

# B.Tech.(I Sem.)(R17) (Suppl.)

## LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

A.Y. 2019-20

B.Tech. (I Semester) (R17) Supplementary Examinations, December 2020

### TIME TABLE

**TIME : 10.00 AM to 1.00 PM**

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
17-12-2020 (Thursday)	17FE01 - Professional Communication-I	17FE01 - Professional Communication - I	17FE01 - Professional Communication-I	17FE01 - Professional Communication-I	17FE01 - Professional Communication-I	17FE01 - Professional Communication-I	17FE01 - Professional Communication - I	17FE01 - Professional Communication-I
18-12-2020 (Friday)	17FE04 - Differential Equations and Linear Algebra	17FE04 - Differential Equations and Linear Algebra	17FE05 - Differential Equations and Numerical Applications	17FE04 - Differential Equations and Linear Algebra	17FE04 - Differential Equations and Linear Algebra	17FE04 - Differential Equations and Linear Algebra	17FE04 - Differential Equations and Linear Algebra	17FE04 - Differential Equations and Linear Algebra
19-12-2020 (Saturday)	17FE13 - Engineering Physics	17FE13 - Engineering Physics	17FE15 - Engineering Chemistry	17FE15 - Engineering Chemistry	17FE12 - Applied Physics	17FE15 - Engineering Chemistry	17FE15 - Engineering Chemistry	17FE13 - Engineering Physics
21-12-2020 (Monday)	17CI01 - Computer Programming	17CI01 - Computer Programming	17CI01 - Computer Programming	17EC01 - Electrical Circuits and Networks	17CI01 - Computer Programming	17CI01 - Computer Programming	17CI01 - Computer Programming	17CI01 - Computer Programming
22-12-2020 (Tuesday)	17ME01 - Engineering Graphics	17CE01 - Building Materials and Construction	17EC02 - Electronic Devices and Circuits	17EC02 - Electronic Devices and Circuits	17ME50 - Basic Engineering Mechanics	17EC01 - Electrical Circuits and Networks	17EC02 - Electronic Devices and Circuits	17ME01 - Engineering Graphics

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

Date: 27-11-2020

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

CONTROLLER OF EXAMINATIONS

*[Signature]*  
**PRINCIPAL**

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

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

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

**17FE01-PROFESSIONAL COMMUNICATION – I**

(Common to All)

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) Is the poetry Kalam quotes relevant to his speech? How? [4M]
- (b) Write a paragraph on 'The advantages and disadvantages of Social media'. [4M]
- (c) i. Identify the '**Part of speech**' of the Italicized word in the following sentences:
- She **thought** of a wise plan..
  - I want to go **now**.
  - That was a **lovely** evening.
  - My father works in a **factory**.
- ii. Fill the blanks with appropriate '**articles**'.
- I want \_\_\_\_ apple from that basket..
  - \_\_\_\_ church on the corner is progressive.
  - Miss Lin speaks \_\_\_\_ Chinese.
  - One of the students said, "\_\_\_\_ professor is late today." [4M]

**(OR)**

- 2(a) Explain the concept of a christmas angel, as depicted in the story? [4M]
- (b) Write a paragraph on "Man and Machines". [4M]
- (c) Change the word as directed by using Prefix/Suffix.
- happy(opposite)
  - believable (opposite)
  - courage(adjective)
  - addict(noun) [4M]

**UNIT-II**

- 3(a) Briefly describe Nadella's thoughts on innovation and its importance.? [4M]
- (b) Write a letter to the Principal of your college requesting him to allot more practical classes so as to enable you (student) to get practical knowledge. [4M]
- (c) Identify the verbs and say whether they are 'Transitive/ Intransitive/ Gerund.
- She **was crying** all day long.
  - We **showed** her the photo album.
  - The doctor **advised** me to exercise regularly.
  - It **was raining** at that time. [4M]

**(OR)**

- 4(a) There is a spirit of regret and longing in the poem "The road not taken"- explain. [4M]
- (b) Write a letter to the Cambridge publications asking him to send you all the Technical English books through courier to your residential address. [4M]

