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.(II Semester) (R17) Supplementary Examinations, September 2021

TIME TABLE

TIME :02.00 PM to 05.00 PM **A.Y. 2020-21**

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
20-09-2021 (Monday)	17FE02 - Professional Communication-II	17FE02 - Professional Communication - II	17FE02 - Professional Communication-II	17FE02 - Professional Communication-II	17FE02 - Professional Communication - II	17FE02 - Professional Communication-II	17FE02 - Professional Communication - II	17FE02 - Professional Communication - II
21-09-2021 (Tuesday)	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus	17FE06 - Transformation Techniques and Vector Calculus
22-09-2021 (Wednesday)	17FE14 - Applied Chemistry	17FE14 - Applied Chemistry	17FE12 - Applied Physics	17FE12 - Applied Physics	17FE14 - Applied Chemistry	17FE12 - Applied Physics	17FE12 - Applied Physics	17FE14 - Applied Chemistry
23-09-2021 (Thursday)	17EE50 - Basic Electrical and Electronics Engineering	17CE02 - Applied Mechanics	17EE52 - Basic Electrical Engineering	17EC03 - Analog Electronic Circuits	17ME51 - Thermal and Hydro Prime Movers	17EI01 - Material Science and Engineering	17EE52 - Basic Electrical Engineering	17EE52 - Basic Electrical Engineering
24-09-2021 (Friday)	17ME02 - Engineering Mechanics	17CE03 - Surveying	17CI02 - Digital Logic Design	17EC04 - Digital Electronic Circuits	17EE01 - Electronic Circuits and Devices	17EC02 - Electronic Devices and Circuits	17CI05 - Data Structures	17ME02 - Engineering Mechanics

Note: Any omissions or clashes in the time table may please be informed to the Controller of Examinations immediately.

Date: 07-09-2021

CONTROLLER OF EXAMINATIONS

PRINCIPAL

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

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21 SEP 2021

R17

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

17FE06-TRANSFORMATION TECHNIQUES AND VECTOR CALCULUS

(Common to All)

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)	Applying convolution theorem, evaluate $L^{-1}\left[\frac{1}{(s^2+1)(s^2+9)}\right]$.	6M	CO1	L3
(b)	Find $L\{e^{4t}sin2tcost\}$.	6M	CO1	L2
	(OR)			
2(a)	Using Laplace transform evaluate find $L\{e^{2t}sin5tcos2t\}$.	6M	CO1	L2
(b)	Find $L^{-1}\left[\frac{1}{(s^2+a^2)(s^2+b^2)}\right]$ by using convolution theorem.	6M	CO1	L3
3(a)	Find $Z\left[\cos\left(\frac{n\pi}{2}+\theta\right)\right]$	6M	CO2	L2
(b)	Converting into partial fractions find the inverse Z-transform of $\frac{z}{(z-1)(z-2)}$	6M	CO2	L3
	(OR)			
4(a)	Find $Z\{5^n cos\, n\theta\}$.	6M	CO2	L2
(b)	Applying Convolution theorem find $Z^{-1}\left[\frac{z^2}{(z-3)(z-5)}\right]$	6M	CO2	L3
5(a)	Evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}(x^2+y^2+z^2)dxdydz$	6M	CO3	L2
(b)	Evaluate $\iint_A xydxdy$ where A is the domain bounded by X-axis ordinate $x = 2a$ and curve $x^2 = 4ay$.	6M	CO3	L3
	(OR)			
6(a)	Evaluate $\int_0^4\int_0^{x^2} e^{\frac{y}{x}}dydx$	6M	CO3	L2
(b)	Find the volume of the tetrahedron bounded by the coordinate planes and the plane $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$.	6M	CO3	L3
7(a)	Find the directional derivative of $\phi = xy^2+yz^3$ at the point (2,-1,1) in the direction of the normal to the surface $xlogz - y^2 = -4$ at (-1,2,1).	6M	CO4	L2
(b)	Prove that curl (grad$\emptyset$) = $\bar{0}$.	6M	CO4	L1
	(OR)			
8(a)	Find a unit normal vector to the given surface $x^3+ y^3+3xyz =3$ at the point (1, 2,-1).	6M	CO4	L2
(b)	If $\vec{f} = e^{x+y+z}(\vec{i}+\vec{j}+\vec{k})$ then find $curl\ \vec{f}$ at the point (1, 1, 1).	6M	CO4	L1
9.	Verify by Green's theorem in the plane for $\int_C (x^2-xy^3)dx+(y^2-2xy)dy$ where C is the Square with vertices (0,0) , (2,0) , (2,2) and (0,2).	12M	CO4	L3
	(OR)			
10.	Verify Stoke's Theorem for $\vec{F}=(x^2+y^2)\vec{i}-2xy\vec{j}$ taken around the rectangle bounded by the lines $x=\pm a,\ y=0,\ y=b$.	12M	CO4	L3

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20 SEP 2021

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

17FE02-PROFESSIONAL COMMUNICATION-II

(Common to all)

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 in your words about the significance of good manners according to J C Hill.	6M	CO3	L2
(b)	Find appropriate one word substitutes for the following sentences. (i) Name the person who believes in God. (ii) Name the person who talks in sleep. (iii) Name the person who loves people. (iv) Name the person who keeps on walking. (v) Name the person who pretends love. (vi) Name the person who loves himself.	6M	CO1	L1
	(OR)			
2(a)	What does J C Hill want to convey in his essay 'Good Manners'?	6M	CO3	L1
(b)	Find suitable idioms for the following sentences. (i) Name a person who is not treated trustworthy. (ii) Name a person who is confused what to do. (iii) Name a person who wants to do by any possible means. (iv) Name a person who talks boastfully about his achievements. (v) Name something that is to be destroyed at an early stage. (vi) Name a person who talks plainly or truthfully.	6M	CO1	L1
3(a)	Construct the theme of Somerset Maugham's Verger in your words.	6M	CO3	L3
(b)	Construct the character 'Tom' from the story 'White Washing the Fence' in your words.	6M	CO3	L3
	(OR)			
4(a)	Explain the character **'Verger'** in the short story 'Verger' in your words.	6M	CO3	L2
(b)	Explain the importance of teamwork with reference to the story 'Washing the Fence'.	6M	CO4	L2
5(a)	Why does 'Oh Father, Dear Father' satirical? Show the writer's perspective in your short essay.	6M	CO3	L1
(b)	Compose nature and significance of report writing.	6M	CO1	L6
	(OR)			
6(a)	How does the writer write about father and son relationship in his story 'Oh Father, Dear Father'?	6M	CO3	L1

(b)	Develop your ideas into a short essay on 'the types of reports'.	6M	CO1	L3
7(a)	Why is organizational communication playing a crucial role now-a-days? Define the writer's point of view in your short essay.	6M	CO3	L1
(b)	Find suitable 'Passive Verbs' for the following sentences. (i) Rama **meets** Hanuma. (ii) Ramesh **wrote** an email. (iii) They **called off** the meeting. (iv) A dangerous dog **attacked** her. (v) She **will help** you in need. (vi) She **may complete** the course in one year.	6M	CO3	L1
	(OR)			
8(a)	Justify the writer's point of view on the importance of adaptability skills at workplace and in real life in your short essay.	6M	CO4	L5
(b)	What does W E Barrett want to say in his lesson 'Señor Payroll'? Construct a short essay on it.	6M	CO4	L1
9(a)	Construct a short essay on the theme of 'A Real Good Smile' by Bill Naughton.	6M	CO3	L3
(b)	Develop your thoughts on non-verbal communication with reference to articulation and gestures.	6M	CO5	L3
	(OR)			
10(a)	Justify how real life experiences can enhance your skills in your short essay.	6M	CO3	L5
(b)	Identify errors from the following sentences. (i) The books comprises of 100 pages. (ii) I prefer coffee than tea. (iii) I am having one sister. (iv) Either you or I are going there. (v) Ramu is the best of his two brothers. (vi) It is high time you stop smoking.	6M	CO1	L3

