LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram-521 230 :: Krishna Dist. :: A.P
Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

B.Tech.(V Semester) (R17) Supplementary Examinations, August 2021

TIME TABLE

TIME :02.00 PM to 05.00 PM

A.Y. 2020-21

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
25-08-2021 (Wednesday)	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
26-08-2021 (Thursday)	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
27-08-2021 (Friday)	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
28-08-2021 (Saturday)	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
31-08-2021 (Tuesday)	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
01-09-2021 (Wednesday)	17ME22 - CAD/CAM *17AE13 - Theory of Machines*	17CE18 - Construction Management	17CI12 - Human Computer Interaction *17CI13 – Advanced Database Management Systems*	17EI18 - Micro Electro Mechanical Systems	17EE14- Renewable Energy Technologies *17EE15 - Electrical Engineering Materials*	17EI07 - Control Systems Engineering	17CI23 - Artificial Intelligence	17ME16 - Non-Conventional Energy Sources 17ME17 - Mechanical Vibrations
02-09-2021 (Thursday)	*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: Any omissions or clashes in the time table may please be informed to the Controller of Examinations immediately.

Date: 05-08-2021

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to: 1. Vice-Principal, Deans & HoDs 2. Transport in-charge & Librarian
3. Canteen, Security & Hostels 4. All Notice Boards

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

1 SEP 2021

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

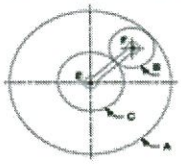
17AE13-THEORY OF MACHINES

(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)	Classify kinematic chains and explain single slider crank chain with a neat sketch.	6M	CO1	L2
(b)	A crank and slotted lever mechanism used in a shaper has a centre distance of 300 mm between the centre of oscillation of the slotted lever and the centre of rotation of the crank. The radius of the crank is 120 mm. Find the ratio of the time of cutting to the time of return stroke.	6M	CO1	L3
	(OR)			
2 (a)	Explain whitworth quick return motion mechanism.	6M	CO1	L2
(b)	In a crank and slotted lever quick return motion mechanism, the distance between the fixed centres is 240 mm and the length of the driving crank is 120 mm. Find the inclination of the slotted bar with the vertical in the extreme position and the time ratio of cutting stroke to the return stroke. If the length of the slotted bar is 450 mm, find the length of the stroke if the line of stroke passes through the extreme positions of the free end of the lever.	6M	CO1	L3
3 (a)	An electric motor driven power screw moves a nut in a horizontal plane against a force of 75 kN at a speed of 300 mm/min. The screw has a single square thread of 6 mm pitch on a major diameter of 40 mm. The coefficient of friction at the screw threads is 0.1. Estimate power of the motor.	6M	CO2	L3
(b)	A 150 mm diameter valve, against which a steam pressure of 2 MN/m^2 is acting, is closed by means of a square threaded screw 50 mm in external diameter with 6 mm pitch. If the coefficient of friction is 0.12 ; find the torque required to turn the handle.	6M	CO2	L3
	(OR)			
4.	A single dry plate clutch transmits 7.5 kW at 900 r.p.m. The axial pressure is limited to 0.07 N/mm^2. If the coefficient of friction is 0.25, find (i) Mean radius and face width of the friction lining assuming the ratio of the mean radius to the face width as 4, and (ii) Outer and inner radii of the clutch plate.	12M	CO2	L4
5(a)	Two parallel shafts, about 600 mm apart are to be connected by spur gears. One shaft is to run at 360 r.p.m. and the other at 120 r.p.m. Design the gears, if the circular pitch is to be 25 mm.	6M	CO3	L3
(b)	An epicyclic gear consists of three gears A, B and C as shown in Fig.The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m.. If the gear A is fixed, determine the speed of gears B and C. 	6M	CO3	L4
	(OR)			

6 (a)	Classify gears and state the advantages and disadvantages of gear drive.	6M	CO3	L2
(b)	A cam drives a flat reciprocating follower in the following manner : During first 120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.	6M	CO3	L3
7 (a)	Derive the expression for Gyroscopic Couple.	6M	CO4	L2
(b)	An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 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	L3
	(OR)			
8 (a)	Explain the effect of precession motion on the stability of moving vehicles such as motor cycle.	6M	CO4	L2
(b)	A four-wheeled trolley car of mass 2500 kg runs on rails, which are 1.5 m apart and travels around a curve of 30 m radius at 24 km/ hr. The rails are at the same level. Each wheel of the trolley is 0.75 m in diameter and each of the two axles is driven by a motor running in a direction opposite to that of the wheels at a speed of five times the speed of rotation of the wheels. The moment of inertia of each axle with gear and wheels is 18 kg-m2. Each motor with shaft and gear pinion has a moment of inertia of 12 kg-m^2. The centre of gravity of the car is 0.9 m above the rail level. Determine the vertical force exerted by each wheel on the rails taking into consideration the centrifugal and gyroscopic effects. State the centrifugal and gyroscopic effects on the trolley.	6M	CO4	L4
9 (a)	What is the necessity of balancing? Explain the static and dynamic conditions of balancing with relations.	6M	CO5	L2
(b)	Four masses m_1, m_2, m_3 and m_4 are 200kg, 300kg, 240kg and 260kg respectively. the corresponding radii of rotation are 0.2m, 0.15m, 0.25m and 0.3m respectively and the angles between successive masses are 45^0, 75^0 and 135^0. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2m.	6M	CO5	L4
	(OR)			
10.	A four crank engine has the two outer cranks set at 120° to each other, and their reciprocating masses are each 400 kg. The distance between the planes of rotation of adjacent cranks are 450 mm, 750 mm and 600 mm. If the engine is to be in complete primary balance, find the reciprocating mass and the relative angular position for each of the inner cranks. If the length of each crank is 300 mm, the length of each connecting rod is 1.2 m and the speed of rotation is 240 r.p.m., what is the maximum secondary unbalanced force?	12M	CO5	L4

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1 SEP 2021

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

17ME22-CAD/CAM
(ASE)

Time : 3 hours Max. Marks : 60

Answer all questions with either or choice
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the different activities of the product cycle with a block diagram.	6M	CO1	L2
(b)	Summarize the application of Computers for the design process.	6M	CO1	L2
	(OR)			
2(a)	Discuss various input devices for the graphics and state their functions.	6M	CO1	L2
(b)	Explain/Illustrate the following geometric transformation. (i) Translation (ii) Scaling (iii) Rotation (iv) Reflection.	6M	CO1	L2
3(a)	List out different types of analytical and synthetic curves and their properties.	6M	CO2	L1
(b)	What are the primitive elements in CAD? Give the classification of geometric modeling systems based on their capabilities.	6M	CO2	L1
	(OR)			
4(a)	Explain the characteristics of the Bezier curve.	6M	CO2	L2
(b)	What is wireframe modeling? Develop a cube by using wireframe modeling.	6M	CO2	L1
5(a)	What is Numerical Control (NC)? Illustrate various elements of NC.	6M	CO3	L1
(b)	Discuss the four types of statements used in APT part programming.	6M	CO3	L2
	(OR)			
6(a)	Discuss the following NC motion control system (i) point to point, (ii) straight cut and (iii) contouring.	6M	CO3	L2
(b)	Describe the fundamentals of CNC programming and its structure.	6M	CO3	L2
7(a)	What are various types of layouts used in FMS design? List out FMS benefits.	6M	CO4	L1
(b)	Contrast OPITZ and MICLASS coding system.	6M	CO4	L2
	(OR)			
8(a)	Explain types of layouts in Group technology.	6M	CO4	L2
(b)	Distinguish between retrieval and generative CAPP systems.	6M	CO4	L2
9(a)	What is a CMM? Classify various types of CMM with neat sketches.	6M	CO5	L1
(b)	Discuss the role of computer networks in CIM.	6M	CO5	L2
	(OR)			
10(a)	Explain the computerized elements of the CIM system with a block diagram.	6M	CO5	L2
(b)	Theorize the integration of CAQC with CAD/CAM.	6M	CO5	L3

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

17AE12-AIRCRAFT SYSTEMS AND INSTRUMENTS

(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)	Why redundancy is required in flight control actuation? Explain the multiple redundancy actuations with suitable sketch.	6M	CO1	L1
(b)	Explain the operation of cable pulley system in detail with a neat sketch.	6M	CO1	L2
	(OR)			
2(a)	Define fly by wire technology of aircraft systems. Discuss about the fly by wire operation in A330.	6M	CO1	L1
(b)	List any four combined flight control surfaces. Describe any one of them.	6M	CO1	L1
3(a)	Explain the working principle of closed hydraulic system and its necessity.	6M	CO2	L2
(b)	List out various types of braking and anti-skidding systems in aircraft. Illustrate the brake system with a neat sketch.	6M	CO2	L1
	(OR)			
4(a)	List the vital components of a landing gear system and explain its uses.	6M	CO2	L1
(b)	Explain how a hydraulic system takes an important role in aircraft.	6M	CO2	L2
5(a)	Is vent necessary in fuel tank. Explain the importance of it.	6M	CO3	L2
(b)	Explain engine monitoring sensors and engine monitoring indicators. Explain engine control of a modern aircraft.	6M	CO3	L2
	(OR)			
6(a)	Explain the working principle of Full Authority Control Systems.	6M	CO3	L2
(b)	What are the basic components present in aircraft fuel system? Discuss with neat sketches.	6M	CO3	L1
7(a)	Explain reversed bootstrap and ram powered bootstrap systems with sketches.	6M	CO1	L2
(b)	With neat sketches, explain the evaporative vapour cycle and evaporative air cycle systems.	6M	CO1	L2
	(OR)			
8(a)	Explain cabin pressurization systems and its components.	6M	CO1	L2
(b)	What are the requirements of fire protection system? Explain briefly about the thermo couple and tubular heat detectors.	6M	CO1	L1
9(a)	Explain about the following (i) Altimeter (ii) Mach meter (iii) Airspeed indicator (iv) Pressure gauge	6M	CO4	L2
(b)	Explain how gyroscopes help in establishing directional references in the aircraft.	6M	CO4	L2
	(OR)			
10(a)	What are the limitations of a free gyroscope? Explain.	6M	CO4	L1
(b)	Explain about (i) Directional Gyro Indicator with neat sketch (ii) Mechanical tachometer with neat sketch.	6M	CO4	L2

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

17AE11-PROPULSION-I

(AE)

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)	Develop the expression for Thrust equation.	6M	CO1	L6
(b)	A Jet Engine travels at 10,080kmph with an effective exhaust jet velocity of 1400m/s and mass flow rate of 5kg/s. If the heat of mass is 6500 kJ/kg of mixture. Determine the following (i) Propulsive power (ii) Propulsive efficiency (iii) Thermal efficiency (iv) Overall efficiency.	6M	CO1	L3
	(OR)			
2(a)	Illustrate briefly about methods of Thrust Augmentation.	6M	CO1	L4
(b)	Determine the various air breathing engines used in aircraft. Give the working principle behind each engine.	6M	CO1	L3
3(a)	Explain briefly about (i) Internal Flow (ii) External Flow.	6M	CO2	L2
(b)	Illustrate briefly shock swallowing by area variation.	6M	CO2	L4
	(OR)			
4(a)	The area of cross section at the entry of the diffuser is 0.24 m^2 Mach number is 1.5 and temperature of air is 340 kelvin. If the exit Mach number is 0.78. Determine the velocity and temperature of air and the area of cross section at exit for isentropic flow.	6M	CO2	L3
(b)	Illustrate about flow patterns for supersonic inlets.	6M	CO2	L4
5(a)	Explain briefly about working principle of centrifugal compressor.	6M	CO3	L2
(b)	Illustrate about axial flow compressor performance characteristics.	6M	CO3	L4
	(OR)			
6(a)	Differentiate between axial flow compressor and centrifugal compressor.	6M	CO3	L2
(b)	Illustratebriefly about centrifugal blade design.	6M	CO3	L4
7(a)	Illustrate the performance of combustion chamber.	6M	CO4	L4
(b)	Explain briefly about (i) Flame Holder uses (ii) Fuel Injection System.	6M	CO4	L2
	(OR)			
8(a)	Explain the flame tube cooling and various methods used for cool the flame tube.	6M	CO4	L2
(b)	Illustrate briefly about the effects of operating variables on performance of combustion chamber.	6M	CO4	L4
9(a)	Explain briefly about the turbine stages.	6M	CO5	L2
(b)	Explain briefly about Reaction turbine.	6M	CO5	L2
	(OR)			
10(a)	Differentiate between axial flow turbine and Radial flow Turbine.	6M	CO5	L2
(b)	Illustrate briefly about the matching of turbine and compressor.	6M	CO5	L3

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

17AE10-AERODYNAMICS-II

(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)	What is speed of sound? Derive the expression for speed of sound for perfect gas under isentropic conditions.	6M	CO1	L3
(b)	Determine the limiting Mach number for high-speed flow.	6M	CO1	L3
	(OR)			
2(a)	Air flows through a duct. The pressure and temperature at station 1 are P_1 = 0.7 atm. and T_1 = 30° Celsius, respectively. At the second station, the pressure is 0.5atm. Calculate the temperature and density at the second station. Assume the flow to be isentropic.	6M	CO1	L3
(b)	Air is compressed from 1 atm at 15° Celsius to 6 atm at 110° Celsius, in a steady-flow device. Determine the entropy change for the air.	6M	CO1	L3
3(a)	What are the various flow fields possible in a convergent-divergent nozzle when operated at various pressure ratios? Explain.	6M	CO2	L2
(b)	Obtain the necessary condition for maximum mass flow rate through a stream tube per unit area for quasi-one-dimensional isentropic flow.	6M	CO2	L3
	(OR)			
4(a)	A De-Laval nozzle has to be designed for an exit Mach number of 1.5 with exit diameter of 200 mm. Find the ratio of throat area to exit area necessary. The reservoir conditions are given as P_0 = 2 atm; T_0 = 20° Celsius. Find also the maximum mass flow rate through the nozzle.	6M	CO2	L4
(b)	Air flows isentropically through a convergent-divergent nozzle of inlet area 12 cm^2 at a rate of 0.7 kg/s. The conditions at the inlet and exit of the nozzle are 8 kg/m^3 and 400 K and 4 kg/m^3 and 300 K, respectively. Find the cross-sectional area at the nozzle exit.	6M	CO2	L3
5(a)	Show that for a perfect gas, the Mach number behind the normal shock (M_2) is a function of only the Mach number ahead of the shock (M_1).	6M	CO3	L3
(b)	Consider an oblique shock wave with a wave angle of 30°. The upstream flow Mach number is 2.4. Calculate the deflection angle of the flow.	6M	CO3	L3
	(OR)			
6(a)	Show that for a perfect gas, the Mach number behind the oblique shock (M_2) is a function of Mach number ahead of the shock (M_1), Shock angle (β) and flow deflection angle (θ).	6M	CO3	L3
(b)	Differentiate the property changes across normal shock wave and Oblique shock wave.	6M	CO3	L2
7(a)	Enlist the salient points with regard to Isentropic flow Fanno flow and Rayleigh flow.	6M	CO4	L2
(b)	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	L3
	(OR)			
8(a)	Air at a stagnation temperature of 380 K is to be transported through a duct of 55 m length. What is the minimum diameter of the duct for the flow to remain unchoked for velocity at the duct entrance of 30 m/s. The average friction factor for the duct is 0.02. Assume the flow to be adiabatic.	6M	CO4	L4
(b)	Derive the basic relations required for the analysis of Rayleigh Flow.	6M	CO4	L3
9.	Derive the Prandtl-Glauret compressibility correction relations for subsonic flows.	12M	CO5	L3
	(OR)			
10.	Express the coefficient pressure in terms of perturbed velocity and freestream velocity.	12M	CO5	L3

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

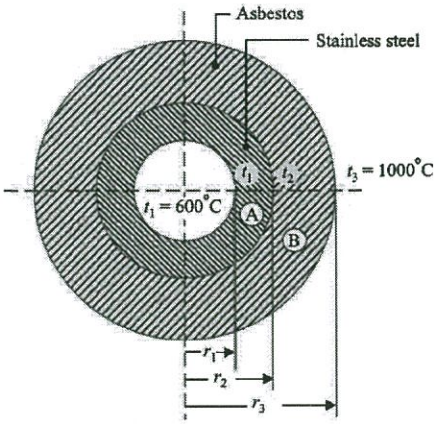
17AE09-ELEMENTS OF HEAT TRANSFER

(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 Cartesian Coordinate.	6M	CO1	L3
(b)	State and explain Fourier's law for one dimensional conduction. What are the underlying assumptions?	6M	CO	L2
	(OR)			
2(a)	A thick walled tube of stainless steel with 20mm inner diameter and 40mm outer diameter is covered with a 30 mm layer of asbestos insulation (k=0.2 W/m0C). If the inside wall temperature of the pipe is maintained at 600^{0}C and the outside insulation is at 1000^{0}C, calculate the heat loss per metre of length. 	6M	CO1	L3
(b)	Calculate the critical radius of insulation for asbestos (k = 0.172 W/m K) surrounding a pipe and exposed to room air at 300 K with h = 2.8 W/m^2 K. Calculate heat loss from a 475 K, 60mm diameter pipe when covered with the critical radius of insulation and without insulation.	6M	CO1	L4
3(a)	A very long 25 mm diameter copper rod (k= 380 W/m^{0}C) extends horizontally from a plane heated wall at 150^{0}C. The temperature of the surrounding air is 30^{0}C and the convective heat transfer coefficient is 10 W/m^{2}K. Determine the heat loss from the rod.	6M	CO2	L3
(b)	Define fin efficiency and show that it is equal to $\frac{\tanh(mL)}{mL}$ for a fin with insulated end.	6M	CO2	L3
	(OR)			
4(a)	Discuss the significance of Biot number and Fourier number in transient heat conduction.	6M	CO2	L2
(b)	A carbon steel (AISI 1010) shaft of 0.2 m diameter is heat treated in a gas fired furnace whose gases are at 1200 K and provide a convection coefficient of 80 W/m^{2}K. If the shaft enters the furnace at 300 K, how long must it remain in the furnace to achieve a centre temperature of 900 K? Given thermo physical properties of AISI 1010 carbon steel : ρ= 7854 kg/m^3, k= 48.8 W/m K, CP= 559 J/kg K.	6M	CO2	L4