**17FE01-PROFESSIONAL COMMUNICATION – I**

- (c) Write the meanings of the 'Phrasal verbs' given below:  
(i) Call on (ii) look into (iii) take over d. turn on [4M]

**UNIT-III**

- 5(a) How does people's technology that the Schumacher propose differ from primitive or super-technology? [4M]  
(b) As a member of your residential society, write an email to the inspector of local Police station, Mr.Sharma, informing him about miscreants who ride their bikes rashly every evening. Sign the email as William. [4M]  
(c) i. Write the 'Synonyms' of the following:  
a. Hamper b. Illicit  
ii. Write the 'Antonyms' of the following:  
a. Diminish b. Abandon  
iii. Fill the blanks with appropriate verb forms.  
a. When I reached home, John \_\_\_\_\_(sleep).  
b. Ravi \_\_\_\_\_( watch) English news on T.V. every day. [4M]

**(OR)**

- 6(a) How is the knowledge acquired by Wordsworth and that acquired by the scientist different? [4M]  
(b) Assume the role of a manager(production) of a small company, and draft a memo to the supervisor asking him to submit a report on the working conditions in his section. [4M]  
(c) Distinguish the pair of words given below writing their meanings.  
(i) canon/cannon (ii) reel/real (iii) live/leave (iv) born/borne [4M]

**UNIT-IV**

- 7(a) Why does the elderly gentleman rush to the general merchant's store? According to him what had Seth Govind Ram done? [6M]  
(b) Expand the proverb on listening skill "The wise man has long ears and a short tongue." [6M]

**(OR)**

- 8(a) Narrate the story of "The boy who broke the bank" justifying the significance of listening. [6M]  
(b) Expand the proverb on listening skill "Opportunity seldom knocks twice". [6M]

**UNIT-V**

- 9(a) Do you think Skavinski will remain at the lighthouse or will he resume his travelling? Justify your answers giving reasons. [6M]  
(b) Expand the proverb on interview skills "The early bird catches the worm." [6M]

**(OR)**

- 10(a) What are the strengths and weakness of Skavinski? What does he achieve when he gets the job? [6M]  
(b) Write a Résumé with covering letter to the HR of WIPRO for the post of a software developer. [6M]

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

B.Tech. (I Semester) Regular/Supplementary Examinations  
**17FE04-DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA**  
(AE,CE,ECE,EEE,EIE,IT&ME)

34

Time : 3 hours

Max. Marks : 60

Answer one question from each unit  
All questions carry equal marks

Q.No	Questions	Marks
1(a)	Solve $[y(1 + \frac{1}{x}) + \cos y] dx + (x + \log x - x \sin y) dy = 0$ .	6M
(b)	If the air is maintained at $30^\circ\text{C}$ and the temperature of the body cools from $80^\circ\text{C}$ to $60^\circ\text{C}$ in 12 minutes, find the temperature of the body after 24 minutes.	6M
(OR)		
2.	Find the orthogonal trajectories of $\frac{x^2}{a^2 + \lambda} + \frac{y^2}{b^2 + \lambda} = 1$ , where $\lambda$ being a parameter.	12M
3(a)	Solve $(D - 2)^2 y = 8(e^{2x} + \sin 2x + x^2)$ .	6M
(b)	Solve by the method of variation of parameters, $y'' - y = \frac{2}{1+e^x}$ .	6M
(OR)		
4(a)	Using method of variation of parameters, solve $y'' + y = \tan x$ .	6M
(b)	Solve $y'' - 2y' + y = x e^x \sin x$ .	6M
5(a)	Expand $\log x$ in powers of $(x - 1)$ and hence evaluate $\log(1.1)$ correct to three decimal places.	6M
(b)	If $u = x\sqrt{1-y^2} + y\sqrt{1-x^2}$ , $v = \sin^{-1}x + \sin^{-1}y$ , show that $u, v$ are Functionally related and find the relation between them.	6M
(OR)		
6(a)	Using Taylor's theorem, prove that $x - \frac{x^3}{6} < \sin x < x - \frac{x^3}{6} + \frac{x^5}{120}$ , for $x > 0$ .	6M
(b)	If $u = x^2 + y^2 + z^2$ , $v = xy + yz + zx$ , $w = x + y + z$ , find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ .	6M
7.	Investigate for what values of $\lambda$ and $\mu$ the simultaneous equations $x + y + z = 6$ , $x + 2y + 3z = 10$ , $x + 2y + \lambda z = \mu$ , Have (i) No solution (ii) A unique solution (iii) A finite number of solutions.	12M
(OR)		
8(a)	Find the two non-singular matrices $P$ and $Q$ such that $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{bmatrix}$ is reduced to normal form. Also find its rank.	6M
(b)	Test for consistency and solve the system of equations : $2x - 3y + 7z = 5$ , $3x + y - 3z = 13$ , $2x + 19y - 47z = 32$ .	6M
9(a)	Using Cayley - Hamilton theorem, find $A^{-2}$ , where $A = \begin{bmatrix} 1 & 2 & 0 \\ 2 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$ .	6M
(b)	Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$ .	6M
(OR)		
10.	Find the characteristic equation of the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and hence compute $A^{-1}$ . Also find the matrix represented by $A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$ .	12M