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24 SEP 2021

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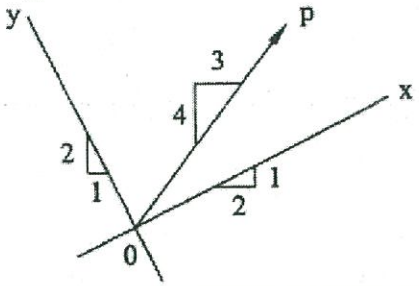
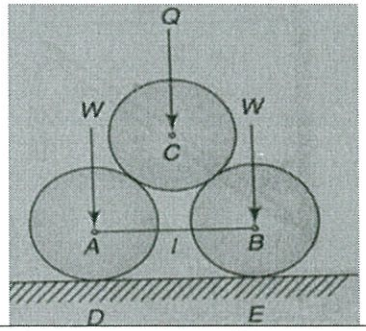
B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations

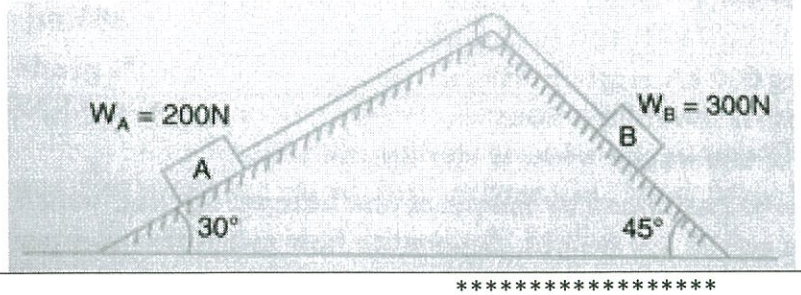
17ME02-ENGINEERING MECHANICS

(ASE & 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)	Summarize the following terms: (i) Free body diagram (ii) Transmissibility of a force (iii) Resultant of a force (iv) Resolution of a force.	6M	CO1	L1
(b)	If the X component of P is 893 N, determine P and its Y component. Refer figure. 	6M	CO1	L3
	(OR)			
2.	Two smooth circular cylinders, each of weight W = 500 N and radius r = 150 mm, are connected at their centers by a string AB of length l = 400 mm and rest upon a horizontal plane, supporting above them a third cylinder of weight Q = 900 N and radius r = 150 mm (as shown in Fig.). Determine the forces S in the string and the pressures produced on the floor at the points of contact D and E. 	12M	CO1	L4
3(a)	List and brief out the laws of friction.	6M	CO2	L4
(b)	The force required to pull a body of weight 200N on a rough horizontal plane is 100N. Determine the μ if the force is applied at an angle of 15^0 with the horizontal.	6M	CO2	L1
	(OR)			
4(a)	Differentiate between types of friction.	6M	CO2	L4
(b)	A uniform ladder of weight 250N and length 5m is placed against a vertical wall in a position where its inclination to the horizontal is 60°. A man weighing 800N climbs the ladder. At which position will he induce slipping? Take coefficient of friction μ=0.25 at both the contact surfaces of the ladder.	6M	CO2	L1

5(a)	From first principles, determine the centroid of a triangle base b and height h.	6M	CO3	L3
(b)	State and prove the parallel axis theorem of moment of inertia	6M	CO3	L3
	(OR)			
6(a)	A right circular cone has the radius of base as 250 mm and height 1000 mm is resting on a right circular cylinder of base diameter 500 mm and height 1.5m. The mass density for both cylinder and cone is 85 kN/m^3. Locate the centre of gravity of the system.	6M	CO3	L3
(b)	Show that the moment of inertia of a thin circular ring of mass M and mean radius R with respect to its geometric axis is MR^2.	6M	CO3	L3
7(a)	Draw various motion curves used in rectilinear motion.	6M	CO2	L2
(b)	A particle starts from rest and moves along a straight line with constant acceleration a. If it acquires a velocity v = 3 m/s after having travelled a distance of s = 7.5 m, find the magnitude of the acceleration.	6M	CO2	L3
	(OR)			
8(a)	A projectile is fired with an initial velocity of 250m/s at a target located at a horizontal distance of 4km and vertical distance of 700 m above the gun. Determine the value of firing angle to hit the target. Neglect air resistance.	6M	CO2	L2
(b)	A car has an initial speed of 25m/s and a constant deceleration of 3m/s^2. Determine the velocity of the car when t=4s. What is the displacement of the car during the 4s time interval? How much time is needed to stop the car?	6M	CO2	L3
9(a)	Write the units of the following quantities: (i) Angular velocity (ii) Angular acceleration (iii) Angular displacement (iv) Mass moment of inertia (v) Work done (vi) Kinetic Energy.	6M	CO2	L2
(b)	A train weighing 3000kN is moving up a slope 2 in 100 with an acceleration of 0.04 m/sec^2. Tractive resistance is 6 N/kN. Determine the acceleration of the train if it moves with the same tractive force down the plane inclined at 2 in 100.	6M	CO2	L3
	(OR)			
10.	In what distance will body A shown in figure attain a velocity of 3 m/sec starting from rest? Take coefficient of friction between the blocks and the plane as 0.2. Assume the pulley is smooth.  	12M	CO5	L5

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23 SEP 2021

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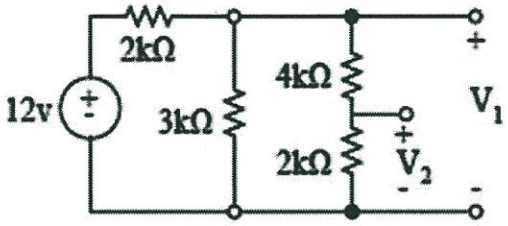
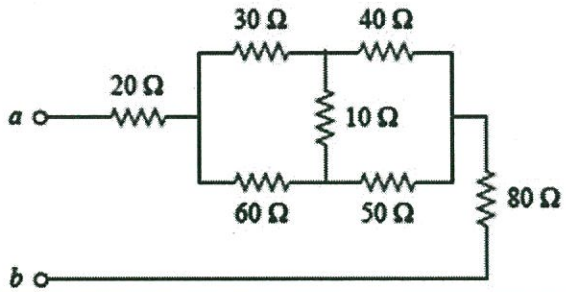
B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations

17EE50-BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(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)	Differentiate between Active and Passive elements.	6M	CO1	L1
(b)	Determine the voltages V1 and V2 in the network in Fig, using voltage division. 	6M	CO1	L3
	(OR)			
2(a)	Recall Star-Delta, Delta-Star conversion Equations.	6M	CO1	L1
(b)	Calculate equivalent resistance R_{ab} in the given circuit. 	6M	CO1	L3
3(a)	Describe the fallowing terms (i)Real Power (ii) Reactive Power (iii)Apparent Power (iv)Power factor.	6M	CO1	L1
(b)	Calculate the current, Real Power ,Reactive Power, Apparent Power, Power factor, when two impedances (30+j25)Ω,(5+j4)Ω are series connected across 230Volts,50Hz supply.	6M	CO1	L3
	(OR)			
4(a)	The current flowing through a pure inductor of 150 milli henry when the frequency is (i) 50Hz (ii) 60Hz. The voltage applied is 230V.	6M	CO1	L3
(b)	Derive the RMS value and Average value of a Sine wave.	6M	CO1	L3
5(a)	Demonstrate how the rotating Magnetic field Induced in Induction Machines.	6M	CO2	L3

