B.Tech.(V Sem) (R17) (Suppl.)

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

A.Y. 2019-20

B.Tech. (V Semester) (R17) Supplementary Examinations, November 2020

TIME TABLE

TIME : 10.00 AM to 1.00 PM

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
23-11-2020 (Monday)	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17HS01 – Engineering Economics and Accountancy	17ME11 - Industrial Management
24-11-2020 (Tuesday)	17AE09 - Elements of Heat Transfer	17CE12 - Structural Analysis – II	17CS03 - UML and Design Patterns	17EC13 - Computer Organization and Architecture	17EE10 - Linear and Digital Integrated Circuits	17EI05 - Communication Systems	17CI17 - Data Communications and Computer Networks	17ME12 - IC Engines and Gas Turbines
25-11-2020 (Wednesday)	17AE10 - Aerodynamics-II	17CE13 - Design of Reinforced Concrete Structures – I	17CI14 - Web Technologies	17EC14 - Transmission Lines and Wave Guides	17EC22 - Microprocessors and Microcontrollers	17EC22 - Microprocessors and Microcontrollers	17EC22 - Microprocessors and Microcontrollers	17ME13 -Mechanical Engineering Design- I
26-11-2020 (Thursday)	17AE11 - Propulsion – I	17CE14- Highway Engineering	17CI15 - Automata Theory and Compiler Design	17EC15 - Digital Communications	17EE11 - Electrical Machines – II	17EI06 - Integrated Circuits and Applications	17CI08 - Design and Analysis of Algorithms	17ME14 - Dynamics of Machines
27-11-2020 (Friday)	17AE12 - Aircraft Systems and Instruments	17CE15 - Hydrology	17CS04 - Operating Systems	17EC16 – VLSI Design	17EE12 - Electrical Power Transmission	17EC16 – VLSI Design 17EI09 - Intelligent Instrumentation	17CI10 - Software Engineering	17ME15 - Metal Cutting and Machine Tools
28-11-2020 (Saturday)	17AE13 - Theory of Machines	17CE18 - Construction Management	17CI13 – Advanced Database Management Systems	17EI18 - Micro Electro Mechanical Systems	17EE15 - Electrical Engineering Materials	17EI07 - Control Systems Engineering	17CI23 - Artificial Intelligence	17ME16 - Non-Conventional Energy Sources 17ME17 - Mechanical Vibrations
30-11-2020 (Monday)	17AE90 - Aerospace Materials (AoC- I)	17CE90 - Green Buildings (AoC- I)	17CS90 - Advanced Graph Algorithms (AoC- I)	17EC90 - Electronic Measurements and Instrumentation (AoC- I)	17EE90 - Electrical Safety (AoC- I)	17EI90 - Safety Instrumentation (AoC- I)	17IT90 - Real Time Operating Systems (AoC- I)	17ME90 – Energy, Environment and Pollution (AoC- I)

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: 09-11-2020

CONTROLLER OF EXAMINATIONS

PRINCIPAL

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

H.T.No | | | | | | | | | | |

23 NOV 2020

R17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17HS01-ENGINEERING ECONOMICS AND ACCOUNTANCY

(AE,CE,CSE,ECE,EEE,EIE&IT)

JCH

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define Engineering economics and Explain about its nature and scope.	6M	CO1	L1
(b)	What is the need for demand analysis? Explain about the determinants of demand.	6M	CO1	L1
	(OR)			
2(a)	Define Engineering economics and Explain about its various branches.	6M	CO1	L2
(b)	Why is demand forecasting important? Explain about various demand forecasting techniques.	6M	CO1	L2
3(a)	What is production function? Explain about isocosts and isoquants with graphs.	6M	CO2	L2
(b)	Explain about the cost and output relationship in short run and long run.	6M	CO2	L2
	(OR)			
4(a)	Explain in detail about internal and external economies of scale.	6M	CO2	L2
(b)	From the following particulars, calculate the break-even point in terms of sales value and in units? Fixed factory overheads cost = 60,000/- Fixed selling overheads cost = 12,000/- Variable manufacturing cost per unit = 12/- Variable selling cost per unit = 3/- Selling price per unit = 24/-	6M	CO3	L3
5(a)	Explain in detail about different types of markets.	6M	CO3	L2
(b)	Define competition. How many types of competition are there in the markets?	6M	CO3	L2
	(OR)			
6(a)	Explain with graphs, about price-output determinations under perfect competition.	6M	CO2	L2
(b)	Explain in detail about different pricing methods with relevant examples.	6M	CO2	L2
7(a)	What is the significance of capital in business? Explain about different types of capital and its components.	6M	CO4	L2
(b)	Explain the meaning as importance and process of capital budgeting.	6M	CO4	L2
	(OR)			
8(a)	What is working capital? What are the sources for acquiring it? Explain about the components of working capital.	6M	CO4	L2
(b)	Explain in detail the techniques of capital budgeting.	6M	CO4	L2
9(a)	Explain about the meaning as importance of financial accounting focussing on the journal, ledger and trial balance postings.	6M	CO5	L2
(b)	Explain about the meaning & importance of ratio analysis. How can a company analyse its financial position through ratios?	6M	CO5	L2
	(OR)			
10(a)	What is the role of accountancy in business? Explain in detail about book keeping & double entry system.	6M	CO5	L2
(b)	What is the purpose of ratio analysis in business? Explain in detail about different types of ratios.	6M	CO5	L2

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R17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17AE09-ELEMENTS OF HEAT TRANSFER

(ASE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive the three-dimensional general heat conduction equation in Cylindrical Coordinate.	6M	CO1	L3
(b)	What are the basic laws of heat transfer? Explain the fundamental laws for conduction and convection.	6M	CO1	L2
	(OR)			
2(a)	A square plate heater (size 15cm X 15 cm) is inserted between two slabs. Slab A is 2 cm thick (k = 50 W/m K) and slab B is 1 cm thick (k = 0.2 W/m K). The outside heat transfer coefficient on both sides of A and B are 200 and 50 W/m²K respectively. Temperature of surrounding air is 25°C. If the rating of heater is 1 kW, Find Maximum temperature in the system.	6M	CO1	L4
(b)	Explain the electrical analogy of heat transfer, Illustrate the concept of electrical analogy considering a multi layer composite wall.	6M	CO1	L2
3(a)	Derive an expression for temperature distribution along a pin fin insulated at the tip.	6M	CO2	L3
(b)	Define 'fin efficiency" and 'fin effectiveness". Explain, as a corollary, why thin fin , closely spaced fin of material of good thermal conductivity are preferable.	6M	CO	L2
	(OR)			
4(a)	What are Heisler charts? Explain their significance in solving transient conduction problems.	6M	CO2	L3
(b)	An egg with mean diameter of 4 cm and initially at 20°C is placed in a boiling water pan for 4 minutes and found to be boiled to consumer's taste. For how long should be a similar egg for same consumer be boiled when taken from a refrigerator at 5°C? Take the following properties for egg: k=10 W/m K, ρ=1200 kg/m³, C_P= 2 kJ/kg K and heat transfer coefficient = 100 W/m² K.	6M	CO2	L4
5(a)	With reference to fluid flow over a flat plate discuss the concept of velocity boundary layer and thermal boundary layer, with necessary sketches.	6M	CO3	L2
(b)	A refrigerated truck is moving at a speed of 85 km/h where ambient temperatures is 50°C. The body of the truck is of rectangular shape of size 10m (L) X 4m (W) X 3m (H). Assume the boundary layer is turbulent and the wall surface temperature is at 10°C. Neglect heat transfer from vertical front and backside of truck and flow of air is parallel to 10m long side. Calculate heat loss from the four surfaces. For turbulent flow over flat surfaces $Nu=0.036.\ Re^{0.8}.Pr^{0.33}$. Average properties of air at 30°C; P=1.165 kg/m³; C_P=1.005 kJ/kgK; v=16.10 m²/S; Pr=0.701.	6M	CO3	L4
	(OR)			

6(a)	Discuss the physical significance of : (i) Reynolds number (ii) Prandtl number (iii) Nusselt number in forced convection	6M	CO3	L2
(b)	Explain the circumstances under which natural convection occurs. Differentiate between natural and forced convection.	6M	CO3	L2
7(a)	Calculate the net radiant heat interchange per m^2 for two large parallel plates maintained at 800°C and 300°C. The emissivities of two plates are 0.3 and 0.6, respectively.	6M	CO4	L3
(b)	The net radiation from the surface of two parallel plates maintained at temperatures T_1 and T_2 is to be reduced by 79 times . Calculate the number of screens to be placed between two surfaces to achieve this reduction in heat exchange, assuming the emissivity of screens as 0.05 and that of surfaces as 0.8.	6M	CO4	L4
	(OR)			
8(a)	A long pipe, 50 mm in diameter, passes through a room and is exposed to air at 20°C. Pipe surface temperature is 93°C. Emissivity of the surface is 0.6. Calculate the net radiant heat loss per metre length of pipe.	6M	CO4	L3
(b)	State Wein's law of displacement and prove that monochromatic emissive power of a black body is maximum when $\lambda_{max}.T=2900\mu mK$.	6M	CO4	L2
9(a)	Derive an expression for the LMTD of counter flow heat exchanger. State clearly any of the four assumptions.	6M	CO5	L3
(b)	The flow rates of hot and cold water steams running through a parallel flow heat exchanger are 0.2 kg/s and 0.5 kg/s respectively. The inlet temperatures on the hot and cold sides are 75°C and 20°C respectively. The exit temperature of hot water is 45°C.If the individual heat transfer coefficients on both sides are 650 W/m^2 °C, Calculate the area of the heat exchanger.	6M	CO5	L4
	(OR)			
10(a)	Derive an expression for effectiveness by NTU method for counter flow heat exchanger.	6M	CO5	L3
(b)	An oil cooler for a lubrication system has to cool 1000kg/h of oil (C_p=2.09 kJ/kg°C)from 80°C to 40°C by using a cooling water flow of 1000kg/hr at 30°C. Give your choice for a parallel floe or counter flow heat exchanger, with reasons. Calculate the surface area of the heat exchanger, if the overall heat transfer coefficient is 24 W/m^2 °C.Take C_p of water as 4.18 kJ/kg°C.	6M	CO5	L4

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25 NOV 2020

R17

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

17AE10-AERODYNAMICS-II
(ASE)

JC7K

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Air is accelerated isentropically from 100 m/s to 400 m/s in a nozzle. If the temperature at the initial state is 400 K and the Mach number at the final state is 1.5. Determine (i) the initial Mach number and (ii) the final temperature.	6M	CO1	L3
(b)	Derive the relations connecting stagnation pressure, static pressure and Mach number for a perfect gas with isentropic flow process. Derive similar relations for temperature and density ratios also.	6M	CO1	L3
	(OR)			
2(a)	The static temperature and pressure of an air stream flowing at 300 m/s are 300 K and 95 kPa, respectively. Determine the stagnation temperature and stagnation pressure of the air. Assume the flow to be isentropic.	6M	CO1	L3
(b)	An aircraft is flying at a constant Mach number 2.2 at an altitude where the atmospheric temperature is 220 K. Determine the stagnation temperature at the aircraft's nose.	6M	CO1	L3
3(a)	Derive the expression for compressibility correction to dynamic pressure.	6M	CO2	L4
(b)	Derive the area-velocity relation for quasi-one-dimensional flow.	6M	CO2	L3
	(OR)			
4(a)	A convergent-divergent nozzle is designed to operate with exit Mach number of 1.75. The nozzle is supplied from an air reservoir at 68 X 10^5 N/m^2 (abs). Assuming one-dimensional flow, calculate maximum back pressure to choke the nozzle.	6M	CO2	L4
(b)	The nozzle exit area to throat area ratio of a convergent-divergent nozzle is 1.688. The nozzle is supplied from an air reservoir at 88 X 10^5 N/m^2 (abs). Assuming one-dimensional flow, calculate back pressure for the nozzle to be perfectly expanded to the design Mach number.	6M	CO2	L3
5(a)	Estimate the pressure ratio required to position the normal shock at the nozzle exit planefor Mach 2 convergent-divergent nozzle.	6M	CO3	L4

(b)	Estimate the range of overexpansion pressure ratios and range of underexpansion pressure ratios for Mach 2 convergent-divergent nozzle.	6M	CO3	L4
	(OR)			
6(a)	A uniform supersonic stream at Mach 2.2 expands around two convex corners of 10^0 each. Determine the Mach number downstream of the second corner and the angle of the second fan.	6M	CO3	L3
(b)	Derive the relation between oblique shock angle (β), flow deflection angle (θ) and upstream Mach number (M_1).	6M	CO3	L3
7.	Derive the basic relations required for the analysis of Fanno Flow.	12M	CO4	L3
	(OR)			
8(a)	Argon gas enters an insulated, constant area duct with a Mach number of 0.6, static pressure 90 kPa, and static temperature 300 K. The diameter is 30 cm and length is 1.9 m. If the average friction factor for the duct is 0.02, Determine the Mach number at the duct exit.	6M	CO4	L4
(b)	Hydrogen gas enters an insulated tube of 25 mm diameter with velocity V_1 = 200 m/s and pressure P_1 = 250 kPa and temperature T_1 = 303 K. What is the length of the tube required for this flow to choke? The average friction factor for this tube is 0.03.	6M	CO4	L4
9.	Derive the basic potential equation for compressible flow.	12M	CO5	L3
	(OR)			
10(a)	Write short notes on drag divergence Mach number.	6M	CO5	L2
(b)	What is area-rule? Explain briefly the importance of area rule.	6M	CO5	L2

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27 NOV 2020

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

17AE12-AIRCRAFT SYSTEMS AND INSTRUMENTS

(AE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

S.No.	Questions	Marks	CO	BL
1(a)	Explain the working principles of powered flight control systems.	6M	CO1	L2
(b)	Distinguish between autopilot and fly by wire.	6M	CO1	L2
	(OR)			
2(a)	Illustrate the operation of Instrument Landing Systems with neat sketches.	6M	CO1	L3
(b)	Differentiate between push pull rod system and Autopilot system.	6M	CO1	L2
3(a)	Describe the working of shock absorber of the landing gear system.	6M	CO2	L1
(b)	Summarize the typical hydraulic system used for retraction of landing gear with a neat sketch.	6M	CO2	L5
	(OR)			
4(a)	Differentiate between oleo – pneumatic strut and pressure regulators.	6M	CO2	L2
(b)	Explain briefly hydraulic brake system.	6M	CO2	L2
5(a)	Analyze with a neat sketch of typical fuel system used in jet engines.	6M	CO3	L4
(b)	Explain gas turbine engine fuel system and its components with a neat sketch.	6M	CO3	L5
	(OR)			
6(a)	Explain with neat sketches of the one of the starting systems for jet engines.	6M	CO3	L2
(b)	Illustrate the ignition and starting systems in reciprocating and jet engines.	6M	CO3	L4
7(a)	With a neat sketch, explain how fire and smoke detection systems works.	6M	CO4	L2
(b)	What are the requirements of fire protection system? Explain briefly about the thermo couple and tubular heat detectors.	6M	CO4	L5
	(OR)			
8(a)	With neat sketches, compose the evaporative vapor cycle and evaporative air cycle systems.	6M	CO4	L6
(b)	What do you understand by anti-icing and deicing problems in aircraft? Determine the system to control them.	6M	CO4	L3
9(a)	Differentiate between air speed indicator and pressure gauge.	6M	CO5	L2
(b)	Write short notes on artificial horizon and tachometer.	6M	CO5	L1
	(OR)			
10(a)	Differentiate between HIS & ADI.	6M	CO5	L2
(b)	Explain the concept of Air data computer.	6M	CO5	L2