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H.T.No

R17

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

**17FE05-DIFFERENTIAL EQUATIONS AND NUMERICAL APPLICATIONS**

(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)	A substance cools from 370K to 330K in 10 minutes, when the temperature of the surrounding air is 290K, find the temperature of the substance after 40 minutes.	6M	CO1	L3
(b)	Solve the differential equation $(x^2 - 4xy - 2y^2)dx + (y^2 - 4xy - 2x^2)dy = 0$ .	6M	CO1	L1
<b>(OR)</b>				
2(a)	Find the complete solution of the differential equation $2xy dy - (x^2 + y^2 + 1)dx = 0$ .	6M	CO1	L2
(b)	Find the orthogonal trajectories of families of cardioids $r = a(1 - \cos\theta)$ , where a is the parameter.	6M	CO1	L3
3(a)	Solve $(D^2 - 5D + 6)y = 4e^x + 5$ .	6M	CO2	L2
(b)	Determine the general solution of $(D^2 + 3D + 2)y = \sin 4x \cos 2x$ .	6M	CO2	L2
<b>(OR)</b>				
4(a)	Solve $(D^2 - 3D + 2)y = 2x^2$ .	6M	CO2	L2
(b)	Apply method of variation parameters, find the complete solution of $\frac{d^2 y}{dx^2} + 4y = \sec 2x$ .	6M	CO2	L3
5(a)	Prove that the functions $u = 2x - y + 3z$ , $v = 2x - y - z$ and $w = 2x - y + z$ are functionally dependent and hence find the relation between them.	6M	CO3	L1
(b)	Expand $e^{xy}$ as a Taylor's series near the point (1,1).	6M	CO3	L3
<b>(OR)</b>				
6(a)	Find a point on the plane $3x + 2y + z = 12$ which is nearest to the origin.	6M	CO3	L2
(b)	Find the extreme values of $f(x, y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$ .	6M	CO3	L1
7(a)	Generate a Partial differential equation by eliminating the arbitrary function from $z = f(x + it) + g(x - it)$ .	6M	CO4	L3
(b)	Solve $(mz - ny)p + (nx - lz)q = ly - nx$ .	6M	CO4	L2
<b>(OR)</b>				
8(a)	By eliminating arbitrary function, find the partial differential equation from $f(x^2 + y^2, z^2 - xy) = 0$	6M	CO4	L3