5 (a)	Air at 30°C flows over a flat plate, 0.4m wide and 0.75 m long with a velocity of 20 m/s. Determine the heat flow rate from the surface of the plate assuming that the flow is parallel to the 0.75 m side. Plate is maintained at 90°C. Use correlations: $Nu_L=0.664.Re^{0.5}.Pr^{1/3}$ for laminar flow, and $Nu_L=[0.036.Re^{0.8}-836].Pr^{1/3}$ for turbulent flow.	6M	CO3	L3
(b)	Water is heated in the annular section of heat exchanger by electrical heating of the inner pipe. Outer pipe is insulated . Mean bulk temperature of water is 60°C. For the annulus, D_i=2.5 cm and D_0=5 cm, Determine the convection coefficient and pressure drop per metre length for flow rate of 0.04 kg/s.	6M	CO3	L4
	(OR)			
6 (a)	Explain with neat sketch the development of hydrodynamic and thermal boundary layer along a verticle plate.	6M	CO3	L2
(b)	In a nuclear reactor core, parallel vertical plates, each 2.5 m high and 1.5 m wide, heat liquid Bismuth by natural convection. Maximum temperatures of the plates should not exceed 755°C and lowest allowable temperature of Bismuth is 320°C. Calculate the maximum heat dissipation from both sides of each plate.	6M	CO3	L3
7 (a)	What is meant by 'view factor'? Write any three properties of view factor.	6M	CO4	L2
(b)	Two large parallel planes facing each other and having emissivities 0.3 and 0.5 are maintained at 827°Cand 527°C, respectively. Determine the rate at which heat is exchanged between the two surfaces by radiation. If a radiation shield of emissivity 0.05 on both sides is placed parallel between the two surfaces, determine the percentage reduction in the radiant heat exchange rate.	6M	CO4	L4
	(OR)			
8(a)	Incident radiation (G=1577 W/m²)strike an object. The amount of energy absorbed is 472W/m² and the amount of energy transmitted is 78.8 W/m². What is the value of reflectivity?	6M	CO4	L3
(b)	A convex grey body having a surface area of 4m² has ε_1=0.35 and T_1=680K. This is completely enclosed by a grey surface having an area of 36 m², ε_2=0.75 and T_2=310K. Find the net rate of heat transfer Q_{12} between the two surfaces.	6M	CO4	L4
9(a)	How are heat exchangers classified? Discuss briefly any two different types of heat exchangers.	6M	CO5	L2
(b)	Oil at 100°C (Cp_{oil}=3.6 kJ/kgK)flows at a rate of 30,000 kg/h and enters into a parallel flow heat exchanger. Cooling water (Cp_{water}=4.2 kJ/kgK)enters the heat exchanger at 10°C at a rate of 50,000 kg/h. The heat transfer area is 10 m² and 'U'=1000 W/m²K. Calculate the following (i)outlet temperature of oil and water (ii) maximum possible outlet temperature of water.	6M	CO5	L4
	(OR)			
10(a)	Derive an expression for the LMTD of parallel flow heat exchanger. State clearly any of the four assumptions.	6M	CO5	L3
(b)	Consider a heat exchanger for cooling oil which enters at 180°C, and cooling water enters at 25°C. Mass flow rates of oil and water are : 2.5 and 1.2 kg/s, respectively. Area for heat transfer = 16 m². Specific heat data for oil and water and overall 'U' are given: Cp_{oil} =1900 J/kgK; Cp_{water} =4184 J/kgK; U=285 W/m²K. Calculate outlet temperatures of oil and water for parallel and counter flow Heat exchanger.	6M	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

17HS01-ENGINEERING ECONOMICS AND ACCOUNTANCY

(ASE,CE,CSE,ECE,EEE,EIE&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)	Define Economics and explain about its nature.	6M	CO1	L1
(b)	Describe about the determinants of demand.	6M	CO1	L2
	(OR)			
2(a)	Economics for Engineers plays a crucial role in enhancing their business skills. Justify.	6M	CO1	L1
(b)	Analyze the concept of Elasticity of demand.	6M	CO1	L4
3(a)	Explain the concept of production function with example.	6M	CO2	L2
(b)	Describe about Isoquant and Isocost.	6M	CO2	L1
	(OR)			
4(a)	Examine the concept of break even analysis.	6M	CO2	L3
(b)	Outline the significance and limitations of breakeven point.	6M	CO2	L4
5(a)	Illustrate about the types of Markets.	6M	CO3	L4
(b)	Explain about different pricing methods and its applications in business.	6M	CO3	L2
	(OR)			
6(a)	Differentiate between monopoly and monopolistic competition.	6M	CO3	L2
(b)	Analyze the concept of oligopoly markets with example.	6M	CO3	L4
7(a)	Describe about the sources of raising capital.	6M	CO4	L1
(b)	Outline the techniques involved in capital budgeting.	6M	CO4	L4
	(OR)			
8(a)	Explain the concept of working capital along with its components.	6M	CO4	L2
(b)	Analyze the process of Capital budgeting.	6M	CO4	L4
9(a)	Explain the importance of Accounting for Listed companies.	6M	C05	L2
(b)	Describe the importance of Ratio analysis with respect to shareholders.	6M	C05	L1
	(OR)			
10(a)	Describe the concept of Trail Balance.	6M	C05	L1
(b)	"Financial Statements can be manipulated". Do you agree with this statement? Justify your answer.	6M	C05	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

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.	Define Green Buildings. Also describe the benefits and environmental impacts of green buildings.	12M	CO1	L1
	(OR)			
2(a)	Explain various typical features of green buildings.	6M	CO1	L2
(b)	Explain about Brown field and green field development.	6M	CO1	L2
3.	Demonstrate the impact of deforestation and climate change on built environment.	12M	CO2	L3
	(OR)			
4.	Explain about the sick building syndrome and the indoor air pollutants.	12M	CO2	L2
5(a)	Determine the concept of recycling of building materials.	6M	CO3	L3
(b)	Demonstrate the advantages of using Bamboo and timber as a building material.	6M	CO3	L3
	(OR)			
6(a)	Explain about various advantages in using materials from agro and industrial waste.	6M	CO3	L2
(b)	Explain in detail about ferro-cement and ferro-concrete.	6M	CO3	L2
7(a)	Demonstrate active and passive energy systems.	6M	CO4	L3
(b)	Explain in detail about various forms of energy used in buildings.	6M	CO4	L2
	(OR)			
8(a)	Explain the concept of energy efficient lighting.	6M	CO4	L2
(b)	Explain about the water harvesting in buildings.	6M	CO4	L2
9.	Describe the wind and solar energy harvesting.	12M	CO5	L1
	(OR)			
10.	Outline the construction and operation of various solar and wind energy based appliances.	12M	CO5	L4

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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)	Discuss about the construction project management.	6M	CO1	L1
(b)	Identify the key points for finalizing the construction contractors.	6M	CO1	L1
	(OR)			
2(a)	Describe the project managers role.	6M	CO1	L1
(b)	Explain about the selection of professional services.	6M	CO1	L2
3(a)	List out the steps involved in project planning.	6M	CO2	L1
(b)	Explain about controlling system.	6M	CO2	L2
	(OR)			
4(a)	Differentiate planning and scheduling.	6M	CO2	L2
(b)	Explain about project budget.	6M	CO2	L2
5(a)	Explain about the equipment management.	6M	CO3	L2
(b)	Discuss about inventory control.	6M	CO3	L2
	(OR)			
6(a)	Summarize about the material procurement and delivery.	6M	CO3	L2
(b)	Identify the need of labour productivity.	6M	CO3	L1
7.	Discuss the prospects and applications in CPM and PERT.	12M	CO4	L2
	(OR)			
8(a)	Define network analysis.	6M	CO4	L1
(b)	List out the merits and demerits of CPM and PERT.	6M	CO4	L1
9.	Explain in detail about contract its types.	12M	CO5	L2
	(OR)			
10(a)	Discuss about the contractor deposits.	6M	CO5	L2
(b)	Tabulate M Book and explain.	6M	CO5	L1

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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)	Discuss briefly with neat sketch the main components of hydrologic cycle.	6M	CO1	L1
(b)	Explain the schematic model of infiltration process for low and high intensity rainfall.	6M	CO1	L4
	(OR)			
2(a)	Discuss various factors affecting the evapotranspiration process.	6M	CO1	L1
(b)	A 6 h storm produced rainfall intensities of 5,16, 22, 10, 8 and 2 mm/h in successive one hour intervals over a basin of 800 square kilometer. The resulting runoff is observed to be 2500 hectare-meters. Determine ϕ-index for the basin.	6M	CO1	L5
3(a)	Discuss the uses of flow duration curve.	6M	CO2	L1
(b)	Explain with a neat sketch how the storage requirement to meet a uniform demand rate can be determined using the mass curve.	6M	CO2	L2
	(OR)			
4(a)	Discuss briefly various factors that are affecting the runoff from a drainage basin.	6M	CO3	L1
(b)	What is dependable yield? How is it estimated from a given record?	6M	CO3	L3
5(a)	What are the uses and applications of unit hydrograph?P	6M	CO3	L2
(b)	From the topographical map of a drainage basin the following quantities are measured. Catchment area A is 3400 km^2, Length of main stream L is 140 km, L_c is 70 km. the 12 h unit hydrograph derived for the basin has a peak ordinate of 150 m^3/s occurring at 40 h. Determine the coefficients C_t and C_p for the synthetic unit hydrograph of the basin.	6M	CO3	L5
	(OR)			
6(a)	Define unit hydrograph. Given the ordinates of the 4-h unit hydrograph as below derive the ordinates of a 8-h unit hydrograph for the same catchment.	6M	CO3	L5
(b)	Discuss briefly factors affecting the flood hydrograph.	6M	CO3	L1

Time (h)	0	4	8	12	16	20	24	28	32	36
Ordinates of 4-h UH	0	21.3	17.84	12.18	8.26	4.98	3.05	1.6	0.53	0

7(a)	Show that in the level pool routing the peak of the outflow hydrograph must intersect the inflow hydrograph.	6M	CO4	L6
(b)	Describe various structural and non structural methods of adopted for flood management.	6M	CO4	L3
	(OR)			
8(a)	Describe the Muskingum method of flood routing an inflow hydrograph through a channel reach. Assume the values of the coefficients K and *x* for the reach are known.	6M	CO4	L1
(b)	Define reservoir routing and channel routing. Write the basic equations for flood routing.	6M	CO4	L4
9(a)	Derive an expression for discharge from a well in unconfined aquifer. The well fully penetrates it.	6M	CO5	L3
(b)	During a recuperation test, the water in an open well was depressed by pumping by 2.2m and it recuperated 1.6 m in 76 minutes. Find (i) yield from a well of 3.5 m diameter under a depression of head of 3m, (ii) the diameter of the well to yield 8 liters per second under a depression head of 2m.	6M	CO5	L5
	(OR)			
10(a)	Distinguish between (i) Specific yield and specific retention and (ii) Storage coefficient and coefficient of transmissibility.	6M	CO5	L1
(b)	What do you understand by recuperation test? Derive an equations used in the test.	6M	CO5	L6

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

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

17CE14-HIGHWAY ENGINEERING

(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)	Compare first & second 20 year road development plans.	6M	CO1	L5
(b)	What are the objectives of highway planning?	6M	CO1	L1
	(OR)			
2(a)	What is the latest classification of national road? Explain.	6M	CO1	L1
(b)	Explain about the various engineering surveys for a highway project.	6M	CO1	L2
3(a)	What are the steps to design superelevation?	6M	CO2	L1
(b)	Calculate the extra widening required for a pavement of width 7m on a horizontal curve of radius 250m if the longest wheel base of vehicle expected on the road is 7m, design speed 80kmph.	6M	CO2	L3
	(OR)			
4(a)	Discuss about stopping distance on plain & sloppy ground.	6M	CO2	L2
(b)	The speeds of overtaking and overtaken vehicles are 65 and 35kmph respectively on a two-way road. If the acceleration of overtaking vehicle is 0.99m/s2. (i) Calculate safe overtaking sight distance (ii) Mention the minimum length of overtaking zone (iii) Draw a neat sketch of overtaking zone.	6M	CO2	L3
5(a)	Write the desirable properties of stone aggregate.	6M	CO3	L2
(b)	Write about Los Angeles Abrasion test.	6M	CO3	L2
	(OR)			
6(a)	Explain about ductility test of bitumen.	6M	CO3	L2
(b)	Explain in detail the construction of WBM road.	6M	CO3	L2
7(a)	Compare flexible and rigid pavements.	6M	CO4	L5
(b)	Write about the failures in flexible pavements.	6M	CO4	L2
	(OR)			
8(a)	It is proposed to widen an existing 2-lane NH section to 4-lane divided road. Calculate cumulative standard axle for new carriageway with the following data: (i) 4-lane divided carriageway (ii) Initial traffic in each direction = 5000CV/day (iii) Design life = 15 years (iV) Design CBR of subgrade soil=5% (v) Traffic growth rate= 6% (vi) VDF (from axle load survey) =4.0 (vii) Distribution factor = 0.75	6M	CO4	L3
(b)	Write westerguard stress equation for wheel load for (i) Interior loading (ii) Edge loading (iii) Corner loading	6M	CO4	L2
9(a)	Explain Volume-speed-Density relation of road traffic.	6M	CO5	L2
(b)	Write about parking studies & draw various parking patterns of off-street parking.	6M	CO5	L2
	(OR)			
10(a)	Write the difference between collision & condition diagram.	6M	CO5	L2
(b)	What is the need for road marking? Explain types of road markings.	6M	CO5	L2

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

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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

17CE13-DESIGN OF REINFORCED CONCRETE STRUCTURES-I

(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 doubly reinforced rectangular beam is 240 mm wide and 500 mm deep. If the limiting stresses in concrete and steel are 5 N/mm^2 and 230 N/mm^2 respectively. Design the beam if it is subjected to a bending moment of 180Kn.m. Take cover = 40 mm and modular ratio = 19. (Use working stress method)	12M	CO1	L3
	(OR)			
2.	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	L3
3.	Design a doubly reinforced beam 350 mm wide and 500 mm deep of M20 grade concrete to resist an ultimate moment of 220 Kn-m. Use Fe 415 bars & sketch the reinforcement details.	12M	CO2	L3
	(OR)			
4.	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 center 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	L3
5(a)	Explain IS code method for design of reinforced concrete structures subjected to torsional moment.	6M	CO3	L2
(b)	Write a short note on limit state of collapse in shear.	6M	CO3	L1
	(OR)			
6.	A simply supported beam 250 mm wide and 500mm effective depth carries a U D L of 40Kn/m including self-weight over an effective span of 8m. Design shear reinforcement in the form of vertical stirrups. Assume beam contains 0.80% reinforcement throughout the length. Use M20 grade concrete and Fe 250 grade steel. Assume width of support as 350 mm.	12M	CO3	L3
7.	Design a reinforced concrete slab for a college having inside dimensions 3.5m X 6.5m. If slab carries a 100mm thick lime concrete at its top, having the unit weight of 20 Kn/m^3. Assume that the two short edges of the slab are discontinued while the long edges are continued. Take M25 grade concrete and Fe 415 steel.	12M	CO4	L3
	(OR)			
8.	Design a R.C.C slab for a room having inside dimensions 3m X 7m. The slab carries 80mm thick lime concrete at its top, having unit weight of 20Kn/m^3. Take M20 grade concrete and Fe 415 steel.	12M	CO4	L3
9.	Design a short axially loaded column for a factored load 2500Kn. Assume M30 mix Fe 415 steel.	12M	CO5	L4
	(OR)			
10.	Design a circular column with 500 mm diameter if it carries a factored load of 1150 Kn. Provide helical reinforcement. Assume M30 mix Fe 500 steel. Sketch the reinforcement details.	12M	CO5	L4

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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