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28 NOV 2020

R17

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17AE13-THEORY OF MACHINES
(ASE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Categorize complete and incomplete constraints in lower and higher pairs; illustrate your answer with neat sketches.	6M	CO1	L2
(b)	Sketch and describe the quadric cycle chain. Why it is considered to be the basic chain?	6M	CO1	L1
	(OR)			
2(a)	Describe the mobility (degrees of freedom) of mechanisms with examples.	6M	CO1	L3
(b)	Discuss about crank and slotted lever quick return motion mechanism with neat sketches.	6M	CO1	L2
3(a)	Describe with a neat sketch the working of a multi plate friction clutch.	6M	CO2	L2
(b)	A belt runs over a pulley of 700 mm diameter at a speed of 190 rpm. The angle of lap is 175⁰ and the maximum tension in the belt is 3 kN. Determine the power transmitted if the coefficient of friction between the belt and the pulley is 0.3.	6M	CO2	L5
	(OR)			
4(a)	The pitch of 50 mm mean diameter threaded screw of a screw jack is 12.5 mm. The coefficient of friction between the screw and the nut is 0.13. Determine the torque required on the screw to raise a load of 25 kN, assuming the load to rotate with the screw. Determine the ratio of the torque required to raise the load to the torque required to lower the load and also the efficiency of the machine.	6M	CO2	L3
(b)	Develop the relation $\frac{T_1}{T_2} = e^{\mu\theta}$ for a flat belt drive. T_1= Tension in the tight side of the belt, T_2 = Tension in the slack side of the belt, μ= Coefficient of friction between the belt and the pulley, and θ= Angle of contact between the belt and the pulley (in radians).	6M	CO2	L6
5(a)	Each of two gears in a mesh has 48 teeth and a module of 8 mm. The teeth are of 20⁰ involute profile. The arc of contact is 2.25 times the circular pitch. Discover the addendum.	6M	CO3	L4
(b)	Draw the displacement, velocity and acceleration diagrams for a follower when it moves with uniform acceleration and retardation. Derive the expression for velocity and acceleration during outstroke and return stroke of the follower.	6M	CO3	L3
	(OR)			
6(a)	What is meant by epicyclic gear train? How do we find velocity ratio of it? Explain by considering tabular method.	6M	CO3	L1
(b)	The following data relate to a cam profile in which the follower moves with uniform acceleration and deceleration during ascent and decent. Minimum radius of cam = 25 mm, lift = 34 mm, roller diameter = 15 mm, angle of ascent = 60⁰, angle of descent = 90⁰, angle of dwell between ascent and decent = 45⁰, speed of the cam = 200 rpm. Draw the profile of the cam and determine the maximum velocity and the uniform acceleration of the follower during outstroke.	6M	CO3	L6

7(a)	Each road wheel of a motor cycle has a mass moment of inertia of 1.5 kg-m^2. The rotating parts of the engine of the motor cycle have a mass moment of inertia of 0.25 kg-m^2. The speed of the engine is 5 times the speed of the wheels and is in the same sense. The mass of the motor cycle with its rider is 250 kg and its centre of gravity is 0.6 m above the ground level. Find the angle of heel if the cycle is travelling at 50 km/h and is taking a turn of 30 m radius. The wheel diameter is 0.6 m.	6M	CO4	L5
(b)	An aeroplane makes a complete half circle of 59 metres radius, towards left, when flying at 235 km per hr. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 r.p.m. clockwise when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.	6M	CO4	L4
	(OR)			
8(a)	Find the angle of inclination with respect to the vertical of a two wheeler negotiating a turn. Given: combined mass of the vehicle with its rider 250 kg; moment of inertia of the engine flywheel 0.3 kg-m^2; moment of inertia of each road wheel 1 kg-m^2; speed of engine flywheel 5 times that of road wheels and in the same direction; height of centre of gravity of rider with vehicle 0.6 m; two wheeler speed 90 km/h; wheel radius 300 mm; radius of turn 50 m.	6M	CO4	L3
(b)	A four-wheeled trolley car of total mass 2000 kg running on rails of 1.6 m gauge, rounds a curve of 30 m radius at 54 km/h. The track is banked at 8°. The wheels have an external diameter of 0.7 m and each pair with axle has a mass of 200 kg. The radius of gyration for each pair is 0.3 m. The height of centre of gravity of the car above the wheel base is 1 m. Determine, allowing for centrifugal force and gyroscopic couple actions, the pressure on each rail.	6M	CO4	L3
9(a)	Four masses *A*, *B*, *C* and *D* are attached to a shaft and revolve in the same plane. The masses are 12 kg, 10 kg, 18 kg and 15 kg respectively and their radii of rotations are 40 mm, 50 mm, 60 mm and 30 mm. The angular position of the masses *B*, *C* and *D* are 60°, 135° and 270° from the mass *A*. Find the magnitude and position of the balancing mass at a radius of 100 mm.	6M	CO5	L3
(b)	The cylinders of a twin V-engine are set at 60^0 angle with both pistons connected to a single crank through their respective connecting rods. Each connecting rod is 600 mm long and the crank radius is 120 mm. the total rotating mass is equivalent to 2 kg at the crank radius and the reciprocating mass is 1.2 kg per piston. A balance mass is also fitted opposite to the crank equivalent to 2.2 kg at a radius of 150 mm. Determine the maximum and minimum values of the primary and secondary forces due to inertia of the reciprocating and the rotating masses if the engine speed is 800 rpm.	6M	CO5	L4
	(OR)			
10(a)	A single cylinder reciprocating engine has speed 290 r.p.m., stroke 390 mm, mass of reciprocating parts 59 kg, mass of revolving parts at 190 mm radius 39 kg. If two third of the reciprocating parts and all the revolving parts are to be balanced, find (i) The balance mass required at a radius of 490 mm, and (ii) The residual unbalanced force when the crank has rotated 69° from top dead centre.	6M	CO5	L3
(b)	A rotating shaft carries four masses *A*, *B*, *C* and *D* which are radially attached to it. The mass centres are 37 mm, 38 mm, 47 mm and 58 mm respectively from the axis of rotation. The masses *A*, *C* and *D* are 7.7 kg, 5.7 kg and 4.5 kg respectively. The axial distances between the planes of rotation of *A* and *B* is 470 mm and between *B* and *C* is 570 mm. The masses *A* and *C* are at right angles to each other. Find for a complete balance (i) the angles between the masses *B* and *D* from mass *A*, (ii)the axial distance between the planes of rotation of *C* and *D*, (iii) the magnitude of mass *B*.	6M	CO5	L4

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30 NOV 2020

H.T.No | | | | | | | | | | |

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

17AE90-AEROSPACE MATERIALS
(ASE)

Time : 3 hours | Max. Marks: 60

Answer one question from each unit
All questions carry equal marks

Q.No.	Questions	Marks	CO	BL
1(a)	Estimate the temperature variation on aircraft wing at a multiple higher altitude.	6M	CO1	L3
(b)	Why we are using the engineering material in human life? What are the differences between Engineering materials and Traditional materials?	6M	CO1	L2
	(OR)			
2(a)	What type of materials are selecting for aerospace vehicle structure manufacturing and material advantages?	6M	CO1	L1
(b)	What is the importance of strength to weight ratio in aerospace material selection for design quality with applications?	6M	CO1	L5
3(a)	How would you summarize the Titanium materials and it`s alloys with properties and suitable applications?	6M	CO1	L3
(b)	What are the specifications and applications of Inconel alloys, Nimonic and super alloys in Aircraft?	6M	CO1	L3
	(OR)			
4(a)	What are the "Refractory Material" and "Ceramic material"? What are the classifications of Ceramics materials and how do you recommend these materials in aerospace industry?	6M	CO1	L5
(b)	What are the differences between Carbon steel and alloy steel-based components?	6M	CO1	L4
5(a)	What are the specifications to indicate the tensile strength of material with nondestructive tests?	6M	CO2	L1
(b)	What are manufacturing defects as well as materials characterization of metals in aircraft?	6M	CO2	L2
	(OR)			
6(a)	How would you describe a suitable method for a quality inspection of welded joints with advantage and disadvantage?	6M	CO2	L1
(b)	What are the differences between Unaided and Aided inspection methods with suitable applications?	6M	CO2	L4
7(a)	How do you classify the "Reinforcement composite" materials? What are the uses and advantages of Reinforcement material in aircrafts?	6M	CO3	L2

(b)	How would you improve composite materials strength to weight ratio? What are the differences between Thermosetting and Thermo plastic matrix materials?	6M	CO3	L6
	(OR)			
8(a)	Explain carbon fiber composite materials with advantages and mechanical properties.	6M	CO3	L2
(b)	Can you explain various features for the following lamination? (i) Symmetric lamination (ii) Angle-ply lamination (iii) Cross-ply lamination.	6M	CO3	L1
9(a)	Would you Explain Filament winding process with neat line diagram. What are the advantages and disadvantages for Filament winding process?	6M	CO4	L5
(b)	What are the differences between Injection moulding and Blow mouldingoperation with neat diagram?	6M	CO4	L4
	(OR)			
10(a)	What is the function of Thermo forming process? How do you manufacture aircraft components and space hardware components with composite materials?	6M	CO4	L4
(b)	Write short note on the following operation: (i) Liquid moulding (ii) Pultrusion (iii) Polyforming.	6M	CO4	L1

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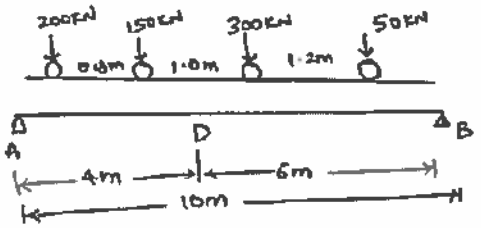
LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

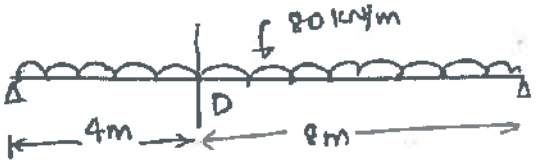
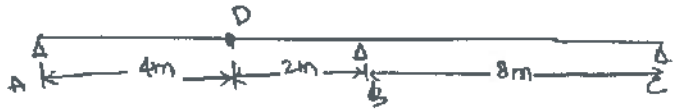
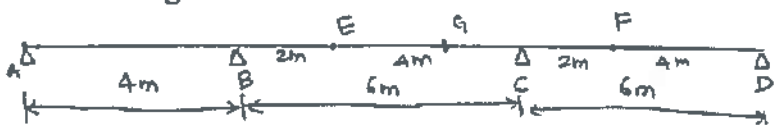
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17CE12-STRUCTURAL ANALYSIS II
(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	(i) Differentiate three hinged arch and two hinged arch (ii) A three hinged parabolic arch of span 20m and rise 4m carries a uniformly distributed load of 20kN per meter run on the left half of the span. Find the maximum bending moment for the arch.	6M	CO1	L2
(b)	A three hinged semi-circular arch of radius R carries a uniformly distributed load of w per unit run over the whole span. Find the horizontal thrust at each support and the location and the magnitude of the maximum bending moment for the arch.	6M	CO1	L4
	(OR)			
2(a)	(i) Define eddies theorem (ii) A three hinged arch has span of 30m and rise 10m. The arch carries a uniformly distributed load of 60kN per metre on the left half of the span. It also carries two concentrated loads of 160kN and 100kN at 5m and 10m form the right end. Determine the horizontal thrust, at each support.	6M	CO1	L2
(b)	Define secondary stresses. Derive the expression of horizontal thrust of temperature effect and rib shortening.	6M	CO1	L4
3(a)	(i) Mention the types of cables (ii) Derive the expression of maximum tension of a cable carrying uniform load with neat sketches.	6M	CO2	L4
(b)	Find the maximum possible span for a cable supported at the ends at the same level allowing a central dip of $1/10^{th}$ the span and a permissible stress of 150N/mm2. Steel weighs 78000N per cum. Assume that the cable takes a parabolic profile.	6M	CO2	L5
	(OR)			
4(a)	A cable of span l has its ends at heights h1 and h2 above the lowest point of the cable, It carries a uniformly distributed load of w per unit run of the span. Determine the vertical and horizontal reactions at each end.	6M	CO2	L5
(b)	A flexible cable weighing 10N per meter hangs between two supports 50 meters horizontally apart. The left support is 8 meters below the right support. The cable also supports a point load of 1200N at a point 15 meters horizontally from the left support and 3 meters below this support. If the weight of the cable is spread uniformly on the horizonal span, find the maximum tension in the cable.	6M	CO2	L5
5(a)	Wheel loads shown as below, roll over along a beam of span 10 metres. Find maximum bending moment which can occur at a section 4 metres from the left end. 	6M	CO3	L5

(b)	(i) A live load of 80kN per metre moves on a simply supported girder of span 12 metres. Find the maximum bending moment which can occur at a section 4 metres from the left end.  (ii) A live load of 50kN per metre 8 metres long moves on a simply supported girder of span 10m. Find the maximum bending moment which can occur at a section 4 metres from the left end.  	6M	CO3	L5
	(OR)			
6(a)	Explain absolute bending moment condition of uniformly distributed load with neat sketches	6M	CO3	L5
(b)	A wheel load system shown, can move on a girder of span 5m. Find the maximum positive and negative shear force of the girder.  	6M	CO3	L5
7(a)	Draw the influence line diagram for the bending moment from 5m of the left support of the beam of length 10m simply supported, carrying uniformly distributed load 15kN per unit run on the span from left to right. Length of the load happens to be larger than the span.	6M	CO4	L4
(b)	A uniformly distributed load of 60kN per metre run of length 5m moves on a girder of span 16 metres. Find the maximum positive and negative shear force at a section 6 meters from the left end.	6M	CO4	L4
	(OR)			
8(a)	Draw the influence lines for reactions at supports A, B and C and bending moment at support B for the beam shown. Hinge provided at D. Find maximum values when a traveling load of 60kN per metre may cover any part of the span.  	6M	CO4	L4
(b)	Draw the influence lines for the following, (i) Reaction Va at A, (ii) Reaction Vb at B, (iii) Bending moment, Mb at B, iv) shear force Sg at G, v) Bending moment Mg at G. Find the maximum values of these quantities due to a moving load of 10kN/m. Consider E and F has internal hinges  	6M	CO4	L4
9(a)	Illustrate the force method procedure.	6M	CO5	L3
(b)	Derive the force displacement relations of flexibility and stiffness matrices .	6M	CO5	L3
	(OR)			
10(a)	Illustrate the displacement method procedure.	6M	CO5	L3
(b)	Derive the relation between flexibility and stiffness matrices.	6M	CO5	L3

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

17CE13-DESIGN OF REINFORCED CONCRETE STRUCTURES-I
(CE)

Time : 3 hours 17CE Max. Marks : 60

Answer one question from each unit
All questions carry equal marks
Use of IS 456-2000 code book and SP 16 Interaction charts are permitted
Assume any necessary data if required.

