the function $F = (A+B) \cdot (\overline{B}+C)$ as a product of maxterms.	2M
(g)	Implement AND gate using NAND gate.	2M
(h)	Mention about parity bit generators.	2M
(i)	Represent the excitation table for D flip-flop.	2M
(j)	Obtain the state table for sequence detector 0001.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Express the given function $F(A,B,C,D) = \overline{B}D + \overline{A}D + BD$ as a sum of minterms and as s product of maxterms.	7M
(b)	Convert the following to Decimal and then to Octal i) $(4234)_{16}$ ii) $(125F)_{16}$ iii) $(10010011)_{2}$ iv) $(10111111)_{2}$	8M
3(a)	Discuss the concept of the non-degenerate forms of two level gate networks.	7M
(b)	Realize AND,NOT,OR,NAND logic gates using NOR gate.	8M
4(a)	Design a 4 bit binary-to-Gray code converter.	8M
(b)	Realize 5-to-32 line decoder using one 2-to-4 and four 3-to-8 decoders.	7M
5(a)	Write about Master Slave JK flip flop.	7M
(b)	Design a Mod-8 asynchronous down counter using J-K flip flops.	8M
6(a)	Illustrate with an example about Moore Machine.	8M
(b)	Draw an ASM chart and state table for a 2-bit up-down counter having mode control input. The circuit should generate an output 1 whenever the count becomes minimum or maximum with M=1 for up counting and M=0 for down counting.	7M
7(a)	Realize the given functions using PAL (i) $F_1(A,B,C)=\sum m(0,1,2,4)$ (ii) $F_2(A,B,C)=\sum m(0,5,6,7)$.	7M
(b)	Implement the given function using 8x1 multiplexer $F(A,B,C,D)=\sum m(0,2,6,10,11,12,13)+\sum d(3,8,14)$.	8M
8(a)	Describe briefly about SR latch using NAND gates and NOR gates with neat sketch.	8M
(b)	Translate T flip flop into SR flip-flop, JK flip-flop, and D flip-flop.	7M

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B.Tech. III Semester Regular/Supplementary Examinations

S361-PULSE AND SWITCHING CIRCUITS
(ECE)

Time : 3 hours   Max.Marks : 75

PART-A
(Compulsory question)

1(a)	Define the time constant of an RC circuit.	[1M]
(b)	Write are the other names of a clamping circuit.	[1M]
(c)	How many types of multivibrators are there? Name them.	[1M]
(d)	Write the expression for gate width of a monostable multivibrator.	[1M]
(e)	What do you mean by pedestal?	[1M]
(f)	When does a low-pass circuit preserve the pulse shape?	[2M]
(g)	Mention any two differences between clippers and clampers.	[2M]
(h)	What do you mean by stable state and quasi stable state of a binary?	[2M]
(i)	Define UTP and LTP.	[2M]
(j)	Draw the circuit of UJT relaxation oscillator.	[2M]

PART-B
Answer any FOUR questions. All questions carry equal marks.

2(a)	Derive the expression for %tilt of high pass RC circuit excited by a square wave input.	[7M]
(b)	A symmetrical square wave of amplitude ±5V and frequency 2 kHz is impressed on an RC low-pass circuit. If R=5KΩ, C=0.1μf, calculate and plot the steady-state output with respect to time.	[8M]

3(a)	Describe the operation of an emitter coupled clipper using transfer characteristics.	[7M]
(b)	Design a clipper circuit to transmit the part of a sine wave which lies between +4V and +8V and explain its working.	[8M]

4(a)	Explain the transistor switching times with help of a neat waveform.	[7M]
(b)	The fixed-bias bistable multivibrator uses n-p-n transistors with h_{fe} = 20. The circuit parameters are V_{CC}=12V, V_{BB}=3V R_C=1KΩ, R_1=5KΩ, R_2=10KΩ, $V_{CE(sat)}$=0.4V, $V_{BE(sat)}$=0.8V. Find the stable state currentsandvoltages.	[8M]

5(a) Precisethe operationofan astable multivibrator witha neat circuit diagram and waveforms. [7M]

(b) Sketch the Schmitt trigger circuit and explain its operation with necessary waveforms. [8M]

6. Derive an expression for slope error, displacement error, transmission error and obtain a relation between them for exponential sweep circuit. [15M]

7(a) A low pass RC circuit is driven by a step input signal. Prove that the output voltage of the circuit is $v_o = V(1 - e^{-\frac{t}{RC}})$. [8M]

(b) With the help of necessary waveforms, obtain the output equations of a high pass RC circuit when pulse input is applied. [7M]

8(a) Discuss about negative peak clipper circuit supplied by positive and negative reference voltages. [8M]

(b) Sketch the basic circuit diagramof Positive peak clamper and explain its operation. [7M]

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B.Tech. (III Semester) Supplementary Examinations

S428-RANDOM VARIABLES AND STOCHASTIC PROCESSES
(ECE)