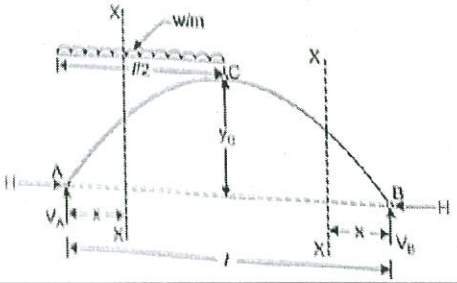
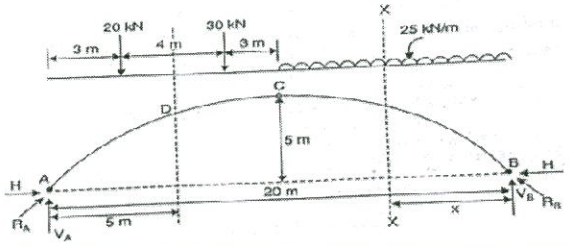
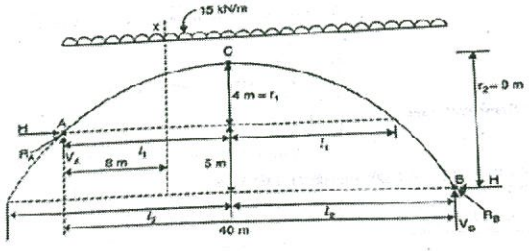
17CE12-STRUCTURAL ANALYSIS-II

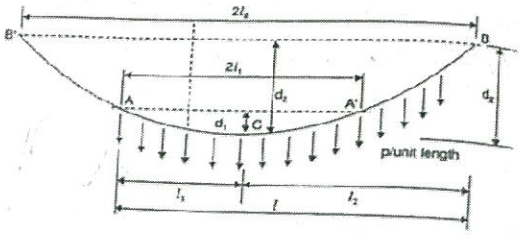
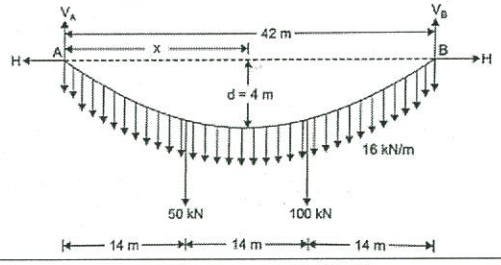
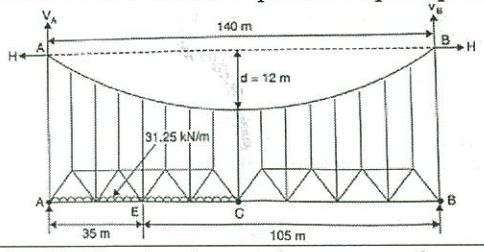
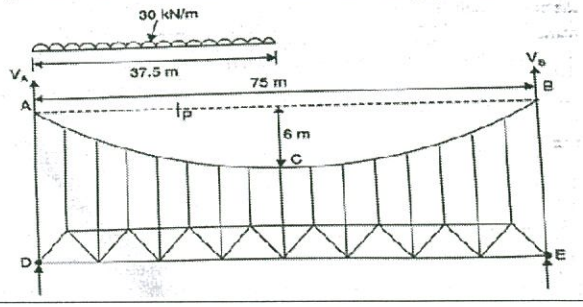
(CE)

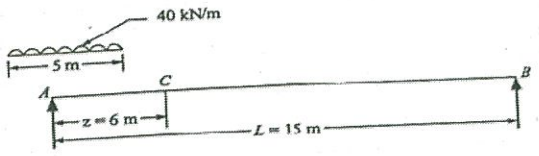
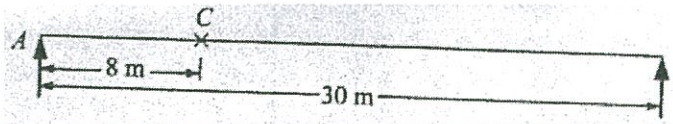
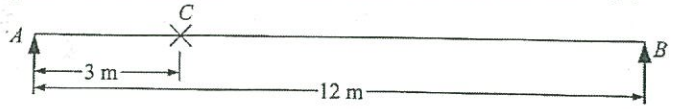
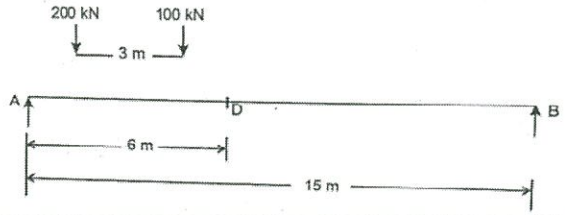
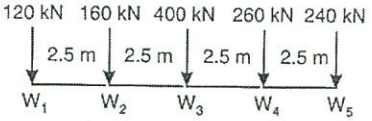
Time : 3 hours Max. Marks : 60

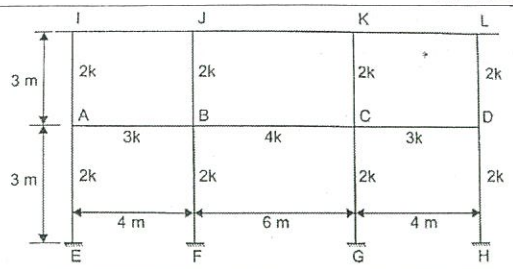
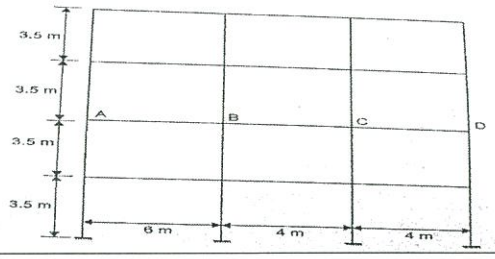
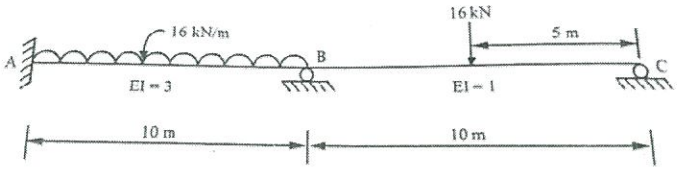
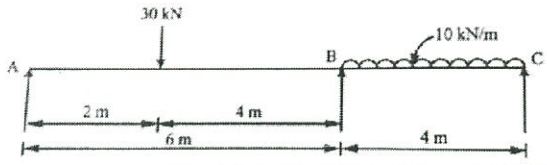
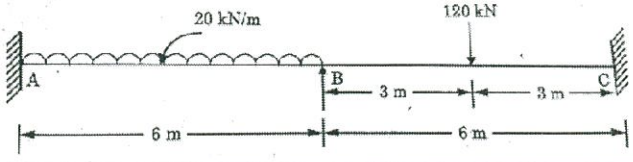
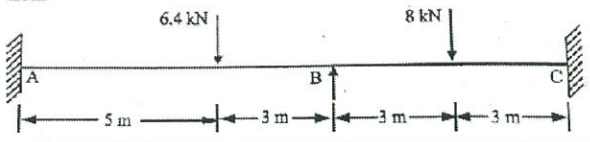
Answer all questions with either or choice

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	A symmetrical three hinged parabolic arch of span'*l*' and central rise y_c carries a u.d.l of w/unit run over the left half of the span. The hinges are provided at the supports and at the centre of the arch. Calculate the location and magnitude of the maximum bending moments. 	6M	CO1	L3
(b)	A parabolic three hinged arch carries loads as shown in figure Determine the resultant reactions at supports. Find the bending moment, normal thrust and radial shear at D,5m from A. 	6M	CO1	L3
	(OR)			
2(a)	A three hinged parabolic arch of 40m span has abutments at unequal levels. The highest point of the arch is 4m above the left support and 9m above the right abutment. The arch is subjected to an u.d.l of 15kN/m over its entire horizontal span. Find the horizontal thrust and bending moment at at a point 8m from the left support. 	6M	CO1	L3
(b)	A 3 hinged arch has a span of 24m and central rise of 8m.the body of the arch is fabricated from rolled steel sections. Find the change in central rise (i) Due to increase in temperature of 30°C. (ii) Due to drop in temperature of 20°C.	6M	CO1	L3

3(a)	Derive the equations for reactions, tension and length of the suspension cable having supports at different level as shown in figure. 	6M	CO2	L2
(b)	A suspension cable having supports at the same level has a horizontal span of 42m and maximum dip of 4m.the cable is loaded with a u.d.l of 16kN/m throughout its length and concentrated loads of 50kN and 100kN at 1/3 points. Find the maximum tension in the cable. 	6M	CO2	L3
	(OR)			
4(a)	A suspension bridge of 140m span has two numbers of 3hinged stiffening girder supported by two cables with a central dip of 12m.the width of the road way supported by the girder is 5m.the dead load is 7kN/m^2 covers the left hand half of the bridge. Find the shear force and bending moment at the loaded quarter span point. 	6M	CO2	L3
(b)	A suspension cable of 75m horizontal span and central dip 6m has a stiffening girder hinged at both ends. The dead load transmitted to the cable including its own weight is 1500kN.the girder carries a live load of 30kN/m uniformly distributed over the left half of the span. Assuming the girder to be rigid, calculate the shear force and bending moment in the girder at 20m from the left support. 	6M	CO2	L3
5(a)	Derive the equations for maximum shear force and bending moment values due to moving loads, when beam subjected to u.d.l smaller than the span .	6M	CO3	L2

(b)	A simply supported beam has a span of 15m.uniformly distributed load of 40kN/m and 5m long crosses the girder from left to right. Calculate the maximum shear force and bending moment at this section 	6M	CO3	L3
	(OR)			
6(a)	Four point loads 8, 15, 15 and 10kN have centre to centre spacing of 2m between consecutive loads and they transverse a girder of 30m span from left to right with 10kN leading. Calculate the maximum bending moment and shear force at 8m from the left support. 	6M	CO3	L3
(b)	Determine maximum shear force and maximum bending moment at quarter span from left end when u.d.l longer than the span of intensity 20kN/m,accompanied by a 100kN concentrated load crosses the span of 12m.the concentrated load can occupy any position 	6M	CO3	L2
7(a)	Two point loads of 100kN and 200kN spaced 3m apart cross a girder of span 15m from left to right with the 100kN load leading. Draw the influence line for shear force and bending moment and find the value of maximum shear force and bending moment at a section D, 6m from the left support. 	6M	CO4	L3
(b)	A train of 5 wheel loads crosses a simply supported beam of span 22.5m; using influence lines, calculate the maximum positive and negative shear forces at mid span. 	6M	CO4	L3
	(OR)			
8(a)	In a multistoried building, the frames shown in figure are spaced at 3.5m intervals. Dead load from the slab is 3kN/m² and live load is 5kN/m².analyse the beam BC for midspan negative bending moment .self weight of beams of 4m span may be taken as 4kN/m and that of 6m span beams may be taken as 5kN/m.use two cycles moment distribution method. The stiffnesses of the members are indicated against each member.			

		6M	CO4	L3
(b)	A multistoried building consists of 4storeyed 3 bay frames spaced at 3m c/c, live load on floor slab is 3kN/m^2.the spans of the beams from left to right are 6m, 4m and 4m respectively. Storey height is 3.5m.moment of inertia of the beams is 1.5times that of columns .self weight of the beam is 3.5kN/m. determine the maximum moment beam at the junction of first span and second span of an intermediate floor. 	6M	CO4	L3
9(a)	Analyse the continuous beam as shown in figure flexibility matrix method. 	6M	CO5	L4
(b)	Analyse the continuous beam as shown in figure by flexibility matrix method 	6M	CO5	L4
	(OR)			
10(a)	Analyse the continuous beam shown in figure by stiffness matrix method. 	6M	CO5	L4
(b)	Analyse the continuous beam as shown in figure by stiffness matrix method. 	6M	CO5	L4

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2 SEP 2021

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

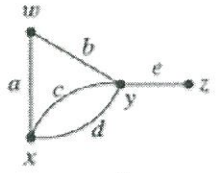
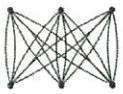
17CS90-ADVANCED GRAPH ALGORITHMS

(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)	Summarize the terminologies about structure of a graph. (i) Chromatic number (ii) subgraph (iii) path.	6M	CO1	L2
(b)	Exhibit the adjacency matrix and incident matrix Consider graph G, Vertex ordering(w,x,y,z) and edge ordering (a,b,c,d,e).  G	6M	CO1	L3
	(OR)			
2(a)	Define Eulerian graphs. Give the proof of theorem Euler circuits, the degree of every vertex in G is even.	6M	CO1	L1
(b)	Prove that a bipartite graph has a unique bipartition (except for inter changing the two partite sets) if and only if it is connected.	6M	CO1	L3
3(a)	List the terminologies and properties of trees.	6M	CO2	L1
(b)	Prove that an edge e of a connected graph G is a cut-edge f and only if e belongs to every Spanning tree. Prove that e is a loop if and only if e belongs to no spanning tree.	6M	CO2	L3
	(OR)			
4(a)	Explain matrix tree theorem.	6M	CO2	L2
(b)	Illustrate the matrix tree computation.	6M	CO2	L2
5(a)	Explain connected graphs with suitable examples.	6M	CO3	L2
(b)	A graph G with at least three vertices, the following conditions are equivalent (and characterize 2-connected graphs). Prove (i) G 1s connected and has no cut-vertex. (ii) For all x. y $\in$ V(G), there are internally disjoint x, y-paths. (iii) For all x, y $\in$ V(G), there is cycle through x and y.	6M	CO3	L3
	(OR)			
6(a)	Define network flow. Maximize the network flow in a graph.	6M	CO3	L1
(b)	Explain Max flow min cut algorithm.	6M	CO3	L2
7(a)	Define (i) k-coloring of a graph. (ii) clique number.	6M	CO4	L1
(b)	Explain Brooks theorem.	6M	CO4	L2
	(OR)			
8(a)	Explain color critical graphs.	6M	CO4	L2
(b)	Use graph coloring for time table scheduling.	6M	CO4	L3
9(a)	Explain the terminology of Plannar graph with characterization.	6M	CO5	L2
(b)	Give the proof of Kuratowski's Theorem.	6M	CO5	L3
	(OR)			
10(a)	Describe Hamiltonian graph.	6M	CO5	L2
(b)	Compute the number of proper 6-edge-colorings of the graph below. 	6M	CO5	L3

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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.	Discuss the following: (i) ACID Properties (ii) Redundancy in Database (iii) Integrity constraints (iv) Primary key.	12M	CO1	L2
	(OR)			
2(a)	Explain the role of Normalization by taking the example database.	6M	CO1	L3
(b)	What is BCNF? How is different from 3 NF? Explain with an example.	6M	CO1	L4
3.	With a neat diagram, explain functions and architecture of Distributed DBMS.	12M	CO2	L3
	(OR)			
4(a)	Discuss the levels of distribution transparency in brief.	6M	CO2	L2
(b)	Discuss fragmentation transparency, location transparency, and replication transparency in distributed databases.	6M	CO2	L2
5(a)	Discuss how query optimization is done using AHY algorithm.	6M	CO3	L3
(b)	Write about the atomicity of transactions in distributed databases with emphasis on failures and logs and recovery methods.	6M	CO3	L2
	(OR)			
6	Explain the following: (i) 2-Phase-Locking as a Distributed Concurrency Control Method (ii) Occur before relationship.	12M	CO3	L2
7(a)	Define parallel databases. Explain inter and intra query parallelism.	6M	CO4	L2
(b)	Write short notes on parallel databases and distributed databases.	6M	CO4	L2
	(OR)			
8(a)	What form of parallelism (inter-query, inter-operation or intra-operation) is likely to be the most important for each of the following tasks: (i) Increasing the through put of a system with many small queries (ii) Increasing the throughput of a system with a few large queries, when the number of disks and CPUs is large.	6M	CO4	L5
(b)	What is the difference between persistent and transient objects? How is persistence handled in typical object oriented database?	6M	CO4	L4
9(a)	Write in detail about ODMG model with ODL and OQL.	6M	CO5	L2
(b)	Distinguish object oriented and object relational databases.	6M	CO5	L4
	(OR)			
10.	How query execution is done in object query processing?	12M	CO5	L2

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

17CI12-HUMAN COMPUTER INTERACTION

(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)	Explain the importance and benefits of good design with a suitable example.	6M	CO1	L2
(b)	Illustrate the brief history of screen design.	6M	CO1	L4
	(OR)			
2(a)	Describe the Principles of graphical user interface with an example.	6M	CO1	L2
(b)	Write the characteristics of direct manipulation systems. Why the concept of direct manipulation is preferable in all cases of screen design? Justify.	6M	CO1	L4
3(a)	Define human computer interaction. Describe the importance of human interface.	6M	CO2	L1
(b)	Describe the human interaction speeds with a suitable example.	6M	CO2	L2
	(OR)			
4(a)	Explain the main human characteristics that are to be considered in designing a good interface.	6M	CO2	L2
(b)	Illustrate the steps to understand the business functions with a suitable example.	6M	CO2	L4
5(a)	Write the principles and various types of grouping screen elements.	6M	CO3	L2
(b)	Explain the importance of statistical graphics in screen design.	6M	CO3	L2
	(OR)			
6(a)	Explain various visually pleasing compositions of screen design with neat diagram.	6M	CO3	L2
(b)	Illustrate the steps involved for information retrieval on web.	6M	CO3	L4
7(a)	Summarize the technical issues in Navigation schemes selection of window.	6M	CO4	L2
(b)	Describe in detail about Device-based controls with an example.	6M	CO4	L2
	(OR)			
8(a)	Classify the various components of a window with an example.	6M	CO4	L4
(b)	Explain in detail about Screen-based controls with a suitable example.	6M	CO4	L2
9(a)	Explain the various possible problems in choosing colors for screen design.	6M	CO5	L2
(b)	Illustrate the characteristics of Icons and list the factors that influence icon's usability.	6M	CO5	L4
	(OR)			
10(a)	Explain various issues in continuous speech generation and recognition.	6M	CO5	L2
(b)	Write short notes on Indirect pointing devices with a suitable example.	6M	CO5	L2