Q.No	Questions	Marks	CO	BL
1.	Design a reinforced concrete beam subjected to a bending moment of 30 kN-m. Use M15 grade concrete and Fe 415 steel; keep width as half of depth of beam. Use working stress method.	12M	CO1	L5
	(OR)			
2.	A beam 250 mm X 500 mm in section is reinforced with 3 bars of 14 mm diameter at top and 5 bars of 20 mm diameter at bottom, each at an effective cover of 40 mm. Determine the moment of resistance of the beam section. Take permissible stress in steel and concrete as 126 N/mm² and 5.2 N/mm² respectively. Take m = 18. (Use working stress method).	12M	CO1	L4
3.	A reinforced concrete beam has width equal to 300 mm and total depth equal to 700 mm, with a cover of 40 mm to the centre of the reinforcement. Design the beam if it is subjected to a total bending moment of 150 kN-m. Use M20 grade concrete and Fe 415 steel.	12M	CO2	L5
	(OR)			
4.	A doubly reinforced section 30cm X 50cm deep is reinforced with 3 bars 20mm diameter bars in compression and 4 bars of 25mm diameter in tension, each at an effective cover of 50 mm. Determine the moment of resistance. Use M25 mix and Fe 500 steel.	12M	CO2	L4
5.	Determine the reinforcement for rectangular beam section with following details; width of section 250 mm, depth of section 400 mm, Factored BM=80 kN-m, Factored torsional moment 45 kN-m and Factored shear force= 60 kN. Use M20 concrete Fe 415 steel.	12M	CO3	L4
	(OR)			
6(a)	Write a short note on limit state of collapse in shear.	6M	CO3	L1
(b)	List out the steps involved in design of shear reinforcement in reinforced concrete beams.	6M	CO3	L1
7.	The drawing –cum-dining room of a residential building measures 4 m X 6.5 m. The slab assumed to be simply supported on 230 mm walls on all the four edges. The live load is 2 kN/m² and load due to finishes may be taken as 1 kN/m². Design the slab using M20 grade concrete and mild steel. Assume four edges are discontinue.	12M	CO4	L5
	(OR)			
8.	Design a R.C.C slab having inside dimensions 4 m X 10 m. The super-imposed load may be taken as 3 kN/m². Use M20 mix & Fe 415 steel.	12M	CO4	L5
9.	Design a short axially loaded column for a factored load 1750kN. Assume M20 mix Fe 415 steel.	12M	CO5	L5
	(OR)			
10.	Design a short column to carry a working load of 2000kN and uniaxial moment of 200 kN.m. Assume M20 mix Fe 415 steel.	12M	CO5	L5

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

17CE15-HYDROLOGY
(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Distinguish between recording and non-recording rain gauges, giving examples of such gauges used in India.	6M	CO1	L4
(b)	The network of 10 stations in and around a river basin have the Thiessen weights of 0.10, 0.06, 0.11, 0.07, 0.08, 0.09, 0.11, 0.12, 0.16 and 0.10 respectively. Stations 2, 4 and 5 lie outside the basin while the remaining are inside. If the rainfalls recorded at these gauges during a storm are 150, 168, 158, 135, 156, 207, 138, 162, 114 and 132 mm respectively. Determine the average depth of rainfall over the basin by arithmetic and Thiessen mean methods.	6M	CO1	L3
	(OR)			
2(a)	Discuss various methods of reducing evaporation losses from water body.	6M	CO1	L2
(b)	Describe how infiltration capacity rate can be measured using double ring infiltrometre. How is better than a tube infiltrometre?	6M	CO1	L2
3(a)	List out the various physiographic factors which affect runoff. Discuss their influence on the volume of runoff and on the time distribution of runoff.	6M	CO2	L2
(b)	A small watershed near Nagpur is 250 ha in size and has group C soil. The land cover can be classified as 30 % open forest (CN = 60) and 70 % poor quality pasture (CN=86). Assuming AMC at average condition and the soil to be black soil, estimate the direct runoff volume due to a rainfall of 75 mm in one day. Use SCS-CN equation applicable to Indian Conditions.	6M	CO2	L3
	(OR)			
4(a)	List out the different methods of computing the run-off. Discuss about the infiltration method.	6M	CO2	L1
(b)	The monthly runoff volumes in million m^3 for a period of 24 months (two water years) recorded at a stream gauging site are 3, 6, 16, 30, 18, 15, 10, 8, 6, 4, 3, 1, 2, 5, 17, 28, 20, 15, 12, 7, 5, 4, 3 and 2. If uniform demand of 8.33 million m^3 per month is to be met by this reservoir, determine the storage capacity of reservoir to meet the demands. (use a flow mass curve). The water year may be taken as June to May.	6M	CO2	L3
5(a)	Discuss about the unit hydrograph of different duration. Summaries the method of superposition.	6M	CO3	L2

(b)	The ordinates of a 6-h unit hydrograph are as given below. If two storms, each of 1 cm rainfall excess and 6-h duration occur in succession, Determine the resulting flood hydrograph of flow. Assume base flow to be uniform at 10 m^3/s.	6M	CO3	L3

Time (h)	0	6	12	18	24	30	36	42	48	54	60
Ordinates of 6-h UH (m^3/s)	0	20	60	120	90	70	50	30	20	10	0

(OR)

6(a)	Describe the three methods of separating the baseflow from the total runoff.	6M	CO3	L2
(b)	Given the ordinates of a 3-h unit hydrograph as below. Derive the ordinates of 6-h unit hydrograph for the same catchment by s-curve method.	6M	CO3	L3

Time (h)	0	3	6	9	12	15	18	21	24	27	30
Ordinates of 3-h UH (m^3/s)	0	25	50	85	100	70	40	25	15	5	0

7(a)	Describe the method of estimating a Tr - year flood using Gumbel's distribution.	6M	CO4	L2
(b)	Explain the Muskingum method of routing an inflow hydrograph through a channel reach. Assume the values of the coefficients ***K*** and ***x*** for the reach are known.	6M	CO4	L2

(OR)

8(a)	Distinguish between, (i) hydraulic routing and hydrologic routing (ii) Channel routing and Reservoir routing.	6M	CO4	L2
(b)	From the analysis of available data on annual flood peaks of a small stream for a period of 35 years, the 50 year and 100 year flood have been estimated to be 660 m^3/s and 740 m^3/s using Gumbel's method. Estimate the 200 year flood for the stream.	6M	CO4	L3
9(a)	Describe recuperation test for an open well. Derive the equation for specific yield or specific capacity of the well in this test.	6M	CO5	L2
(b)	An unconfined aquifer has a thickness of 30 m. A fully penetrating 20 cm diameter well in this aquifer is pumped at a rate of 35 lit/s. The drawdown measured in two observation wells located at distances of 10 m and 100 m from the well are 7.5 m and 0.5 m respectively. (i) Determine the average hydraulic conductivity of the aquifer (ii) Determine the radius of influence and the drawdown in the well.	6M	CO5	L3

(OR)

10(a)	List out the assumptions made in the analysis of steady radial flow into well.	6M	CO5	L1
(b)	A 25 cm diameter well penetrate fully a confined aquifer of thickness 30 m. When the well is pumped at a rate of 250 litres/minute the steady state drawdown in the two observations wells located at 15 m and 100 m distance from the pumping well are found to be 3.5 m and 0.05 m respectively. (i) Determine the transmissivity and the permeability of the aquifer (ii) Determine the radius of influence and the drawdown in the well.	6M	CO5	L3

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

17CE18-CONSTRUCTION MANAGEMENT
(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Identify the objectives and explain the function of construction management.	6M	CO1	L1
(b)	List out the rights and responsibilities of project manager.	6M	CO1	L1
	(OR)			
2(a)	Describe various phases of project management.	6M	CO1	L2
(b)	How do you select professional services?	6M	CO1	L1
3(a)	Explain briefly the phases of construction planning.	6M	CO2	L3
(b)	What are the methods of scheduling? Explain with the help of a suitable example, the method of preparing a bar chart.	6M	CO2	L1
	(OR)			
4(a)	Describe the terms project monitoring and control.	6M	CO2	L2
(b)	Why do projects need planning?	6M	CO2	L1
5(a)	Explain in detail different factors affecting selection of construction equipment.	6M	CO3	L2
(b)	Describe the terms material management and material procurement.	6M	CO3	L3
	(OR)			
6(a)	Explain in detail different factors affecting job site productivity.	6M	CO3	L2
(b)	Explain briefly equipment management.	6M	CO3	L2
7.	What are the different types of floats involved in CPM?	12M	CO4	L1
	(OR)			
8(a)	Differentiate between Critical Path Method and PERT technique.	6M	CO4	L2
(b)	Explain about Project evaluation and review technique with one example.	6M	CO4	L2
9(a)	Tell the salient features of contract document.	6M	CO5	L1
(b)	List out the important conditions of contract.	6M	CO5	L1
	(OR)			
10(a)	Explain the various deposits provided by contractor.	6M	CO5	L2
(b)	Write a note on "Muster Roll".	6M	CO5	L1

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

17CE90-GREEN BUILDINGS
(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Distinguish between Green field and Brown field.	6M	CO1	L2
(b)	List out advantages and disadvantages of green and brown Fields.	6M	CO1	L1
	(OR)			
2(a)	List out the advantages and disadvantages of green buildings.	6M	CO1	L1
(b)	Summarize the various factors involved in selection of site for green building constructions.	6M	CO1	L2
3(a)	Illustrate the Indoor Air Quality with suitable examples.	6M	CO2	L3
(b)	Describe the concept and importance of climate change.	6M	CO2	L2
	(OR)			
4(a)	Summarize the various causes of deforestation.	6M	CO2	L2
(b)	List out the impacts of deforestation.	6M	CO2	L1
5(a)	Discuss the salient features of green building material obtained from rammed or compressed earth blocks along with its advantages.	6M	CO3	L2
(b)	Explain the possible opportunities for using the recycled or reused materials in green building constructions.	6M	CO3	L2
	(OR)			
6(a)	Describe the salient features of obtaining green building material from fiber reinforced cement and its applications.	6M	CO3	L2
(b)	Discuss the salient features of obtaining green building material from lime, pozzolona, and lime mortar.	6M	CO3	L2
7(a)	Classify the building automation and building management systems.	6M	CO4	L2
(b)	Discuss natural ventilation systems adopted in green building constructions.	6M	CO4	L2
	(OR)			
8(a)	Explain the energy used in transportation and construction processes.	6M	CO4	L2
(b)	Elaborate energy efficient lighting for green buildings along with steps to apply energy efficient lighting.	6M	CO4	L2
9.	Elaborate salient features of green building constructions in India.	12M	CO5	L2
	(OR)			
10.	Describe the Indian green building rating system.	12M	CO5	L2

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

17CS03-UML AND DESIGN PATTERNS

(CSE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Sketch 4+1 view architecture. Explain every view in details.	6M	CO1	L2
(b)	What is modeling ? Why we model? Explain in detail.	6M	CO2	L2
	(OR)			
2(a)	Which diagrams comes under structural diagrams? Explain purpose of each diagram.	6M	CO1	L2
(b)	Write short notes on: (i) An notational thing (ii) Grouping thing	6M	CO1	L2
3(a)	Differentiate class and interface Demonstrate the concept of Application programming interface using class and interface.	6M	CO3	L2
(b)	Explain <<import>> and <<export>> concept with suitable example in UML.	6M	CO3	L2
	(OR)			
4(a)	Draw the UML class diagram for the people within the university. Provide a person class – A person may be a citizen or foreigner male or female. Each person may play the role of a student or employee. Employee can be either professor or registrar. Student may be a under-graduate, master_student or Ph.D. Student.	6M	CO2	L3
(b)	Justify when realization relationship is possible between class and interface. sketch your model.	6M	CO2	L2
5(a)	Draw the state chart diagram of your personal system screen saver state on and off using Time and Change events.	6M	CO3	L3
(b)	Prepare an activity diagram for computing a restaurant bill. There should be a charge for each delivered item. The total amount should be subject to tax and service charge of 18% for groups of six or more. Any coupons charge submitted by the customer is subtracted from bill.	6M	CO3	L3
	(OR)			
6(a)	Describe the following terms which are used in interaction diagrams (i) Object life line (ii) <<create>> and << destroy>> (iii) Flow of control (iv) messages.	6M	CO3	L3
(b)	Apply the following concepts and Explain with suitable examples: (i) <<instanceOf>> stereotype between class and object (ii) <<include>> stereotype between use case to use case.	6M	CO3	L3
7(a)	Define design pattern. Explain categories of patterns.	6M	CO4	L3
(b)	Explain MVC architecture with an example.	6M	CO4	L2
	(OR)			
8(a)	If any specification are given how to select a specific design pattern. Explain it.	6M	CO4	L3
(b)	In your smart phones how many design patterns you will observer. List out. Explain it.	6M	CO4	L4
9(a)	How implementation of strategy pattern helps in real time? Explain it.	6M	CO5	L3
(b)	Draw the implementation of Adapter pattern. Explain its intent.	6M	CO5	L3
	(OR)			
10(a)	State pattern comes under which care gory og pattern? Explain its implementation with neat diagram.	6M	CO5	L3
(b)	Demonstrate the applicability of Factory method pattern with an example.	6M	CO5	L3

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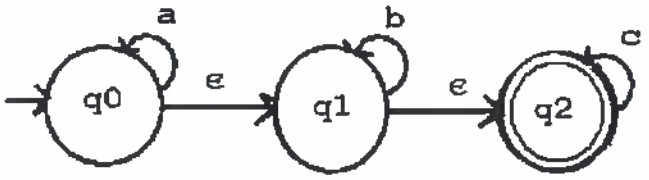
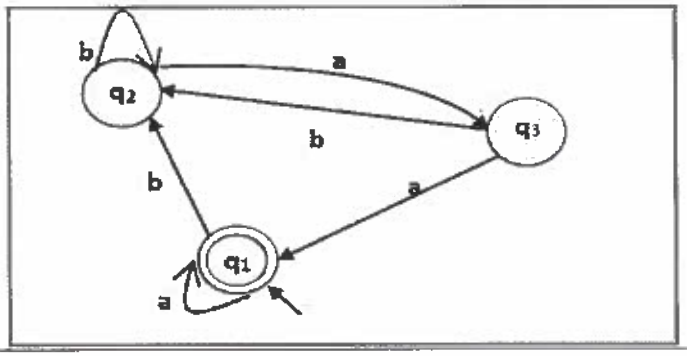
B.Tech. (V Semester) Regular/Supplementary Examinations

17CI15-AUTOMATA THEORY AND COMPILER DESIGN
(CSE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Use Pumping lemma to show that the following language is not regular **L={0^n10^n | n>=0}.**	6M	CO1	L3
(b)	Construct a Deterministic Finite Automation that accepts the Language over the alphabet {a,b} such that all strings contains **exactly three a's.**	6M	CO1	L2
	(OR)			
2(a)	Construct the Deterministic Finite Automaton for the following NFA with epsilon. 	6M	CO1	L2
(b)	Construct the regular expression for the following Deterministic Finite Automaton (DFA) using Arden's theorem. 	6M	CO1	L3
3(a)	Consider the grammar G **S→aB | bA , A→a |aS |bAA , B→b | bS | aBB** Find the Leftmost derivation, rightmost derivation and parse tree for the string "**aabbabab**"	6M	CO2	L2
(b)	Construct a Push down Automaton that accepts by empty stack equivalent to the following grammar: **S→0BB, B→0S|1S|0**	6M	CO2	L2
	(OR)			
4(a)	Design a Pushdown Automaton to accept the following Language. **L= {0^n1^n |n>0)**	6M	CO2	L2

(b)	Check the given grammar is in Chomsky Normal Form (CNF) or not? If not convert it into CNF. **S→ASB | € , A→aAS| a, B→SbS | A |bb.**	6M	CO2	L2
5(a)	Construct LL (1) Parsing table for the given grammar and parse the string **id*id+id.** **E→E+T|T, T→T*F|F, F→ (E) |id.**	6M	CO3	L3
(b)	Illustrate the process of compilation by considering the statement **a=b+c*60**. (Assume a, b and c are floating-point data types).	6M	CO3	L2
	(OR)			
6.	Consider the grammar given below: **S→AS | b, A→SA | a** Construct the SLR parse table and show the actions of the parser for the input string **"abab".**	12M	CO3	L3
7(a)	Consider the following Syntax- directed definition and construct annotated parse tree for the input string "**int a,b,c** " ProductionSemantic Rule D→ TL L.in=T.type T→ int T.type=integer T→ float T.type=float L→ L_1,id L_1.in= L.in addType(id.entry,L.inh) L→ id addType(id.entry,L.inh)	6M	CO4	L3
(b)	Construct quadruples, triples and indirect triples for the following statement. **-(a+b)*(c+d)-(a+b+c)**	6M	CO4	L3
	(OR)			
8(a)	Write short notes on the following. i) Activation Record ii) Dynamic scope	6M	CO4	L2
(b)	Elaborate various forms of intermediate representations with a suitable example.	6M	CO4	L2
9(a)	What are the applications of DAG? And Construct the DAG for the following basic block d = b * c e = a +b b = b * c a = e- d	6M	CO5	L3
(b)	Explain the register allocation and assignment in target code generation.	6M	CO5	L2
	(OR)			
10.	Discuss about the principle sources of code optimization.	12M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17CI13-ADVANCED DATABASE MANAGEMENT SYSTEMS
(CSE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Draw the E-R Diagram for college database by considering the following constraints (i) A college contains many departments (ii) Each department can offer any number of courses (iii) Many instructors can work in a department (iv) An instructor can work only in one department (v) Each instructor can take any number of courses (vi) A course can be taken by only one instructor (vii) A student can enroll for any number of courses (viii) Each course can have any number of students.	12M	CO1	L5
	(OR)			
2.	Explain 1NF, 2NF and 3NF of normalization with example.	12M	CO1	L2
3.	Design the architecture of distributed databases. Discuss the advantages and disadvantages of a distributed database management system.	12M	CO2	L4
	(OR)			
4(a)	Explain Integrity Constraints in Distributed Database.	6M	CO2	L2
(b)	Explain objectives, features and services supported by Distributed databases.	6M	CO2	L2
5(a)	How are transactions handled in distributed databases? Explain.	6M	CO3	L3
(b)	Discuss about the communicational structure for distributed transactions.	6M	CO3	L2
	(OR)			
6(a)	Explain how deadlocks are detected in concurrent transactions of Distributed DBMS.	6M	CO3	L3
(b)	Explain the Distributed Query processing techniques in detail.	6M	CO3	L2
7(a)	Explain in detail the parallel database architecture with neat diagram.	6M	CO4	L2
(b)	Describe data partitioning and parallelizing sequential operator evaluation code with relevant examples.	6M	CO4	L3
	(OR)			
8(a)	Explain Parallel Evaluation of Relational Query in DBMS.	6M	CO4	L2
(b)	Explain inter query and intra query Parallelism in parallel Databases.	6M	CO4	L3
9(a)	Explain about the mandatory features of Object oriented DBMS and illustrate the syntax of OQL.	6M	CO5	L3
(b)	Explain object identity and reference types with examples.	6M	CO5	L2
	(OR)			
10.	List the basic operations of the following built in interfaces of ODMG object model (i) Interator (ii) Set (iii) collection (iv) Object.	12M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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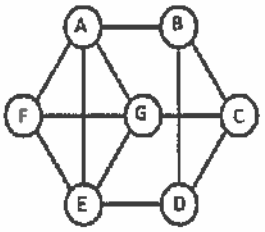
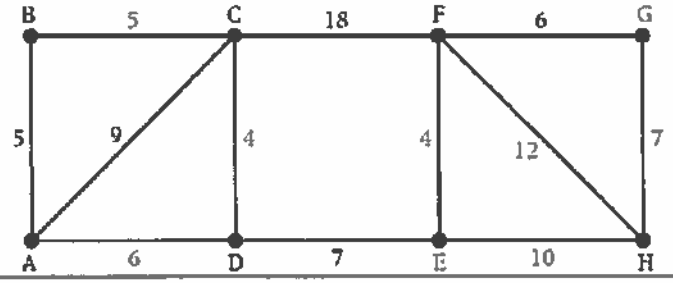
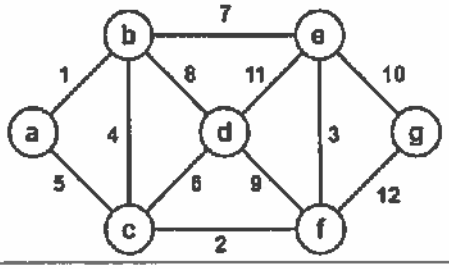
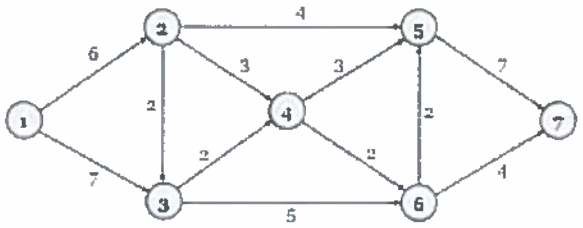
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17CS90-ADVANCED GRAPH ALGOTITHMS
(CSE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define bipartite graph and complete bipartite graph. Give an example for each.	6M	CO1	L1
(b)	Define eulerian graph. Verify the following graph is eulerian graph or not. 	6M	CO1	L2
	(OR)			
2(a)	Describe about Handshaking property with an example.	6M	CO1	L1
(b)	Find the length of an optimal Chinese postman route starting at A and finishing at H. 	6M	CO1	L2
3(a)	Explain the terms trail, circuit, path and cycle with an example for each.	6M	CO2	L2
(b)	Construct the minimum spanning tree (MST) for the given graph using Prim's algorithm. 	6M	CO2	L3
	(OR)			
4(a)	State and prove Cayley's formula.	6M	CO2	L2
(b)	Draw the labeled tree corresponding to the prufer sequence 4,2,4,1,4,2.	6M	CO2	L3