Time : 3 hours　　　　　　　　　　　　　　　　　　　　　Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Distinguish between the distribution and density function of a random variable.	1M
(b)	Distinguish the correlation and covariance of X and Y with respect to their functionality.	1M
(c)	When the random process X(t) is strict sense stationary.	1M
(d)	Interpret the relation between cross power P_{XY} & P_{YX} of X(t) and Y(t).	1M
(e)	Examine the system h(t) = u(t) exp(-3t) is causal or not.	1M
(f)	List any two properties of conditional density function.	2M
(g)	Show that for two random variables X & Y $Var(aX+bY) = a^2 Var(X) + b^2 Var(Y) + 2ab C_{XY}$	2M
(h)	Show that mean value of Y(t) is zero, if Y(t) = X(t) – X(t+τ), if X(t) has non zero mean and WSS.	2M
(i)	Determine the frequency response, whose PSD of a WSS is $S_{XX}(\omega) = 4\pi\delta(\omega) + 3\pi\delta(\omega - 5\pi) + 3\pi\delta(\omega + 5\pi)$.	2M
(j)	Compute the power in X(t), if its PSD is $S_{XX}(\omega) = \dfrac{1}{64 + \omega^2}$	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain the following distributions with example. (i) Gaussian Distribution. (ii) Poisson Distribution.	8M
(b)	Determine the density function $f_Y(y)$ of the transformation Y = T[X] = a Tan(X), where a is constant & X is Uniform random variable on $(-\dfrac{\pi}{2}, \dfrac{\pi}{2})$.	7M
3(a)	Given the function $$f_{XY}(x,y) = b(x+y)^2 \quad -2 < x < 2, \text{ and } -3 < y < 3$$ $$0 \qquad\qquad elsewhere$$ (i) Evaluate the constant b if it is a valid density function. (ii) Determine the marginal density functions $f_X(x)$ and $f_Y(y)$.	8M
(b)	Deduce the expression for covariance and correlation coefficient of random variables X and Y.	7M
4(a)	Explain the time averages and ensemble averages of random process X(t).	7M
(b)	Check the given stationary random process X(t) =10 Cos(100t+θ), where θ is a random variable with a uniform probability distribution in the interval (-π, π) is Ergodic in the mean.	8M

5(a)	Deduce the expression for Auto Power Spectral density of a random process X(t).	8M
(b)	The cross correlation of jointly WSS process X(t) & Y(t) is $R_{XY}(\tau) = B u(\tau) \exp(-W\tau)$, where B>0, W>0 are constants. Find (i) $R_{YX}(\tau)$ (ii) $S_{XY}(\omega)$ & $S_{YX}(\omega)$	7M

6(a)	Explain the following (i) Response of the LTI system. (ii) Transfer function of the System.	7M
(b)	A random process Y(t) is obtained from the system as shown in figure, then express the output PSD in terms of input PSD, where A, ω are constants.	8M

$$X(t) \longrightarrow \boxed{\text{Product Modulator}} \longrightarrow Y(t)$$

$$\uparrow$$

$$ACos(\omega_1 t)$$

7(a)	Define Conditional Distribution and density function with their properties.	7M
(b)	Find the Characteristics function of a uniformly distributed random variable X in the range of (0, 1) and hence determine the m_1.	8M

8(a)	Develop a relation between Cross Power Spectral Density and Cross Correlation Function of a random process X(t) & Y(t).	7M
(b)	Evaluate the power spectrum of X(t), whose autocorrelation is $$R_{xx}(\tau) = A[1 - (\frac{|\tau|}{T})] \quad , \quad -T \le t \le T$$ $$0 \qquad , \quad elsewhere$$ Plot the auto correlation & PSD.	8M

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S378-SIGNALS AND SYSTEMS
(ECE & EIE)

Time: 3 hours   Max. Marks: 75

PART-A
(Compulsory question)

1(a)   Prove that integrating unit step function over - ∞ to t. gives ramp function. [1M]

(b)   Mention the necessary conditions for a Fourier series to exist. [1M]

(c)   What is Nquist interval? [1M]

(d)   What are the conditions to be satisfied by the frequency response for a distortion less transmission system? [1M]

(e)   Mention the applications of Bilateral Laplace transforms. [1M]

(f)   Determine whether the given signal is energy or power signal $x(n)=\cos(\pi n/4)$. [2M]

(g)   Magnitude spectrum of Fourier series is continuous or not continuous? Mention the reason. [2M]

(h)   Find the Fourier Transform of ramp function r(t). Comment on the result. [2M]

(i)   Mention the condition for a system to be causal in frequency domain. [2M]

(j)   Derive the relation between Fourier Transform and Laplace Transform. [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)   Evaluate the convolution integral graphically for a system with input x(t) and impulse response h(t) respectively given by $x(t)=h(t)=A[u(t+\tau)-u(t-\tau)]$. [7M]

(b)   Draw the waveforms of the following signals:
i) $x_1(t)=r(t)-r(t-1)-u(t-1)$ ii) $x_2(t)= -u(t+1)+r(t+1)-r(t-1)-u(t-1)$
iii) $x_3(t)=dx_1(t)/dt$ iv) $x_4(t)= dx_2(t)/dt$. [8M]

3(a)   Show that the signals $\emptyset_k(t) = e^{\frac{j(2\pi kt)}{T}}$,k= 0,±1,±2,... form an orthogonal set on the interval 0<t<T. [7M]

(b)   Suppose we are given the following information about a signal x(t):
1. x(t) is real and odd.
2. x(t) is periodic with period T=2 and has Fourier coefficient X_n.
3. $X_n=0$ for $|n| > 1$
4. $\frac{1}{2}\int_0^2 |x(t)|^2 \, dt = 1$
Specify two different signals that satisfy these conditions. [8M]

4(a)   Find the Fourier transform of the
i) Gaussian pulse signal $x(t)== e^{-at^2}$ $a > 0$ and ii) $g(t)=\frac{1}{\pi t}$. [8M]

(b) Specify the Nyquist rate and Nyquist interval for each of the following signals:

(i) x(t)=sinc(200t)   (ii) x(t)=sinc²(200t)   (iii) x(t)=cos(150πt) sin(100πt).   [7M]

5(a) Prove that the power spectral density of the periodic signal x(t) with period T is

$$G_x(\omega) = 2\pi \sum_{n=-\alpha}^{\alpha} |X_n|^2 \, \delta(\omega - n\omega_0)$$ Where X_n are the Fourier series coefficients

of x(t) and $\omega_0 = \dfrac{2\pi}{T}$.   [8M]