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

17CS04-OPERATING 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(a)	Describe Computer System Organization with diagram.	6M	CO1	L1
(b)	Write the importance of Direct Memory Access (DMA) with a suitable diagram.	6M	CO1	L2
	(OR)			
2(a)	What is a System Call? Explain any four types of System Calls.	6M	CO1	L2
(b)	Explain the simple structure of the Operating System with a neat diagram.	6M	CO1	L2
3(a)	Draw a diagram to show CPU switch from process to process by considering two processes P1 and P2.	6M	CO2	L3
(b)	Differentiate short-term and long-term schedulers with diagram.	6M	CO2	L2
	(OR)			
4(a)	If time quantum increases, Round Robin process scheduling tends to become FCFS process scheduling. Justify.	6M	CO2	L3
(b)	Compare Priority Scheduling and SJF Scheduling algorithms.	6M	CO2	L2
5(a)	What is critical-section problem? Give Peterson's solution to the critical-section problem.	6M	CO3	L2
(b)	Discuss the dining philosopher's problem and suggest solutions.	6M	CO3	L2
	(OR)			
6(a)	List and elaborate the necessary condition for Deadlock occurrence.	6M	CO3	L1
(b)	How to detect Deadlock? Discuss with suitable example.	6M	CO3	L2
7(a)	Differentiate the Logical address space from Physical address space.	6M	CO4	L2
(b)	How would you explain memory mapping with Relocation and Limit Registers?	6M	CO4	L2
	(OR)			
8(a)	State and explain Demand paging scheme of Memory Management.	6M	CO4	L2
(b)	Consider the following page reference string: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur with LRU replacement algorithm? Assume three frames of allocation.	6M	CO4	L3
9(a)	Differentiate the Sequential and the Direct file access methods.	6M	CO5	L2
(b)	Describe any two types of directory structure.	6M	CO5	L2
	(OR)			
10.	Explain VFS (Virtual File System) in handling variety of file systems.	12M	CO5	L2

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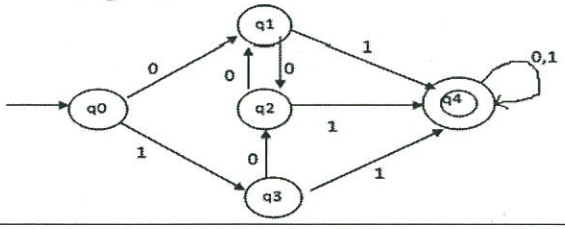
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

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)	Design a Deterministic Finite Automata that starts with 0 and has odd number of 0's over the alphabet $\sum = \{0,1\}$.	6M	CO1	L3
(b)	Construct a DFA for the regular expression $(a + b)^*(aa + bb)(a + b)^*$.	6M	CO1	L3
	(OR)			
2(a)	Minimize the DFA given below 	6M	CO1	L3
(b)	State the pumping lemma for regular sets. Using pumping lemma find whether $L = \{a^i b^j c^k)$ $i,j,k > 0\}$ is a regular set or not.	6M	CO1	L3
3(a)	Find an equivalent CFG with no useless variables for the grammar G defined by the following productions $S \rightarrow ABC \mid BaB$, $A \rightarrow aA \mid BaC \mid aaa$, $B \rightarrow bBb \mid a$, $C \rightarrow CA \mid AC$	6M	CO2	L3
(b)	Design a non-deterministic push down automata for the following language. $L = \{ ww^r \mid w \text{ in } (0 + 1)^*\}$.	6M	CO2	L3
	(OR)			
4(a)	Consider the CFG, G = (V, T, P, S) where V = {S, A}, T = {a, b} and P = {S → AA, A → AAA, A → a, A → bA, A→ Ab}. Give the leftmost and rightmost derivations for the string *babbab*. Specify whether the CFG is ambiguous or not.	6M	CO2	L3
(b)	Reduce the following Context Free Grammar to Chomsky Normal Form S → aAD, A → aB| bAB, B → b, D → d.	6M	CO2	L3
5(a)	What is the role of lexical analyzer? Describe the lexical errors and various error recovery strategies with suitable examples.	6M	CO3	L2
(b)	Construct a predictive parsing table for the following grammar $S \rightarrow a \mid \uparrow \mid (T)$ $T \rightarrow T,S \mid S$ Is the parser LL(1). Show the actions of the parser for the input string (a,a).	6M	CO3	L3
	(OR)			

6(a)	Explain the role of input buffering in identifying tokens in the Lexical Analysis phase.	6M	CO3	L2
(b)	LR(0) parsing: Consider the following grammar: $S \rightarrow SS+ \mid SS* \mid T$ $T \rightarrow id \mid num$ Is the grammar LR(0)? Build the LR(0) items and the parsing table to answer this question.	6M	CO3	L3
7(a)	Convert the following expression into three-address code statements. Write the quadruples and triples representation of these three address code statements. $-(a + b) * (c - d) - (a + b + c)$	6M	C04	L3
(b)	Explain about stack allocation storage strategy	6M	C04	
	(OR)			
8(a)	List out the functions used in the construction of a syntax tree. Write the steps used to Construct the syntax tree for a given expression and draw the syntax tree for the expression (a*b) + (c-d) * (a*b) + b using these steps.	6M	C04	L2
(b)	Explain the organization of run time memory with a suitable example	6M	C04	L2
9(a)	Explain loop optimization, common sub expression elimination techniques with suitable examples	6M	C05	L2
(b)	Describe the issues in the design of the code generator	6M	C05	L2
	(OR)			
10(a)	What is code optimization? Explain the advantages of code optimization.	6M	C05	L2
(b)	Explain in detail about register allocation with example.	6M	C05	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

17CI14-WEB TECHNOLOGIES

(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)	Describe in detail about sub tags and its attributes of <table> tag with an example program.	6M	CO1	L1
(b)	Summarize the following Hypertext Markup Language (HTML) tags with suitable examples. (i) Bold (ii) Italic (iii) Underline (iv) Paragraph (v)Strike (vi) Break a line (vii) Horizontal line (viii) Pre-Formatting.	6M	CO1	L2
	(OR)			
2	How many selectors available in CSS? Illustrate each one with suitable example programs.	12M	CO1	L3
3(a)	Write an XML document for Book Catalog. The Book Catalog elements are Title, Author, Publisher, Edition, ISBN, Price.	6M	CO2	L2
(b)	How can you say the given XML document is well-formed or not?	6M	CO2	L4
	(OR)			
4(a)	Develop a java bean program that demonstrate the usage of Boolean property and also write the steps to deploy the above bean in BDK.	6M	CO2	L3
(b)	State the advantages of java beans.	6M	CO2	L1
5(a)	What are the steps to be followed to connect Oracle Database in JDBC?	6M	CO3	L2
(b)	Distinguish Statement Interface and Prepared Statement Interface.	6M	CO3	L4
	(OR)			
6.	What is Batch Processing? Write a JDBC program that demonstrates the batch processing.	12M	CO3	L3
7.	How session management can be done in Servlets? Write a servlet program that maintains the session of user using Http Session.	12M	CO4	L3
	(OR)			
8.	Develop a Servlet program to display student table data (rollno, sname, branch, cgpa) from Oracle Database.	12M	CO4	L3
9(a)	Draw and explain lifecycle of JSP.	6M	CO5	L2
(b)	List out the Advantages of JSP over Servlet.	6M	CO5	L1
	(OR)			
10(a)	List various action elements of JSP.	6M	CO5	L1
(b)	What are the elements of Model View Controller Architecture in Struts?	6M	CO5	L1

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

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)	Write about Software Development Life Cycle in UML with a diagram.	6M	CO1	L2
(b)	Discuss the Architecture of UML with a neat diagram.	6M	CO1	L2
	(OR)			
2(a)	Illustrate the RELATIONSHIPS in UML with their notations.	6M	CO1	L2
(b)	Summarize the THINGS in UML with their symbolic notations.	6M	CO1	L2
3(a)	Identify the steps required to Modelling the Comments.	6M	CO2	L2
(b)	Write short notes on Modelling Single Inheritance.	6M	CO2	L2
	(OR)			
4(a)	Identify the steps needed for Modelling New Semantics.	6M	CO2	L2
(b)	Describe a Class Diagram. List the Contents of Class Diagram with examples.	6M	CO2	L2
5(a)	Demonstrate USE CASE diagram for Library Management System.	6M	CO3	L2
(b)	List the Contents and Common uses of Interaction Diagrams with notations.	6M	CO3	L1
	(OR)			
6.	Write about different kinds of Events in UML with their notations.	12M	CO3	L2
7(a)	Define the term 'Design Pattern'. State the elements of a Design Pattern defined by Gang-of-Four.	6M	CO4	L2
(b)	List the various ways of Organizing the Design Patterns.	6M	CO4	L1
	(OR)			
8(a)	Summarize different steps in Describing a Design pattern.	6M	CO4	L2
(b)	Name the patterns along with their intents that are included in the Catalog of Design Patterns.	6M	CO4	L2
9(a)	Illustrate the Consequences with Adapter Patter.	6M	CO5	L2
(b)	Summarize the Structure of Decorator Pattern with suitable example.	6M	CO5	L2
	(OR)			
10.	Summarize the Abstract Factory Design Pattern with example.	12M	CO5	L2

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

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)	Define the following (i) Response (ii) Fidelity (iii) Lag (iv) Dynamic error.	6M	CO1	L2
(b)	What are the errors observed in instruments while measuring? Explain with suitable examples and discuss the means to minimize these errors.	6M	CO1	L2
	(OR)			
2(a)	Explain the working of true RMS responding voltmeter with necessary diagram.	6M	CO1	L2
(b)	Convert a basic D'Arsonval movement with an internal resistance of 50 Ω and a full scale deflection current of 2mA into a multi range dc Voltmeter with volt range of 0-10V, 0-50V,0-100V and 0-250V.	6M	CO1	L3
3(a)	Draw the circuit diagram of Ohmmeter series type, and explain its operation in detail.	6M	CO1	L2
(b)	A 200 Ω basic movement is to be used as an ohmmeter requiring full scale deflection of 1 mA and internal battery voltage of 5 V. A half scale deflection marking of 2 k is desired. Calculate (i) The values of R_1 and R_2 (ii) Maximum value of R_2 to compensate for a 3% drop in battery voltage.	6M	CO4	L3
	(OR)			
4(a)	Draw the Wien Bridge and derive the expression for the frequency of excitation Signal at balance.	6M	CO4	L2
(b)	An ac bridge has the following Constants: Aram AB: Capacitor of 0.5μF in Parallel with 1KΩ Aram AD: resistance of 2KΩ Aram BC: Capacitor of 0.5μF Aram CD: unkonwn Capacitor C_x and R_x in series. Frequency-1KHZ Determine the Unknown Capacitance and Dissipation factor.	6M	CO4	L4
5(a)	What is AF oscillators and explain its operation along with circuit diagram?	6M	CO2	L2
(b)	Draw the Circuit Diagram and explain the working of a Heterodyne type wave analyzer.	6M	CO2	L2
	(OR)			

17EC90-ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

6(a)	Mention the importance of each block in Modern laboratory signal generator. What techniques would you recommend to improve its stability?	6M	CO2	L4
(b)	Describe the circuits and working of wave analyzers used for audio frequency and megahertz range.	6M	CO2	L2
7(a)	With a neat block diagram explain the working of a CRO.	6M	CO1	L2
(b)	The voltage across horizontal deflection plates of a CRO is V1 sin ($\omega t + \theta_1$) and that across the vertical plates is V2 sin ($\omega t + \theta_2$). Prove that the trace on the screen is an ellipse. Determine its equation and interpret its meaning.	6M	CO1	L4
	(OR)			
8(a)	What are the advantages of dual trace over dual beam CRO's for multiple trace?	6M	CO1	L2
(b)	How is the digital storage oscilloscope differ from the conventional storage Oscilloscope using a storage cathode tube?	6M	CO1	L2
9(a)	What are the different types of strain gauges? Explain any one in detail.	6M	CO3	L2
(b)	Explain the functional aspects of a resistance thermometer.	6M	CO3	L2
	(OR)			
10(a)	Explain the working principle of a thermocouple. Discuss Seeback effect and peltier emf.	6M	CO3	L2
(b)	Explain how linear velocity is measured in brief.	6M	CO3	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

17EI18-MICRO ELECTRO MECHANICAL SYSTEMS

(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)	Illustrate the working principle of Micro sensor and Micro actuator with an example.	6M	CO1	L3
(b)	List out the applications of Microsystems in Consumer, Industrial products and Telecommunications.	6M	CO1	L1
	(OR)			
2(a)	Discuss scaling in Geometry with two examples.	6M	CO2	L2
(b)	What is the role of miniaturization in consumer products?	6M	CO1	L1
3(a)	Compare Diffusion and Ion implantation processes. Support any one of them in your own words.	6M	CO3	L2
(b)	Explain in detail about working principle of Chemical Vapor Deposition along with its rate of deposition.	6M	CO3	L2
	(OR)			
4(a)	Define etchant and summarize about Plasma etching.	6M	CO3	L2
(b)	Discuss about Low pressure chemical vapor deposition and Plasma enhanced chemical vapor deposition.	6M	CO3	L2
5(a)	State how Bulk micromachining technique differs from Surface micromachining techniques and describe the general process involved in surface micromachining.	6M	CO3	L2
(b)	Discuss in detail about : (i) Adhesion of layers (ii) Interfacial stresses (iii) Stiction.	6M	CO3	L2
	(OR)			
6(a)	What are the basic requirements of substrate and photoresist materials that are used in LIGA process?	6M	CO3	L1
(b)	Show the die, device and system packaging levels with a neat schematic diagram.	6M	CO3	L3
7(a)	What are the required characteristics for a material to be used as an ideal substrate?	6M	CO3	L1
(b)	Describe Langmuir Blodgett (LB) process and explain its applications in micro systems with few examples.	6M	CO3	L2
	(OR)			
8(a)	Explain the significance of piezoelectric crystals as materials for Micro electro mechanical systems (MEMS) and Microsystems.	6M	CO3	L2
(b)	Summarize about Chemiresistor sensor, Chemicapacitor sensor, Chemimechanical sensor, metal oxide gas sensors.	6M	CO3	L2
9(a)	Describe the working of a pressure sensor working with (i) Thin silicon die (ii) Four piezo resistors.	6M	CO4	L2
(b)	Illustrate the four fundamental optical sensing devices.	6M	CO4	L3
	(OR)			
10(a)	List out the various actuation methods used in Micro electro mechanical systems (MEMS) and describe about any two methods with neat sketch.	6M	CO4	L1
(b)	Describe the construction of micropumps with neat sketch.	6M	CO5	L2

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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)	With neat diagrams summarize the fabrication steps of P Well process.	6M	CO1	L2
(b)	An nMOS transistor is operating in saturation region with the following parameters. V_{GS} = 5V, V_{tn} = 1.2V, W/L = 70, $\mu_n C_{ox}$ = 80 μA/V. Find the Trans conductance and output resistance of the device.	6M	CO1	L3
	(OR)			
2(a)	Outline the enhancement mode NMOS transistor operation in various regions.	6M	CO1	L2
(b)	With a neat diagram explain in detail about the DC transfer characteristics of CMOS inverter.	6M	CO1	L2
3(a)	Construct the stick diagram for NMOS NOR gate.	6M	CO2	L3
(b)	Calculate the area capacitance of Metal1 to substrate with the dimensions of L=24λ & W=2λ.	6M	CO2	L3
	(OR)			
4(a)	Model the static CMOS layout for the expression [a(b+c)]'.	6M	CO2	L3
(b)	Determine the scaling factors for the following (i) Gate area (ii) Gate Capacitance (Cg) (iii) Maximum Operating frequency (iv) Power dissipation per unit area (P_a) (v) Gate delay.	6M	CO2	L3
5(a)	Model the static DCVS logic that computes (AB+C)'.	6M	CO3	L3
(b)	Analyze the "Standard Cell-Based Layout".	6M	CO3	L4
	(OR)			
6(a)	Develop 2 to 1 multiplexer using pass transistor logic.	6M	CO3	L3
(b)	Model the switch simulation.	6M	CO3	L3
7(a)	Design a 4-bit counter by using the adder.	6M	CO4	L3
(b)	Illustrate the single transistor DRAM operation.	6M	CO4	L2
	(OR)			
8(a)	Analyze the Performance of Flip-Flop Based Systems.	6M	CO4	L4
(b)	Demonstrate the state assignment procedure.	6M	CO4	L3
9(a)	Diagram the Chip Design methodology and describe the each block.	6M	CO5	L2
(b)	Illustrate the switchbox routing.	6M	CO5	L2
	(OR)			
10(a)	Outline the Global Interconnect of a chip.	6M	CO5	L2
(b)	Identify the FPGA architecture and explain.	6M	CO5	L2