(b)	Develop an expression for E.M.F produced by DC generator.	6M	Co2	L2
	(OR)			
6(a)	Derive the expression Torque produced by DC Motor.	6M	CO2	L2
(b)	A DC motor takes an armature current of 110amps at 480 Volts .The machine has 6 poles and the armature is LAP Connected with 864 conductors. The flux/pole is 0.05webers. Calculate Torque developed by the Motor.	6M	CO2	L3
7(a)	Derive an expression for induced EMF in Single phase Transformer.	6M	CO2	L2
(b)	The primary winding of 50HZ ,single phase Transformer has 460 turns and it is fed from a 5400V supply the secondary winding has 18 turns. Compute (i) Peak value of flux in the core (ii) Secondary voltage.	6M	CO2	L3
	(OR)			
8(a)	Describe the construction and working of Moving Iron Instruments.	6M	CO4	L2
(b)	Demonstrate different types of Torques in measuring instruments.	6M	CO4	L3
9(a)	Illustrate Zener Diode operation and V-I characteristics with neat sketches. Describe the terms break down voltage, static resistance& dynamic resistance in this context.	6M	CO3	L3
(b)	Illustrate Full Wave Rectifier operation with the help of waveforms and recall the term ripple factor.	6M	CO3	L3
	(OR)			
10(a)	Convert the fallowing numbers into its Decimal equivalents. (i)$(1101.101)_2$ (ii) $(231.23)_4$ (iii) $(614.15)_7$	6M	CO3	L3
(b)	List out different types of Logic gates and explain its functions with truth tables.	6M	CO3	L1

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B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations
17FE14-APPLIED CHEMISTRY
(AE,CE,EEE&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)	List out the salts that cause temporary hardness. How to remove it? Write the equations involved?	6M	CO1	L1
(b)	List out the reasons for priming and foaming. Mention disadvantages and methods of prevention.	6M	CO1	L2
	(OR)			
2(a)	Justify the following statement "Water softened using lime and soda damages boiler material".	6M	CO1	L3
(b)	Calculate temporary and total hardness of a sample of water containing $Ca(HCO_3)_2$=162mg/L; $Mg(HCO_3)_2$=73mg/L; $CaSO_4$=136mg/L; $MgCl_2$=95mg/L.	6M	CO1	L2
3(a)	How to manufacture gasoline using water gas and hydrogen as raw materials?	6M	CO2	L2
(b)	Summarize the steps involved in mining and refining of crude oil.	6M	CO2	L2
	(OR)			
4(a)	Describe the mechanism of propulsion.	6M	CO2	L2
(b)	List out the sources of biomass. Explain preparation of biodiesel from rape seed oil.	6M	CO2	L2
5(a)	Write the Nernst equation and calculate the EMF of the following cell at 298K. $Mg(s)/Mg^{2+}(0.001M)//Cu^{2+}(0.0001M)/Cu(s)$ $E^0_{Cu^{2+}/Cu}$=0.34V; $E^0_{Mg^{2+}/Mg}$=-2.37V.	6M	CO3	L3
(b)	How can you say that electrochemical series has many important applications?	6M	CO3	L2
	(OR)			
6(a)	Describe the construction and working of Ni-Cd battery.	6M	CO3	L2
(b)	Why S.H.E is called primary reference electrode which can be reversible? Draw a neat diagram of S.H.E.	6M	CO3	L2
7(a)	Differentiate electro chemical and galvanic series.	6M	CO4	L2
(b)	Explain corrosion by other gases and liquid metal corrosion by giving examples.	6M	CO4	L1
	(OR)			
8(a)	How does the following factors influence rate of corrosions? (i) Purity of metal (ii) Position in galvanic series (iii) Relative areas of cathode and anode (iv) Nature of oxide layer.	6M	CO4	L2
(b)	What are the conditions for wet corrosion to occur? Discuss the mechanism.	6M	CO4	L2
9(a)	What are conducting polymers? Write about intrinsic conducting polymers.	6M	CO5	L1
(b)	Differentiate addition and condensation polymerizations.	6M	CO5	L2
	(OR)			
10(a)	How to prepare thiokol? Give properties and uses.	6M	CO5	L1
(b)	Justify the following statement "Raw rubber turns into usable form only due to vulcanization". Draw the structure of vulcanized rubber.	6M	CO5	L4

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24 SEP 2021

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

17CE03-SURVEYING
(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)	List the applications of surveying, describe plane and geodetic surveying.	6M	CO2	L1
(b)	The length and bearing of a closed traverse PQRSP are given below line | length | Bearing PQ | 78.2 m | 140°12' QR | 198.0 m | 36°24' RS | 37.8 m | 338°48' SP | ? | ? Compute the missing length and bearing of SP.	6M	CO2	L1
	(OR)			
2(a)	Distinguish between prismatic compass and surveys compass.	6M	CO2	L1
(b)	(i) Convert the following from WCB to QB WCB of AB =35° 30' ;WCB of BC =125° 45' ; WCB of CD =242° 15' (ii) Convert the following from QB to WCB QB of AB =N45°30'E ;QB of BC =S56°45'W ;QB of CD =S22°15'E.	6M	CO3	L2
3.	The following staff readings were taken with an instrument in leveling work 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044 and 2.684 m. the position of the instrument was changed after 3rd, 6th and 8th readings. Draw the form of a level book and enter the above readings properly. Assuming theR.L of starting point as 432.0384m. Calculate R.L of all points by rise and fall method and apply usual checks.	12M	CO3	L3
	(OR)			
4(a)	Define the term contour and describe the applications of developing contours.	6M	CO2	L2
(b)	In a grid of 15m*15m the elevations of the points at the corner A 100.2, corner B 100.9, corner C 100.4 and corner D 99.8. Determine the positions of the point of 100.4, 100.6, and 100.8m contours on the grid.	6M	CO3	L2
5(a)	The following perpendicular offsets were taken from chain line to hedge Chainage (m) | 0 | 5.0 | 12.5 | 25.7 | 40.0 Offset (m) | 4.25 | 6.0 | 3.15 | 4.90 | 2.70 Calculate the area between the chain line and hedge by coordinate method.	6M	CO3	L4

(b)	(i) Describe the procedure to calculate the capacity of reservoir. (ii) The areas within the contour line at the site of the reservoir and the face of the proposed dam are as follows Contour / Area (m^2): 101 / 1000; 102 / 12800; 103 / 95200; 104 / 147600; 105 / 872500; 106 / 1350000; 107 / 1985000; 108 / 2286000; 109 / 2512000 Taking 101 as the bottom level of the reservoir and 109 as the top level calculate the capacity of reservoir by trapezoidal formula.	6M	CO4	L2
	(OR)			
6(a)	The following offsets were taken at 10m intervals from a survey line to irregular boundary line 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65 m .Compute the area between the survey line and the irregular boundary line by (i) Average- ordinate rule (ii) Trapezoidal rule (iii) Simpson's rule.	6M	CO4	L3
(b)	A railway embankment is 9 m wide at formation level, with side slope of 2 to 1.Assuming the ground to be level transversely, calculate the volume of embankment in a length of 180m, the central heights at 30m intervals being 0.6, 0.8, 1.5, 1.7, 0.7, 0.3 and 0.67m respectively. Use trapezoidal method.	6M	CO3	L2
7(a)	Discuss the temporary adjustments of transit theodolite and explain.	6M	CO2	L3
(b)	Describe the procedure for measuring horizontal angle by repetition method of transit theodolite.	6M	CO4	L3
	(OR)			
8(a)	State the applications of theodolite. List out fundamental lines of a transit theodolite and describe relation among them.	6M	CO1	L2
(b)	A tacheometer was kept at a station A and observations taken on a stadia rod kept over station B. The vertical angle is 5^0 and stadia readings are 1.375, 2.003, 2.631, the staff held vertical to the line of sight. The reading on staff held at bench mark of elevation 750.00m is 1.575m. Find the distance AB and RL of B assuming K = 100 and C = 0.	6M	CO3	L2
9(a)	Define a simple curve and discuss the classification of curves.	6M	CO4	L4
(b)	If a curve is designated as 2^0 curve on a 30 m arc, find the tangent length, length of long chord, length of arc, apex distance and mid ordinate if the deflection is 30^0.	6M	CO2	L4
	(OR)			
10(a)	Define the elements of a simple curve.	6M	CO2	L2
(b)	Describe the degree of curve and state the relation between radius and degree of a curve.	6M	CO2	L2