(b) Using Paley-Wiener criterion, prove that $|H(\omega)| = e^{-\omega^2}$ is not a suitable magnitude response for causal LTI system.   [7M]

6(a) Using Laplace Transform properties find the Laplace transforms and mention ROC s of the following signals:

i) $g(t)=te^{-at}u(t)$.   ii) g(t)= u(-2t-1).   [7M]

(b) Check whether the following LTI system is Causal (or) Anti causal using ROC Properties of Laplace Transform for

(i) $H(S) = \dfrac{1}{S^2 + 5S + 6} R\{S\} > -2$ (ii) $H(S) = \dfrac{1}{S^2 + 5S + 6} R\{S\} < -3$.   [8M]

7(a) Show that the complex exponential signal $x(n) = e^{j\omega_0 n}$ is periodic only if $\dfrac{2\pi}{\omega_0}$ is a ratio   number.   [7M]

(b) Consider a signal x(t) with Fourier transform X(w).suppose we are given the following facts:

1. x(t) is real and non-negative.
2. $F^{-1}[(1 + j\omega)X(\omega)] = Ae^{-2t}u(t)$, Where A is independent of t.
3. $\int_{-\infty}^{\infty}|X(\omega)|^2 d\omega = 2\pi$.

Using Fourier Transform properties determine the closed form expression for x(t).   [8M]

8(a) Consider a discrete – time system with input x(n) and output y(n) related by $y(n) = \sum_{k=n-n_0}^{n+n_0} x(k)$ Where n_0 is a finite positive integrer.

(i) Is this system Linear?
(ii) Is this system time-invariant.
(iii) If x(n) is known to be bounded by a finite integer B_x[i.e; $|x(n)| < B_x$], it can be shown that y(n) is bounded by a finite number 'C' we conclude that the given system is stable.Express 'C' interms of B_x and n.   [8M]

(b) Find the inverse Laplace transform of $H(S) = \dfrac{4S^2 + 15S + 8}{(S+2)^2(S-1)}$ assuming that

i) h(t) is Causal and
(ii) The Fourier transform of h(t) exists i.e., h(t) is absolutely integrable.   [7M]

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S355-PROFESSIONAL ETHICS AND HUMAN VALUES
(ECE,EEE & EIE)

Time : 3 hours   Max.Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Define the term 'right'.	1M
(b)	Define morality.	1M
(c)	What is 'A balanced outlook on law'?	1M
(d)	What is meant by 'Authority'?	1M
(e)	Define 'Hacking'.	1M
(f)	What is engineering ethics?	2M
(g)	Give few examples for values.	2M
(h)	List the elements that should make an engineer as responsible experimenter.	2M
(i)	List the factors that affect the risk acceptability.	2M
(j)	List out the issues in 'computer ethics'.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Express your views on 'Rights theory' AND 'Virtue theory'.	7M
(b)	Demonstrate on utilitarian theory and duty theory.	8M
3(a)	Demonstrate on the following : (i) Courage (ii) Valuing time (iii) Commitment (iv) Empathy.	7M
(b)	Mention the differences between morality and ethics.	8M
4(a)	Draw the design of an interactive process from the concept 'Engineering as experimentation'.	7M
(b)	Discuss the similarities present in engineering projects Vs standard experiments.	8M
5(a)	Discuss in detail the concept of 'Assessment of safety and risk.	8M
(b)	What is meant by personal risk? Discuss in detail.	7M
6(a)	Discuss in detail the concept of multinational companies.	8M
(b)	Engineers as experimenters have certain duties towards environment, state them in detail.	7M
7(a)	Explain the concept of service learning in detail.	7M
(b)	What is virtue? State how virtue is different from civic virtue.	8M
8(a)	Laws are needed to provide a minimum level of compliance, justify your answer.	7M
(b)	What is meant by moral commitment? Justify your answer.	8M

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S301-MEASUREMENTS AND INSTRUMENTATION
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	What is significance of deflecting torque in indicating instruments?	[1M]
(b)	Which bridge is suitable for measurement of a capacitor at high voltage?	[1M]
(c)	Define nominal ratio of a potential transformer.	[1M]
(d)	Define Meter constant in energy meter.	[1M]
(e)	What is the order of minimum displacement that can be measured with capacitive transducer?	[1M]
(f)	Why eddy current damping cannot be used in moving iron instruments?	[2M]
(g)	List out the methods for measurement of high resistance.	[2M]
(h)	Why the secondary of a C.T. never left opened while its primary is energized?	[2M]
(i)	What are the errors in electrodynamometer wattmeter?	[2M]
(j)	Ceramic materials are used for piezo-electric transducers. Why?	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) Derive the equation for deflection of a PMMC instrument if the instrument is spring controlled. [7M]

(b) The inductance of a moving iron ammeter with a full scale deflection of 90^0 at 1.5A is given by the expression $L=(200+40\theta-4\theta^2-\theta^3)\mu H$, where θ is the deflection in radian from the zero position. Estimate the angular deflection of the pointer for a current of 1.0A. [8M]

3(a) Classify the resistances from the point of view of measurements. Describe the ammeter-voltmeter method of measurement of resistances. [7M]

(b) The four arms of the Maxwell's capacitance bridge at balance are:
Arm ab: Unknown inductance L_1 having an inherent resistance R_1.
Arm bc: A non inductive resistance of 1000Ω.
Arm cd: A capacitor of $0.5\mu F$ in parallel with a resistance of 1000Ω.
Arm da: A resistance of 1000Ω.
Determine the values of R_1 and L_1. [8M]