(b)	Obtain the general solution of the Lagrange's partial differential equation $pyz + qzx = xy$	6M	CO4	L2
9(a)	Solve $y' = y + x$ , $y(1) = 0$ to find $y(1.1)$ and $y(1.2)$ by Taylor's series method.	6M	CO5	L2
(b)	Apply Runge - Kutta fourth order method to obtain solution to differential equation $\frac{dy}{dx} = x^2 - y$ , $y(0)=1$ and hence estimate the value of $y(0.1)$ .	6M	CO5	L2
<b>(OR)</b>				
10(a)	Apply Modified Euler's method to find approximate value of $y$ when $x=0.1$ for $\frac{dy}{dx} = x + y^2$ where $y=0$ at $x=0$ .	6M	CO5	L2
(b)	Employ Picard's method to find the value of $y$ when $x=0.1, 0.2$ given that $y=1$ when $x=0$ , $\frac{dy}{dx} = 1 + xy$	6M	CO5	L2

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B.Tech. I Semester ~~Regular~~/Supplementary Examinations**17FE13-ENGINEERING PHYSICS**

(AE, CE &amp; ME)

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) How Newton's rings are formed in the reflected light? Derive an expressions radius of curvature of plano-convex lens. [6M]

(b) Explain the phenomenon of interference observed in reflected light from thin films. Obtain the condition for maxima and minima. [6M]

**(OR)**

2(a) Describe the fraunhofer diffraction due to single slit with intensity distribution curves. [6M]

(b) Define grating and derive the expression for the resolving power of grating. [6M]

**UNIT-II**

3(a) What are Quarter wave plate (QWP) and Half wave plate (HWP)? Estimate the minimum thickness of QWP & HWP for a light beam of wavelength 589.3nm, if refractive indices for O-ray & E-rays are 1.65833, 1.48640. [6M]

(b) Illustrate the working of Laurent's Half shade Polarimeter to find the specific rotation of optically active solution. [6M]

**(OR)**

4(a) Distinguish between spontaneous and stimulated emission of radiation. Obtain the relations between Einstein coefficients. [6M]

(b) With the help of suitable diagrams, explain the construction and working of a Helium-Neon gas laser. [6M]

**UNIT-III**

5(a) What are matter waves? Explain their properties. Show that the wavelength ( $\lambda$ ) associated with an electron of mass 'm' and kinetic energy 'E' is given by  $\lambda = \frac{h}{\sqrt{2mE}}$ . [6M]

(b) Analyze the Davisson and Germer's experiment to verify the wave nature of particles. [6M]

**(OR)**

6(a) Show that FCC is the most closely packed of the three cubic structures by working out the packing factors. [6M]

(b) Define Miller indices. Explain the procedure to find the miller indices of a plane and significance of Miller indices. [6M]

**UNIT-IV**

7(a) Define the terms susceptibility ( $\chi$ ), magnetic induction (B) and magnetization (M). A magnetic material has a magnetisation of 2300A/m and produces a flux density of 0.00314Wb/m<sup>2</sup>. Calculate the magnetising force and the relative permeability of the material. [6M]

(b) Explain the origin of magnetic moment in materials. [6M]

**(OR)**

8(a) Classify the magnetic materials based on electron spin. [6M]

(b) Illustrate Weiss domain theory of ferromagnetism. [6M]

**UNIT-V**

9(a) Explain the phenomenon of super conductivity and bring out the importance of critical temperature. [6M]

Calculate the critical field for a wire of lead having a diameter of 1 mm at 4.2 K. Critical temperature for lead is 7.18 K and  $H(C) = 6.5 \times 10^4$  A/m.

(b) Explain the phenomenon of Meissner effect. Distinguish between type I & type-II super conductors with necessary diagrams. [6M]

**(OR)**

10(a) Derive London equations to explain the superconductivity. [6M]

(b) Illustrate AC & DC Josephson effect of superconductivity with their V-I characteristics. [6M]