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23 SEP 2021

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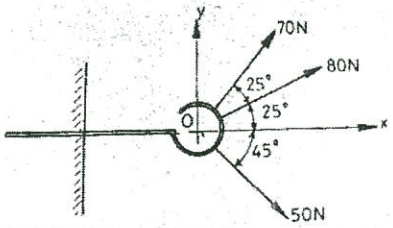
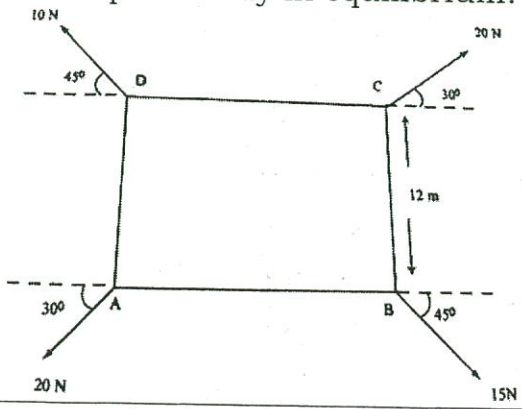
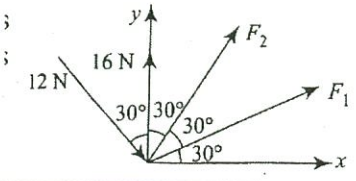
B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations

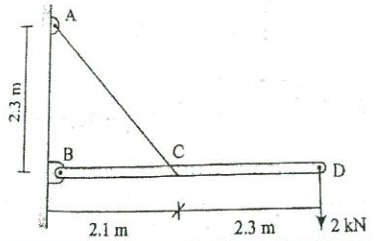
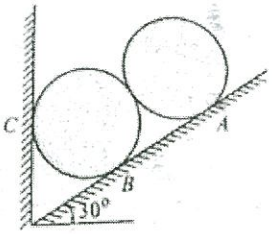
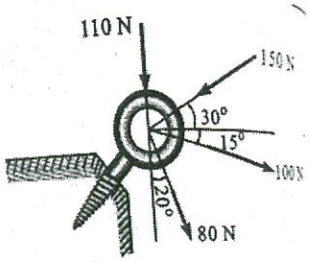
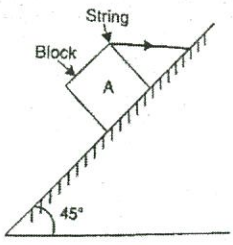
17CE02-APPLIED MECHANICS

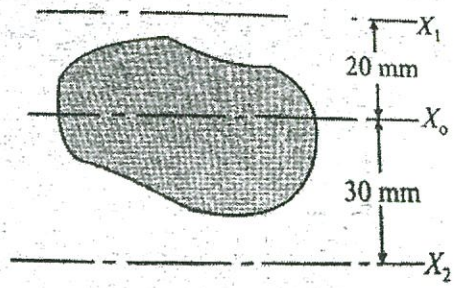
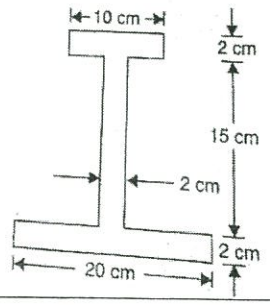
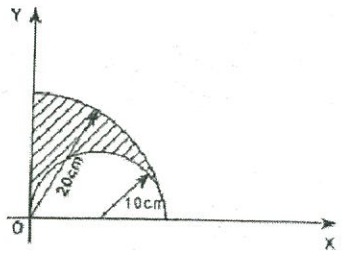
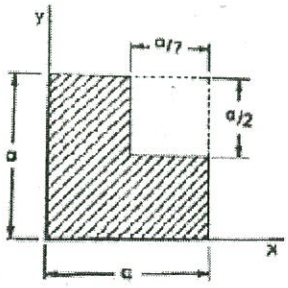
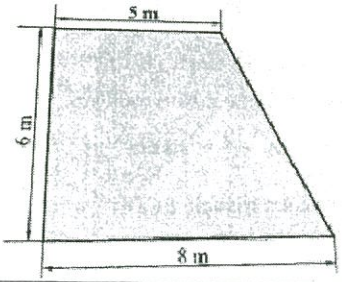
(CE)

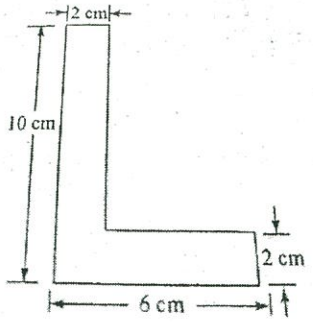
Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks
1(a)	The resultant of two forces, one of which is double the other is 260N.If the direction of the larger force is reversed and the other remains unaltered, the resultant reduces to 180N. Determine the magnitude of the forces and the angle between the forces.	6M
(b)	Determine the resultant of the three forces acting on a hook as shown if fig. 	6M
	(OR)	
2(a)	Fig shows a body under the action of coplanar forces. Determine the magnitude, direction and position of a single force which will keep the body in equilibrium. 	6M
(b)	Determine the magnitudes of F1 and F2 for the following system of forces, as shown in fig, which are equilibrium. 	6M
3(a)	Explain the different types of support and loading on a beam.	6M

(b)	A weightless beam BCD is held with the help of a tie rod AC shown in fig. Determine the reaction at B and tension in the tie rod AC.  	6M
	(OR)	
4(a)	Two identical rollers of weight 500N are supported by an inclined plane and a vertical wall as shown in fig. Assuming smooth surfaces, find the reactions induced at the point of support A, B and C.  	6M
(b)	Four forces act on an eye bolt as shown in fig. Determine the resultant and direction.  	6M
5(a)	The force required to pull a body of weight 50N on a rough horizontal plane is 15N. Determine the coefficient of friction, if the force is applied at an angle of 15^0 with the horizontal.	6M
(b)	Block A weighing 15N is a rectangular prism resting on a rough inclined plane as shown in fig--. The block is tied up by a horizontal string which has a tension of 5N. Find i) The frictional force on the block ii) The normal reaction of the inclined plane, and iii) The coefficient of friction between the surfaces of contact.  	6M
	(OR)	

6(a)	The shaded area as shown in fig has an area of 500 mm^2 and a moment of inertia of $30x10^4$ mm^4 about axis X1. Find the moment of inertia about axis X2. 	6M
(b)	Find the center of gravity of the I-section as shown in fig. 	6M
7(a)	Locate the centroid of the shaded area as shown in fig. 	6M
(b)	Find the coordinates of the centroid of the area left after removing a square area from a square plate as shown in fig. 	6M
	(OR)	
8(a)	Find the centroid of the shaded area as shown in fig. 	6M