5(a)	Show that every k-connected graph of order at least 2k contains a cycle of length at least 2k. Let k ≥ 2.	6M	CO3	L4
(b)	Explain about Max-flow Min-cut theorem.	6M	CO3	L2
	(OR)			
6(a)	Write the algorithm to identify the articulation points.	6M	CO3	L2
(b)	Find the maximal flow from node 1 to node 7 in the following network. The numbers by the arcs are their upper flow bound, whereas their lower flow bound is assumed to be 0. 	6M	CO3	L4
7(a)	Find the chromatic number of a cycle graph with n vertices in the following cases (i) n is even (ii) n is odd.	6M	CO4	L2
(b)	Explain about Register allocation through graph coloring.	6M	CO4	L2
	(OR)			
8(a)	Explain Brook's theorem with an example.	6M	CO4	L2
(b)	Explain about Job scheduling through graph coloring.	6M	CO4	L2
9(a)	Prove that the Petersen graph is non-planar.	6M	CO5	L4
(b)	State and prove Wagner's theorem.	6M	CO5	L4
	(OR)			
10.	Find out the travelling sales person's path for the following cost matrix. ∞ 11 10 9 6 / 8 ∞ 7 3 4 / 8 4 ∞ 4 8	12M	CO5	L4

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17EC13-COMPUTER ORGANIZATION AND ARCHITECTURE

(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Summarize the various steps involved in the execution of a machine instruction.	6M	CO1	L2
(b)	How do you evaluate the performance of computer using SPEC rating?	6M	CO1	L3
	(OR)			
2(a)	Demonstrate the effect on performance of computer by integrating cache memory into the processor.	6M	CO1	L3
(b)	Analyze the basic performance equation for measuring the performance of Processor.	6M	CO1	L4
3.	Demonstrate booth algorithm for signed multiplication and show sequence of steps for multiplication of -15 with +9.	12M	CO2	L3
	(OR)			
4(a)	Describe the logic circuit arrangement for restoring division and mention the steps needed to perform restoring division.	6M	CO2	L2
(b)	Outline the general procedure for addition, subtraction, multiplication and division of floating-point numbers.	6M	CO2	L4
5(a)	Differentiate hardwired and micro programmed control.	6M	CO3	L4
(b)	Summarize the fields of a typical microinstruction format.	6M	CO3	L2
	(OR)			
6(a)	Describe the flow chart of instruction cycle.	6M	CO3	L2
(b)	Analyze the Microinstruction-Sequencing organization with Next-Address field.	6M	CO3	L4
7.	Discuss the following with respect to memories i) Interleaving ii) Hit rate and Miss Penalty iii) Caches on the processor chip.	12M	CO4	L2
	(OR)			
8(a)	Show the typical organization that implements virtual memory.	6M	CO4	L1
(b)	Illustrate the procedure for translating virtual address generated by the processor to physical address in main memory.	6M	CO4	L3
9(a)	Analyze the internal architecture of 8255A.	6M	CO4	L4
(b)	Classify the types of I/O channels.	6M	CO4	L4
	(OR)			
10(a)	Summarize the SCSI bus signals.	6M	CO4	L2
(b)	Compare Programmed I/O and Interrupt-Driven I/O Techniques.	6M	CO4	L5

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

17EC14-TRANSMISSION LINES AND WAVE GUIDES
(ECE)

JC4

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Differentiate lossless and distortion less transmission lines.	6M	CO1	L2
(b)	Determine the line parameters R,L,G,C for a distortion less line with γ=0.04+j15 /m, Z_0=80 Ω, f=500MHz.	6M	CO1	L3
	(OR)			
2(a)	Discuss primary constants of transmission line with the use of equivalent model.	6M	CO1	L2
(b)	Derive the characteristic impedance of transmission line in terms of its line constants.	6M	CO1	L6
3(a)	Describe how UHF lines can be treated as circuit elements using the necessary equivalent circuits.	6M	CO1	L2
(b)	Summarize the significance of quarter wave and half wave transmission lines.	6M	CO1	L2
	(OR)			
4(a)	Interpret the usefulness of Smith chart in solving transmission line problems.	6M	CO1	L2
(b)	Illustrate the matching between load and line using single stub.	6M	CO1	L4
5(a)	Examine the modes of rectangular wave guide from cutoff frequency.	6M	CO4	L3
(b)	An air field rectangular wave guide has dimensions of a = 6 cm, b=4cm.The signal frequency is 3 GHz. Calculate Cut off frequency, Wave length, phase velocity for TE_{10}, TE_{11} modes.	6M	CO4	L3
	(OR)			
6(a)	Evaluate the field expressions for TM_{mn} mode in a Rectangular waveguide.	6M	CO3	L5
(b)	Outline the properties of TEM wave in a parallel plane wave guide.	6M	CO2	L4
7(a)	Analyze rectangular cavity resonator for the TM_{mnp} field expressions.	6M	CO2	L4
(b)	A circular wave guide has a cut off frequency of 9GHz in dominant mode. Determine the inside diameter of the guide if it is i) air-filled. ii) Filled with dielectric with ε_r=4.	6M	CO4	L3
	(OR)			
8(a)	Demonstrate the procedure to calculate Q of rectangular cavity assuming lossy conducting walls and lossless dielectric.	6M	CO4	L3
(b)	Conclude the impedance of TE, TM waves with neat graph in a circular waveguide.	6M	CO3	L5
9(a)	Assess the Qfactor of microstrip line with respect to loss tangent and frequency.	6M	CO3	L5
(b)	Apply the wire above ground and effective dielectric constant concepts to get characteristic impedance of microstrip line.	6M	CO4	L3
	(OR)			
10(a)	Examine the microstrip line with waveguide and coaxial transmission line.	6M	CO4	L3
(b)	A microstrip line has the following parameters: ε_r=5.23, h=7mm, t=2.8mm, w=10mm. Calculate the characteristic impedance Z_0 of microstrip line.	6M	CO4	L3

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

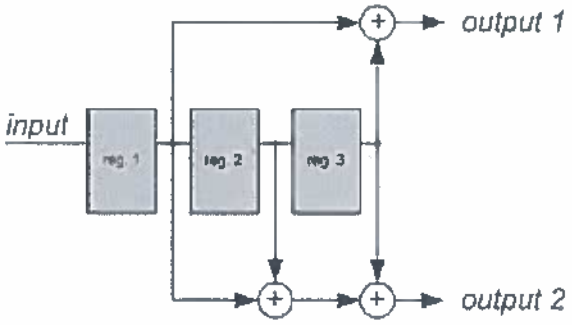
JC7

17EC15- DIGITAL COMMUNICATIONS
(ECE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define Quantization and show that the quantization error in PCM is $\Delta^2/12$.	6M	CO1	L2
(b)	Explain how non-uniform quantization is achieved through Companding in PCM system.	6M	CO1	L3
	(OR)			
2(a)	A signal having bandwidth equal to 5KHz is sampled, quantized and coded by a PCM system with 256 quantization levels. Determine codeword length, transmission bandwidth, bit rate and output signal to noise ratio in dB.	6M	CO1	L5
(b)	Draw the block diagram of Delta Modulator and explain each block. Give the condition to avoid slope overload in Delta Modulation.	6M	CO1	L6
3(a)	Illustrate the generation of QPSK modulation with the help of constellation and block diagrams.	6M	CO2	L2
(b)	Describe the detection of ASK modulation scheme.	6M	CO2	L3
	(OR)			
4(a)	Explain the generation of FSK modulation scheme with necessary waveforms and alsomention the expressions for bit rate and Bandwidth.	6M	CO2	L2
(b)	Explain the DPSK modulation process and encode the data stream 101100011110 using DPSK modulator. What are the advantages of DPSK over BPSK?	6M	CO2	L3
5(a)	Obtain the expression for probability of error of matched filter Receiver.	6M	CO3	L5
(b)	Obtain the expression for probability of error of QPSK Receiver.	6M	CO3	L5
	(OR)			
6(a)	Obtain the expression for probability of error of BPSK Receiver. Compare it with the probability of errors of ASK and FSK.	6M	CO3	L5
(b)	Obtain the expression for probability of error of Optimum filter Receiver.	6M	CO3	L5
7(a)	What is the significance of Entropy in information theory? Prove the Entropy relation H(XY) = H(Y/X) + H(X).	6M	CO4	L4

(b)	A source with 6 emitting messages A,B,C,D,E having probabilities P(A) = 1/3, P(B) =1/4, P(C) = P(D) = 1/8, P(E) = P(F) =1/12. Find coding efficiency using Huffman coding.	6M	CO4	L5
	(OR)			
8(a)	A source transmits two independent messages with probabilities of P and (1-P) respectivily. Prove that the entropy is maximum when both the messages are equally likely.	6M	CO4	L4
(b)	Derive the Channel capacity of Gaussian Channel using Shannon-Hartley Theorem.	6M	CO4	L5
9(a)	A (7,4) block code is generated by using a generator matrix 1 0 0 0 : 1 1 1 0 1 0 0 : 1 1 0 0 0 1 0 : 1 0 1 0 0 0 1 : 0 1 1 Find the following: (i) Parity check matrix (ii) Code vectors for a message block (1001) and (1110) (iii) Show how a single error can be corrected.	6M	CO5	L5
(b)	For a convolutional encoder with g1=[100], g2=[111] and g3=[101], draw the state diagram and determine the output code word in transform domain approach for message u=[10100].	6M	CO5	L3
	(OR)			
10(a)	Sketch the state diagram and tree diagram for the given convolutional encoder. 	6M	CO5	L4
(b)	The generator polynomial of a (7,4) systematic cyclic code is $g(x) = 1+x+x^3$. Find the code words for the messages (1110), (1001) using shift register method.	6M	CO5	L5

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(AUTONOMOUS)

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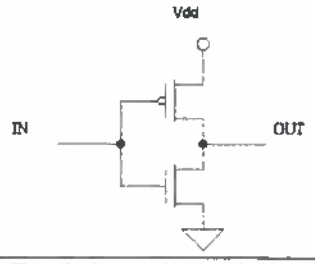
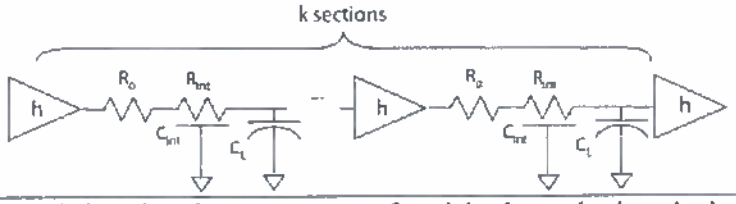
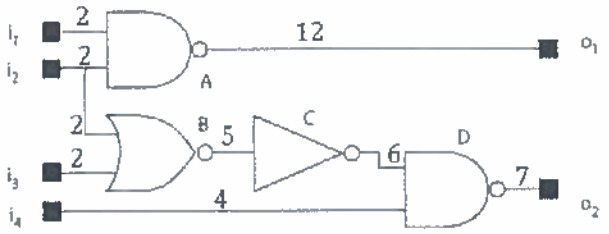
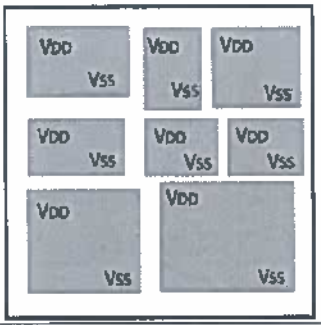
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17EC16-VLSI DESIGN
(ECE & EIE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What are the limitations of simple switch implemented by a NMOS transistor and how a pass transistor or transmission gate can overcome them? Explain with suitable expressions.	6M	CO1	L1
(b)	What are major differences between CMOS and Bipolar transistors and technologies?	6M	CO1	L1
	(OR)			
2(a)	State at least 6 design rules that can minimize latch-up condition in P-well process.	6M	CO1	L1
(b)	NMOS and PMOS transistors are having same dimensions of (W/L) = 10/5, and same drain current of 10μA with the following technology parameters. Find the intrinsic gain (g_m*r_{ds}) of these transistors and compare them. Technology parameters: Threshold voltage: V_{THN} = 0.7V, V_{THP} = -0.8V Mobility μ_n = 350 $cm^2/V.s$, μ_p = 100 $cm^2/V.s$ Oxide thickness = 9 nm Permittivity: free space (ε_o)=8.854 x 10^{-12} F/m; SiO_2 (ε_r) = 3.9 Channel length modulation parameter: λ_n= 0.1,λ_p= 0.2.	6M	CO1	L3
3(a)	Explain leakage and subthreshold currents in a MOS transistor. What is the impact of technology scaling on these currents?	6M	CO2	L3
(b)	Give the stick diagram of 1 bit multiplexer using NAND gates.	6M	CO2	L3
	(OR)			
4(a)	What happens if PMOS is used for Pulldown and NMOS is used for Pullup?	6M	CO2	L3
(b)	Design a carry look ahead adder to add two binary numbers (a, b), where each of them has 4 binary digits (a = $a_3a_2a_1a_0$ and b = $b_3b_2b_1b_0$).	6M	CO2	L3
5(a)	Explain operation of the CMOS inverter shown in the figure below, for complete full-scale range of the input (from 0 to V_{DD}). 	**6M**	**CO3**	**L3**
(b)	Explain the difference between static and dynamic power consumption of logic gate sand. Why static power is becoming important in nanometer technologies?	6M	CO3	L2
	(OR)			
6(a)	Implement a function with Differential cascode voltage switch logic (DCVSL) to obtain (x + y) and (x'.y')and draw the circuit schematic.	6M	CO3	L3