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

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)	Compare the Pulse Code Modulation and Delta Modulation techniques.	6M	CO1	L2
(b)	The temperature at a particular place varies between 14^{0}C to 34^{0}C. For the purpose of transmitting the temperature record of that place using PCM, the record is sampled at an appropriate sampling rate and the samples are quantized. If the error in representation of the samples due to quantization is not to exceed ±1% of the dynamic range, what is the minimum number of quantization levels that can be used?	6M	CO1	L2
	(OR)			
2(a)	An Analog waveform with an amplitude range from -10V to +10V and bandwidth of 200Hz is to be PCM-ed and transmitted with an accuracy of ±0.2% of the dynamic range of the signal. Determine the following (i) The minimum sampling rate (ii) The number of bits/code word (iii) The minimum bit rate.	6M	CO1	L2
(b)	Derive the signal to quantization Noise ratio when a sinusoidal signal is modulated using PCM.	6M	CO1	L2
3(a)	The bit stream 11011100101 is to be transmitted using DPSK. Determine the encoded sequence and the transmitted phase sequence. Also find demodulated signal.	6M	CO2	L2
(b)	Compare BFSK, BPSK, DPSK and QPSK modulation techniques.	6M	CO2	L2
	(OR)			
4(a)	Explain the generation and detection of BFSK signal with a neat block diagram. Also draw the Signal space representation for it.	6M	CO2	L2
(b)	Explain the DPSK System with a neat block diagram. Mention its advantages and limitations.	6M	CO4	L2
5(a)	What is an optimum filter? Derive the expression for the transfer function of an optimum filter.	6M	CO3	L3
(b)	Derive an expression for the error probability of the QPSK system.	6M	CO3	L4
	(OR)			

6(a)	Derive an expression for probability of error of FSK.	6M	CO3	L3
(b)	What is matched filter? Derive the expression for signal to noise ratio of a matched filter.	6M	CO3	L3
7(a)	Define mutual information and write its properties.	6M	CO2	L2
(b)	Show that entropy of extremely likely and extremely unlikely message is zero.	6M	CO2	L3
	(OR)			
8(a)	An analog signal is band limited to 20 KHz, sampled at twice the Nyquist rate, and the samples are quantized into 4 levels. The quantization levels Q_1, Q_2, Q_3 and Q_4 are assumed independent and occur with probabilities $p_1= p_4= p_2= p_3=1/4$. Determine the information rate of the source.	6M	CO2	L3
(b)	Explain Shannon's theorem for channel capacity of analog channels.	6M	CO2	L3
9(a)	Consider a (7, 4) linear code whose generator matrix is $G=\begin{bmatrix}1&0&0&0&1&0&1\\0&1&0&0&1&1&1\\0&0&1&0&1&1&0\\0&0&0&1&0&1&1\end{bmatrix}_{4X7}$ (i) Explain encoding procedure and find all code vectors of the code. (ii) Summarize the error detection and correction capabilities of the code.	6M	CO5	L4
(b)	Explain error detection and error correction capabilities of linear block codes.	6M	CO5	L4
	(OR)			
10(a)	An error control code has the following generator matrix: $G=\begin{bmatrix}1&0&0&1&1&1\\0&1&0&1&1&0\\0&0&1&0&1&1\end{bmatrix}_{3X6}$ (i) Construct the parity check matrix H. (ii) List all the code vectors of this code. (iii) Examine the error detection and correction capabilities of the code.	6M	CO5	L4
(b)	Explain time domain approach to analysis of convolutional encoder with an example.	6M	CO5	L4

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

17EC14-TRANSMISSION LINES AND WAVE GUIDES
(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)	Derive the relationship between the Z_0 and Primary constants of Transmission Line.	6M	CO1	L2
(b)	Explain the concept of loading of a transmission line and why it is used and different types of loading along with its applications.	6M	CO1	L4
	(OR)			
2(a)	Explain frequency distortion and delay distortion of a transmission line and derive the condition for distortion less transmission line.	6M	CO1	L2
(b)	A loss less transmission line operating at 500MHz and $Z_0 = 80\Omega$, $\sigma = 0.04Np/m$, $\beta = 1.5rad/m$. Find the line parameters R, L, G, C.	6M	CO1	L3
3(a)	Define Reflection coefficient and VSWR and express the relation between them.	6M	CO1	L2
(b)	Explain the principle of impedance matching using a quarter wave transformers. Design a Quarter wave Transformer to match a line having impedance of 300 Ω to a load of 600 Ω.	6M	CO2	L5
	(OR)			
4(a)	Explain the concept of UHF lines as circuit elements of the transmission lines.	6M	CO1	L2
(b)	A certain RF transmission line is terminated in pure resistive load. The characteristic impedance of the line is 1200 Ω and the reflection coefficient was observed to be 0.2. Calculate the terminating load, which is less than characteristic impedance.	6M	CO2	L3
5(a)	What are dominant and degenerate modes in a waveguide? What is the significance of the dominant mode? Indicate the dominant mode in rectangular wave guide and calculate f_c for the same.	6M	CO3	L2
(b)	A Rectangular waveguide has a cross section of 1.5cm X0.8cm, σ =0,μ=μ0, and $\varepsilon = 4\epsilon_0$. The magnetic field component is given as H_x =2 sin $(\frac{\pi x}{a})$ cos $(\frac{3\pi y}{b})$ sin $(\pi X 10^{11t} - \beta z)$ A/m, Determine (i) The mode of operation (ii) Cut off frequency (iii) The propagation constant (iv) The phase constant (v) Wave impedance.	6M	CO3	L3
	(OR)			

6(a)	Explain briefly about impossibility of TEM Modes in waveguides	6M	CO3	L2
(b)	A Rectangular wave guide is filled by dielectric material of $\varepsilon r = 9$ and has dimensions of 7 × 3.5 cm. It operates in the dominant TE mode. (i) Determine the cut off frequency. (ii) Find the phase velocity in the guide at a frequency of 2 GHz (iii) Find the guided wave length at 2GHz.	6M	CO3	L3
7(a)	What is meant by a circular wave guide and derive the expression for the propagation of TM mode in a circular wave guide along with the expressions of cut off wavelength, guide wavelength, phase velocity and wave impedance.	6M	CO3	L2
(b)	Calculate the cut off wavelength, characteristic wave impedance of a circular waveguide whose internal diameter is 4cm for a 10GHz signal propagated in the dominant mode of TE.	6M	CO3	L3
	(OR)			
8(a)	What is meant by Quality factor and explain the Quality factor for a rectangular cavity resonator and justify that the quality factor for a rectangular cavity resonator is large at microwave frequencies?	6M	CO3	L2
(b)	Draw the field patterns of a rectangular cavity resonator for TE_{101}, TE_{111} with neat sketches and give the expression for the resonant frequency.	6M	CO3	L3
9(a)	What is meant by the re-entrant cavity and explain the significance of resonant cavity in a circular cavity resonator at resonance?	6M	CO4	L2
(b)	A circular waveguide has a radius of 3cm and is used as a resonator for TM_{011} mode at 10GHz by placing the two perfect conducting plates at its two ends. Determine the minimum distance between the two end plates.	6M	CO4	L3
	(OR)			
10(a)	Explain in detail the various losses in micro strip lines along with the Quality factor expressions.	6M	CO5	L2
(b)	Explain the significance of substrate materials used in the micro strip materials and the types of micro strip lines with neat sketches.	6M	CO5	L2

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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)	Illustrate the sharing of processor time by user program and os routines.	6M	CO1	L1
(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)	List out processor registers used in executing of instruction with their operation.	6M	CO1	L3
3.	Draw the architecture of combinational circuit Array multiplier and explain its working.	12M	CO2	L2
	(OR)			
4.	Demonstrate booth algorithm for signed multiplication and show sequence of steps for multiplication of -9 with +10.	12M	CO2	L3
5(a)	Analyze the general model of a control unit.	6M	CO3	L4
(b)	Summarize the fields of a typical microinstruction format.	6M	CO3	L2
	(OR)			
6(a)	Describe the basic organization of a micro-programmed control unit.	6M	CO3	L4
(b)	Design the control unit using Hardwired control.	6M	CO3	L6
7.	Design 2M×16 Memory module using 512K×8 Static Memory Chips.	12M	CO4	L6
	(OR)			
8.	Classify the types of mapping techniques used between cache and main memory.	12M	CO4	L4
9(a)	Categorize the functions for an I/O module.	6M	CO4	L4
(b)	Explain the Programmed I/O technique for I/O operations.	6M	CO4	L2
	(OR)			
10(a)	Use Interrupt-Driven I/O for reading in a block of data.	6M	CO4	L3
(b)	Describe the block diagram of 82C55A PPI.	6M	CO4	L2

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

17EE14-RENEWABLE ENERGY TECHNOLOGIES
(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)	Distinguish between Flate plate Collectors and Concentric collectors.	6M	CO1	L1
(b)	Write a short notes on(i) Yawing (ii)solidity (iii) torque coefficient.	6M	CO2	L1
	(OR)			
2(a)	Examine the working principle of various types of concentrating solar collectors with neat sketch.	6M	CO2	L3
(b)	Classify renewable energy sources. Compare in brief these energy sources with Alternate energy sources.	6M	CO3	L2
3(a)	Draw and discuss about solar thermal power plant.	6M	CO2	L2
(b)	Distinguish the role of Parabolic and Fresnel collector solar thermal power generation.	6M	CO2	L3
	(OR)			
4(a)	Discuss the Economic Analysis of solar thermal power plant.	6M	CO3	L2
(b)	With the help of a neat sketch describe a solar heating system using water heating of solar collectors.	6M	CO1	L1
5(a)	Discuss Applications of PV Systems briefly any two of them.	6M	CO2	L1
(b)	Classify with neat sketches, Commercially available PV modules.	6M	CO1	L2
	(OR)			
6(a)	Mention the different considerations of PV modules connected in series and parallel for deciding pv system design.	6M	CO2	L1
(b)	Discuss the necessity of using MPPT with help of PV and I-V characteristics. Which factors affected the efficiency of solar cell?	6M	CO3	L2
7(a)	Define grid interfacing. How it is interconnected with grid in wind energy conversion systems?	6M	CO1	L1
(b)	Distinguish between Grid-Tie Inverter and Hybrid Inverter with relevant figures.	6M	CO2	L2
	(OR)			
8(a)	Distinguish between 2-level and 3-level voltage source converters.	6M	CO1	L1
(b)	Discuss with neat diagrams the contribution of power electronic switching devices in renewable energy sources interconnection with grid.	6M	CO3	L4
9(a)	Describe the role of High energy capacitors in storage systems, illustrate with diagram.	6M	CO2	L1
(b)	Illustrate and discuss about a Micro turbine.	6M	CO1	L1
	(OR)			
10(a)	Construct the block diagram and describe the superconducting magnetic storage system.	6M	CO1	L2
(b)	Distinguish between the battery and superconducting magnetic storage systems.	6M	CO1	L1

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

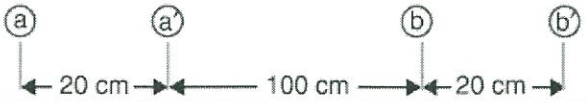
17EE12-ELECTRICAL POWER TRANSMISSION

(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)	Derive an equation of inductance for 3-phase overhead line with symmetrical spacing.	6M	CO3	L2
(b)	In a single-phase line (See Fig.), conductors a and a' in parallel form one circuit while conductors b and b' in parallel form the return path. Calculate the total inductance of the line per km assuming that current is equally shared by the two parallel conductors. Conductor diameter is 2·0 cm. 	6M	CO3	L3
	(OR)			
2(a)	Discuss the concept of GMR and GMD.	6M	CO3	L2
(b)	Calculate the capacitance of a single-phase transmission line 35Km long consisting of two parallel wires each 5 mm in diameter and 1.8 m apart. The height of each conductor above the ground is 7.5 m.	6M	CO3	L3
3(a)	Illustrate the ferranti effect in the overhead lines.	6M	CO1	L2
(b)	Evaluate ABCD constants of medium lines in nominal-T method.	6M	CO1	L2
	(OR)			
4(a)	Classify the transmission lines with respect to voltage and distance.	6M	CO1	L1
(b)	A single phase overhead line is transmitting 1200KW power to a factory at 11KV and 0.8 power factor lagging. The total resistance and loop reactance of the line are 3Ω and 4.5Ω respectively. Determine (i) The voltage at the sending end (ii) The sending end power factor (iii) Percentage regulation (iv) Transmission efficiency.	6M	CO1	L3
5(a)	Describe the effect of wind and ice loading on the sag.	6M	CO2	L2
(b)	A 132 kV transmission line has the following data : Wt. of conductor = 680 kg/km ; Length of span = 260 m; Ultimate strength = 3100 kg ; Safety factor = 2 Calculate the height above ground at which the conductor should be supported. Ground clearance required is 10 meters.	6M	CO2	L3
	(OR)			
6(a)	Derive the capacitance of single-core cable.	6M	CO2	L2
(b)	Illustrate the insulating materials used for underground cables.	6M	CO2	L2
7.	Define String efficiency and evaluate it for 3-disc string.	12M	CO4	L2
	(OR)			
8(a)	Discuss the critical voltages during the corona effect.	6M	CO4	L2
(b)	A 3-phase line has conductors 2 cm in diameter spaced equilaterally 1m apart. If the dielectric strength of air is 30 kV (max) per cm, find the disruptive critical voltage for the line. Take air density factor δ = 0·952 and irregularity factor m_0 = 0·9.	6M	CO4	L3
9(a)	Analyze the reflection and refraction of voltage and current waves for open end line.	6M	CO5	L2
(b)	A surge of 10KV magnitude travels along a cable towards its junction with an overhead line. The inductance & capacitance of the cable and overhead line are respectively 0.3mH, 0.4μF & 1.5mH, 0.012μF. Find the voltage rise at the junction due to surge.	6M	CO5	L3
	(OR)			
10(a)	Derive the per unit impedance quantities for three phase system.	6M	CO5	L2
(b)	List the advantages of per unit system.	6M	CO5	L1

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

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)	Explain the Constructional details and working principle of three phase induction motor with neat sketch?	6M	CO1	L2
(b)	A 12 pole three phase 600v, 50Hz, star Connected, induction motor has rotor resistance and stand still reactance of 0.03 and 0.5 ohm per phase respectively. Calculate (i) Speed maximum torque (ii) Ratio of full load torque to the maximum torque if the full load speed is 495rpm.	6M	CO2	L3
	(OR)			
2(a)	Explain the phenomenon of Cogging and crawling in Induction motor.	6M	CO2	L2
(b)	A three phase star Connected 400V, 50Hz four pole induction motor has the following per phase parameters in ohms, refer to the stator. R1=0.15, X1=0.45 R21=0.12, X21=0.45 Xm=28.5 Compute the stator current and power factor when the motor is operated at rated voltage and frequency with s=0.04.	6M	CO2	L3
3(a)	Classify different starting methods for induction motor and Explain the auto transformer starting method for three phase induction motor?	6M	CO2	L4
(b)	A six pole, 50Hz three phase induction motor running at 960rpm on full load 4% slip develops a torque of 149.3N-m at its pulley rim. The friction and Windage losses are 200W and stator Cu and iron loses equal 1,620W. Calculate the i) Output power ii) the rotor Cu losses iii) the efficiency at full load.	6M	CO2	L4
	(OR)			
4.	A 415-V, 29.84KW, 50Hz , delta Connected motor gave the following text data No-Load : 415V, 21A, 1,250W Short circuit : 100V, 45A, 2,730W Construct the circle diagram and determine (i) The line current and power factor for rated output (ii) The Maximum torque. Assume Stator and Rotor Cu loss at stand still.	12M	CO2	L4
5(a)	Explain how to make the single phase induction motor self - start by split phase method.	6M	CO3	L2

(b)	Explain the Construction and working of shaded pole single phase induction motor.	6M	CO3	L2
	(OR)			
6(a)	Draw and explain the Torque Speed characteristics of single phase induction motor.	6M	CO3	L4
(b)	Find the mechanical power output at as slip of 0.05 of the 185-W, 4-pole,110-V, 60H-z single phase induction motor whose Constants are given below R_1=1.86 ohm, X_1=2.56 ohm R_2=3.56 ohm, X_2=2.56 ohm, X_m=53.5 ohm.	6M	CO3	L5
7(a)	Derive the EMF equation of an alternator.	6M	CO2	L4
(b)	The stator of a three phase, 16 pole alternators has 144 slots and three are four Conductors per slot Connected in two layers and the Conductors of each phase are Connected in series. If the speed of the alternator is 375 r.p.m, Calculate the emf induced per phase. Resultant flux in the air gap is 5 X 10-2 Webers per pole sinusoidal distributed. Assume the COil span as 1500 electrical.	6M	CO2	L5
	(OR)			
8(a)	Explain the procedure for the determination of voltage regulation by ZPF Method.	6M	CO2	L2
(b)	A 750-KVA, 11KV, 4 pole, 3 phase, star Connected alternator has percentage resistance and reactance of 1 and 15respectivally. Calculate the synchronizing power per mechanical degree of displacement at (i) No-load (ii) At full load 0.8 P.F lag. The terminal voltage in each case is 11KV.	6M	CO2	L3
9(a)	Classify different torques in synchronous motor, and derive the expression for the power developed by a synchronous motor.	6M	CO4	L4
(b)	A75 KW, 400-V, 4-pole three phase star Connected synchronous motor has resistance and synchronous reactance per phase of 0.04 ohm and 0.4 ohm respectively. Compute for full load 0.8 p.f lead the open circuit emf per phase and mechanical power developed. Assume an efficiency of 92.5%.	6M	CO4	L3
	(OR)			
10(a)	Explain the effect of excitation on armature Control and power factor for synchronous motor.	6M	CO4	L2
(b)	A 6600V Star Connected three phase synchronous motor works at Constant voltage and Constant excitation. Its synchronous reactance is 20 Ohm per phase and armature resistance negligible. When the input power is 1000KW, the power factor is 0.8 leading. Find the power angle and power factor when the input is increased to 1500kW.	6M	CO4	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