(b)	Calculate the moment of inertia of the L-section as shown in fig about the horizontal and vertical passing through the center of gravity.  	6M
9(a)	A stone is thrown vertically up from the top of a tower with a certain initial velocity. It reaches ground in 5.64 seconds. A second stone thrown down from the same tower with the same initial velocity reaches ground in 3.6 seconds. Determine i) The height of the tower, and ii) the initial velocity of the stones.	6M
(b)	The motion of the body is given by an equation: $a=t^2-2t+2$, where a is acceleration in m/s^2 and t is time in seconds. The velocity and displacement of the body after 1 second was 19/3 m/s and 59/4 m respectively. Find the velocity and displacement after 2 seconds.	6M
	(OR)	
10(a)	A shot is fired horizontally from the top of a tower with a velocity of 100m/s. If the shot hits the ground after 2 seconds, find the height of the tower and the distance from the foot of the tower, where the shot strikes the ground.	6M
(b)	A projectile is aimed at a target which lies in the horizontal plane through the point of projection. It falls 'a' meters short of the target when the angle of projection is α and goes 'b' meters too far off when the angle of projection is β. Show that the $(a+b)\sin 2\theta = (a\sin 2\beta + b\sin 2\alpha)$, where θ is the angle of projection.	6M

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H.T.No										

24 SEP 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. (II Semester) ~~Regular~~/Supplementary Examinations

17CI02-DIGITAL LOGIC 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)	Convert the decimal number 1973 to base 3 base 5 and base7.	6M	CO1	L2
(b)	Using 10's complement, subtract (i) 72532_{10}-3250_{10} (ii) 3250_{10}-72532_{10}. What do you infer from the results?	6M	CO1	L2
	(OR)			
2(a)	Realize EX-OR and EXNOR gates with universal gates.	6M	CO1	L1
(b)	Obtain the truth table for the function xy+xy'+y'z.	6M	CO1	L2
3(a)	Simplify the following Boolean expressions using K-map and implement them using NAND gates: **F (W, X, Y, Z) = XZ + WXY + WXY + WYZ + WYZ.**	6M	CO2	L3
(b)	Using K-map method determine the possible minimal expression for the following function F(A,B,C,D) = ∑m(8,12,13) + d(1,2,4,6,7,11) .	6M	CO2	L2
	(OR)			
4.	Simplify the following expression using tabulation method: F (A, B, C, D) = ∑ (0, 1, 2, 8, 10, 11, 14, 15).	12M	CO2	L4
5(a)	Compare combinational circuits and sequential circuits.	6M	CO3	L3
(b)	Develop 32 x 1 Multiplexer using 8 x 1 Multiplexer and 4 x1 Multiplexers.	6M	CO3	L2
	(OR)			
6(a)	Design the full adder circuit using decoder and de-multiplexer.	6M	CO3	L2
(b)	Implement the following using a multiplexer F(w ,x, y, z) = ∑m(0,1,2,3,4,9,13,14,15).	6M	CO3	L4
7(a)	Convert the following i) J-K flip-flop to T- flip-flop ii) J-K flip-flop to D- flip-flop.	6M	CO4	L2
(b)	Explain synchronous and ripple counters. Compare their merits and demerits.	6M	CO4	L2
	(OR)			
8.	Design a modulo -12 up synchronous counter using T- flip flops and draw the circuit diagram.	12M	CO4	L2
9(a)	Implement the following function using a PROM. (i) F (A, B, C, D) = Σm (0,1,2,3,4,5,7,8,10,11,12,13,14,15).	6M	CO5	L3
(b)	Explain how a PLA is used for the realization of combinational function.	6M	CO5	L2
	(OR)			
10.	Implement the following Boolean functions using PAL. w(A,B,C,D) = ∑ m (0,2,6,7,8,9,12,13) x (A,B,C,D) = ∑m (0,2,6,7,8,9,12,13,14) y (A,B,C,D) = ∑m (2,3,8,9,10,12,13) z (A,B,C,D) = ∑ m (1,3,4,6,9,12,14).	12M	CO5	L3

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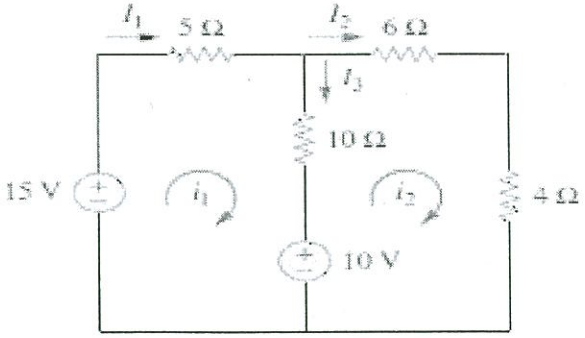
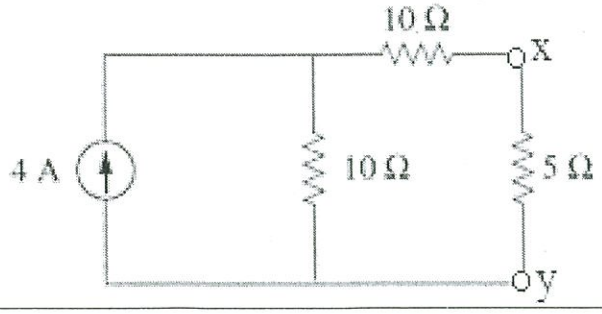
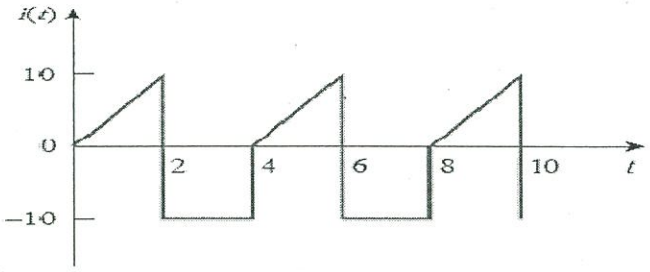
B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations

17EE52-BASIC ELECTRICAL ENGINEERING
(CSE,IT&ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks
1(a)	State and prove Kirchhoff's laws using an example.	6M
(b)	When three resistors are connected in parallel show the relation between obtain the equation for currents.	6M
	(OR)	
2(a)	Explain the star-delta and delta-star transformation for a resistive network.	6M
(b)	Three resistances 2 ohms, 4 ohms and 6 ohms are connected in series across 24V supply. Find the voltages across three resistors and current through each resistor.	6M
3(a)	State and prove the superposition theorem.	6M
(b)	Find the branch currents I_1, I_2 and I_3 using mesh analysis for the following circuit 	6M
	(OR)	
4(a)	State and prove the thevenin's theorem.	6M
(b)	Using Thevenin'stheorem for the circuit shown in below, calculate the current flowing through the 5 Ω resistor. 	6M
5(a)	Explain the concept of Average value and RMS value.	6M