(b)	Draw the circuit schematic of the logic function $y = (a.b + c.(d + e))'$ using pseudo-nMOS logic.	6M	CO3	L3
7(a)	The figure shown below presents an RC transmission line with k sections. Calculate the number of buffers required when a minimum-size inverter drives a metal 1 wire that is 20,000λ x 3λ. In this case, R_0 = 6.5kΩand C_0 = 1.5fF while R_{int} = 500Ω and C_{int}= 210fF. Where R_{int} and C_{int} are the total resistance and capacitance of the transmission line. R_0 is the driver's equivalent resistance and C_0 its input capacitance. 	6M	CO4	L3
(b)	Explain the importance of critical path in timing analysis of a system. For the combinational circuit shown below determine the critical path(s) and corresponding delay. For each path corresponding delay is presented in ns. 	6M	CO4	L4
	(OR)			
8(a)	Explain the operation of a dynamic latch with the help of circuit schematic at transistor level.	6M	CO4	L1
(b)	Draw a block diagram for an eight-bit shift register built from two four-bit shift registers, which is in turn built from one-bit shift registers.	6M	CO4	L2
9(a)	Design a n-bit barrel shifter built from static gates and clocked inverters.	6M	CO5	L3
(b)	Draw a logic diagram for an ALU that performs these functions: a AND b, a OR b, a XOR b, NOT a, a + b, a -b.	6M	CO5	L3
	(OR)			
10(a)	For the floorplan below, determine whether it can be routed with planar power and ground nets. 	6M	CO5	L4
(b)	Draw a transistor-level schematic of an inverter, power supply,and decoupling capacitor.	6M	CO5	L4

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

17EC90-ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(ECE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe the operation of D'Arsonval Galvanometer.	6M	CO1	L1
(b)	Show the working of Average responding AC voltmeter.	6M	CO1	L2
	(OR)			
2(a)	The expected value of the current through a resistor is 20mA. However the measurement gives a value of 18mA. Calculate (i) Absolute error (ii)% error (iii)relative accuracy and (iv)% of accuracy.	6M	CO4	L3
(b)	Interpret static and dynamic characteristics of an instrument.	6M	CO1	L2
3(a)	Interpret the steps for calibration in series type ohmmeter. Derive unknown resistances R_1 & R_2.	6M	CO1	L4
(b)	A 100Ω basic movement is to be used as an ohmmeter requiring a full scale deflection of 1mA and internal battery voltage of 3V. A half scale deflection marking of 2kΩ is desired. Calculate Value or R_1 and R_2.	6M	CO4	L3
	(OR)			
4(a)	Design wheatstone's bridge to measure unknown resistance.	6M	CO4	L4
(b)	Derive an equation how unknown capacitance can be measured by Schering's bridge.	6M	CO4	L4
5(a)	List out the requirements needed in choosing signal generator instrument. Mention the importance of each block in Modern laboratory signal generator.	6M	CO2	L2
(b)	Describe the operation of each block in AF Sine and Square signal generator.	6M	CO2	L2
	(OR)			
6(a)	How can total harmonic distortion be measured in Harmonic distortion analyzer? Summarize the working of different harmonic distortion analyzers.	6M	CO2	L2
(b)	Illustrate how Audio frequencies are analyzed by frequency selective wave analyzer.	6M	CO2	L3
7(a)	Draw the basic CRO block diagram and state the functions of each block.	6M	CO1	L2
(b)	Why delay lines are used in vertical deflection circuit of a cathode ray oscilloscope (CRO)? Name at least two types of delay lines used in CRO.	6M	CO1	L2
	(OR)			
8(a)	Outline the uses of probes in measuring instruments. Describe when Active and High impedance probes are used.	6M	CO1	L2
(b)	What is the use of Time/base generator? Describe its operation using necessary block diagram.	6M	CO1 CO3	L2
9(a)	Describe the working of resistance thermometer and Mention its advantages and limitations.	6M	CO3	L3
(b)	Justify the statement. "Thermistors have a negative temperature coefficient (NTC)". How is it different from sensistors?	6M	CO3	L3
	(OR)			
10(a)	Summarize the principle for working of inductive transducers. Derive each one with neat sketches.	6M	CO3	L2
(b)	Analyze the working of a capacitive transducer with neat sketches.	6M	CO3	L2

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

17EE10-LINEAR AND DIGITAL INTEGRATED CIRCUITS
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the working of Non-Inverting amplifier and derive the equation of its Gain	6M	CO1	L3
(b)	Design the adder circuit using inverting amplifier and test with the inputs 10 and 20.	6M	CO1	L4
	(OR)			
2(a)	Explain the working of a Schmitt trigger with neat circuit diagram.	6M	CO1	L2
(b)	Generate square wave with 100ms time period using Schmitt trigger.	6M	CO1	L3
3(a)	What is order of a filter? Discuss band reject and band pass filters.	6M	CO2	L2
(b)	Design an active high pass filter with cutoff frequency of 4KHz.	6M	CO2	L3
	(OR)			
4(a)	Describe the circuit and working of Quadrature type Wein bridge oscillator.	6M	CO2	L2
(b)	How to generate a sawtooth wave form? Explain the working of such a circuit with neatcircuit diagram.	6M	CO2	L3
5(a)	What is PLL? Explain the role of VCO in PLL with neat diagrams.	6M	CO4	L2
(b)	Justify the use of 555 as flipflop.	6M	CO4	L5
	(OR)			
6(a)	With a neat diagram explain the working principle of R-2R ladder type DAC.	6M	CO1	L2
(b)	Explain the working of dual slope ADC with neat circuit diagram and compare itsperformance with other ADC.	6M	CO1	L4
7(a)	Analyze 3 bit TTL NAND gate and draw its characteristics.	6M	CO3	L4
(b)	Design the system to use a channel to transmit 15 different signals and verify it.	6M	CO3	L4
	(OR)			
8(a)	Design a driving circuit for LED and which 74XX series IC is used for it.	6M	CO3	L3
(b)	Design circuit to add the numbers in the range of 0 - 99.	6M	CO3	L3
9(a)	Design a synchronous counter using 74XX ICs and explain its working with neattiming waveforms.	6M	CO4	L4
(b)	Design a counter to count all the prime numbers upto 99.	6M	CO4	L2
	(OR)			
10(a)	Discuss the implementation and access of 256M memory using 4 address lines.	6M	CO4	L2
(b)	Design 4 bit flash EEPROM.	6M	CO4	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17EC22-MICROPROCESSORS AND MICROCONTROLLERS
(EEE,EIE&IT)

JC4

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Compare various Microprocessors over the aspect of their Architecture.	6M	CO1	L2
(b)	Explain the role of Bus interfacing unit in 8086 microprocessor with neat diagrams.	6M	CO1	L2
	(OR)			
2(a)	Describe the architecture of 8086 microprocessor with diagram.	6M	CO1	L2
(b)	Explain about various addressing modes of 8086.	6M	CO1	L2
3(a)	Analyze the Read cycle operation in minimum mode of 8086 using timing diagrams.	6M	CO2	L4
(b)	Compare RAM and ROM on various aspects.	6M	CO2	L2
	(OR)			
4(a)	Illustrate the Pin diagram of 8086 microprocessor.	6M	CO2	L3
(b)	Illustrate about Interrupt vector table of 8086 microprocessor.	6M	CO2	L3
5(a)	Explain the purpose of direct memory Access controller in 8086.	6M	CO4	L2
(b)	Describe the cascading concept of Interrupt controller 8259.	6M	CO4	L4
	(OR)			
6(a)	Illustrate various modes of PPI interfacing unit.	6M	CO1	L4
(b)	Determine an Assembly language program to generate a triangular waveform using a D/A converter-interfacing unit.	6M	CO1	L3
7(a)	Explain briefly about instruction set of 8051 microcontroller with an example.	6M	CO3	L2
(b)	Write a program to store 01H, 02H, 03H, 04H in Registers R0, R1, R2 and R3 respectively and exchange data stored in Register R0 with R1 and data in Register R2 with R3.	6M	CO3	L3
	(OR)			
8(a)	Describe the architecture of 8051 microcontroller with neat diagrams.	6M	CO3	L2
(b)	Illustrate various addressing modes of 8051 with an example each.	6M	CO3	L3
9(a)	Analyze the register structure of Interrupt Enable, Instruction Priority and TCON registers of 8051.	6M	CO4	L3
(b)	Explain about the serial port operation carried out in 8051.	6M	CO4	L3
	(OR)			
10(a)	Illustrate stepper motor interfacing of 8051 with necessary program.	6M	CO4	L4
(b)	Illustrate Seven-segment display interfacing of 8051 with necessary Diagram.	6M	CO4	L4

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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations JC4

17EE11-ELECTRICAL MACHINES-II
(EEE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the phenomenon of crawling and cogging in an induction motor.	6M	CO1	L1
(b)	Describe the rotating magnetic field produced by three-phase currents of I.M.	6M	CO1	L2
	(OR)			
2(a)	Derive an expression for rotor current and power factor of 3-phase induction motor at stand still and at slip **s**.	6M	CO1	L2
(b)	A 3 – phase induction motor is wound for 4 poles and is supplied from 50 HZ system. Calculate (i) the synchronous speed (ii) the rotor speed. When slip is 4% and (iii) rotor frequency when rotor runs at 600 rpm.	6M	CO1	L3
3.	A 3-phase, star connected, 3.73 kW, 200 V, 4-pole, 50 Hz IM gave the following test results: No load Test: 200 V, 5 A, 350 W Blocked rotor test: 100 V, 26 A, 1700W All above are the line values. Plot the circle diagram and for full load Determine (i) The line current, (ii) The power factor, (iii) Slip, (iv) Torque (v) Efficiency, (vi) Maximum power factor. Given that rotor copper losses are 50% to stator copper losses at stand still.	12M	CO2	L3
	(OR)			
4(a)	Describe the construction and operation of auto transformer starter.	6M	CO2	L2
(b)	A 3-phase 50Hz, 500V, 6-pole Induction Motor gives an output of 37.3 kW at 955 r.p.m. the p.f is 0.86. Frictional and windage losses or 1492 kW; stator losses amount to 1.5 kW. Determine line current, efficiency and rotor copper losses for this load.	6M	CO2	L3
5(a)	Discuss about the operation of shaded pole motor with squirrel cage rotor briefly.	6M	CO3	L2
(b)	List the applications for the following motors: (i) A resistance-start induction-run motor (ii) A capacitor-start induction-run motor.	6M	CO3	L2
	(OR)			

6(a)	Illustrate the double field revolving theory.	6M	CO3	L1
(b)	Discuss the working of Capacitor start and run 1- phase induction motor.	6M	CO3	L2
7(a)	Describe the two reaction theory in an alternator. Draw its phasor diagram for a lagging power factor load.	6M	CO2	L2
(b)	A 3 -φ, star connected alternator is rated 1600KVA, 13500V. The effective armature resistance and reactance are 1.5Ω/ph and 30Ω/ph respectively. Calculate the percentage regulation for a load of 1280KW at a power factor of (i) 0.8 leading (ii) 0.8 lagging.	6M	CO2	L3
	(OR)			
8(a)	Why parallel operation of alternators is necessary? What are the advantages of connecting alternators in parallel? Mention all necessary conditions for successful parallel operation of alternators.	6M	CO4	L2
(b)	The OC and SC test data for a 500KVA, 1100V, 50Hz, star connected synchronous generator are 1280v between lines on open circuit with a field current of 8A and 380A on short circuit with same field current. When a DC voltage of 5v was applied to two of its terminals, a current of 25A was measured. Find the value of synchronous impedance and synchronous reactance.	6M	CO4	L3
9(a)	Describe the operation of synchronous motor.	6M	CO1	L2
(b)	Discuss about various losses present in a synchronous motor.	6M	CO2	L2
	(OR)			
10(a)	Derive the mechanical power developed per phase of a synchronous motor.	6M	CO4	L2
(b)	A 3300V, 3 phase synchronous motor running at 1500 rpm has its excitation kept constant corresponding to no-load terminal voltage of 3000V. Determine the power input, power factor and torque developed for an armature current of 250A if the synchronous reactance is 5 Ω per phase and armature resistance is neglected.	6M	CO4	L3

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

17EE12 - ELECTRICAL POWER TRANSMISSION
(EEE)

JC4

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive an expression for the inductance of a single phase two wire line.	6M	CO1	L6
(b)	A single phase line of 230 V has conductor spacing of 135 cm. The radius of conductor is 0.8 cm. Calculate the loop inductance in mH of the line per km.	6M	CO1	L3
	(OR)			
2(a)	Explain the effect of earth on the capacitance of single phase transmission line.	6M	CO1	L2
(b)	Derive the expression for capacitance of a single phase overhead transmission line.	6M	CO1	L6
3(a)	Define regulation of a short 3-phase ac transmission system and develop an expression for appropriate voltage regulation.	6M	CO2	L1
(b)	A single phase line is transmitting 1,100 kW power to a factory at 11 kV and at 0.8 pf lagging. It has a total resistance of 2ohms and a loop reactance of 3ohms. Determine (i) the voltage at sending end, (ii) percentage regulation and (iii) transmission efficiency.	6M	CO2	L3
	(OR)			
4(a)	Derive the A, B, C, D, constants of a medium length transmission line and draw the phasor diagram assuming a π- configuration.	6M	CO2	L6
(b)	The generalized circuit constants of a transmission line are: $A = 0.93 + j0.06$ $B = 20 + j140$ The load at the receiving end is 60 MVA, 50 Hz, 0.8 power factor lagging. The voltage at the supply end is 220 KV. Calculate the load voltage.	6M	CO2	L3
5(a)	Discuss the effect of both wind and ice on sag calculation.	6M	CO3	L2
(b)	What is the most general criterion for the classification of cables? Draw the sketch of a single core lowtension cable and label the various parts.	6M	CO3	L1
	(OR)			
6(a)	Derive the expression for the insulation resistance of a single core cable.	6M	CO3	L6

(b)	A 11 kV, 50 Hz, single-phase cable has a diameter of 10 mm and an internal sheath radius of 15 mm. If the dielectric has a relative permittivity of 24, determine for a 2.5 km length cable: (i) The capacitance. (ii) The charging current.	6M	CO3	L3
7(a)	Explain the methods of improving string efficiency.	6M	CO4	L2
(b)	A 3-phase, 50 Hz, 110 kV line with 1 cm diameter conductors are constructed so that corona takes place if the line voltage exceeds 175 kV (rms). Determine the spacing between the conductors. Assume smooth conductor. Air density factor = 1.0.	6M	CO4	L3
	(OR)			
8(a)	What are the factors that affecting corona? Explain methods to reduce corona loss.	6M	CO4	L2
(b)	A single phase overhead line consists of two conductors of diameter 2 cm with a spacing of 1.5 m between centers. Determine line voltage for commencing of corona. Dielectric strength of air = 21 kV/cm.	6M	CO4	L3
9(a)	What are the causes of over voltages, lightning, switching, insulation failure and arcing ground in power system?	6M	CO5	L2
(b)	What is a Bewley-Lattice diagram? Explain its utility in the study of travelling waves.	6M	CO5	L1
	(OR)			
10(a)	Explain how a faulted power system can be represented through a single line diagrams.	6M	CO5	L2
(b)	Define per unit system. Discuss merits and demerits of per-unit system.	6M	CO5	L1

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

17EE15-ELECTRICAL ENGINEERING MATERIALS
(EEE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Underline the properties and applications of ALNICO materials.	6M	CO1	L1
(b)	Discuss about the nitride magnets, bonded and ductile magnets.	6M	CO1	L2
	(OR)			
2(a)	How a magnetic field is created and give its properties?	6M	CO1	L1
(b)	Identify the core losses in electrical machines and mention their expressions.	6M	CO1	L2
3(a)	List out the advantages and disadvantages of induction heating.	6M	CO2	L1
(b)	Describe about the process of Electron beam cutting with a neat sketch.	6M	CO2	L2
	(OR)			
4(a)	Distinguish between fixed resistors and variable resistors.	6M	CO2	L2
(b)	What are the effects of environment on various materials and components?	6M	CO2	L1
5(a)	Illustrate the working principle of Liquid Crystal Display with its applications.	6M	CO3	L2
(b)	Summarize the processes of epitaxial growth and oxidation in IC fabrication.	6M	CO3	L2
	(OR)			
6(a)	Interpret the process of photolithography in IC fabrication.	6M	CO3	L2
(b)	Why encapsulation is needed for IC's? What are the different types of encapsulation techniques?	6M	CO3	L1
7.	Describe about the working of solar cells and mention their applications.	12M	CO3	L2
	(OR)			
8(a)	Discriminate between different types of fuel cells with its materials.	6M	CO2	L2
(b)	List out the components used in micro turbines.	6M	CO2	L1
9(a)	Interpret the synthesis of nano materials.	6M	CO4	L2
(b)	Discuss about the process of Sol-gels in nano materials.	6M	CO4	L2
	(OR)			
10(a)	Identify the applications of nano materials in different fields.	6M	CO4	L1
(b)	Summarize the process of Pulsed laser deposition in fabrication of Carbon Nano Tubes (CNT's).	6M	CO4	L2