17EC22-MICROPROCESSORS AND MICROCONTROLLERS
(EEE,EIE&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)	Discuss how pipelined architecture is implemented in 8086	6M	CO1	L2
(b)	Explain the following assembler directives: (i) DB (ii) SEGMENT (iii) PROCEDURE	6M	CO2	L2
	(OR)			
2(a)	List the string instructions and the operations they perform.	6M	CO2	L1
(b)	Explain the function of Flag register, and discuss each flag bit functionality with relevant example.	6M	CO1	L4
3.	Analyze the Minimum Mode Configuration of 8086 Microprocessor in detail with read and write timing diagram.	12M	CO1	L4
	(OR)			
4(a)	What is an interrupt vector table of 8086? Explain its structure.	6M	CO1	L2
(b)	Explain the read and write timing diagrams of 8086-Maximum mode with neat sketch.	6M	CO1	L2
5.	Illustrate the control word formats of 8259: (i) Initialization Command Words(ICWs) (ii) Operational Command words(OCWs).	12M	C03	L3
	(OR)			
6(a)	Analyze the interfacing of 8255 with the DAC to generate a Saw tooth waveform on a display device connected to Port A with a neat circuit diagram.	6M	CO4	L4
(b)	Identify the different modes of operation of 8255 and give a detailed explanation.	6M	CO3	L1
7(a)	Illustrate the differences between the external and internal program memory of 8051.	6M	CO1	L3
(b)	List and explain arithmetic instructions of 8051 microcontroller with suitable examples.	6M	CO2	L2
	(OR)			
8(a)	List and Explain the instructions used to access external RAM.	6M	CO2	L1
(b)	Explain different addressing modes of 8051 and explain each mode with example.	6M	CO2	L2
9(a)	What is a timer? Draw and explain the special function registers of the timers of 8051.	6M	CO1	L2
(b)	What are interrupts? What are various interrupts supported by 8051microcontrollers? Specify the priority of these interrupts.	6M	CO1	L1
	(OR)			
10(a)	Discuss the interfacing procedure of Seven segment display with the 8051microcontroller.	6M	CO4	L2
(b)	Discuss Serial communication control in 8051 microcontroller.	6M	CO1	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 various stages in op-amp with block diagram.	6M	CO1	L2
(b)	Explain the DC characteristics of an op-amp briefly.	6M	CO1	L2
	(OR)			
2(a)	With neat sketch explain the operation of instrumentation amplifier.	6M	CO1	L2
(b)	Explain the operation of differentiator using OP-AMP.	6M	CO1	L2
3(a)	Design first order LPF for the given cut-off frequency as 400HZ.	6M	CO2	L3
(b)	Explain the circuit operation of square wave generator.	6M	C01	L2
	(OR)			
4(a)	Draw the all pass filter and derive the gain and phase angle equation.	6M	C02	L3
(b)	Discuss the operation of RC phase shift oscillator.	6M	C01	L2
5(a)	With neat sketch explain the operation of a stable multivibrator using 555 timer.	6M	CO1	L2
(b)	Draw the circuit of R-2R ladder type Digital to Analog converter and derive expression for output analog voltage.	6M	CO1	L3
	(OR)			
6(a)	Explain the block diagram of PLL and its working.	6M	CO1	L2
(b)	With neat sketch explain the operation of dual slope Analog to Digital converter.	6M	CO1	L2
7(a)	Analyze the TTL logic of NAND gate.	6M	CO3	L4
(b)	Design 16x4 encoder using two no. of 74XX148 8x3 encoders and additional logic gates.	6M	CO3	L3
	(OR)			
8(a)	With neat diagrams discuss IC interfacing.	6M	CO3	L2
(b)	Design 32x1 multiplexer using IC 74X151.	6M	CO3	L3
9(a)	Sketch the architecture of ROM and explain.	6M	CO4	L2
(b)	Describe and compare various memory devices.	6M	CO4	L2
	(OR)			
10(a)	Explain about operation of SDRAM with diagrams.	6M	CO4	L2
(b)	Draw the logic diagram of DRAM and explain.	6M	CO4	L2

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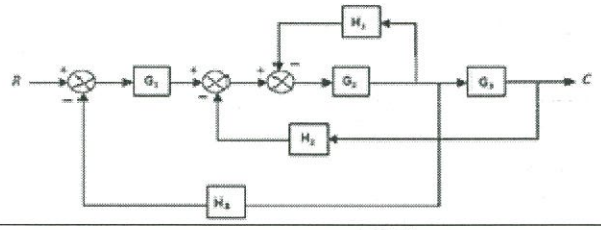
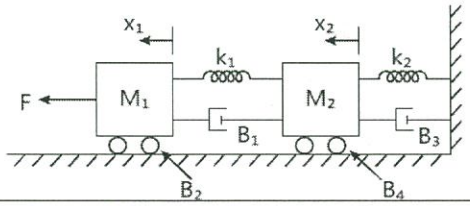
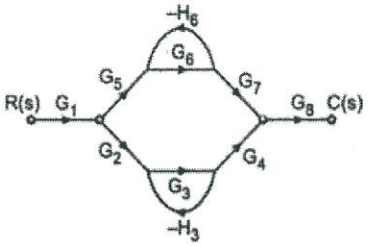
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

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 are the various types of control systems? Give an example of each. What are the advantages and disadvantages of open loop and closed loop systems?	6M	CO1	L1
(b)	Using block diagram reduction technique, obtain closed loop transfer function of the figure given below. 	6M	CO1	L3
	(OR)			
2(a)	Write the differential equations, find the transfer function $\frac{X_1(s)}{F(s)}$ and also obtained force Voltage analogy for the system shown in figure. 	6M	CO1	L2
(b)	Find transfer function $\frac{C(s)}{R(s)}$ by mason's gain formula. 	6M	CO1	L3
3(a)	Derive the expression for time response of second order system for under damped case when input is step.	6M	CO1	L4
(b)	A unity feedback system has the forward transfer function $G(s) = \frac{K_1(2S+1)}{S(5S+1)(1+S)^2}$. The input r(t) = 1+6t is applied to the systems. Determine the minimum value of k_1 if the steady state error (e_{ss}) is to be less than 0.1.	6M	CO1	L4
	(OR)			

4 (a)	Derive the expression for the time response of first order system excited by Unit step, Unit ramp and Unit parabolic input and determine the steady state error.	6M	CO1	L4
(b)	A unity feedback control system is given by an open loop transfer function $G(s)=\frac{k}{s(s+8)}$. Find out (i) The value of K for ξ=0.5 (ii) for this value of K find rise time and maximum peak Overshoot for unit step input.	6M	CO1	L4
5 (a)	Write short notes on correlation between time domain and frequency domain specifications.	6M	CO2	L1
(b)	Sketch the polar plot for the following transfer function $G(S)=\frac{(1+0.2S)(1+0.025S)}{S^3(1+0.005S)(1+0.001S)}$.	6M	CO2	L4
	(OR)			
6 (a)	Derive an expression for Resonat peak (Mr) of the second order system.	6M	CO2	L2
(b)	Sketch the bode plot for the following transfer function and determine system gain K for the gain cross over frequency ω_c to be 5 rad/sec. $G(s)=\frac{ks^2}{(1+0.2s)(1+0.02s)}$.	6M	CO2	L4
7 (a)	Draw the root locus diagram for a closed loop system whose loop transfer function is given by $G(s)H(s)=\frac{k}{s(s+5)(s+10)}$. Comment on the stability.	6M	CO3	L3
(b)	List the differences between Lag compensator and Lead compensator.	6M	CO3	L3
	(OR)			
8 (a)	Define stability. What do you mean by absolute stability and limitedly stability? Explain the Routh-Hurwitz stability criterion with suitable example.	6M	CO3	L3
(b)	Determine the range of K for the following system to be stable using R.H. criterion. $G(s)=\frac{k}{s(s+4)(s^2+2s+2)}$	6M	CO3	L3
9 (a)	Write all the properties of state transition matrix.	6M	CO4	L3
(b)	Obtain two differential state representations for the system with transfer function $\frac{Y(S)}{U(S)}=\frac{2}{S^3+6S^2+11S+6}$.	6M	CO4	L3
	(OR)			
10 (a)	For a system represented by the state equation $\dot{x}=AX(t)$ the response is $X(t)=\begin{bmatrix} e^{-3t} \\ -2e^{-2t} \end{bmatrix}$ when $x(0)=\begin{bmatrix} 1 \\ -2 \end{bmatrix}$ and $X(t)=\begin{bmatrix} e^{-t} \\ -e^{-t} \end{bmatrix}$ when $X(0)=\begin{bmatrix} 1 \\ -1 \end{bmatrix}$ Dtermine the system matrix A and state transition Matrix.	6M	CO4	L4
(b)	Given $A1=\begin{bmatrix} \sigma & 0 \\ 0 & \sigma \end{bmatrix}$; $A2=\begin{bmatrix} 0 & \omega \\ -\omega & 0 \end{bmatrix}$; $A=\begin{bmatrix} \sigma & \omega \\ -\omega & \sigma \end{bmatrix}$ Compute e^{At}.	6M	CO4	L4

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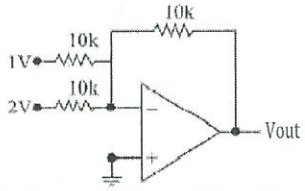
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17EI06-INTEGRATED CIRCUITS AND APPLICATIONS
(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)	Draw block diagram of operational amplifier and explain each block.	6M	CO1	L1
(b)	Compare ideal and practical parameters of op-amp.	6M	CO1	L2
	(OR)			
2(a)	Describe the working of op-amp as a comparator with neat diagram.	6M	CO2	L2
(b)	Identify the configuration of a given Op-amp circuit and then find output voltage. 	6M	CO2	L2
3(a)	Draw the diagram of wide band pass filter and derive an equation for gain.	6M	CO1	L2
(b)	Design Butter worth low pass filter of first order with a cutoff frequency of 15 kHz and a pass band gain of 1.5 using op-amp.	6M	CO1	L3
	(OR)			
4(a)	Discuss and derive equations for RC phase shift oscillator.	6M	CO2	L2
(b)	Draw the circuit diagram of triangular wave generator and explain the operation.	6M	CO2	L3
5(a)	Construct PLL using proper blocks and explain importance of each block.	6M	CO3	L3
(b)	Draw and discuss block diagram of voltage controlled oscillator.	6M	CO3	L2
	(OR)			
6(a)	With the help of a neat diagram, explain the working of a weighted-resistor D/A converter.	6M	CO3	L1
(b)	Explain the following for an ADC : (i) Input stage (ii) Resolution (iii) Accuracy (iv) Quantization error.	6M	CO3	L2
7(a)	Draw the circuit of a TTL NAND gate and explain its operation in brief.	6M	CO4	L2
(b)	Compare decoder and de-multiplexers with suitable block diagrams.	6M	CO4	L2
	(OR)			
8(a)	Describe Tri-state logic inverter with the help of a circuit diagram.	6M	CO4	L2
(b)	What is meant by a priority encoder? Name the 7400 series TTL chip acting as encoder.	6M	CO4	L1
9.	Draw the logic diagram of 16-bit ROM Array and explain its principle of operation.	12M	CO5	L2
	(OR)			
10(a)	Distinguish ROM, PROM and EPROM.	6M	CO5	L2
(b)	Why dynamic RAMs require refreshing? Justify.	6M	CO5	L3

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

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.	Question	Marks	CO	BL
1(a)	Derive an expression for AM wave and draw its frequency spectrum.	6M	CO3	L3
(b)	Discuss the Generation of AM wave in square law Modulator in detail.	6M	CO1	L2
	OR			
2(a)	Compare the AM, DSBSC and SSBSC.	6M	CO2	L2
(b)	Determine modulation efficiency(η) and percentage of total power carried by the sidebands of AM wave for single-tone modulation when modulation index(μ) is 0.5 and 0.3	6M	CO3	L3
3(a)	Derive the expression for narrow band FM.	6M	CO3	L3
(b)	Discuss the Phase description method of FM Demodulation.	6M	CO1	L2
	OR			
4(a)	Derive the expression for the Bandwidth of FM Wave for Sinusoidal and Non-Sinusoidal modulation.	6M	CO3	L3
(b)	Explain the generation of WBFM using Indirect method.	6M	CO1	L2
5(a)	Discuss the PWM modulator with near diagram.	6M	CO1	L2
(b)	Compare and Contrast PAM, PWM and PPM.	6M	CO4	L2
	OR			
6(a)	Discuss different types of sampling techniques.	6M	CO1	L2
(b)	What is noise? Give classification of different types of noises.	6M	CO1	L2
7(a)	Write down the modulation waveforms for transmitting binary information over baseband channels, for ASK, FSK and PSK modulation schemes.	6M	CO1	L2
(b)	What are the advantages and disadvantages of digital modulation schemes?	6M	CO4	L2
	OR			
8(a)	Discuss the coherent detection for the ASK detector.	6M	CO1	L2
(b)	The bit stream 1011100011 is to be transmitted using BPSK, determine the phase sequence and draw the neat waveforms.	6M	CO3	L3
9(a)	Summarize the DPCM transmitter and receiver.	6M	CO1	L2
(b)	Why the predictor is used in DPCM system?	6M	CO1	L2
	OR			
10(a)	What are advantages of Digital communication over Analog communication?	6M	CO4	L2
(b)	Derive the expression for Signal to Quantization Noise ratio in Delta Modulation (DM) system.	6M	CO3	L3

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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)	Write any six key features of RTOS.	6M	CO1	L1
(b)	Explain the history of embedded system.	6M	CO1	L2
	(OR)			
2(a)	How to handle Interrupt Source Calls in Real- Time Operating Systems?	6M	CO1	L1
(b)	Explain basic real time service polling technique with the help of pseudo code and state diagram.	6M	CO1	L2
3(a)	Interpret the Cortex-M3 design of static memory allocation.	6M	CO2	L3
(b)	Illustrates Free RTOS.	6M	CO2	L2
	(OR)			
4(a)	Illustrate the various features of dynamic memory allocation.	6M	CO2	L2
(b)	Analyze the set jump and long jump of static memory allocation	6M	CO2	L4
5(a)	Illustrate the semaphores signal without polling.	6M	CO3	L2
(b)	Explain the process of handle missed deadlines.	6M	CO3	L2
	(OR)			
6(a)	Explain the graphical synchronization of petri nets.	6M	CO3	L2
(b)	Interpret resource managers.	6M	CO3	L2
7(a)	Illustrate one technique for preventing deadlock during the design.	6M	CO4	L2
(b)	Explain the priorities of message communication.	6M	CO4	L2
	(OR)			
8(a)	Explain the deadlock detection and recovery.	6M	CO4	L2
(b)	Illustrate the synchronization coordination through election algorithm.	6M	CO4	L2
9(a)	Explain the relational database of data management.	6M	CO5	L2
(b)	Show the file organization of file management.	6M	CO5	L2
	(OR)			
10(a)	Illustrate the role of Hash tables of data management	6M	CO5	L2
(b)	Explain the Keli RTX RTOS of file management.	6M	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(a)	Discuss the significance of Means Ends Analysis problem solving technique with an example.	6M	CO1	L2
(b)	Summarize Goal based agent and Simple reflex agent.	6M	CO1	L1
	(OR)			
2(a)	Demonstrate AND-OR graphs with the help of an example.	6M	CO1	L2
(b)	Illustrate the best first search algorithm with an example.	6M	CO1	L2
3(a)	Discuss any four techniques of knowledge representation.	6M	CO2	L1
(b)	Summarize the importance and features of predicate logic using suitable examples.	6M	CO2	L2
	(OR)			
4(a)	Demonstrate the concept of resolution with an example.	6M	CO2	L2
(b)	Summarize the concept of Weak slot filler structure.	6M	CO2	L2
5(a)	Demonstrate the importance of rule based system with an example.	6M	CO3	L2
(b)	Discuss the significance of Dempster-Shafer theory with example.	6M	CO3	L2
	(OR)			
6(a)	Describe the Bayes networks with an example.	6M	CO3	L2
(b)	Demonstrate various fuzzy set applications and Draw the architecture of fuzzy logic.	6M	CO3	L3
7(a)	Compare conditional planning and continuous planning.	6M	CO4	L2
(b)	Outline the process of Neural Net Learning.	6M	CO4	L2
	(OR)			
8(a)	Describe Reinforcement Learning with suitable example	6M	CO4	L1
(b)	Outline the genetic learning mechanism with example.	6M	CO4	L2
9.	Discuss Mini-max algorithm and alpha-beta cutoffs with an example.	12M	CO5	L2
	(OR)			
10(a)	Summarize any four applications of Robotics.	6M	CO5	L2
(b)	Describe the working of Ant Colony System.	6M	CO5	L2

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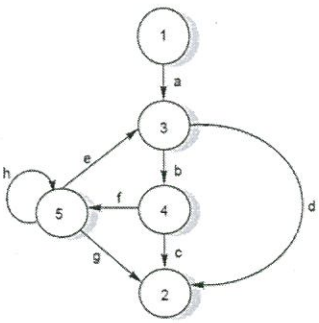
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations
17CI10-SOFTWARE ENGINEERING