4(a) What are the disadvantages of shunts and multipliers when used for extension of range? How instrument transformers are better substitute for shunts and multipliers? [7M]

(b) Describe with suitable diagrams , how a dc potentiometer can be used for:
(i) Calibration of voltmeter
(ii) Calibration of ammeter
(iii) Calibration of a wattmeter
(iii) Determination of an unknown resistance. [8M]

5(a) Describe the construction and working of fluxmeter. [7M]
(b) Two wattmeters connected to measure the input to a balanced 3 phase circuit indicate 2000W and 500W respectively. Find the power factor of the circuit
   (i)   When readings are positive
   (ii)   When the latter reading is obtained after reversing the connections to the current coil of first instrument. [8M]

6(a) Describe the construction and working of a strain gauge. [7M]
(b) A resistance strain gauge is used to measure stress on steel. The steel is stressed to 1400kgf/cm². Assume Young's modulus of steel $2.1x10^6$kgf/cm². Calculate the percentage change of resistance of a strain gauge assuming gauge factor equal to 2. [8M]

7(a) Derive the general equations for balance for an a.c bridge. [7M]
(b) Distinguish between precision and accuracy. [8M]

8(a) Describe the method for measurement of reactive power in a single phase circuits. [7M]
(b) Classify various Transducers. [8M]

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S216-ELECTRICAL MACHINES – I
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	State Faraday's laws of electromagnetic induction.	[1M]
(b)	State Fleming's Left hand rule.	[1M]
(c)	What is the purpose of laminating the core in a transformer?	[1M]
(d)	What is the angle between voltage and current for ideal transformer at no load?	[1M]
(e)	Mention the condition for maximum efficiency for transformer.	[1M]
(f)	Under what circumstance a dc shunt generator does fails to generate?	[2M]
(g)	What is the need of four point starter in dc motors?	[2M]
(h)	List out applications of step-up & step-down transformer.	[2M]
(i)	How does change in frequency effect the operation of a given transformer?	[2M]
(j)	List the four possible ways of connecting a bank of three transformers for 3-phase operation.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Describe the construction of DC machine.	[7M]
(b)	A separately excited generator when running at 1200 rpm supplies a current of 200 A at 125V to a circuit of constant resistance. What will be the current when the speed drops to 1000 rpm if the field current is unaltered? Armature resistance is 0.04 ohm and the total voltage drop at the brushes is 2V. Ignore the change in armature reaction.	[8M]
3(a)	Discuss the procedure of Hopkinson's test on identical dc machines and list out the advantages and disadvantages.	[7M]
(b)	A 220 V shunt motor has armature and field resistance of 0.2 Ω and 220Ω respectively. The motor is driving a constant load torque and running at 1000 rpm drawing 10 A current from the supply. Calculate the new speed and armature current if an external armature resistance of value 5Ω is inserted in the armature circuit. Neglect armature reaction and saturation.	[8M]
4(a)	Illustrate energy efficiency and all day efficiency.	[7M]
(b)	The daily variation of load on a 100KVA transformer is as follows: 8.00A.M to 1.00P.M : 65KW, 45kvar 1.00 P.M to 6.00P.M : 80KW, 50KVar 6.00P.M to 1.00A.M : 30KW, 30KVar 1.00A.M to 8.00A.M : No load This transformer has no-load core loss of 370watts and full load cu loss of 1200 watts. Determine the all day efficiency of the transformer.	[8M]

5(a) Illustrate the conditions required for the parallel operation of two transformers. [7M]

(b) Determine (i) the full load efficiency at unity power factor (ii) the voltage at the secondary terminals when supplying full load secondary current at power factors of unity, 0.8 lag and 0.8 lead for the 4 KVA, 200/400V, 50Hz, single phase transformer of which the following are the test figures: open circuit with 200V applied to the primary winding: current 0.8A, power 70W. Short circuit with17.5Vapplied to secondary (high voltage) side: current 9A, power 50W. [8M]

6(a) Illustrate the open delta of 3-phase transformers with diagram and compare open delta with scott connection. [7M]

(b) Develop the equation for saving of copper in using auto transformer when compared to using two winding transformer. [8M]

7(a) Illustrate the importance of compensating windings in dc machines. [8M]

(b) Analyze the characteristics dc series motor. [7M]

8(a) Describe the effects of variation of frequency and supply voltage on iron losses of transformer. [7M]

(b) Illustrate the T-T Connections of three phase systems. [8M]

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B.Tech. (III Semester) Supplementary Examinations