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

17EE90-ELECTRICAL SAFETY
(EEE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate various factor influence the severity of electrical shock.	6M	CO1	L4
(b)	Describe about hot sticks, mention their applications.	6M	CO1	L1
	(OR)			
2(a)	Draw and Explain safety electrical one-line diagram.	6M	CO1	L2
(b)	Explain about locking devices, where to use lockout tag out.	6M	CO1	L2
3(a)	Explain general requirements for grounding and bonding.	6M	CO2	L2
(b)	Compare various types of system grounding methods.	6M	CO2	L5
	(OR)			
4(a)	Summarize the concept of grounding of electrical systems.	6M	CO2	L5
(b)	List out various types of equipment grounding conductors.	6M	CO2	L1
5(a)	Make use of Diagram,explain hot-work decision tree flow chart.	6M	CO3	L4
(b)	Explain about flash hazard calculations.	6M	CO3	L2
	(OR)			
6(a)	Explain the concept of six step safety method.	6M	CO3	L2
(b)	Classify different methods for calculating flash boundary approach distances below 600volts.	6M	CO3	L4
7(a)	Illustrate eight step maintenance program for RCM.	6M	CO4	L3
(b)	Discuss the relationship of improperly maintained electrical equipment to the hazards of electricity.	6M	CO4	L5
	(OR)			
8(a)	What is OSHA'S? Justify OSHA'S role in protecting healthcare workers.	6M	CO4	L1
(b)	Explain National Electrical safety code.	6M	CO4	L2
9(a)	State and explain the Indian electricity rules related to ground clearance and section clearance.	6M	CO5	L2
(b)	Explain about system neutral earthing.	6M	CO5	L2
	(OR)			
10(a)	Explain safety precautions related to the earthing of various electrical installations.	6M	CO5	L2
(b)	Explain the key features of IE Act.	6M	CO5	L2

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

17EI05-COMMUNICATION SYSTEMS
(EIE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	An audio frequency signal $10 \sin 2\pi \times 500t$ is used to amplitude modulate a carrier of $50 \sin 2\pi \times 10^5 t$. Calculate: (i) Modulation index (ii) Sideband frequencies (iii) Amplitude of each sideband frequency (iv) Bandwidth required (v) Total power delivered to the load of 600Ω.	6M	CO3	L5
(b)	"In DSB-SC, suppression of carrier so as to save transmitter power results in receiver complexity." Justify this statement.	6M	CO1	L4
	(OR)			
2(a)	Consider a two stage SSB modulator where the message signal occupies a band 0.3 KHz to 4 KHz and the two carrier frequencies are f1=10 KHz and f2=100 KHz. Evaluate (i) Side bands of DSB SC modulated waves at the output of the product modulators. (ii) The side bands of the SSB modulated waves at the outputs of BPFs (iii) The pass band and Guard bands of the two BPFs.	6M	CO3	L5
(b)	Explain the carrier re-insertion technique for the demodulation of VSB wave.	6M	CO1	L2
3(a)	An angle modulated signal is described by $s(t)= 10 \cos(2\prod 10^6 t + 0.1 \sin 2\prod 10^3 t)$. (i) Considering s(t) as a PM signal with Kp=10, find m(t). (ii) Considering s(t) as a FM signal with Kf=10∏, find m(t). (iii) Find the modulation index and bandwidth.	6M	CO3	L3
(b)	Explain the operation of phase discrimination method with phasor diagrams to demodulate frequency modulated signal.	6M	CO1	L2
	(OR)			
4(a)	A single tone modulating signal Cos(5000πt) frequency modulates a carrier of 5MHz and produces a frequency deviation of 50kHz. Find (i) The modulation indexes (ii) If another modulating signal produces a modulation index of 100 while maintaining the same deviation, find the frequency and amplitude of the modulating signal, assume K_f =15kHz per volt.	6M	CO3	L3

(b)	Explain the operation of the Balanced slope detector to demodulate FM signal, using a circuit diagram and response characteristic. Discuss, in particular, the method of combining the outputs of the individual diodes.	6M	CO1	L2
5(a)	Define Pulse position modulation. Explain with a neat diagram Pulse Position Modulation generation.	6M	CO1	L2
(b)	Explain with a neat diagram Pulse Position Modulation Demodulation.	6M	CO1	L2
	(OR)			
6(a)	Define Pulse Amplitude modulation and Explain PAM generation with a neat diagram.	6M	CO1	L2
(b)	Define noise and classify noise with suitable examples.	6M	CO1	L2
7(a)	Describe the functional aspects of ASK binary modulation.	6M	CO2	L1
(b)	Differentiate analog and digital modulation techniques.	6M	CO2	L2
	(OR)			
8(a)	Explain the working of a Coherent PSK receiver.	6M	CO2	L2
(b)	An FSK system transmits the binary data at a rate of 10^6bits per second. Assuming the channel noise to be additive white Gaussian noise with zero mean and the power spectral density at the receiver to be 2 x10^{-20}W/Hz, determine the probability of error. Assume acoherent detection and the amplitude of the received sinusoidal signal for both the symbols 0 and 1 to be 1.2μV.	6M	CO2	L5
9(a)	Describe in detail, the elements of a PCM system.	6M	CO4	L1
(b)	A PCM system uses a uniform quantizer followed by a 7-bit encoder. The bit rate of the system is 50μ bits/s. What is the message bandwidth for which the system operates satisfactorily? Also determine the output signal to quantizing noise ration when a sinusoidal modulating wave of frequency 1MHz is applied to the input.	6M	CO4	L5
	(OR)			
10(a)	With a neat process flow diagram, enumerate the salient aspect of adaptive delta modulation.	6M	CO4	L1
(b)	Compare analog and digital communications.	6M	CO4	L2

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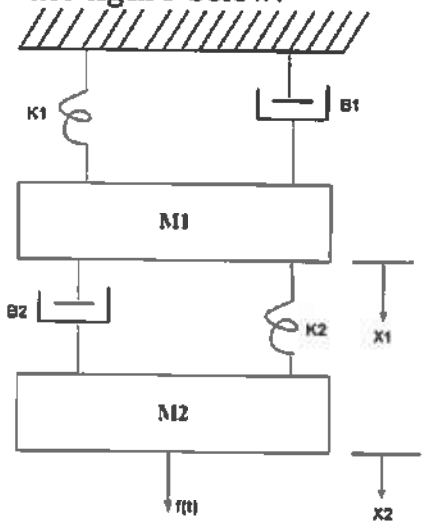
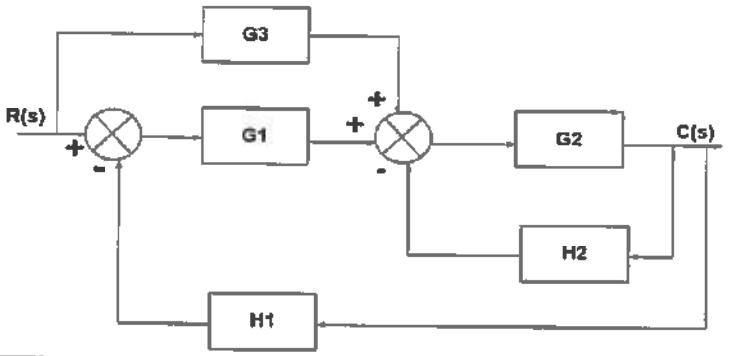
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17EI07-CONTROL SYSTEMS ENGINEERING

(EIE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What is feed back? Explain the effects of feedback.	6M	CO1	L2
(b)	Obtain the transfer function $X_1(s)/F(s)$ for the mechanical system shown in the figure below. 	6M	CO1	L3
	(OR)			
2(a)	Reduce the given block diagram and hence obtain the transfer function. 	6M	CO1	L3
(b)	State and explain the Mason's gain formula.	6M	CO1	L2
3(a)	Determine the error coefficients and static error for $G(S)=\frac{1}{S(S+1)(S+10)}, H(S)=S+2$	6M	CO2	L3
(b)	Find out the output of the undamped second order system when the input applied to the system is unit step input.	6M	CO2	L1
	(OR)			

4.	Obtain the unit – step response of a unity feedback control system whose open loop transfer function is $G(S)=\frac{1}{S(S+1)}$. Obtain also the rise time, peak time, maximum overshoot and settling time.	12M	CO2	L3
5(a)	Explain the procedure for constructing the polar plots.	6M	CO3	L2
(b)	Determine the resonant frequency ω_r, resonant peak MP and bandwidth for the system whose transfer function is $G(j\omega)=\frac{5}{5+j2\omega+(j\omega)^2}$.	6M	CO3	L3
	(OR)			
6.	The forward path transfer function of a Unity feedback control system is given as $G(S)=\frac{K}{S(1+0.1S)(1+0.5S)}$ Draw the Bode plot of G(s) and find the value of K so that the gain margin of the system is 20 dB.	**12M**	CO3	L3
7(a)	How RH Stability criterion can be used to study the relative stability?	6M	CO4	L1
(b)	Determine the range of 'K' for which the system having the characteristic equation: $S^4+20KS^3+5S^2+10S+15=0$ is Stable.	6M	CO4	L5
	(OR)			
8.	Sketch the root locus plot of a unity feedback system whose open loop T.F is $G(S)=\frac{K(S^2-2S+2)}{(S+2)(S+3)(S+4)}$.	12M	CO4	L5
9.	The state equation of a linear time-invariant system is given below: $\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix}=\begin{bmatrix}-2 & 0\\ 1 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}0\\ 1\end{bmatrix}U$ Determine the following: i) State transition matrix ii) Controllability and observability of the system	12M	CO5	L5
	(OR)			
10(a)	Derive the transfer function from the state space representation.	6M	CO5	L5
(b)	Determine the state model of the system characterized by the differential equation $(S^4+8S^3+2S^2+4S+3)Y(S)=10U(S)$	6M	CO5	L5

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

17CI17-DATA COMMUNICATIONS AND COMPUTER NETWORKS
(IT)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Name seven layers of OSI model and explain two important functions offered by each layer.	6M	CO1	L1
(b)	What is Guided media? Explain all the 4-categories of Twisted Pair Cabling with neat diagram.	6M	CO1	L3
	(OR)			
2(a)	Compare and Contrast TCP/IP and ISO-OSI Reference Models with diagram.	6M	CO1	L2
(b)	Compare the delay in sending an x-bit message over a k-hop path (i.e. k-1intermediate switches/routers) in a circuit switched network and in a packet switched network. The circuit setup time is s seconds. The propagation delay is d seconds per hop, the packet size is p bits, and the data rate for all links is b bps. Under what conditions does the packet switched network have a lower delay?			L3
3(a)	Transmission time of a packet is given as 1 Mille Second and propagation delay is 49.5 Mille Seconds, in a sliding window protocol for maximum utilization, what should be the minimum sequence numbers required? And find minimum number of bits dedicated for sequence number field.	6M	CO2	L3
(b)	Length of a packet is 1000 bits, bandwidth given is 1000 bps, and the propagation delay given as 49.5 millie seconds. Then calculate the efficiency of Selective Repeat protocol, where the sender window size is Ws=50. Also calculate throughput of the protocol.	6M	CO2	L3
	(OR)			
4(a)	Compare protocols like STOP AND WAIT, GBN, SELECTIVE REPEAT. Using the parameters like : efficiency, number of buffers, sequence umbers, Bandwidth required, CPU Required, retransmissions required in case of error, Implementation and Acknowledgements.	6M	CO2	L4
(b)	What is GobackN Protocol? In GoBack 4 if every 6th packet that is being transmitted is lost and if sender has to send 10 packets, then calculate how many total transmissions required by using GoBack N protocol.	6M	CO2	L3

5(a)	What is ALOHA protocol? Deduce the expressions in the case of pure aloha and slotted aloha and comment on the efficiency factors of both aloha.	6M	CO3	L3
(b)	Give the Performance of Ethernet and also describe IEEE 802.3, IEEE802.5.	6M	CO3	L2
	(OR)			
6(a)	Give the differences between Virtual Circuits and Data grams.	6M	CO3	L3
(b)	Brief the Protocols: (i) Token ring (ii) FDDI.	6M	CO3	L2
7(a)	Mention the drawbacks of TCP and what is the importance of UDP.	6M	CO4	L2
(b)	What is Quality of Service? What are the major factors of QOS that influence any network?	6M	CO4	L2
	(OR)			
8(a)	Illustrate various transport layer service primitives and give the state diagram for transport layer service primitives.	6M	CO4	L2
(b)	What is count-to-infinity Problem? Explain in detail With an Example.	6M	CO4	L2
9(a)	What are the services provided by the Simple Mail Transfer Protocol? List its importance in the network communication.	6M	CO5	L2
(b)	What is Cryptography? Explain RSA Algorithm with an Example.	6M	CO5	L2
	(OR)			
10(a)	Mention the different types of electronic mail and also Illustrate the different parts of E-mail address.	6M	CO5	L2
(b)	Give any two examples for both Substitutions and Transposition Ciphers.	6M	CO5	L2

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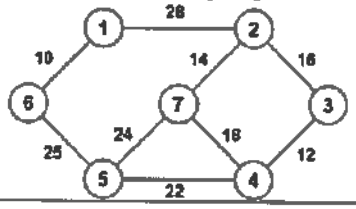
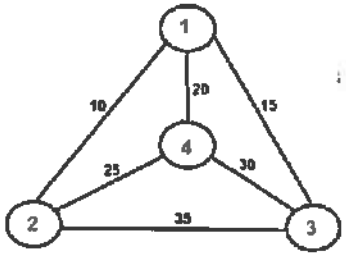
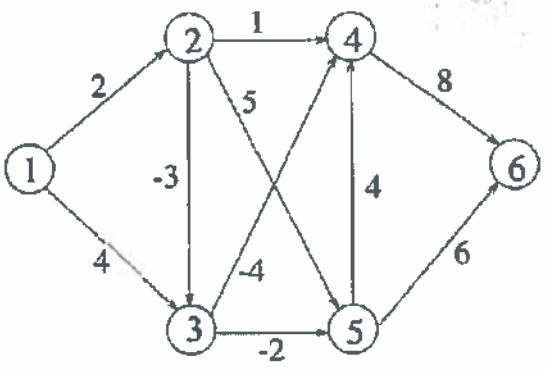
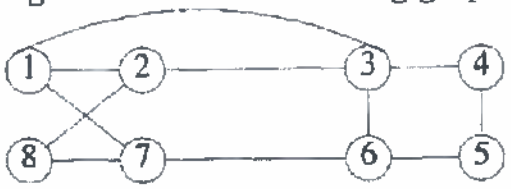
LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations
17CI08-DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 hours (IT) Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Present the recursive algorithm for finding the factorial of a given number and analyze its time complexity using frequency count method.	6M	CO1	L4
(b)	Define pseudo code. How pseudo code is used for expressing algorithms?	6M	CO1	L3
	(OR)			
2(a)	Give the quick sort algorithm. Apply this algorithm for sorting the following sequence of keys 65, 70, 75, 80, 85, 60, 55, 50, and 45.	6M	CO1	L3
(b)	Write an algorithm for binary search and derive the time complexity of binary search algorithm.	6M	CO1	L2
3(a)	Use greedy approach to find an optimal solution to the Knapsack instance n=6, m=16, $(p_1,p_2,p_3,p_4,p_5,p_6) = (12,6,10,8,5,9)$ and $(w_1,w_2,w_3,w_4,w_5,w_6) = (5,4,3,1,3,2)$.	6M	CO2	L3
(b)	Find an optimal placement for 13 programs on two tapes T0 and T1, where the programs are of length 12,5,8,32,7, 5,18,26,4,3,11,10, and 6.	6M	CO2	L1
	(OR)			
4.(a)	Illustrate the algorithms used for constructing spanning tree. Identify the difference between these algorithms.	6M	CO2	L2
(b)	Use the Prim's algorithm to compute a minimum cost spanning tree for the following graph. 	6M	CO2	L3
5(a)	Compare and contrast Greedy method and dynamic programming method.	6M	CO3	L2
(b)	State the Traveling salesperson problem. Find out the optimal tour cost for the following graph using dynamic programming. 	6M	CO3	L3