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)	Define "Software Engineering". When a "Bath Tub Curve" and "Ideal Curve" occurs.	6M	CO1	L2
(b)	Why "Software Engineering" is called as "Layered Technology"? Justify your answer with a neat figure.	6M	CO1	L2
	(OR)			
2(a)	What is a process pattern? What are the templates that can be used to describe a process pattern?	6M	CO1	L1
(b)	Define software process. What are the generic framework activities those are present in every software process?	6M	CO1	L1
3(a)	List out the different phases of Unified Process with a neat diagram.	6M	CO2	L1
(b)	What are the Core Principles of SE Practices? Memorise those Principles briefly.	6M	CO2	L1
	(OR)			
4(a)	How RAD Model is used in Software Development? Explain with a diagram.	6M	CO2	L2
(b)	Compare "Incremental Model" and "RAD Model".	6M	CO2	L4
5(a)	Illustrate different Requirements Engineering tasks briefly.	6M	CO3	L2
(b)	How you develop Use Cases? Draw the diagram for building a use case Model with example.	6M	CO3	L3
	(OR)			
6.	Analyze Class-Based Modeling with diagrams.	12M	CO3	L4
7.	Explain different Design Concepts in Design Engineering.	12M	CO4	L2
	(OR)			
8(a)	When a design is said to be Complete and Sufficient?	6M	CO4	L1
(b)	Describe about data-centered and Layered architectural styles.	6M	CO4	L2
9.	Discuss about Flow Graph Notations with an example.	12M	CO5	L4
	(OR)			
10(a)	With the help of diagram, Explain about Bottom-Up Integration Testing.	6M	CO5	L4
(b)	Consider the Flow graph shown below. Draw the graph and connection matrices 	6M	CO5	L3

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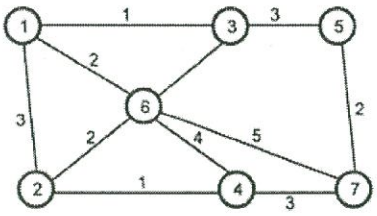
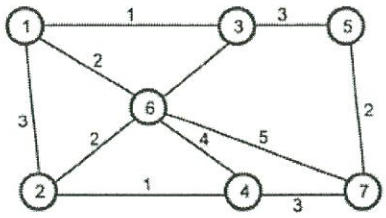
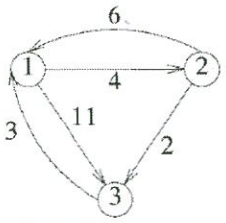
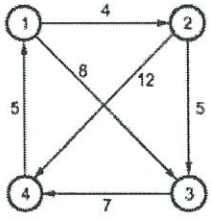
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

17CI08-DESIGN AND ANALYSIS OF ALGORITHMS
(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)	Calculate the time complexity of binary search.	6M	CO1	L2
(b)	Calculate the time complexity of Merge sort and Quick Sort.	6M	CO1	L2
	(OR)			
2(a)	Break down the given elements to find the maximum and minimum elements using divide and conquer strategy. The elements are 15,73,-9,7,16,42,49,11,5,-1.	6M	CO1	L3
(b)	Define algorithm. List the 5 criteria's that an algorithm should satisfy and also four distinct area to study the algorithm.	6M	CO1	L1
3(a)	Diagram minimum cost spanning tree for the following graph by using prim's algorithm. 	6M	CO2	L3
(b)	Diagram minimum cost spanning tree for the following graph by using Kruskal's algorithm. 	6M	CO2	L3
	(OR)			
4(a)	Summarize Job sequencing with deadlines problem and show optimal sequence for the jobs (p1,p2,p3,p4)= (100,10,15,27) and deadlines (d1,d2,d3,d4)=(2,3,2,1).	6M	CO2	L3
(b)	Summarize Knapsack problem and calculate the optimal solution for the knapsack instance of n=4; M=15, (p1, p2, p3, p4) = (10, 10, 12, 18); (w1, w2, w3, w4) = (2, 4, 6, 9).	6M	CO2	L3
5(a)	Show the solution for knapsack instance of m=11,n=5 and P_i=(5,4,7,2,3) and W_i=(4,3,6,2,2) by using Dynamic Programming.	6M	CO3	L3

(b)	Calculate shortest path between all pairs of vertices by using dynamic programming method for the following graph.  	6M	CO3	L3
	(OR)			
6(a)	Describe the procedure of Reliability design. Model a three stage system with device types d1,d2,d3, costs are 30/-, 15/-,20/- and the cost of entire system is 105/- and the reliabilities are 0.9,0.8,0.5.	6M	CO3	L3
(b)	Calculate the shortest path between all pairs of vertices by using dynamic programming method for the following graph.  	6M	CO3	L2
7(a)	Show solution set for 8 queen problem.	6M	CO4	L2
(b)	Diagram the state space tree to find the positions of 4 queens on a 4X4 chessboard.	6M	CO4	L2
	(OR)			
8(a)	Illustrate graph coloring problem.	6M	CO4	L2
(b)	Diagram the state space tree for the given graph with n=3 colors, using backtracking search method.  	6M	CO4	L3
9.	Describe 0/1knapsack problem. Calculate the solution for the knapsack instance of n = 4; M = 15, (p_1, p_2, p_3, p_4) = (10, 10, 12, 18); (w_1, w_2, w_3, w_4) = (2, 4, 6, 9) by using FIFO Branch and Bounch.	12M	CO5	L2
	(OR)			
10.	Discuss about Travelling salesperson problem. Solve the TSP for the given cost matrix using Branch and Bound algorithm. $\begin{bmatrix} \infty & 11 & 10 & 9 & 6 \\ 8 & \infty & 7 & 3 & 4 \\ 8 & 4 & \infty & 4 & 8 \\ 11 & 10 & 5 & \infty & 5 \\ 6 & 9 & 5 & 5 & \infty \end{bmatrix}$	12M	CO5	L3

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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

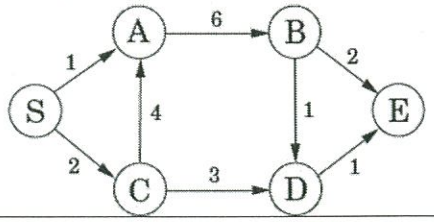
17CI17-DATA COMMUNICATIONS AND COMPUTER NETWORKS

(IT)

Time : 3 hours Max. Marks : 60

Answer all questions with either or choice

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define Physical address, IP address, Port address and Socket address.	6M	CO1	L1
(b)	Discuss the functionalities of different layers in TCP/IP model with the help of neat sketch.	6M	CO1	L2
	(OR)			
2(a)	Define piggybacking and explain in detail about ARQ technique with the help of diagram.	6M	CO1	L1
(b)	Describe any two guided transmission media techniques with the help diagrams.	6M	CO1	L1
3(a)	Design an algorithm for CRC. Calculate the checksum for given M(x) = x^7+x^6+x^4+x^3+x+1 and the generator polynomial is g(x) = x^4+x+1 using CRC on both sending side, receiving side.	6M	CO2	L3
(b)	A bit word 1011 is to be transmitted. Construct the even parity 7-bit hamming code for this data.	6M	CO2	L3
	(OR)			
4.	Design an algorithm for One bit stop -and-wait ARQ protocol for sender side and receiver side.	12M	CO2	L3
5.	Describe in detail about Random access protocols.	12M	CO3	L1
	(OR)			
6(a)	Differentiate between FDMA and TDMA.	6M	CO3	L2
(b)	List out the functionalities of Router, Switch and Hub.	6M	CO3	L1
7(a)	Explain how congestion is control is performed by token bucket algorithm? Explain with neat diagram.	6M	CO4	L2
(b)	Examine the steps involved in Dijkstra's algorithm to find out shortest path. Derive the shortest route from the origin "S" to the destination "E" using Dijkstra's Algorithm. 	6M	CO4	L3
	(OR)			
8(a)	Draw ARP packet header format and explain each field in the header.	6M	CO4	L2
(b)	Illustrate elements of Transport layer protocols.	6M	CO4	L3
9(a)	What is the use of DNS? Explain the classification of various domains.	6M	CO5	L1
(b)	What is cryptography? Explain RSA algorithm with an example.	6M	CO5	L1
	(OR)			
10(a)	List out the functionalities of FTP, Telnet protocols.	6M	CO5	L1
(b)	Give any two examples for both Substitutions and Transposition Ciphers.	6M	CO5	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

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)	What do you mean by primary and secondary energy sources? Mention the difference between them with suitable example.	6M	CO1	L2
(b)	Explain any one of the geothermal energy conversion technologies.	6M	CO2	L2
	(OR)			
2(a)	What are the applications of solar energy?	6M	CO1	L1
(b)	What are the properties of biogas?	6M	CO2	L1
3(a)	Explain about contamination of ground water.	6M	CO2	L2
(b)	What are the effects of global warming?	6M	CO4	L1
	(OR)			
4(a)	Discuss any two case studies related to pollution of environment in detail.	6M	CO4	L2
(b)	Elucidate atmospheric Ozone depletion.	6M	CO3	L2
5(a)	Define air pollution. Discuss causes and effect of air pollution.	6M	CO4	L1
(b)	Give an account of the impacts of noise pollution on human beings.	6M	CO4	L2
	(OR)			
6(a)	What are the sources of solid wastes?	6M	CO3	L1
(b)	Illustrate the effects and control measures of urban industrial waste.	6M	CO3	L2
7.	Elaborate the causes, effects and control measures of Thermal Pollution.	12M	CO4	L2
	(OR)			
8(a)	What do you understand by pollutants? Describe different types of pollutants.	6M	CO4	L2
(b)	Explain the impact of air and water pollution from thermal power plants on environment.	6M	CO4	L2
9(a)	Analyse risk assessment with a case study.	6M	CO5	L4
(b)	Differentiate natural and Artificial lighting.	6M	CO5	L2
	(OR)			
10(a)	Explain Global warming potential.	6M	CO5	L2
(b)	What are the sources and effects of Noise.	6M	CO5	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

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)	What is meant by renewable energy sources? Differentiate renewable energy sources and non-conventional energy sources with two examples each. What are the prospects of renewable energy sources in India?	6M	CO1	L2
(b)	With a neat sketch explain the construction and working of a solar pond. Also, draw a line diagram for power generation using solar pond.	6M	CO1	L1
	(OR)			
2(a)	Define the fill factor of a solar cell. What is Shockley-Queisser efficiency limit for a PV panel? List the assumptions considered for this theory.	6M	CO1	L2
(b)	With a neat sketch explain the construction and working of a solar water heating system.	6M	CO1	L1
3(a)	Using the Betz model of a wind turbine, derive the expression for power extracted from wind. What is the maximum theoretical power that can be extracted and under what condition?	6M	CO2	L5
(b)	Wind at one standard atmospheric pressure and 15°C has a speed of 10 m/s. A 10 m diameter wind turbine is operating at 5 rpm with a maximum efficiency of 40%. Calculate the (i) total power density in wind stream (ii) maximum power density (iii) actual power density (iv) power output of the turbine and (v) axial thrust on the turbine structure.	6M	CO2	L5
	(OR)			
4(a)	Distinguish the following geothermal energy sources. (i) Hot Water Reservoirs (ii) Natural Stem Reservoirs (iii) Geo-pressured Reservoirs (iv) Hot Dry Rock and (v) Molten Magma.	6M	CO2	L4
(b)	With neat sketches differentiate power extraction methods for ocean thermal energy and geothermal energy.	6M	CO2	L2
5(a)	With neat sketches explain the working of closed and open ocean thermal energy conversion systems.	6M	CO3	L1
(b)	How can power be extracted from wave motion? Explain transverse waves and longitudinal waves.	6M	CO3	L3
	(OR)			

6.	During the tide cycle, a difference between the high and low water of a tide was observed to be 5.5m. It was estimated that the estuary's area = 0.5 km^2 which can generate power for 3 hours in each cycle. Assuming the average available head to be 5 m and the overall efficiency of generation to be 75%, calculate (i) the power at any instant and (ii) the total energy in the year. (Take specific gravity of seawater =1025kg/m^3).	12M	CO3	L5
7.	Give examples for biogas. What raw materials can be used for the production of biogas? What is the biogas yield of cow dung? How much LPG a biogas plant with gas production of 2 m^3/day can replace in a month?	12M	CO4	L4
	(OR)			
8(a)	With neat sketches compare the relative performances of a floating drum and fixed dome type biogas plants.	6M	CO4	L2
(b)	Explain the process for the production of biogas from biomass. What are the main advantages of anaerobic digestion of biomass?	6M	CO4	L1
9(a)	With a neat sketch explain the construction and working of a seeded inert gas carrier-based closed-cycle magnetohydrodynamic (MHD) generator.	6M	CO5	L1
(b)	Compare PEM and MCFC fuel cells by providing their electrolyte, operating temperature range and electrochemical reactions.	6M	CO5	L2
	(OR)			
10(a)	In what way the thermoelectric and thermionic power generation methods are different. Discuss with neat sketches.	6M	CO5	L2
(b)	By comparing MHD generator to a Rankine cycle based power plant list out its advantages and disadvantages.	6M	CO5	L2

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(AUTONOMOUS)

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

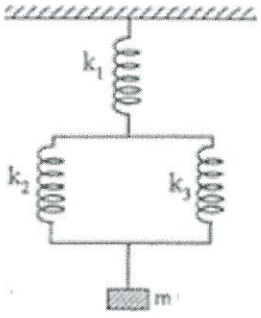
B.Tech. (V Semester) Regular/Supplementary Examinations

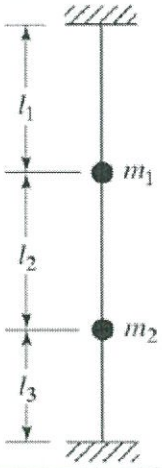
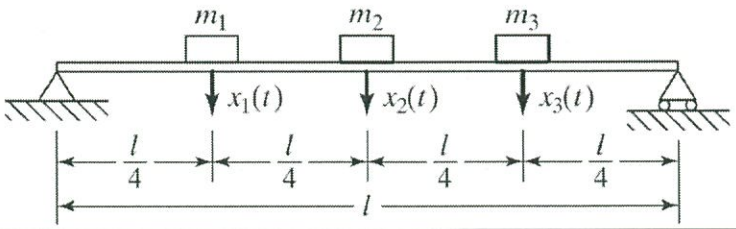
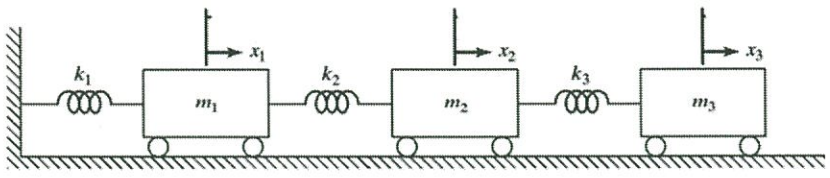
17ME17-MECHANICAL VIBRATIONS

(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)	Differentiate free and forced vibrations.	6M	CO1	L1
(b)	A steel shaft 6 cm diameter and 50 cm long fixed at one end carries a flywheel of mass 100 kg and radius of gyration 30 cm at its free end. Calculate the frequency of free longitudinal vibration.	6M	CO1	L3
	(OR)			
2(a)	Derive equivalent stiffness matrix when springs are in series.	6M	CO1	L1
(b)	Determine the natural frequency of spring mass system shown in figure take m= 15Kg, K_1= 1500N/m and K_2= K_3=2000N/m. 	6M	CO1	L3
3(a)	Differentiate damping coefficient and damping ratio.	6M	CO2	L1
(b)	A vibrating system consists of a mass of 50 kg, a spring with a stiffness of 30 KN/m and a damper. The damping provided is only 20% of the critical value. Determine the (i) damping factor (ii) critical damping coefficient (iii) natural frequency of damped vibrations (iv) logarithmic decrement (v) ratio of two consecutive amplitudes.	6M	CO2	L3
	(OR)			
4(a)	Explain the need of damping and its applications.	6M	CO2	L2
(b)	A vibrating system consists of a mass 50 kg, a spring of stiffness 30KN/m and a damper. The damping provided is only 20% of the critical value. Calculate: (i) The damping factor. (ii) The critical damping coefficient. (ii) The logarithmic decrement. (iii) The natural frequency of damped vibrations. (iv) The ratio of two consecutive amplitudes.	6M	CO2	L3
5(a)	A machine of 50kg is supported on a spring of stiffness 500kN/m and has an unbalanced rotating element, which results in a disturbing force of 250N and at a speed of 2400rpm.Assuming a damping factor of 0.15. Determine the transmissibility and the transmitted force.	6M	CO3	L3

(b)	Discuss vibration isolation and transmissibility in detail.	6M	CO3	L1
	(OR)			
6 (a)	Explain the type of mounts used for rotating machines.	6M	CO3	L2
(b)	Discuss in detail about vibration measuring instruments.	6M	CO3	L2
7 (a)	Calculate the natural frequencies and mode shapes of two-rotor torosinal system.	6M	CO4	L3
(b)	What are the applications of two rotor and three rotor system?	6M	CO4	L1
	(OR)			
8 (a)	Explain the principle of working any one undamped dynamic vibration absorber.	6M	CO4	L2
(b)	Figure shows a system of two masses attached to a tightly stretched string, fixed at both ends. Determine the natural frequencies and mode shapes of the system for $l_1 = l_2 = l_3 = l$ 	6M	CO4	L2
9.	Estimate the fundamental natural frequency of a simply supported beam carrying three identical equally spaced masses. 	12M	CO5	L4
	(OR)			
10.	Determine the natural frequencies and mode shapes of the system shown in figure as k_1=3k, k_2= k3= k and m_1=4m, m_2=2m, m_3 = m. 	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