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

**17FE15-ENGINEERING CHEMISTRY**

(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(a)	Derive Nernst equation.	6M	CO1	L3
(b)	Define the terms standard electrode potential, primary cell, secondary cell.	6M	CO1	L1
<b>(OR)</b>				
2(a)	Explain the construction and working of fuel cell.	6M	CO1	L2
(b)	How can you say that calomel electrode is reversible with respect to chloride ions?	6M	CO1	L4
3(a)	State the principle of cathodic protection. Explain impressed current method to control corrosion.	6M	CO2	L2
(b)	Illustrate the galvanic corrosion.	6M	CO2	L1
<b>(OR)</b>				
4(a)	How the following factors influence rate of corrosion? (i) Purity (ii) Position in galvanic series (ii) Relative areas of cathode and anode.	6M	CO2	L2
(b)	Write a note on types of oxide layers formed over metallic surfaces.	6M	CO2	L1
5(a)	What are conducting polymers? How conduction occurs in intrinsic conducting polymers?	6M	CO3	L2
(b)	Differentiate thermosets and thermoplasts.	6M	CO3	L2
<b>(OR)</b>				
6(a)	Outline the applications of nano materials.	6M	CO3	L2
(b)	Analyze the techniques involved in sol-gel process to prepare nano materials.	6M	CO3	L3
7(a)	Define the term phosphorescence and give its applications.	6M	CO4	L2
(b)	Illustrate photosensitization and chemiluminescence.	6M	CO4	L1
<b>(OR)</b>				
8(a)	Summarize applications of liquid crystals.	6M	CO4	L2
(b)	Categorize thermotropic liquid crystals in view of their structure and specific properties.	6M	CO4	L2
9(a)	Analyze the titration of weak base versus strong acid using conductometry.	6M	CO5	L4
(b)	How to estimate ferric ion in given water sample using standard KCNS solution by colorimetric method?	6M	CO5	L2
<b>(OR)</b>				
10(a)	Illustrate possible shifts in U.V spectroscopy.	6M	CO5	L1
(b)	Summarize the applications of I.R spectroscopy.	6M	CO5	L2



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

**17FE12-APPLIED PHYSICS**

(EEE)

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) Derive the expressions for the diameters of dark and bright rings in Newton's rings experiment. [6M]  
(b) Evaluate the thickness of air film at 10<sup>th</sup> dark ring in Newton's ring system viewed normally by a reflected light of wavelength 500 nm. The diameter of 10<sup>th</sup> dark ring is 2 mm. [6M]

**(OR)**

- 2(a) Define resolving power of a grating and obtain the expression for it. [6M]  
(b) Monochromatic light of wavelength 5000 Å, incident normally on a grating 2 cm wide. The first order spectrum is produced at an angle of 18°15' from the normal. Deduce the total number of lines on the grating. [6M]

**UNIT-II**

- 3(a) Describe the construction and working of a Quarter wave plate. [6M]  
(b) Calculate the thickness of a mica sheet to convert into a quarter wave plate when light of wavelength 546.1 nm is used. Given the refractive indices of ordinary and extraordinary rays are 1.586 and 1.592. [6M]

**(OR)**

- 4(a) Write about the basic requirements of a laser. [6M]  
(b) Explain the construction and working of He-Ne laser. [6M]

**UNIT-III**

- 5(a) Enumerate the physical significance of wave function. [6M]  
(b) Show that the energies of a particle in a potential box are quantized. [6M]

**(OR)**

- 6(a) Explain the classical free electron theory of metals. [6M]  
(b) Write the merits and demerits of classical free electron theory. [6M]

**UNIT-IV**

- 7(a) Obtain the expression for conductivity of intrinsic semiconductor. [6M]  
(b) The intrinsic carrier density at room temperature in germanium is  $2.37 \times 10^{19} \text{ /m}^3$ . If the electron and hole mobilities are 0.38 and 0.18  $\text{m}^2\text{V}^{-1}\text{S}^{-1}$  respectively calculate the resistivity. [6M]

**(OR)**

- 8(a) Formulate the Einstein's equation. [6M]  
(b) Determine the diffusion coefficient of electrons in silicon at 300 K if mobility of electrons is  $0.19 \text{ m}^2\text{V}^{-1}\text{S}^{-1}$ . [6M]

**UNIT-V**

- 9(a) Define ionic polarization and obtain the expression for ionic polarizability. [6M]  
(b) Write a brief note on piezo electricity. [6M]