	(OR)			
6.	Use Bellman and Ford algorithm to compute shortest paths from node 1 to every other node in the following graph.  	12M	CO3	L3
7(a)	List out the differences between Backtracing and Branch and Bound methods.	6M	CO4	L1
(b)	Draw the portion of state space tree generated by Hamiltonian algorithm for the following graph.  	6M	CO4	L3
	(OR)			
8.	Draw the portion of the state space tree for sum of subsets problem instance m=31 and w={7,11,13,24} using Backtracking algorithm.	12M	CO4	L3
9.	Apply Branch and Bound approach to solve the Traveling Salesperson problem for the following cost matrix. $\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$	12M	CO5	L3
	(OR)			
10.	Draw the portion of the state space tree generated by FIFO Branch and Bound technique for the knapsack instance of n = 5; (p1, p2, p3, p4,p5) = (10, 15, 6, 8,4); (w1, w2, w 3, w4,w5) = (4, 6, 3,4, 2) and m = 12.	12M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17CI10-SOFTWARE ENGINEERING
(IT)

JCT

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain different software myths with respect to Management, Customer, Practitioner with neat case studies.	6M	CO1	L2
(b)	Define software. Explain the changing nature of software.	6M	CO1	L2
	(OR)			
2(a)	Explain the Software Process framework with neat diagram.	6M	CO1	L2
(b)	What is the difference between a unified Process Phase and a unified process workflow?	6M	CO1	L2
3(a)	In an interesting analysis of actual projects it is found that the linear nature of the classic life cycle leads to "blocking states" in which some project team members must wait for other members of the team to complete dependent tasks. In which of the process models the blocking states is found. Explain in detail.	6M	CO2	L4
(b)	Distinguish the incremental and waterfall model.	6M	CO2	L2
	(OR)			
4(a)	Briefly explain about planning principles.	6M	CO2	L2
(b)	Write about the deployment practice.	6M	CO2	L1
5(a)	What is the need for requirement validation? How to perform the process of requirements validation?	6M	CO3	L1
(b)	How to perform the process of requirement analysis and negotiation? Explain requirement specification.	6M	CO3	L4
	(OR)			
6(a)	What is Object Oriented Design Process? Why is it so important for software development?	6M	CO3	L1
(b)	Explain the behavioral model considering an example.	6M	CO3	L2
7(a)	Narrate the process for design of user interface with neat sketch.	6M	CO4	L4
(b)	Correlate the terms design and software quality. What are the guidelines to be followed for good design?	6M	CO4	L4
	(OR)			
8(a)	What is a pattern? Explain in brief.	6M	CO4	L1
(b)	Discuss how do you do architectural mapping using data flow.	6M	CO4	L2
9(a)	Define software quality assurance. Explain various quality assurance activities.	6M	CO5	L1
(b)	Explain validation testing and software testing.	6M	CO5	L2
	(OR)			
10.	Explain the following. (i) Black box testing (ii) Basic path testing.	12M	CO5	L2

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

17CI23-ARTIFICIAL INTELLIGENCE
(IT)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Elaborate various characteristics of problems that can be solved by various AI techniques.	12M	CO1	L2
	(OR)			
2.	Assign unique values from 0-9 for each letter to the following words so that the sum of the first two leads to the resultant. SEND+MORE=MONEY.	12M	CO1	L4
3.	Outline the strengths and weakness of Strong Slot Filler Structure.	12M	CO2	L3
	(OR)			
4.	Explain the importance of the Unification Algorithm with an example.	12M	CO2	L2
5(a)	Define certainty factor. Write the components of certainty factors.	6 M	CO3	L2
(b)	Discuss the pros and cons of Bayesian method of reasoning.	6 M	CO3	L3
	(OR)			
6(a)	Demonstrate the importance of rule based system with an example.	6 M	CO3	L2
(b)	Explain how fuzzy logic can be used to solve real time problems.	6 M	CO3	L2
7(a)	Outline the strength of Multi Agent Planning with an example.	6 M	CO4	L2
(b)	Discuss the pros and cons of reinforcement learning.	6 M	CO4	L2
	(OR)			
8(a)	Explain Genetic Leaning mechanism with an example.	6 M	CO4	L3
(b)	Outline the pros and cons of various forms of learning.	6 M	CO4	L3
9.	Discuss the implementation of Minmax algorithm with alpha-beta cutoffs with an example.	12M	CO5	L2
	(OR)			
10.	Outline the application and working of Ant Colony System.	12M	CO5	L2

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

17IT90-REAL TIME OPERATING SYSTEMS
(IT)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	List the functions and activities for Real- Time Operating Systems.	6M	CO1	L1
(b)	Explain the real time service timeline with hardware acceleration and without hardware acceleration.	6M	CO1	L2
	(OR)			
2(a)	What are the three resources to be considered for the design of any embedded system?	6M	CO1	L1
(b)	Write the basic block diagram of distributed continuous media real time services.	6M	CO1	L2
3(a)	Explain the various dynamic memory allocation strategies.	6M	CO2	L2
(b)	Write the Cortex-M3 design of static memory allocation.	6M	CO2	L3
	(OR)			
4(a)	Explain the set jump and long jump of static memory allocation.	6M	CO2	L2
(b)	Illustrate the various features of dynamic memory allocation.	6M	CO2	L2
5(a)	Interpret synchronization through token passing.	6M	CO3	L2
(b)	Explain priority inversion and solution.	6M	CO3	L2
	(OR)			
6(a)	Analyze Multiple tasks and their synchronization model using semaphores and mailbox messages.	6M	CO3	L4
(b)	Explain the role of device management.	6M	CO3	L2
7(a)	Explain one technique for preventing deadlock during the design.	6M	CO4	L2
(b)	interpret the synchronization coordination through election algorithm.	6M	CO4	L3
	(OR)			
8(a)	Illustrate the deadlock detection and recovery.	6M	CO4	L2
(b)	Explain the priorities of message communication.	6M	CO4	L2
9(a)	Explain the file organization of file management.	6M	CO5	L2
(b)	Illustrate the role of linear data structure of data management	6M	CO5	L2
	(OR)			
10(a)	Interpret the file abstraction of file management.	6M	CO5	L2
(b)	Explain the non relational database of data management.	6M	CO5	L2

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

17ME11 INDUSTRIAL MANAGEMENT

(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain Henry Fayal's principles of management.	6M	CO1	L2
(b)	What are the principles of good plant layout?	6M	CO1	L2
	(OR)			
2(a)	Discuss about Maslow hierarchy of needs.	6M	CO1	L2
(b)	What are the factors that affect a plant location?	6M	CO1	L2
3(a)	What are the benefits of Work study?	6M	CO2	L2
(b)	Explain with an example travel chart.	6M	CO2	L3
	(OR)			
4(a)	Define work study. State the objectives and Scope.	6M	CO2	L2
(b)	Define Method study. How do you carry it out?	6M	CO2	L2
5(a)	What do you understand by work measurement? Explain how you determine standard time. Illustrate.	6M	CO3	L2
(b)	The following data represents the number of defects found on each sewing machine cabinet inspected. Plot a control chart with control limits. Comment on the chart.	6M	CO3	L4
	(OR)			
6(a)	An operator was kept under observation for 20 days. He was found working 300 occasions out of 400 observations. He produced 20 jobs during these days. The observation per day was only for four hours. Consider a performance rating of 140 for the operator and 30 percent as allowance. Calculate standard time.	6M	CO3	L4
(b)	What is control? Explain the concepts of Quality Control Charts.	6M	CO3	L3
7(a)	Discuss about Rapid Entire body Assessment.	6M	CO4	L3
(b)	Explain about anthropometry and its uses in Ergonomics.	6M	CO4	L4
	(OR)			
8(a)	Outline the Dutch Musculoskeletal Questionnaire. (DMQ).	6M	CO3	L3
(b)	Discuss about designing for a population of users sources of human variability.	6M	CO3	L3
9(a)	What are functions of Human resource manager?	6M	CO5	L3
(b)	Discuss about the development and use of human factor data.	6M	CO5	L2
	(OR)			
10(a)	Describe about history and development of human factors Engineering.	6M	CO5	L3
(b)	Discuss about wage and salary Administration.	6M	CO5	L4

Sample no	1	2	3	4	5	6	7	8	9	10
No. of defective resistors	8	10	7	9	6	7	8	9	4	5

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

17ME12-IC ENGINES AND GAS TURBINES
(ME)

9.12.21

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Elucidate the working of a two stroke CI engine with suitable sketches.	6M	CO1	L2
(b)	Provide the valid technical reasoning for the variation in theoretical and actual valve timing diagrams of IC engines.	6M	CO1	L4
	(OR)			
2(a)	Illustrate the working of individual pump type of fuel supply system in CI engines.	6M	CO1	L2
(b)	Compare supercharging and turbo charging systems in terms of their construction and working.	6M	CO5	L2
3(a)	Derive an expression for the air standard efficiency of Otto cycle.	6M	CO2	L3
(b)	A petrol engine working on Otto cycle has maximum pressure of 50 bar. Heat supplied is 1000 kJ/kg. If the pressure ratio during compression is 12.286. Find the compression ratio and also the ratio of peak temperature to the inlet temperature. Take suction pressure = 1 bar and its temperature = 27 ^{0}C.	6M	CO2	L3
	(OR)			
4(a)	Illustrate the working of an electronic ignition system.	6M	CO1	L2
(b)	Discuss the essential parameters that are considered for fuel air cycle analysis.	6M	CO2	L1
5(a)	Differentiate normal and abnormal combustion in SI engines with diagrams.	6M	CO3	L3
(b)	Elucidate the stages of combustion in CI engines using pressure versus crank angle diagram.	6M	CO3	L2
	(OR)			
6(a)	What are homogeneous and heterogeneous mixtures? In which engines these mixtures are used? Explain.	6M	CO3	L2
(b)	Discuss the fuel requirements and fuel rating for SI engines.	6M	CO3	L1
7(a)	A four stroke petrol engine delivers a brake power of 36.8 kW with a mechanical efficiency 80%. The air-fuel ratio is 15:1 and specific fuel consumption is 0.4068 kg/ kWh. The heating value of the fuel is 42,000 kJ/kg. Calculate (i) Indicated power (ii) air consumption per second (iii) Brake thermal efficiency.	6M	CO4	L3

(b)	Discuss any one type of fuel consumption measurement in IC engines with necessary sketches.	6M	CO4	L2
	(OR)			
8(a)	A six-cylinder, gasoline engine operates on the four-stroke cycle. The bore of each cylinder is 80mm and the stroke 100 mm. The clearance volume per cylinder is 70 cc. At a speed of 4000 rpm the fuel consumption is 20 kg/h and torque developed is 150 Nm. Calculate (i) the brake power (ii) the brake mean effective pressure (iii) brake thermal efficiency if the calorific value of the fuel is 43000 kJ/kg.	**6M**	**CO4**	**L3**
(b)	Discuss the measurement of air-flow rate using the air-box method.	6M	CO4	L2
9(a)	Illustrate a gas turbine plant layout that include intercooling, reheating and regeneration systems.	6M	CO5	L3
(b)	Deduce an expression for efficiency of a simple open cycle gas turbine in terms of pressure ratio.	6M	CO5	L3
	(OR)			
10(a)	Elucidate the working of ramjet engine with the help of a sketch and mention its applications.	6M	CO5	L2
(b)	Describe the working of a turbo fan engine with a neat sketch. What are its merits and demerits?	6M	CO5	L2

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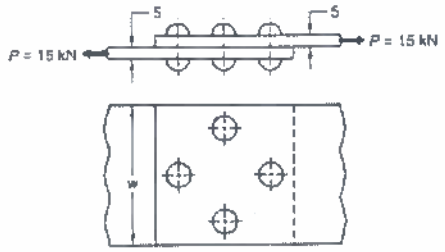
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17ME13-MECHANICAL ENGINEERING DESIGN-I
(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the basic procedure for machine design.	6M	CO1	L1
(b)	A shaft, 5 cm in diameter and subjected to a bending moment of 1.5 kN-m and a twisting moment of 3.0 kN-m. If the yield stress of the shaft material is 400 MPa. Determine the factor of safety of the shaft according to the maximum distortion energy theory tof failure.	6M	CO1	L3
	(OR)			
2(a)	Explain the importance of preferred sizes while designing a components.	6M	CO1	L2
(b)	A shaft is loaded by a torque of 5 KN-m. The material has a yield point of 350 MPa. Find the required diameter using (i) Maximum shear stress theory (ii) Maximum distortion energy theory Take a factor of safety of 2.5.	6M	CO1	L3
3.	A pulley is keyed to a shaft midway between two anti-friction bearings. The bending moment at the pulley varies from – 170 N-m to 510 N-m and the torsional moment in the shaft varies from 55 N-m to 165 N-m. The frequency of the variation of the loads is the same as the shaft speed. The shaft is made of cold drawn steel having an ultimate strength of 540 MPa and a yield strength of 400 MPa. Determine the required diameter for an indefinite life. The stress concentration factor for the keyway in bending and torsion may be taken as 1.6 and 1.3 respectively. The factor of safety is 1.5. Take size factor = 0.85 and surface finish factor = 0.88.	12M	CO2	L3
	(OR)			
4(a)	What are the methods to reduce stress concentration? Explain.	6M	CO2	L2
(b)	A bar of circular cross section is subjected to alternating tensile forces varying from a minimum of 200KN to a maximum of 500KN. It is to be manufactured of material with an ultimate tensile strength of 900Mpa and an endurance limit of 700Mpa. Determine the diameter of bar using safety factors of 3.5 related to ultimate tensile strength and 4 related to endurance limit and stress concentration factor of 1.65 for a fatigue load. Use Goodman straight line as basis for design	6M	CO2	L3
5(a)	Find the efficiency of double riveted lap joint of 6 mm plates with 20 mm diameter rivets having a pitch of 65 mm. Assume Permissible tensile stress in rivets = 90 MPa Permissible crushing stress in rivets = 180 MPa.	6M	CO3	L3

(b)	Two plates, 5mm thick, are connected by means of four rivets shown in Fig. The permissible stresses for rivets and plates in tension, shear and compression are 80,60 and 120 N/mm² respectively. Calculate diameter of the rivets and width of the plate. 	6M	CO3	L3
	(OR)			
6(a)	What is the minimum size for fillet weld? If required weld size from strength consideration is too small how will you fulfil the condition of minimum weld size?	6M	CO3	L4
(b)	Find the efficiency of the single riveted lap joint of 8 mm plates with 25 mm diameter rivets having a pitch of 75mm. Assume Permissible tensile stress in rivets = 120 MPa, Permissible crushing stress in rivets = 240 MPa.	6M	CO3	L4
7.	Design a cotter joint to transmit 250 kN. The design stresses may be taken as 150 MPa in tension, 120 MPa in shear and 300 MPa in compression.	12M	CO4	L5
	(OR)			
8(a)	A steam engine cylinder has an effective diameter of 350 mm and the maximum steam pressure acting on the cylinder cover is 1.25 N/mm. Calculate the number and size of studs required to fix the cylinder cover, assuming the permissible stress in the studs as 33 MPa.	6M	CO4	L3
(b)	Discuss on bolts of uniform strength? Show examples of practical applications of such bolts.	6M	CO4	L3
9.	Design a cast iron clamp coupling to connect two shafts in order to transmit 7.5 kW at 720 r.p.m. The following permissible stresses may be used : Permissible shear stress for shaft, bolt and key material = 33 MPa Permissible crushing stress for bolt and key material = 60 MPa Permissible shear stress for the cast iron = 15 MPa	12M	CO5	L5
	(OR)			
10.	A shaft is supported by two bearings placed1 m apart. A 600 mm diameter pulley is mounted at a distance of 300 mm to the right of left hand bearing and this drives a pulley directly below it with the help of belt having maximum tension of 2.25 KN. Another pulley 400 mm diameter is placed 200 mm to the left of the right hand bearing and is driven with the help of electric motor and belt, which is placed horizontally at the right. The angle of contact for both the pulleys is 180° and μ = 0.24. Determine the suitable diameter for a solid shaft, allowing working stress of 63 MPa in tension and 42 MPa in shear for the material of shaft. Assume that the torque on one pulley is equal to that on the other pulley.	12M	CO5	L4