S210-ELECTRICAL CIRCUITS-II
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	When phase sequence at the 3-phase load is reversed what will happen?	1M
(b)	Represent an inductor at steady state condition.	1M
(c)	Define Z-parameters: Z_{11}, Z_{22}, Z_{12} and Z_{21}	1M
(d)	Define Fourier analysis.	1M
(e)	List the types of filters.	1M
(f)	State Millman's theorem.	2M
(g)	For a series R-C circuit, write the time-domain expressions for i_c and v_c.	2M
(h)	What is two-port network and why we go for two-port network?	2M
(i)	Explain odd symmetry of a function f(t) with example.	2M
(j)	Draw the characteristics of band pass and band stop filters.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	State and explain Millman's theorem with an example.	7M
(b)	List out the advantages of three phase system. Differentiate between single and three phase systems.	8M
3.	In the network shown in Fig. below, assuming all initial conditions as zero, find $i_1(0^+)$, $i_2(0^+)$, $\frac{di_1}{dt}(0^+)$, $\frac{di_2}{dt}(0^+)$, $\frac{d^2 i_1}{dt^2}(0^+)$, $\frac{d^2 i_2}{dt^2}(0^+)$.	15M
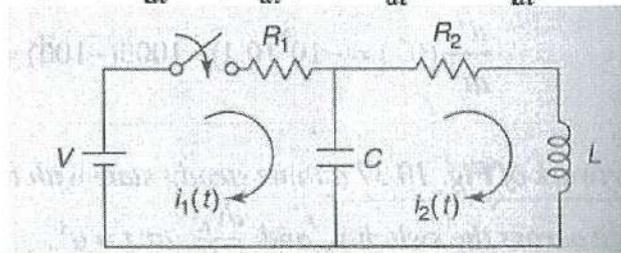
4(a)	Find the **Y** parameters of the two-port network shown in Fig. below. Then determine the current in a 4Ω load, that is connected to the output port when a 2A source is applied at the input port.	8M
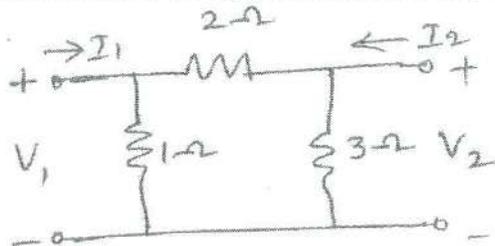
(b)	Develop the equivalent circuit of a two port network using Z parameters.	7M
5.	Find the trigonometric Fourier series of the waveform shown in Fig. below.	15M
6.	Test the following polynomials for Hurwitz property: $s^7 + 2s^6 + 2s^5 + s^4 + 4s^3 + 8s^2 + 8s + 4$ $s^6 + 7s^4 + 5s^3 + s^2 + s$	15M
7(a)	If $[z] = \begin{bmatrix} 40 & 10 \\ 20 & 30 \end{bmatrix}$ Ω for a two-port network, calculate the average power delivered to 50Ω resistor.	8M
(b)	Express Y- parameters in terms of ABCD parameters.	7M
8.	Derive the expressions for constants of trigonometric Fourier series for even function symmetry.	15M
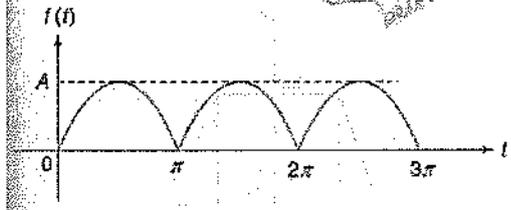
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B.Tech. (III Semester) Supplementary Examinations

S206-ELECTRIC AND MAGNETIC FIELDS
(EEE & EIE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	Specify the differential length in Circular co-ordinate system.	1M
(b)	Write the expression for capacitance of co-axial capacitor.	1M
(c)	What is the unit of permeability?	1M
(d)	What is the unit of scalar magnetic potential?	1M
(e)	What is displacement current?	1M
(f)	State gauss law.	2M
(g)	Define Electric field strength.	2M
(h)	Define Magnetization.	2M
(i)	What is Statically induced EMF?	2M
(j)	Define displacement current.	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	State and prove the Gauss law.	7M
(b)	What is cross product? Explain its properties and applications.	8M
3(a)	Develop continuity equation and Point form of Ohms law.	7M
(b)	Develop the expression for Capacitance of a co-axial cable.	8M
4(a)	State and Explain Ampere's circuital law and write its applications.	7M
(b)	Current carrying circular wire of radius 'a' is centered on the origin in the plane z = 0. Obtain an expression for magnetic field intensity on the axis of the wire at (0, 0, 2).	8M
5(a)	Describe the scalar magnetic potential and mention its limitations.	7M
(b)	A current element of length 3 cm placed at the origin in free space and carries current 23 mA along a_x. A filamentary current of 14 a_z A is located along x=3, y=8. Find the force on the current element.	8M
6(a)	State and Explain Faraday's laws of electromagnetic induction in both integral and differential forms.	7M
(b)	In a nonmagnetic medium E= 7 sin $(2\pi \times 10^7 t-0.9x)$ a_z V/m. Find (i) ε_r, η (ii) the time average power carried by the wave.	8M
7(a)	Develop the Maxwell's equation for magneto statics.	7M
(b)	Planes z =0 and z =4 carry current K= -10 a_x A/m and K= 10 a_x A/m, respectively. Determine H at (i) (1, 3, -1) and (ii) (0,3,-10).	8M
8(a)	Find the current passing through spherical shell of r=0.02m in spherical coordinate system, if J= 10^4 sinθ a_r A/m².	7M
(b)	Explain the capacitance and derive its basic expression.	8M

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B.Tech III Semester ~~Regular~~/Supplementary Examinations

S144 - BASIC ELECTRONIC DEVICES AND CIRCUITS
(EEE)

Time : 3 hours   Max.Marks : 75

PART - A
(Answer all the questions)   (1M x 5 + 2M x 5 = 15M)

1 (a) Interpret which capacitance is dominant in reverse bias of a diode. [1 M]
(b) What is meant by Regulation of a Rectifier? [1 M]
(c) Draw the symbol of SCR. [1 M]
(d) What is The value of thermal voltage? [1 M]
(e) Define frequency stability S?. [1 M]
(f) List the Applications of Hall effect. [2 M]
(g) If RL=100O and Rf=10O of a full wave rectifier then what is its Rectification efficiency? [2 M]
(h) Draw the symbols for both npn and pnp transistors and indicate voltages and currents along with polarities. [2 M]
(i) What is meant by negative feedback and mention where this type of feedback is used? [2 M]
(j) List the features of a CB amplifier. [2 M]

PART - B
(Answer any 4 questions)   (15M x 4 = 60M)

2. Explain the terms: i) Static resistance, ii) dynamic resistance, iii) forward resistance, iv) reverse resistance, v) cut-in voltage, vi) PIV. [15 M]