**(OR)**

- 10(a) Derive an expression for the internal field. [6M]  
(b) Write the applications of dielectric materials. [6M]

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

**17EC01-ELECTRICAL CIRCUITS AND NETWORKS**  
(ECE)

Time : 3 hours

Max. Marks : 60

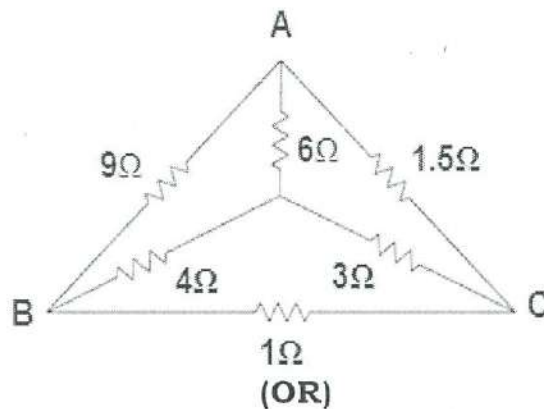
Answer one question from each unit.

All questions carry equal marks

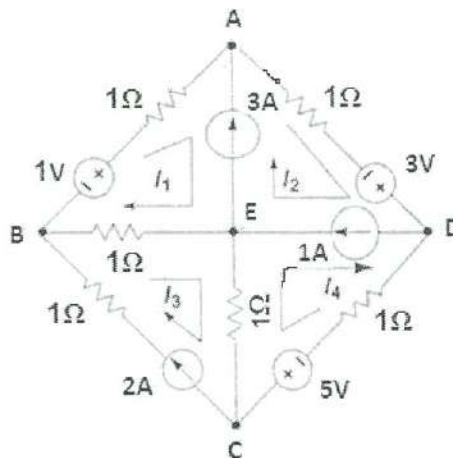
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**UNIT-I**

- 1(a) Define the following:  
i) Tree ii) Co-tree iii) Twig iv) Link [6M]
- (b) Find the equivalent resistance between A and B. [6M]



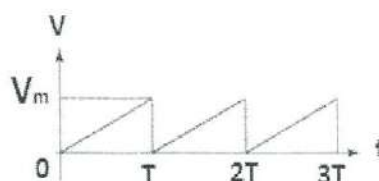
2. Analyze the given circuit using mesh analysis and determine the currents.



[12M]

**UNIT-II**

3. Demonstrate the concepts of instantaneous power, average power, apparent power and reactive power. [12M]
- (OR)**
- 4(a) Obtain the average value, R.M.S value, Form factor and Peak factor for the given signal.



[6M]

## 17EC01-ELECTRICAL CIRCUITS AND NETWORKS

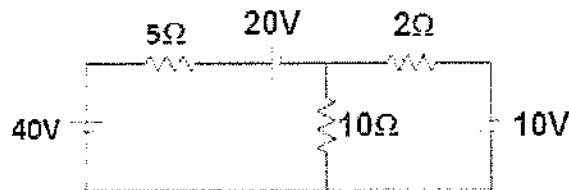
- (b) Define the following terms  
 i) Impedance ii) Reactance iii) Admittance iv) Susceptance [6M]

### UNIT-III

- 5(a) Derive the quality factor of series RLC circuit. [6M]  
 (b) Determine the impedance of series RLC circuit with  $R=12\Omega$ ,  $L=0.15H$ ,  $C=22\mu F$  at resonant frequency, 10Hz below resonant frequency and 10Hz above resonant frequency. [6M]

(OR)

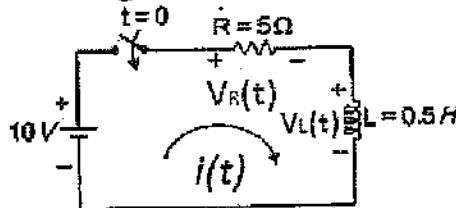
- 6(a) State and write the procedure for thevenin's theorem to apply any circuit. [6M]  
 (b) Determine the current through  $2\Omega$  resistor using thevenin's theorem.