(b)	In an a.c. circuit, v = 200 Sin ($\omega t+30^0$) V, i = 15 Sin ($\omega t-30^0$) A. Find reactive power.	6M
	(OR)	
6.	Determine the average value, rms value and form factor for the following current waveform 	12M
7(a)	Derive the EMF equation of a DC generator.	6M
(b)	An 8-pole, wave-connected armature has 600 conductors and is driven at 625 rev/min. If the flux per pole is 20 mWb, determine the generated e.m.f.	6M
	(OR)	
8(a)	Derive the torque equation of a DC motor.	6M
(b)	Explain the different types of rotating electrical machines.	6M
9(a)	Explain principle of operation of a 1- phase transformer.	6M
(b)	The frequency of the supply to the stator of a 6-pole induction motor is 50 Hz and the rotor frequency is 2 Hz. Determine (i) slip and (ii) rotor speed in rev/min.	6M
	(OR)	
10(a)	Explain the operating principle of Three phase Induction motor.	6M
(b)	Explain about various losses of Single phase transformer. How to minimize them?	6M

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

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

17FE12-APPLIED PHYSICS

(CSE,ECE,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.	Derive the equations for bright and dark fringes in thin parallel film by reflected light. A parallel beam of light of 6000A° is incident on a thin glass plate of refractive index 1.5 such that the angle of refraction into the plate is 50°. Find the least thickness of glass plate which will appear dark by reflection.	12M	CO1	L2
	(OR)			
2.	Describe the fraunhofer diffraction due to single slit with intensity distribution. The first diffraction minima due to a single slit diffraction at $\theta = 30^0$ for a light of wavelength $5000A^0$.Estimate the width of the slit.	12M	CO1	L2
3(a)	State and explain Brewster's law. Prove that the reflected and refracted light rays are perpendicular.	6M	CO2	L2
(b)	Illustrate the construction working principle of Polarimeter .	6M	CO2	L2
	(OR)			
4(a)	Explain the basic principle involved in laser action.	6M	CO2	L2
(b)	Derive the expression for energy density of radiation in terms of Einstein coefficients.	6M	CO2	L2
5(a)	Explain de-Broglie hypothesis.	6M	CO3	L2
(b)	Show that the energy of the particle is quantized in a one dimensional potential box.	6M	CO3	L2
	(OR)			
6(a)	What are the advantages and drawbacks of classical free electron theory? The relaxation time of conduction electrons in metal is $3x10^{-14}$ seconds. If the density of electrons is $5.8x10^{28}$ per m^3, calculate the resistivity of the material.	6M	CO3	L1
(b)	Categorize the materials into conductors, insulators and semiconductors on the basis of band theory.	6M	CO3	L4
7(a)	Estimate an expression for Energy Band Gap of a semiconductor.	6M	CO4	L3
(b)	Describe a Solar Cell and write the V- I characteristics of a solar cell.	6M	CO4	L2
	(OR)			
8(a)	What is Hall effect? Obtain an expression for Hall coefficient.	6M	CO4	L1
(b)	List out the advantages of Hall effect.The Hall coefficient and conductivity of Cu at 300K have been measured to be $-0.55x10^{-10}$ m^3 A^{-1} s^{-1} and $5.9x10^7$ Ω^{-1} m^{-1}, respectively. Calculate the drift mobility of electrons in copper.	6M	CO4	L3
9(a)	Develop an expression for internal field in Dielectrics.	6M	CO5	L2
(b)	Derive an expression for Claussius-Mosotti equation.	6M	CO5	L3
	(OR)			
10(a)	List out the applications of Dielectric materials.	6M	CO5	L3
(b)	Interpret the Dielectric loss and Dielectric break down.	6M	CO5	L2

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B.Tech. (II Semester) ~~Regular~~/Supplementary Examinations
17EC04-DIGITAL ELECTRONIC CIRCUITS
(ECE)

Time : 3 hours Max. Marks : 60

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

1(a) Convert the decimal numbers 250.5, 12.0625, 673.23 to binary, base 8 and base 16. [6M]

(b) What is a Gray code? Obtain a 3-bit and 4-bit gray code from a 2-bit gray code by reflection. [6M]

(OR)

2(a) Using K-map method determine the prime implicant and obtain the possible minimal expression for the following function
$F(A,B,C,D) = \Sigma m(8,12,13) + d(1,2,4,6,7,11)$. [6M]

(b) What is a reflected code? Write about reflected codes by giving examples. [6M]

UNIT-II

3(a) List the universal gates. Implement XOR & XNOR gates using universal gates. [6M]

(b) Implement the following functions in canonical Sop and Pos forms and realize using NOR gates.
i) $f(A, B, C, D) = A'B + BC + CD' + ACD$
ii) $f(A, B, C, D) = (A + B' + C)(A + D)(B' + C')(A + B + C)$ [6M]

(OR)

4(a) Realize AND, OR, NAND circuits using discrete components and explain. [6M]

(b) Show that bubbled Input NAND gate is equivalent to OR gate and Bubbled Input NOR gate is equivalent to AND gate. [6M]

UNIT-III

5(a) Mention the need to go for carry look ahead adder and explain. [6M]

(b) Design a 4 bit combinational logic to subtract one bit from the other. Draw the circuit. [6M]

(OR)

6(a) Realize the following Boolean function using PROM
$f(x, y, z, w) = \Sigma m(0, 1, 3, 6, 8, 9, 15)$. [6M]

(b) Design 4X1 MUX using 2X4 decoder and basic logic gates. [6M]

UNIT-IV

7(a) Explain the working of a master-slave JK flip flop. State its advantages. [6M]

(b) Draw and explain 4-bit universal shift register. [6M]

(OR)

8(a) Determine how the circuit shown in Fig. 1 functions as a T-type flip-flop. What problem would there be when T= 1 and how could it be resolved.

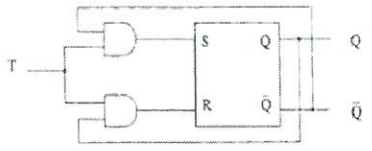

Figure 1

[6M]

(b) Draw the logic diagram for a 4-bit binary ripple down counter using positive edge triggered flip-flops. [6M]

UNIT-V

9(a) Explain in detail the Mealy state diagram with one example. [6M]

(b) Explain the state machine capabilities and limitations in detail . [6M]

(OR)

10(a) Draw a state diagrams of a sequence detector which can detect 011. [6M]

(b) Explain the procedure of Meelay to Moore conversion. [6M]

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

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

17EC03-ANALOG ELECTRONIC CIRCUITS

(ECE)

Time : 3 hours Max.Marks : 60

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

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UNIT-I

1(a) Draw the Circuit of CC amplifier, including biasing network. Obtain its ac circuit. Draw the ac circuit replacing the transistor by its low-frequency model. Derive the expressions for the performance quantities. [6M]

(b) A CE amplifier is driven by a source of internal resistance R_s=1kΩ, and load resistance R_L=2kΩ. The transistor parameters are h_{ib}=21.6Ω, h_{fb}=-0.98,h_{rb}=2.9x10^{-4} and h_{ob}=0.49μA/V. Compute all Current and Voltage gains, input and output resistances of the amplifier. [6M]

(OR)

2(a) Derive the expressions for voltage gain, current gain, Input impedance, output impedance, voltage gain with respect to source and current gain with respect to source for generalized transistor amplifier at low frequencies. [6M]

(b) Give the comparison of CE, CC and CB amplifiers with respect to voltage gain current gain, Input impedance and output impedance. [6M]

UNIT-II

3(a) Explain the significance of capacitors used in an RC coupled amplifier. [6M]

(b) Draw the hybrid π model of the BJT and explain the significance of each element. [6M]

(OR)

4(a) Explain the operation of Cascode Amplifier. [6M]

(b) Draw the equivalent circuits of Two Stage RC coupled amplifier for Mid-band ,Low frequency range, high frequency range and derive the expressions for current gain, voltage gain. [6M]