3 (a) Derive an expression for regulation of a half wave rectifier in terms of diode resistance and load resistance. [8 M]
(b) List out the advantages and disadvantages of half wave rectifier. [7 M]

4 (a) A transistor has ß=150.Find the collector and base currents, if IE=10mA. [8 M]
(b) Compare SCR and diode. [7 M]

5. A germanium transistor having β=100, VBE=0.2V is used in a fixed bias transistor amplifier where VCC= 16V, RC=5k Ω and RB=790 k Ω. Determine Q- point. [15 M]

6. Draw the circuit diagram of CB amplifier and explain its working clearly and also list out the features of it. [15 M]

7. A 230V, 50Hz voltage is applied to the primary of a 5:1 step down, center tapped transformer used in a full wave rectifier having a load of 900 ohm. If the diode resistance and the secondary coil resistance together has a resistance of 100 ohm, determine
i) DC and AC voltage across the load ii)DC and AC currents flowing through the load iii)DC and AC power delivered to the load iv)PIV across each diode v)Ripple voltage and its frequency vi)Ripple factor and efficiency. [15 M]

8 (a) Draw the circuit of Hartley oscillator and describe the working of it. [7 M]
(b) Derive the expressions for frequency of oscillations and condition for oscillations of Hartley oscillator. [8 M]

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B.Tech III Semester ~~Regular~~/Supplementary Examinations

S220 - ELECTRICAL TECHNOLOGY
(EIE)

Time : 3 hours
Max.Marks : 75

PART - A
(Answer all the questions)

(1M x 5 + 2M x 5 = 15M)

1 (a) What are the essential components of a generator? [1 M]

(b) How can you eliminate the eddy current losses in transformer? [1 M]

(c) What are the maximum and minimum values of slip? [1 M]

(d) Why salient pole rotor used for low and medium speed alternators? [1 M]

(e) Which is the most efficient damping method? [1 M]

(f) What are the types of armature winding used in DC machines? [2 M]

(g) What is the purpose of performing S.C test on transformer? [2 M]

(h) Derive the frequency of rotor current of 3-phase induction motor? [2 M]

(i) Write the applications of salient pole type rotor alternator? [2 M]

(j) Draw the diagram of eddy current damping. [2 M]

PART - B
(Answer any 4 questions)

(15M x 4 = 60M)

2 (a) Derive the condition for maximum efficiency in dc machine. [7 M]

(b) A 230V shunt motor takes 4A at no load. The resistances of the armature and field circuit are 0.20Ω and 100Ω respectively. If the motor is loaded so as to carry 30A. Determine iron losses and efficiency. [8 M]

3 (a) Describe the principle and operation of 1-phase transformer and derive the e.m.f equation. [8 M]

(b) Give and explain the types of transformer based upon construction of core. [7 M]

4 (a) (i)Define slip and derive rotor current frequency in induction motor. [7 M]
(ii)A 6-pole, 3-phase induction motor is connected to 50Hz supply. If it is running at 970 r.p.m., find the slip.

(b) An 8-pole,3-phase,50Hz induction motor is taking 50KW and running at 725 r.p.m. Stator losses are 1.2KW and frictional losses 1.8KW. Find (i) rotor Cu loss and (ii)efficiency of the motor. [8 M]

5. Describe the principle of operation of alternator and also explain different types of [15 M] alternators based on construction.

6 (a) Derive an expression for deflection torque in PMMC instrument. [8 M]

(b) The meter element of a permanent-magnet moving coil instrument has a resistance [7 M] of 8 ohms and requires 13mA for full-scale deflection. Calculate the resistance to be connected (i) in parallel to enable the instrument to read upto 2A (ii) in series to enab

7 (a) Draw the equivalent circuit of a 1-phase transformer with referred to primary side. [8 M]

(b) A 230/460V transformer has a primary resistance of 0.2Ω and reactance of 0.5Ω [7 M] and the corresponding values for the secondary are 0.75Ω and 1.8Ω respectively. Find the secondary terminal voltage when supplying 10A at 0.8p.f.lagging.

8. With neat sketch describe the principle and working of dynamometer type [15 M] instrument and give advantages and disadvantages of this instrument.

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B.Tech. III Semester Regular/Supplementary Examinations

S290-LINUX PROGRAMMING
(IT)

Time: 3 hours   Max. Marks: 75

PART-A
(Compulsory question)

1(a)	What are the three levels of security in Linux?	[1M]
(b)	How to display inode number of each file?	[1M]
(c)	Define hard links.	[1M]
(d)	Define socket.	[1M]
(e)	Describe process creation.	[1M]
(f)	Explain architecture of Linux.	[2M]
(g)	What is quoting? What are the three quote tokens?	[2M]
(h)	Explain about readdir() function with example.	[2M]
(i)	Differentiate awk and sed.	[2M]
(j)	Explain about Kill() and raise() functions.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain about networking commands.	[8M]
(b)	Explain sort and uniq filters with all options.	[7M]
3(a)	Discuss shell meta characters in detail.	[7M]
(b)	Define shell script. How shell programs are executed. Write different types of shell in Linux programming along with advantages.	[8M]
4(a)	Explain the concept kernel support for the files.	[7M]
(b)	How a file can be described in Unix environment? List and explain about the various types of files in Unix.	[8M]
5(a)	Illustrate awk command and write program to print the fields 1 and 4 from a File.	[7M]
(b)	Demonstrate client and server programming using TCP protocol with neat diagram.	[8M]
6(a)	Explain about socket address structure	[7M]
(b)	Illustrate pipes. Explain their limitations. Explain how pipes are created and used in IPC with an examples.	[8M]
7(a)	Describe usage of dup(), dup2() system calls with example.	[7M]
(b)	Write a program that takes one or more file/directory names as command line input and reports the following information on the file. i. File type. ii. Number of links iii. Time of last access iv. Read, Write and Execute permissions.	[8M]
8(a)	Write an example program for client and server programs.	[8M]
(b)	Explain control structures used in shell programming with suitable examples.	[7M]