[6M]

### UNIT-IV

- 7(a) Evaluate  $i(t)$  and sketch its response of the circuit shown in figure, the switch is kept open for a long time. The switch is closed at  $t=0$ .

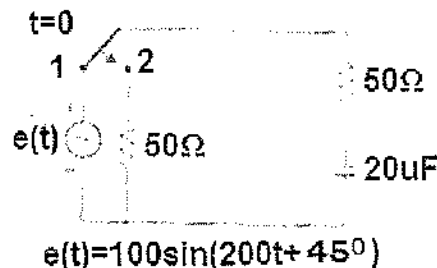


[6M]

- (b) Estimate the transient response of series RC circuit having Sinusoidal excitation. [6M]

(OR)

- 8(a) In the circuit the switch remains in position-1 for a long time. At  $t=0$ , the switch is moved from position-1 to position-2. Evaluate the expression for the current through the RC circuit.

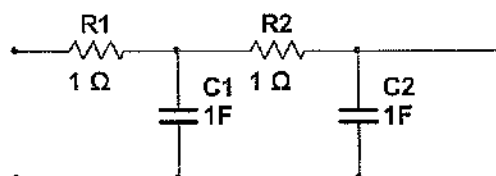


[6M]

- (b) Estimate the transient response of series RLC circuit having Sinusoidal excitation. [6M]

### UNIT-V

- 9(a) Compute the short-circuit admittance parameters for the network shown in figure.



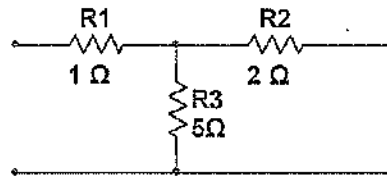
[6M]

- (b) Demonstrate that the Z-parameters with the given ABCD-parameters. [6M]



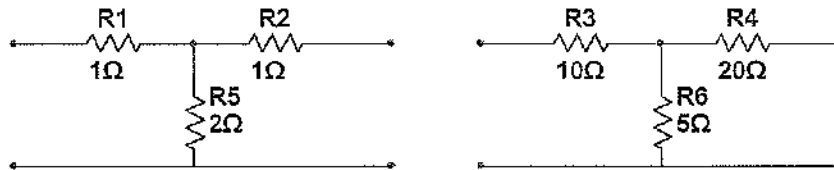
(OR)

- 10(a) Compute the transmission parameters for the network shown in figure.



[6M]

- (b) Compute the Z- parameters of the resulting network. When two networks shown below are connected in series.



[6M]

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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

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

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

**17CE01-BUILDING MATERIALS AND CONSTRUCTION**

(CE)

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) Discuss briefly about classification of rocks based on geological formation. [6M]  
 (b) What are the characteristics of a good building stone? [6M]

**(OR)**

- 2(a) Explain the steps involved in manufacturing of clay bricks. [6M]  
 (b) List out the characteristics of a good clay brick. [6M]

**UNIT-II**

- 3(a) Summarize the classification of lime as per IS 712. [6M]  
 (b) Distinguish between lime and cement. [6M]

**(OR)**

- 4(a) Name the ingredients of cement and mention their functions. [6M]  
 (b) Demonstrate various field tests for cement. [6M]

**UNIT-III**

- 5(a) Explain about the selection of mortar for different engineering works. [6M]  
 (b) Classify mortars based on binding materials. [6M]

**(OR)**

- 6(a) Outline the plans and elevation of  $1\frac{1}{2}$  brick wall in Flemish bond. [6M]  
 (b) Recall various defects in brick masonry. [6M]

**UNIT-IV**

- 7(a) Classify the buildings based on occupancy as per NBC. [6M]  
 (b) What are the essential requirements of a good foundation? [6M]

**(OR)**

- 8(a) What is a lintel? Give its classification. [6M]  
 (b) Outline a Dog-legged staircase and tell its details. [6M]

**UNIT-V**

- 9(a) Explain the structure of timber with neat sketch. [6M]  
 (b) List out various characteristics of good timber. [6M]