UNIT-III

5(a) Design a single ended transformer coupled class A power amplifier to deliver a power of 150 mW audio power into a load of 3Ω. The Quiescent base current is adjusted so that V_m=V_{CC}. The Collector dissipation should not exceed 250mW. [6M]

(b) Draw the circuit diagram of complementary push pull power amplifier with trickle bias and temperature compensation and explain its working. What is its advantage over a conventional push pull power amplifier? [6M]

(OR)

6(a) A transistor delivers a power of 1W to a load R_L of 1kΩ. The quiescent collector current is 30mA and the collector current with signal is 35mA. Determine D_2. [6M]

(b) Draw the circuit of Double tuned transistor voltage amplifier and derive the expression for its gain. [6M]

UNIT-IV

7(a) For a Voltage Series feedback amplifier, Obtain for A_V,R_{if} and R_{of}. [6M]

(b) An amplifier with 2.5KΩ input resistance and 50KΩ output resistance has a voltage gain of 100.The amplifier is now modified to provide 5% negative feedback in series with the input. Calculate (i) the voltage gain (ii) the input resistance and (iii)the output resistance with feedback [6M]

(OR)

8(a) The distortion in an amplifier is found to be 3%,when the feedback ratio of a negative feedback amplifier is 0.04,when the feedback is removed, the distortion becomes 15%.Find the open loop gain and closed loop gain. [6M]

(b) For a Current Shunt feedback amplifier, Derive A_V, R_{if} and R_{of} [6M]

UNIT-V

9(a) Derive the frequency of oscillation and condition for sustained oscillation in a FET based RC Phase shift oscillator. [6M]

(b) Perform the generalized analysis of LC oscillators with suitable block diagram and obtain the condition for Hartley and colpitt's oscillators. [6M]

(OR)

10(a) A phase shift oscillator is to be designed with FET having gm =5000μs ,rd=4kΩ while the resistance in the feedback circuit is 9.7kΩ. Select the proper value of C and R_D to have the frequency of oscillations as 5KHz. [6M]

(b) What are the factors that affect the frequency stability of an oscillator? How frequency stability can be improved in oscillators? [6M]

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

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

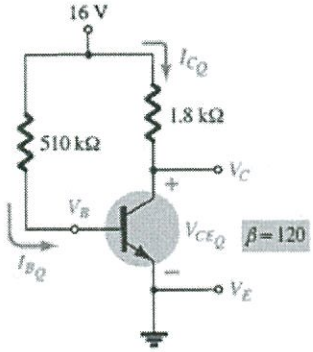
17EE01-ELECTRONIC CIRCUITS AND DEVICES

(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)	In your own words, define an intrinsic material, a negative temperature coefficient, and covalent bonding.	6M	CO1	L1
(b)	Describe in your own words how diffusion and transition capacitances differ.	6M	CO1	L1
	(OR)			
2(a)	Explicate the V-I characteristics of a Zener diode, define avalanche breakdown and Zener breakdown.	6M	CO1	L2
(b)	Determine the thermal voltage for a diode at a temperature of 20°C. For the same diode, find the diode current if I_s=40 nA, n= 2 and the applied bias voltage is 0.5 V.	6M	CO1	L4
3(a)	Show that a full wave rectifier is twice efficient as a half wave rectifier.	6M	CO2	L1
(b)	A diode whose internal resistance is 20 Ω is to supply power to a 1000Ω load from a 110V (rms) source of supply. Calculate (i) The peak load current. (ii) The DC load current (iii) AC Load Current (iv) The DC diode voltage.	6M	CO2	L2
	(OR)			
4(a)	Compare half wave, full wave and bridge rectifiers.	6M	CO2	L1
(b)	Define ripple factor and compare various filter circuits in terms of ripple factor.	6M	CO2	L2
5(a)	How must the two transistor junctions be biased for proper transistor amplifier operation? Explain.	6M	CO3	L2
(b)	Demonstrate input and output characteristics for a common-base silicon transistor amplifier.	6M	CO3	L4
	(OR)			
6(a)	Sketch a figure for the majority- and minority-carrier flow of an *npn* transistor. Describe the resulting carrier motion.	6M	CO3	L3
(b)	Draw the basic construction of a *p* -channel JFET.	6M	CO3	L2
7.	For the fixed-bias configuration of below figure, determine: (i) I_{BQ} (ii) I_{CQ} (iii) V_{CEQ} (iv) V_C (v) V_B (vi) V_E  	12M	CO4	L3
	(OR)			
8(a)	Explain diode and thermistor compensations.	6M	CO4	L2
(b)	Compare different biasing techniques with respect to stability factors.	6M	CO4	L2
9.	Derive and express voltage gain, current gain, input impedance and output impedance of single stage common-emitter transistor amplifier in terms of h-parameters. Give important features of h-parameter model compared to other model.	12M	CO5	L4
	(OR)			
10(a)	Give the constructional features of Schottky diode with applications.	6M	CO5	L2
(b)	What is SCR? Explain the volt-ampere characteristics. Define holding current and latching current.	6M	CO5	L4

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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. (II Semester) ~~Regular~~/Supplementary Examinations

17ME51-THERMAL AND HYDRO PRIME MOVERS

(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)	A mass of 1.5 kg of air is compressed in a quasi- static process from 0.1 MPa to 0.7 MPa for which PV=constant. The initial density of air is 1.16 kg/m^3. Find the work done by the piston to compress the air.	6M	CO1	L2
(b)	Explain various thermodynamic systems.	6M	CO1	L3
	(OR)			
2(a)	When a stationary mass of gas was compressed without friction at constant pressure. Its initial state of 0.4m^3 and 0.105 MPa was found to change to final state of 0.2 m^3 and 0.105 MPa. There was a heat transfer of 42.5 kJ of heat from the gas during the process. How much did the internal energy of the gas change.	6M	CO1	L2
(b)	What is heat pump? How does it differ from a refrigerator?	6M	CO1	L1
3(a)	Explain the working of four stroke diesel engine with a neat sketch.	6M	CO3	L2
(b)	In an open cycle constant pressure gas turbine air enters the compressor at 1 bar and 300 K. The pressure of air after compression is 4 bar. The isentropic efficiencies of the compressor and turbine are 78% and 85% respectively. The air fuel ratios are 80:1. Calculate the power developed and thermal efficiency of the cycle if the flow rate of air is 2.5 kg/s. Take c_p = 1.005 kJ/kgK and Υ=1.4 for air and take c_{pg} = 1.147 kJ/kgK and Υ = 1.33 for gases. R = 0.287 kJ/kg K. Calorific value of fuel = 42000 kJ/kg.	6M	CO2	L5
	(OR)			
4(a)	A 6 cylinder four stroke gas engine with a stroke volume of 1.75 litres develops 26.3 kW at 504 rpm. The m.e.p is 6 bar. Find the average number of times each cylinder misfires in one minute.	6M	CO3	L5
(b)	Illustrate the working of closed cycle gas turbine with a neat sketch.	6M	CO2	L2
5(a)	What do you mean by compounding of steam turbine. Discuss velocity compounding steam turbine.	6M	CO2	L1