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B.Tech. III Semester ~~Regular~~/Supplementary Examinations

S325-OBJECT ORIENTED PROGRAMMING USING JAVA
(IT)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Define Recursion.	[1M]
(b)	How to prevent Method Overriding?	[1M]
(c)	Write two built in exceptions in java.	[1M]
(d)	How to set the size of window in AWT?	[1M]
(e)	What are containers available in Swing?	[1M]
(f)	What is constructor? Write its special properties.	[2M]
(g)	How do declare an abstract method in java?	[2M]
(h)	Differentiate Thread based multitasking and process based multitasking.	[2M]
(i)	List the constructors of Button Class in AWT.	[2M]
(j)	What is the difference between JTabbedPane and JScrollPane?	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Illustrate the importance of this keyword in java. Give a suitable example.	[8M]
(b)	What is method overloading? Write a java program that demonstrates this concept.	[7M]
3(a)	What is package? How to create a user defined package in java? Give a suitable example.	[7M]
(b)	What is meant by Multilevel hierarchy? Explain with an example program in Java.	[8M]
4(a)	Draw and explain life cycle methods of a Thread.	[8M]
(b)	Write a java program that demonstrates the usage of throws keyword in exception handling mechanism.	[7M]
5 (a)	Develop an applet that draw various graphics shapes (such as line, rectangle, oval and polygon).	[7M]
(b)	What is Border Layout? Develop a java program that demonstrates the border layout concept.	[8M]
6.	What is a JTable? Write the constructors of JTable Class. Develop a swing program to display Student marks table with Roll, Name, Average and Grade columns by using JTable class.	[15M]
7.	What is Event Listener? What is the use of Event Listener? List out Event Listeners and their methods. Explain the role of Event Listeners in Event Handling.	[15M]
8(a)	How do you handle events on JButton? Explain it with an example program.	[7M]
(b)	Write a java program that creates multiple threads.	[8M]

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B.Tech. (III Semester) Regular/Supplementary Examinations

S191-DIGITAL LOGIC DESIGN
(IT)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Find $(ABEH)_{16}$ = (____)$_{10}$.	[1M]
(b)	Define the terms i) Prime implicants. ii) Essential prime implicants.	[1M]
(c)	What is combinational logic circuit?	[1M]
(d)	What is flip-flop?	[1M]
(e)	Write a short note on PLD's.	[1M]
(f)	Explain the importance of gray code.	[2M]
(g)	What are don't care conditions? Explain its advantage with example.	[2M]
(h)	Construct logic circuit and truth table of full adder.	[2M]
(i)	How can race condition be avoided in flip-flops?	[2M]
(j)	Construct and explain the block diagram of PLA.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Encode the decimal numbers using 6,3,1,-1 weighted code. Is it a self-complementing code.	[7M]
(b)	Subtract $(EEE)_{16}$ from $(ECE)_{16}$ using two's complement method.	[8M]

3. Minimize the following functions by first finding the essential prime implicants.
(i) $F(w,x,y,z)= \sum(0,2,4,5,6,7,8,10,13,15)$.
(ii) $F(w,x,y,z)= \sum(0,2,3,5,7,8,10,11,14,15)$. [15M]

4. Construct the block schematic and truth table for full-subtractor. Explain the design approach for full-subtractor with two half-subtractors. Draw the relevant logic diagram with necessary expressions. [15M]

5(a)	Design, draw and explain a synchronous MOD-12 down-counter using j-k flip-flop.	[8M]
(b)	Formulate a D flip – flop into SR flip-flop and T flip – flop.	[7M]

6(a)	Design the PLA programming table for the combinational circuit that squares a 3-bit number. Draw the relevant logic diagram.	[8M]
(b)	A ROM chip of 4,096 × 8 bits has two chip select inputs and operates from a 5-volt power supply. How many pins are needed for the integrated circuit package? Draw and explain the relevant block diagram.	[7M]

7(a)	Minimize the following using K- map and implement the same using NAND gates. Y(A,B,C)= (0,2,4,5,6,7)	[7M]
(b)	Show the design approach of ripple adder. Draw the circuit diagram.	[8M]

8(a)	What is a decoder? Construct a 4×16 decoder with two 3×8 decoders. Draw and explain the relevant logic diagram.	[8M]
(b)	Design a BCD to excess-3 code converter using PAL.	[7M]

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B.Tech. III Semester Regular/Supplementary Examinations

S327-OPERATING SYSTEMS

Time : 3 hours　　　　　　　　(IT)　　　　　Max. Marks : 75

PART-A
(Answer all questions)

1(a)	List any four system programs.	[1M]
(b)	Define Throughput.	[1M]
(c)	Define Deadlock.	[1M]
(d)	Define Address Binding.	[1M]
(e)	What is shared lock?	[1M]
(f)	Why do we call operating system as a Resource Allocator?	[2M]
(g)	Write the difference between a thread and a process.	[2M]
(h)	List the necessary conditions for a Deadlock occurrence..	[2M]
(i)	Define external fragmentation.	[2M]
(j)	Give the file system Mounting procedure.	[2M]

PART-B
(Answer any FOUR questions)

2(a)	Distinguish multiprogramming and multiprocessing.	[7M]
(b)	Why "disable all interrupts" is implemented only in kernel mode?	[8M]