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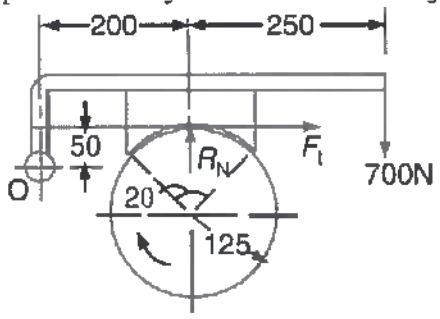
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17ME14-DYNAMICS OF MACHINES
(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive the expression for total frictional torque acting on the single plate clutch.	6M	CO1	L2
(b)	A multi-disc clutch has three discs on the driving shaft and two on the driven shaft. The outside diameter of the contact surfaces is 240 mm and inside diameter 120 mm.Assuming uniform wear and coefficient of friction as 0.3, find the maximum axial intensity of pressurebetween the discs for transmitting 25 kW at 1575 r.p.m.	6M	CO1	L3
	(OR)			
2(a)	Analyze the Effect of Gyroscopic Couple on a Naval Ship during Steering	6M	CO1	L4
(b)	A single block brake is shown in the below Figure. The diameter of the drum is 250 mm and the angle of contact is 90°. If the operating force of 700 N is applied at the end of a lever and the coefficient of friction between the drum and the lining is 0.35, determine the torque that may be transmitted by the block brake.  All dimensions in mm.	6M	CO1	L2
3(a)	Define the terms with suitable expressions (i) Coefficient of Fluctuation of Energy (ii) Coefficient of Fluctuation of Speed	6M	CO2	L1
(b)	A horizontal cross compound steam engine develops 300 kW at 90 r.p.m. The coefficient of fluctuation of energy as found from the turning moment diagram is to be 0.1 and the fluctuation of speed is to be kept within ± 0.5% of the mean speed. Find the weight of the flywheel required, if the radius of gyration is 2 metres.	6M	CO2	L3
	(OR)			
4.	A single cylinder, single acting, four stroke gas engine develops 20 kW at 300 r.p.m. The work done by the gases during the expansion stroke is three times the work done on the gases during the compression stroke, the work done during the suction and exhaust strokes being negligible. If the total fluctuation of speed is not to exceed ± 2 per cent of the mean speed andthe turning moment diagram during compression and expansion is assumed to be triangular in shape, find the moment of inertia of the flywheel.	12M	CO2	L3

5.	In an engine governor of the Porter type, the upper and lower arms are 200mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find taking friction into account, range of speed of the governor.	12M	CO3	L3
	(OR)			
6.	Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor.	12M	CO3	L3
7(a)	Four masses m_1, m_2, m_3 and m_4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.(use analytical method).	6M	CO4	L3
(b)	Derive the expression for Hammer blow for an uncoupled two cylinder locomotive engine.	6M	CO4	L2
	(OR)			
8(a)	A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg,400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.	6M	CO4	L3
(b)	Give the conditions of complete balance of several revolving masses in (i) different planes and (ii) single plane.	6M	CO4	L2
9(a)	Explain the Effect of Inertia of the Constraint in Longitudinal Vibrations.	6M	CO5	L2
(b)	A cantilever shaft 50 mm diameter and 300 mm long has a disc of mass100 kg at its free end. The Young's modulus for the shaft material is 200 GN/m^3. Determine the frequency of longitudinal and transverse vibrations of the shaft.	6M	CO5	L3
	(OR)			
10(a)	Derive the expression for natural frequency of free transverse vibrations due to uniformly distributed load acting over a simply supported shaft	6M	CO5	L2
(b)	A mass of 50 kg suspended from a spring produces a statical deflection of 17 mm and when in motion it experiences a viscous damping force of value 250 N at a velocity of 0.3 m/s. Calculate the periodic time of damped vibration. If the mass is then subjected to a periodic disturbing force having a maximum value of 200 N and making 2 cycles/s, find the amplitude of ultimate motion.	6M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17ME15-METAL CUTTING AND MACHINE TOOLS
(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	In an orthogonal turning of MS with a tool having rake angle 10^0, the main cutting force is measured as 1200 N. The force along the shear plane is found to be 600 N. Find all other force components with the help of Merchant Circle Diagram. Assume 30^0 shear angle.	6M	CO1	L3
(b)	Explain HSS as Cutting tool material. Mention its merits and demerits as cutting tool material.	6M	CO1	L2
	(OR)			
2(a)	Under what circumstances would you recommend the use of cutting fluids listed below: (i) Extreme pressure emulsion (ii) Compressed air (iii) Straight mineral oil	6M	CO1	L5
(b)	Show that in metal cutting, when the normal rake is 0°, the ratio of shear strength(τ_s) of the work material to the specific cutting energy (u_t) is given by $\frac{\tau_s}{u_t} = \frac{r_c(1-\mu r_c)}{1+r_c^2}$ where r_c= chip thickness ratio = $\frac{t_1}{t_2}$; t_1 is the uncut chip thickness and t_2 is the chip thickness.	6M	CO1	L3
3(a)	Explain any four work holding devices that are used on a lathe with the help of neat sketches. Also mention the applications of each.	6M	CO2	L3
(b)	List various methods available for taper turning on a center lathe? Explain the method used for machining steep tapers of short length with the help of a neat sketch.	6M	CO2	L2
	(OR)			
4(a)	Explain the following accessories used in a lathe with the help of neat sketches and also mention their applications: (i) Steady rest (ii) Follower rest (iii)Mandrel.	6M	CO2	L3
(b)	Explain the principle and working of Turret and Capstan lathes.	6M	CO2	L2
5(a)	Differentiate between a Shaper and a Planer. Where will you use shaper and where a planer?	6M	CO3	L2

(b)	Why is quick return motion mechanism employed in a shaper? How the stroke length and relative position of the ram are adjusted in a shaper using this? Explain.	6M	CO3	L3
	(OR)			
6(a)	A 12 mm hole is to be drilled through a 20 mm thick plate. The cutting speed is 12 mm/min and the feed rate is 0.12 mm/rev. Estimate the machining time, Take over travel plus clearance of the tool as 5 mm.	6M	CO3	L3
(b)	Why drilling – boring – reaming is better than drilling – reaming in machining holes with highest accuracy? Explain.	6M	CO3	L4
7(a)	Differentiate between up milling and down milling. Also mention their applications.	6M	CO3	L2
(b)	Show the calculation for indexing 69 divisions in a milling machine by compound indexing. The following index plates are available: Plate No. I: 15, 16, 17, 18, 19 and20 Plate No. 2: 21, 23, 27, 29, 31 and 33 Plate No. 3: 37,39,41, 43,47and 49	6M	CO3	L3
	(OR)			
8(a)	Explain the following grinding processes with a neat sketch: i) Centre less grinding ii) Internal grinding	6M	CO4	L2
(b)	Describe grinding wheel structure with a neat sketch. Give its specification.	6M	CO4	L2
9(a)	What is unique about broaching compared with other basic machining processes? Explain	6M	CO4	L4
(b)	List at least three product applications each for lapping and honing processes.	6M	CO4	L1
	(OR)			
10(a)	What do you understand by "location" in a jig or a fixture? Discuss the various guiding principles of location.	6M	CO5	L2
(b)	How does the fixture differ from a jig?	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

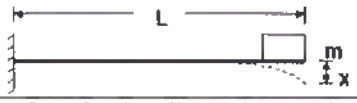
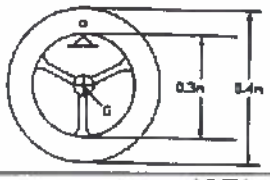
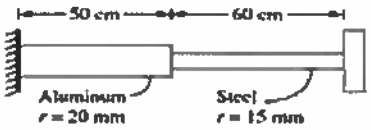
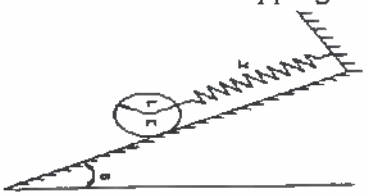
17ME17-MECHANICAL VIBRATIONS

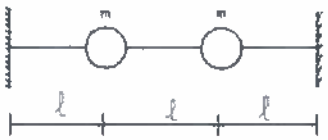
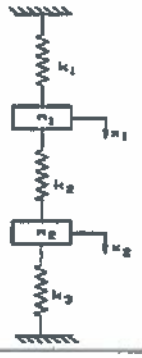
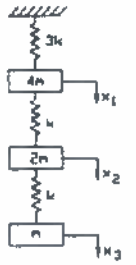
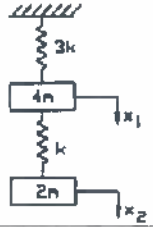
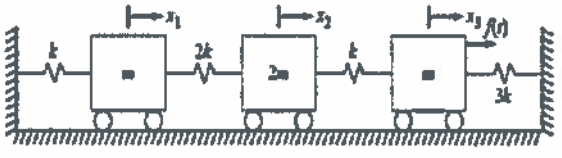
(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Determine the natural frequency of the mass 'm' placed at one end of a cantilever beam of negligible mass as shown in figure. 	6M	CO1	L2
(b)	A fly wheel having a mass of 35 kg is allowed to swing as pendulum about a knife edge at the inner side of the rim as shown in figure. If the measured period of oscillation is 1.22 seconds, find the moment of inertia of the flywheel about its geometric axis. 	6M	CO1	L3
	(OR)			
2(a)	Determine equivalent stiffness of the shafts as shown in figure. Take $G=0.8\times10^5 N/mm^2$ 	6M	CO1	L3
(b)	A homogeneous solid cylinder of mass 'm' and radius ' r' is linked up by a spring of constant 'k' and is resting on an inclined plane as shown in figure. Determine its frequency of oscillations, if it rolls without slipping on the inclined place. 	6M	CO1	L2
3(a)	With the help of neat sketches elucidate different types of damping systems.	6M	CO2	L1
(b)	A mass of 9 kg rests on a spring of stiffness 1800 N/m. The dash pot is filled with oil having a damping coefficient of 0.009×10^3 N-sec/m. Find the ratio of successive amplitudes and amplitude of body 10 seconds after it is released with initial amplitude of 0.02m.	6M	CO2	L3
	(OR)			
4(a)	The mass of a spring-mass-dashpot system is given an initial velocity of (A. Wn) from the equilibrium position, where Wn is the undamped natural frequency of the system. Find the equation of motion for the system when $\zeta = 0.2$.	6M	CO2	L3
(b)	Amplitude of a simple spring-mass-damper system is observed to decrease to 25% of initial value after 5 successive cycles of motion. Determine the damping coefficient of the system. Mass m= 5 kg and stiffness k = 40,000 N/m.	6M	CO2	L3
5(a)	A system of beams supports a motor of mass 1200kg. The motor has an unbalanced mass of 1 kg located at 60 mm radius. It is known that the resonance occurs at 2210rpm. What amplitude of vibration is expected at the motor's operating speed of 1440rpm, if damping factor is assumed to be less than 0.1?	6M	CO3	L3

(b)	A vibrating system having mass 1 kg is suspended by a spring of stiffness 1000N/m and it is put to harmonic excitation of 10N. Assuming viscous damping, determine (i) the resonant frequency (ii) the amplitude at resonance (iii) damped frequency.	6M	CO3	L3
	(OR)			
6.	Derive the expression for the transmissibility ratio.	12M	CO3	L2
7.	Determine the two natural frequencies and the corresponding mode shapes for the system shown in figure. The string is stretched with an uniform tension T.  	12M	CO4	L2
	(OR)			
8(a)	Draw and discuss the mode shapes for the following system shown in figure.  	6M	CO4	L3
(b)	For A 2-rotor system consists of the rotors of mass 500 kg and 1000 kg and having radius of gyration 950mm and 700mm respectively. The connecting shaft is 100 mm in diameter (uniform) and 3000mm length. The modulus of rigidity is 0.83×10^{11} N/m^2. Determine the two natural frequencies, the corresponding amplitude ratios and position of the rod.	6M	CO4	L3
9.	For the system shown in figure, determine the frequencies and also find different principal modes of vibration if m = 9.8 kg and k= 8820 N/m  	12M	CO5	L3
	(OR)			
10(a)	A two degree of freedom is schematically shown in figure. Formulate the equations of motion in matrix form.  	6M	CO5	L2
(b)	Derive the equation of motion of system shown in the figure below and calculate the mass and stiffness matrix for the system shown in the figure.  	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

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

17ME16-NON-CONVENTIONAL ENERGY SOURCES
(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the prospects of non conventional energy sources availability in India.	6M	CO1	L2
(b)	Define the following solar energy terms (i) Declination (ii) Altitude angle (iii) Solar constant (iv) Zenith angle	6M	CO1	L1
	(OR)			
2(a)	Discuss the primary and secondary energy resources.	6M	CO1	L2
(b)	Elaborate different types of solar Energy storage systems.	6M	CO1	L2
3(a)	Differentiate the HAWT and VAWT	6M	CO2	L2
(b)	Elucidate the Betz model of expanding airstream tube to determine extraction of wind energy by windmill.	6M	CO2	L2
	(OR)			
4(a)	Elaborate hot dry rock geothermal resource power plant.	6M	CO2	L2
(b)	Discuss the main considerations in selecting a site for power generation from geothermal energy.	6M	CO2	L1
5(a)	Explicate the working principle of Heaving float type wave energy conversion device.	6M	CO3	L2
(b)	List out the main factors to be considered while locating a tidal power plant.	6M	CO3	L1
	(OR)			
6(a)	Elucidate the working of open cycle OTEC plant with a neat sketch	6M	CO3	L2
(b)	Enumerate the merits and limitations of wave energy.	6M	CO3	L1
7(a)	Illustrate the working of batch type biogas plant.	6M	CO4	L2
(b)	List the advantages and disadvantages of floating dome type biogas plant.	6M	CO4	L1
	(OR)			
8(a)	Describe the process of production of biogas from fixed dome type biogas plant.	6M	CO4	L2
(b)	Enumerate the applications of Biogas in IC engines.	6M	CO4	L1
9(a)	Illustrate the working of closed cycle MHD system.	6M	CO5	L2
(b)	List out various applications of fuel cell.	6M	CO5	L1
	(OR)			
10(a)	Classify the fuel cells and explain the working of hydrogen –oxygen fuel cell.	6M	CO5	L2
(b)	List out the advantages and limitations of MHD generating system.	6M	CO5	L1

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

17ME90-ENERGY ENVIRONMENT AND POLLUTION

(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain in brief the Solar energy principles and applications.	6M	CO1	L3
(b)	Differentiate between Aerobic and anaerobic bio- conversion processes.	6M	CO1	L2
	(OR)			
2(a)	Discuss briefly about the Biomass generation.	6M	CO1	L2
(b)	What are properties of biogas? Expain how the storage of biogass is done.	6M	CO1	L2
3(a)	Discuss briefly the sources, effects and control methods of Ozone Holes.	6M	CO2	L3
(b)	Explain the different types of Forest fires.	6M	CO2	L2
	(OR)			
4(a)	Discuss on climate change and global warming.	6M	CO2	L2
(b)	What are the Environmental Effects on Groundwater Pollution? Explain	6M	CO2	L2
5(a)	Write a note on effects and control measures of water pollution.	6M	CO3	L2
(b)	Discuss control measures of Thermal pollution .	6M	CO3	L3
	(OR)			
6(a)	Explain the role of individual in prevention of pollution.	6M	CO3	L2
(b)	Write a detailed note on sources and adverse effects of solid waste.	6M	CO3	L2
7(a)	Illustrate the Post-combustion process of gaseous removal. List the advantages and disadvantages.	6M	CO4	L4
(b)	Describe a method to remove or reduce the nitrogen content from coal by the Solvent application.	6M	CO4	L2
	(OR)			
8(a)	Explain the different methods of Gaseous air pollutants sampling from the Ambient atmosphere.	6M	CO4	L2
(b)	Explain how Air pollution and water pollution is controled in Thermal Plants.	6M	CO4	L2
9(a)	Explain the concept of Energy balance.	6M	CO5	L2
(b)	Discuss about various sources of noise and methods to control noise.	6M	CO5	L3
	(OR)			
10(a)	Explain the impact of environment design on accuracy and efficiency of a man.	6M	CO5	L2
(b)	How heat and noise effect the health of workers? What essential steps need to be undertaken for safeguarding the health of workers?	6M	CO5	L4

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