(b)	A single row impulse turbine develops 132.4 kW at a blade speed of 175 m/s, using 2 kg of steam per sec. Steam leaves the nozzle at 400 m/s. Velocity coefficient of the blades is 0.9. Steam leaves the turbine blades axially. Determine nozzle angle, blade angles at entry and exit, assuming no shock.	6M	CO2	L5
	(OR)			
6(a)	Explain the working of impulse turbine with a neat sketch.	6M	CO2	L2
(b)	In a stage of impulse reaction turbine provided with single row wheel, the mean diameter of the blade is 1m. It runs at 3000 rpm. The steam issues from the nozzle at a velocity of 350 m/s and the nozzle angle is 20°. The rotor blades are equiangular. The blade friction factor is 0.86. Determine the power developed if the axial thrust on the end bearing of a rotor is 118N.	6M	CO2	L5
7(a)	Prove Bernoulli's equation from Euler's equation and write the assumptions.	6M	CO4	L5
(b)	A horizontal venturimeter with inlet diameter 20cm and throat diameter10cm is used to measure the flow of water. The pressure at inlet is 17.658N/cm^2 and the vacuum pressure at the throat is 30cm of mercury. Find the discharge of water through venturimeter. Take C_d=0.98.	6M	CO4	L4
	(OR)			
8(a)	The left leg of U-tube manometer if connected to a pipe line conveying water, the level of mercury in the leg being 0.6m below the centre of pipe line and the right leg if open to atmosphere. The level of mercury in the right leg is 0.45m above that in the left leg and the space above mercury in the right leg contains benzene (specific gravity 0.88) to a height of 0.3m. Find the pressure in pipe.	6M	CO4	L5
(b)	Define the following fluid properties and give their units. (i) Specific weight (ii) Specific gravity (iii) Mass density (iv) Viscosity	6M	CO4	L1
9(a)	Elaborate the advantages and disadvantages of Francis turbine over a Pelton wheel turbine.	6M	CO5	L6
(b)	Outline the schematic diagram of a Francis turbine and explain briefly its construction and working.	6M	CO5	
	(OR)			
10.	The following data pertain to a kaplan turbine: Power available at shaft = 22500kW, Head = 20m, Speed = 150rpm, Hydraulic efficiency = 95%, Overall efficiency = 88%, Outer diameter of runner = 4.5m, Diameter of the hub = 2m. Assume that the turbine discharges without whirl at exit, determine the runner vane angles at the hub and at the outer periphery.	12M	CO5	L5

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

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

17EC02-ELECTRONIC DEVICES AND CIRCUITS
(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)	Distinguish intrinsic and extrinsic semiconductor materials with examples.	6M	CO1	L3
(b)	Define Hall Effect and mention the applications of Hall Effect.	6M	CO1	L1
	(OR)			
2(a)	Show that Fermi level lies in the middle of the forbidden band for intrinsic semiconductors.	6M	CO1	L3
(b)	Derive an expression for relation between mobility and conductivity.	6M	CO1	L3
3(a)	Summarize the applications of Zener diode and LED.	6M	CO2	L2
(b)	Using V-I characteristics of p-n junction diode, summarize the region of operations.	(6M)	CO2	L3
	(OR)			
4(a)	Illustrate the operation of p-n junction diode in forward bias and reverse bias condition with its characteristics.	6M	CO2	L3
(b)	Derive an expression for diode current equation.	6M	CO2	L2
5(a)	List out the advantages of bridge rectifier circuit.	6M	CO4	L1
(b)	Illustrate the operation of full wave rectifier with capacitor filter and derive the expression for the ripple factor using capacitor filter.	6M	CO4	L3
	(OR)			
6(a)	Distinguish the half-wave rectifier and full wave rectifier in terms of its parameters.	6M	CO4	L4
(b)	Illustrate TUF and Mention the Transformer Utilization Factor (TUF) for full wave rectifier.	6M	CO4	L3
7(a)	Select cut-off region of transistor by discussing various configurations of transistor.	6M	CO2	L3
(b)	Illustrate the operation of Common-Collector configuration with its input and output characteristics.	6M	CO2	L3
	(OR)			
8(a)	Illustrate the construction and operation of depletion mode MOSFET with its transfer and drain characteristics.	6M	CO2	L3
(b)	Distinguish BJT and FET.	6M	CO3	L3
9(a)	Draw the circuit of voltage divider bias and derive the expression for stability factor **S**, $\mathbf{S^I}$ & $\mathbf{S^{II}}$.	6M	CO3	L2
(b)	Classify the bias compensation techniques and explain any one of them.	6M	CO3	L4
	(OR)			
10(a)	Mention various regions of operation of a transistor and explain how a transistor works as an amplifier.	6M	CO3	L3
(b)	A voltage divider bias circuit designed to establish the quiescent point at V_{CE} = 12V, I_C =2mA and stability factor ≤ 5.1. If V_{CC} =24V, V_{BE} =0.7V, β = 50 and R_C =4.7KΩ, calculate the values of resistors R_E, R_1, R_2.	6M	CO3	L3

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

17EI01-MATERIAL SCIENCE AND ENGINEERING

(EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks
1.	Show that FCC is most closely packed of three cubic structures (SC, BCC and FCC) by working out the packing factors with necessary diagrams.	12M
	(OR)	
2(a)	How properties of solids are varying with nature of bonding? Discuss.	6M
(b)	Distinguish between ionic, covalent and metallic bonds.	6M
3(a)	Briefly discuss about ferrimagnetic materials. Write their applications.	6M
(b)	How the susceptibility of a ferromagnetic substance varies with temperature? Explain with the help of suitable sketch. Give mathematical expression for Curie-Weiss law.	6M
	(OR)	
4(a)	What is hysteresis curve? Explain residual magnetism, coercive force and hysteresis loss with a neat diagram.	6M
(b)	Distinguish soft and hard magnetic materials. Write the applications of both magnetic materials.	6M
5(a)	Show your understanding about critical parameters of superconductors.	6M
(b)	How do you explain that superconductors are perfect diamagnetic in nature?	6M
	(OR)	
6(a)	Write in detail about high temperature superconductors.	6M
(b)	Mention properties and any four applications of high temperature superconductors.	6M
7(a)	Discuss in detail about optical absorption in metals, semiconductors and insulators.	6M
(b)	Explain how LED works? Write its advantages.	6M
	(OR)	
8(a)	What is meant by acousto-optic effect? Describe briefly about acousto-optic modulators.	6M
(b)	Show your understanding about magneto-optic modulators.	6M
9(a)	How do you explain biocompatibility? Write properties of biomaterials.	6M
(b)	Give the examples for metals and alloys, polymers and ceramics used as biomaterials.	6M
	(OR)	
10(a)	Show your understanding about conducting polymers.	6M
(b)	Write short notes on high temperature and thermoelectric materials.	6M

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B.Tech. (II Semester) Supplementary Examinations

17CI05-DATA STRUCTURES
(IT)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks
1(a)	How to represent single linked list? Discuss.	6M
(b)	Differentiate between doubly and circular linked lists.	6M
	(OR)	
2.	Explain and write pseudo code for creation, insertion and deletion operations on circular linked list.	12M
3(a)	How to represent stacks? Discuss.	6M
(b)	Write a program to evaluate postfix expressions.	6M
	(OR)	
4.	Explain about Circular Queues implementation. Write the pseudo code for the operations on Circular Queues.	12M
5(a)	Explain about Fibonacci search? Give an example.	6M
(b)	Discuss binary search with an example.	6M
	(OR)	
6(a)	Explain and Write an algorithm for Merge Sorting.	6M
(b)	Sort the elements using Merge Sort: 52, 38, 81, 22, 48, 13, 69, 93, 14, 45, 58, 79, 72.	6M
7.	Discuss about different binary tree traversals with examples.	12M
	(OR)	
8(a)	What is a Binary search tree? Discuss.	6M
(b)	Write an algorithm for insert an element into a binary search tree.	6M
9(a)	What is a Graph? How graphs can be represented? Discuss.	6M
(b)	Explain about the prim's algorithm with example.	6M
	(OR)	
10(a)	Explain DFS.	6M
(b)	Discuss about BFS.	6M

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