3. Define process. Describe the contents of a Process Control Block (PCB). [15M]

4. Write the structure of the consumer process and producer process in Bounded buffer problem. [15M]

5. Consider the following page reference string:
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1.
How many page faults would occur for the following replacement algorithms? Assume three frames of allocation.
　　LRU replacement
　　Optimal replacement [15M]

6. Discuss the following schemes for defining the logical structure of a directory:
　　Single-Level Directory
　　Two-Level Directory [15M]

7(a)	Explain the layered file system.	[7M]
(b)	What is a semaphore? Explain the usage of semaphores.	[8M]

8(a)	What is meant by a process? Illustrate states of process with neat sketch and discuss the process state transition with a neat diagram.	[7M]
(b)	Explain the Layered approach of the operating system with neat diagram.	[8M]

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S309-METALLURGY AND MATERIAL SCIENCE
(ME)

Time : 3 hours   Max.Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks
1(a)	What is the packing factor for F.C.C structure?	1M
(b)	What is liquidus line?	1M
(c)	What is the structure of γ-iron?	1M
(d)	What is Martempering?	1M
(e)	What are the advantages of hand layup process?	1M
(f)	What is an amorphous solid? Give example.	2M
(g)	State the Gibb's phase rule.	2M
(h)	What is maximum solubility of carbon % in iron?	2M
(i)	What are the types of heat Treatment?	2M
(j)	What is role of tin in bronze?	2M

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	What is an alloy? Describe the necessity of alloying.	8M
(b)	How are solid solutions classified? Give example for each.	7M
3(a)	Define phase and Construct the phase diagram for two metals completely soluble in liquid state and partially insoluble in solid state.	8M
(b)	What is Dendrite? Explain how it is formed?	7M
4(a)	Sketch and explain the allotropic forms of pure iron with the help of cooling curve.	8M
(b)	Explain the classification of steels based on eutectoid composition.	7M
5(a)	Explain the three different stages of heat treatment process.	8M
(b)	With the help of TTT diagram explain how the martensite is formed.	7M
6(a)	Define composite material. Explain how the composite materials are classified.	8M
(b)	Enumerate the advantages of non ferrous materials over the ferrous materials.	7M
7(a)	Explain the terms solute and solvent with respect to solid solutions.	8M
(b)	Why the grain boundary is irregular? Explain.	7M
8(a)	Enumerate and explain the function of matrix and reinforcement materials in a composite material.	8M
(b)	What are Carbon – Carbon Composites? Explain.	7M

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

S305- MECHANICS OF MATERIALS
(ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Define Hooke's law.	[1M]
(b)	Differentiate between a Simply supported beam and a Overhanging beam.	[1M]
(c)	What do you mean by Simple bending?	[1M]
(d)	Define the term Obliquity.	[1M]
(e)	What is Moment area Method?	[1M]
(f)	What do you mean by thermal stresses and thermal strains?	[2M]
(g)	Draw the sign conventions for Shear force and Bending moment in general.	[2M]
(h)	Illustrate the shear stress distribution for I-section.	[2M]
(i)	Differentiate between thin and thick cylinders.	[2M]
(j)	What are the assumptions in the theory of simple bending?	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) What is a bulk modulus? Derive an expression for Young's Modulus in terms of Bulk Modulus and Poisson's ratio. [8M]

(b) Two vertical rods one of steel and the other of copper are each rigidly fixed at the top and 50 cm apart. Diameters and lengths of each rod are 2 cm and 4 m respectively. A crossbar fixed to the rods at the lower ends carries a load of 5000 N such that the crossbar remains horizontal even after loading.Find the stress in each rod and the position of the load on the bar.Take E for steel = 2×10^5 N/m² and E for copper = 1×10^5 N/m². [7M]

3. A simply supported beam of length 8 m rests on supports 6 m apart,the right hand end is overhanging by 2 m.The beam carries a uniformly distributed load of 1500 N/m over the entire length.Draw the Shear force and Bending moment diagrams and find the position of Contra flexure. [15M]

4(a) Derive the bending equation with standard notation. [8M]

(b) A rectangular beam 25 cm deep and 10 cm wide is subjected to a maximum bending moment of 500 kNm.Determine the maximum bending stress in the beam.Find the radius of curvature of that position of the beam where bending moment is maximum.Take E = 200 GN/m². [7M]

5(a) Write a note on Mohr's circle of stresses. [7M]

(b) An element is subjected to tensile stresses of 30 N/mm² and 10 N/mm² acting on two mutually perpendicular planes and a shear stress of 10 N/mm² on these planes. Draw the Mohr's circle of stresses and determine the principal stresses and maximum shear stress. [8M]

6(a) Find an expression for radial stress and hoop stress at a point in case of a thick cylinder. [7M]

(b) A water main 80 cm diameter contains water at a pressure head of 100 m.If the weight density of water is 9810 N/m³.Find the thickness of the metal required for the water main.Take the permissible stress as 20 N/mm². [8M]

7(a) What are the assumptions made in the theory of Torsion? [7M]

(b) A solid steel shaft has to transmit 75 Kw at 200 rpm. Taking allowable shear stress as 70 N/mm²,find suitable diameter for the shaft, if the maximum torque transmitted at each revolution exceeds the mean by 30%. [8M]

8(a) Derive an expression for the slope and deflection of a beam subjected to uniform bending moment. [7M]

(b) A cantilever of length 2 m carries a uniformly distributed load of 2.5 kN/m run for a length of 1.25 m from the fixed end and a point load of 1kN at the free end. Find the deflection at the free end if the section is rectangular 12 cm wide and 24 cm deep and E = 1×10^4 N/mm². [8M]

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