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)	Explain the mechanism of chip formation in brittle materials with a neat sketch.	6M	CO1	L2
(b)	A medium carbon steel bar 40 mm diameter is turned on a lathe with a cutting tool having top rake angle 30^0 and with a cutting speed of 24 mpm (meter per minute). If the cutting forces is 200 kg, feed force 80 kg and feed given to tool is 0.12 mm/rev. length of chip in one revolution = 70 mm. determine the following: (i) Shear angle (ii) Chip thickness (iii) Velocity of chip along tool face.	6M	CO1	L3
	(OR)			
2(a)	Explain the following terms briefly (i) Desirable properties of tool materials (ii) Oblique Cutting.	6M	CO1	L2
(b)	A tool life of 80 minutes is obtained at a speed of 30 mpm and 8 minute at 60 mpm. Determine the following: (i) tool life equation (ii) cutting speed for 4 minute tool life.	6M	CO1	L3
3(a)	Draw a neat sketch of engine lathe and label the parts.	6M	CO2	L4
(b)	Draw a neat sketch of taper turning by taper turning attachment method.	6M	CO2	L4
	(OR)			
4(a)	List and explain any one lathe accessories.	6M	CO2	L1
(b)	Differentiate between capston and turret lathe.	6M	CO2	L2
5(a)	Sketch deep hole drilling machine and mention its advantages and applications.	6M	CO3	L2
(b)	Sketch and describe a hydraulic circuit for a shaper.	6M	CO3	L2
	(OR)			
6(a)	Distinguish between the shaping machine, and planing machine .Your explanation should focus on (i) principle of working (ii) primary and auxiliary motions (iii) mechanisms used for the motion of tool and work (iii) operations performed (iv) size of the work and (v) surface finish.	6M	CO3	L2
(b)	Draw a neat sketch of horizontal boring machine and label its parts.	6M	CO3	L2
7(a)	Describe the centre less grinding process. What are the various feeding methods used in centre less grinding?	6M	CO4	L1
(b)	Explain the column and knee type milling machine with a neat sketch.	6M	CO4	L2
	(OR)			
8(a)	List the various types of milling cutters and explain any one milling cutter with a sketch.	6M	CO4	L1
(b)	List and describe any one type of special grinding machine.	6M	CO4	L1
9(a)	Describe continuous broaching machine with a sketch.	6M	CO5	L1
(b)	List the essential characteristics in the proper design of jigs and fixture.	6M	CO5	L1
	(OR)			
10(a)	What is Honing? Explain the vertical honing machine with sketch.	6M	CO5	L2
(b)	Explain the principle of six point location.	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

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)	A multi plate clutch has three pairs of contact surfaces, the outer and inner radius of surfaces are 100 mm and 50 mm respectively. The maximum axial spring force is limited to 1 KN. If the coefficient of friction is 0.35 and assume uniform wear. Find the power transmitted by the clutch at 1500 rpm.	6M	CO1	L3
(b)	Explain any one type of absorption dynamometer with a neat sketch.	6M	CO1	L3
	(OR)			
2.	The rotor of a marine turbine has a moment of inertia of 750Kg.m^2 and rotates at 3000 rpm clockwise when viewed from aft. If the ship pitches with angular simple harmonic motion having a periodic time of 16 seconds and an amplitude of 0.1 radian, Determine (i) maximum angular velocity of the rotor axis (ii) maximum value of the gyroscopic couple (iii) gyroscopic effect as the bow dips.	12M	CO1	L3
3.	The torque delivered by a two stroke engine is represented by T = (1200+1400Sinθ+210Sin2θ+21Sin3θ) N m where θ is the angle turned by the crank from the inner dead centre .The engine speed is 210 rpm. Determine the power of the engine and the minimum mass of the flywheel if its radius of gyration is 800 mm and the maximum fluctuation of speed is to be +/- 1.5 % of the mean.	12M	CO2	L3
	(OR)			
4.	The turning moment diagram for a petrol engine is drawn to the following scale: Turning moment,1mm = 5 N-m, crank angle, 1 mm = 1^0. The turning moment diagram repeats itself at every half revolution of the engine and areas above and below the mean turning moment line taken in order are 295,-685,40,-340,960 and -270 mm^2.The rotating parts are equivalent to the mass of 36 kg at a radius of gyration of 150 mm. Determine the coefficient of fluctuation of speed when the engine runs at 1800 rpm..	12M	CO2	L3
5.	In a Hartnell governor, the lengths of ball and sleeve arms of a bell crank lever are 120 mm and 100 mm respectively. The distance of the fulcrum of the bell crank lever from the governor axis is 140 mm. Each governor ball has a mass of 4 kg. The governor runs at a mean speed of 300 rpm with the ball arms vertical and sleeve arms horizontal. For an increase of speed of 4 percent, the sleeve moves 10 mm upwards. Neglecting friction, find (i) The minimum equilibrium speed if the total sleeve movement is limited to 20 mm (ii) The spring stiffness (iii) The sensitiveness of governor and (iv) The spring stiffness if the governor is to be isochronous at 300 rpm.	12M	CO3	L3
	(OR)			

6.	In a Porter governor, each of the four arms is 400 mm long. The upper arms are pivoted on the axis of the sleeve where as the lower arms are attached to the sleeve at a distance of 45 mm from the axis of rotation. Each ball has a mass of 8 kg and the load on the sleeve is 60 kg. What will be the equilibrium speeds for the two extreme radii of 250 mm and 300 mm of rotation of the governor balls?	12M	CO3	L3
7.	Four masses A, B, C and D are completely balanced Masses C and D make angles of 90° and 195° respectively with that of mass B in the counter-clockwise direction. The rotating masses have the following properties: Mass of B=25kg, Mass of C=40kg, Mass of D=35kg.Radii of A, B, C and D are 150mm, 200mm, 100mm, 180mm respectively.Planes B and C are 250mm apart. Determine the (i) Mass A and its angular position with that of mass B (ii) Positions of all the planes relative to plane of mass A.	12M	CO3	L2
	(OR)			
8(a)	The following data relate to a single-cylinder reciprocating engine : Mass of reciprocating parts =40kg Mass of revolving parts =30kg at crank radius Speed=150rpm Stroke=350rpm If 60% of the reciprocating parts and all the revolving parts are to be balanced, Determine the balanced mass required at a radius of 320mm.	6M	CO4	L3
(b)	Explain the effect of partial balancing in locomotives.	6M	CO4	L3
9(a)	Derive the natural frequency of a longitudinal vibrating system	6M	CO5	L3
(b)	Explain briefly about Vibration isolation and Transmissibility.	6M	CO5	L2
	(OR)			
10.	The following data relate to a shaft held in long bearings. Length of shaft = 1.2m Diameter of shaft =14mm Mass of a rotor at mid point= 16kg Eccentricity of centre of mass of rotor from centre of rotor = 0.4mm Modulus of elasticity of shaft material = 200GN/m^2 Permissible stress in shaft material = 70 $\times 10^6$N/m^2 Determine the critical speed of the shaft and the range of speed over which it is unsafe to run the shaft. Assume the shaft to be massless.	12M	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

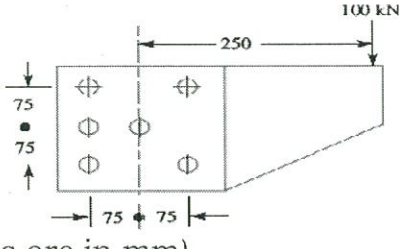
17ME13-MECHANICAL ENGINEERING DESIGN-I

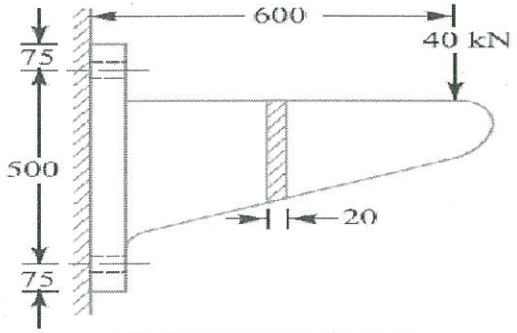
(ME)

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 manufacturing considerations in design.	6M	CO1	L2
(b)	Explain the various factors to be considered for factor of safety in machine design.	6M	CO1	L2
	(OR)			
2(a)	Explain briefly the various theories of failures.	6M	CO2	L2
(b)	A shaft is transmitting 100 kW at 160 r.p.m. Find a suitable diameter for the shaft, if the maximum torque transmitted exceeds the mean by 25%. Take maximum allowable shear stress as 70 MPa.	6M	CO2	L3
3(a)	Define stress concentration factor. What are the different methods to reduce the stress concentration factor? Explain with neat sketches.	6M	CO1	L2
(b)	Write short notes on: (i) Endurance limit, (ii) Notch sensitivity.	6M	CO2	L2
	(OR)			
4(a)	A machine component is subjected to a flexural stress which fluctuates between + 300 MN/m^2 and – 150 MN/m^2. Determine the value of minimum ultimate strength according to (i) Modified Goodman relation; and (ii) Soderberg relation. Take yield strength = 0.55 Ultimate strength; Endurance strength = 0.5 Ultimate strength; and factor of safety = 2.	6M	CO2	L3
(b)	Define factor of safety under static and fluctuating loads.	6M	CO2	L2
5(a)	Two lengths of mild steel tie rod having width 300 mm are to be connected by means of Lozenge joint with two cover plates to withstand a tensile load of 200 kN. Completely design the joint, if the permissible stresses are 100 N/mm^2 in tension, 70 N/mm^2 in shear and 160 N/mm^2 in crushing. Draw a neat sketch of the joint.	6M	CO3	L3
(b)	State Advantages and Disadvantages of Welded Joints over Riveted Joints.	6M	CO3	L2
	(OR)			
6.	A bracket is riveted to a columm by 6 rivets of equal size as shown in Fig. It carries a load of 100 kN at a distance of 250 mm from the column. If the maximum shear stress in the rivet is limited to 63 MPa, determine the diameter of the rivet.  (All the dimensions are in mm)	12M	CO3	L4

7(a)	Define the terms: (i) Stress area (ii) Pitch iii. Major diameter related to screw fastenings.	6M	CO4	L1
(b)	A wall bracket, as shown in Fig. is fixed to a wall by means of four bolts. Find the size of the bolts and the width of bracket. The safe stress in tension for the bolt and bracket may be assumed as 70 MPa.  All dimensions in mm.	6M	CO4	L3
	(OR)			
8.	Design and draw a sleeve and cotter joint to connect two rods to transmit maximum tensile load of 100 kN. Assume sleeve, cotter and rods are made of same material and design stresses in the material are 75 N/mm^2 in tension, 150 in crushing and 45 N/mm^2 in shear.	12M	CO4	L4
9(a)	Compare the weight, strength and stiffness of a hollow shaft of the same external diameter as that of solid shaft. The inside diameter of the hollow shaft being half the external diameter. Both the shafts have the same material and length.	6M	CO5	L2
(b)	How the shaft is designed when it is subjected to axial loads in addition to combined torsional and bending loads?	6M	CO5	L2
	(OR)			
10.	Design a muff coupling to connect two shafts transmitting 40kW at 120rpm. The permissible shear and crushing stresses for the shaft and key material (mild steel) are 30MPa and 80MPa respectively. The material of muff is cast iron with permissible shear stress of 15MPa. Assume that the maximum torque transmitted is 25% greater than the mean torque.	12M	CO5	L4

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26 AUG 2021

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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

17ME12-IC ENGINES AND GAS TURBINES
(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)	Outline the differences between valve timing diagrams and port timing diagrams of an Internal Combustion Engine and explain the significance.	6M	CO1	L4
(b)	Identify the modification suggested in the carburetor in order to achieve the required air fuel ratio and explain in detail.	6M	CO1	L2
	(OR)			
2(a)	What is the importance of supercharging in the internal combustion engine? Explain the importance of the supercharging.	6M	CO1	L2
(b)	Why the fuel is to be injected into the combustion chamber of diesel engine? Describe the principle of operation of the injection pump.	6M	CO1	L3
3(a)	Illustrate the differences among the air standard, fuel air and actual cycles of S.I. Engine along with the salient features.	6M	CO2	L3
(b)	Why the lubricant is added along with the fuel for some of the engines? What are the advantages and limitations of this type of lubrication system?	6M	CO2	L4
	(OR)			
4(a)	Find the percentage change in thermal efficiency of Otto cycle having a compression ratio of 12 and specific heat at constant pressure increases by 1%.	6M	CO2	L3
(b)	Explain the principle of operation of electric ignition system used in internal combustion engine along with their applications.	6M	CO2	L2
5(a)	Explain the actions to be taken in order to reduce the knocking phenomena of S.I. Engine for different operating parameters.	6M	CO3	L3
(b)	Why pre-combustion improves the performance of combustion in diesel engine? Explain the operational features of pre-combustion chamber.	6M	CO3	L2
	(OR)			
6(a)	What is optimum flame travel velocity? How to achieve such condition to minimize knocking in S.I. Engine?	6M	CO3	L5

(b)	Bring out clearly the process of combustion in C.I. Engines and explain various stages of combustion with suitable diagrams.	6M	CO3	L4
7(a)	Explain Willian's line method of determination of frictional power and explain why this method is not advantageous for petrol engines.	6M	CO4	L2
(b)	A nine-cylinder petrol engine of bore 150 mm and stroke 200 mm has a compression ratio 6:1 and develops 360 kW at 2000 rpm when running on a mixture of 20% rich. The fuel used has a calorific value of 43 MJ/kg and contains 85.3% carbon and 14.7% hydrogen. Assuming volumetric efficiency of 70% at 17°C and mechanical efficiency of 90%, find the indicated thermal efficiency of the engine.	6M	CO4	L4
	(OR)			
8(a)	Explain the procedure to determine the mean effective pressure with the diagram.	6M	CO4	L2
(b)	An engine is used on a job requiring 110 kW B.P., the mechanical efficiency of the engine is 80 % and the engine used 50 kg fuel per hour under the conditions of operation. A design improvement is made which reduces the engine friction by 5 kW. Assuming the indicated thermal efficiency remains the same. How many kg of fuel per hour will be saved?	6M	CO4	L4
9(a)	Draw the schematic layout of Ramjet engine and explain the working principle along with its applications.	6M	CO5	L3
(b)	A Gas turbine plant works between the temperature limits of 1152 K and 288 K. The isentropic efficiencies for compressor and turbines are 0.85 and 0.8 respectively. Determine the optimum pressure ratio for maximum work output and also for maximum cycle thermal efficiency.	6M	CO5	L3
	(OR)			
10(a)	What are different methods to improve the performance of gas turbine cycle? Explain.	6M	CO5	L4
(b)	Differentiate between turbo prop engine with the turbojet engine and discuss in detail.	6M	CO5	L2

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25 AUG 2021

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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

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 and evaluate the process of Scientific management.	6M	CO1	L2
(b)	Summarize the developments in management thought during Human relations period.	6M	CO1	L2
	(OR)			
2(a)	Explain in brief the factors determining the location of an industrial plant.	6M	CO1	L2
(b)	What do you understand by plant layout? Explain its systems and evaluate the same.	6M	CO1	L2
3(a)	Illustrate any two techniques of recording the current method of doing the job.	6M	CO2	L3
(b)	Demonstrate with an example Multiple activity chart.	6M	CO2	L3
	(OR)			
4(a)	Outline the steps involved in method study and Explain.	6M	CO2	L3
(b)	Show the flow process chart for making a screw.	6M	CO2	L3
5(a)	Calculate the number of observations required for an accuracy of ± 5 percent and confidence level of 95 per cent, if p = 0.5.	6M	CO3	L2
(b)	Explain the concept of SQC. Explain how you can construct control charts for variables.	6M	CO3	L3
	(OR)			
6(a)	A PC assembly shop owner decided to use control chart to monitor the number of defectives in all the PCs assembled every day. The data from the last 10 inspections, in one shift, is given in the following table. Which chart do you employ? Compute control limits and plot the chart.	6M	CO3	L4
	PC number: 1 2 3 4 5 6 7 8 9 10 / No. of defective resistors: 4 3 6 9 6 7 12 9 14 08			
	You are free to assume any additional data, if required.			
(b)	What do you understand by work measurement? Explain how you determine standard time. Illustrate.	6M	CO3	L2
7(a)	Discuss about RULA.	6M	CO4	L3
(b)	Explain about anthropometry and its uses in Ergonomics.	6M	CO4	L3
	(OR)			
8(a)	Discuss about principles of applied anthropometry in ergonomics.	6M	CO4	L3
(b)	Outline the Dutch Musculoskeletal Questionnaire.	6M	CO4	L4
9(a)	Discuss about the principles of human resource management.	6M	CO5	L3
(b)	Describe about history and development of human factors Engineering.	6M	CO5	L3
	(OR)			
10(a)	What are the Steps in Manpower Planning?	6M	CO5	L3
(b)	What is merit rating and explain any three methods of merit rating?	6M	CO5	L3

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