**(OR)**

- 10(a) Explain in brief about constituents of paint. [6M]  
 (b) List out various types of varnishes and mention their uses. [6M]

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(AUTONOMOUS)**

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

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

**17ME01-ENGINEERING GRAPHICS**  
(ASE&ME)

Time : 3 hours

Max. Marks : 60

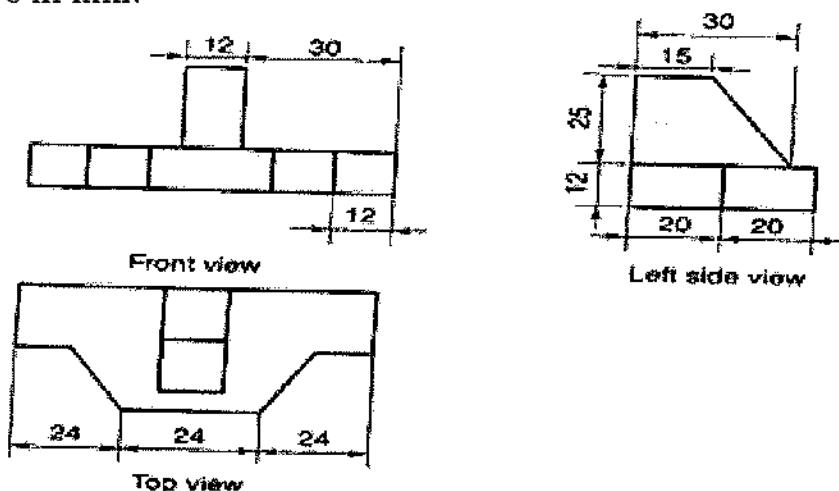
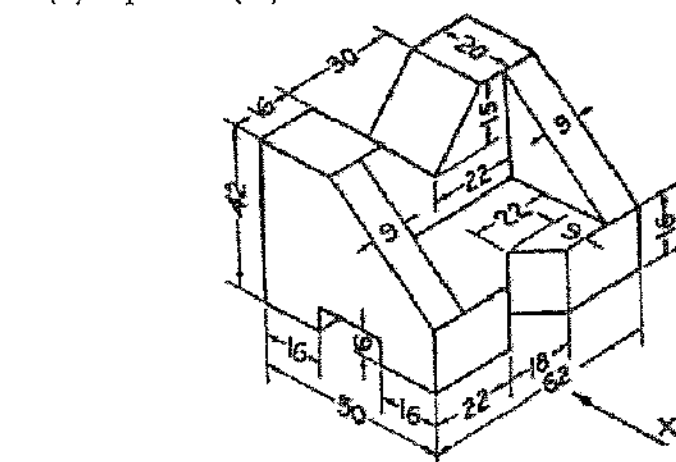
Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	A vertex of a hyperbola is 65mm from its focus. Draw the curve if the eccentricity is $5/2$ . Draw a tangent and a normal to the curve at any point on the curve.	6M	CO1	L1
(b)	Draw involute of a pentagon side 30 mm. Draw its tangent and normal fit at 70 mm of the centre of pentagon.	6M	CO1	L1
<b>(OR)</b>				
2(a)	A circle of 50 mm diameter rolls on a straight line, without slipping. Draw the locus of a point on the circumference of the circle for one revolution. Name the curve. Draw the tangent and normal to the curve at a point 20 mm below the axis.	6M	CO1	L2
(b)	Construct an ellipse when its major axis is equal to 100mm and minor axis is equal to 65mm.	6M	CO1	L1
3(a)	A line AB 40mm long is parallel to HP and perpendicular to VP. Point A is nearer to VP and is 30mm above HP. And 20mm in front of VP. Draw its projections.	6M	CO2	L1
(b)	A line PQ, inclined at $45^\circ$ to the V.P., has a 60 mm long front view. The end P is 10 mm from both the principal planes while the ends Q is 45 mm above the H.P. Draw the projections of the line and determine its true length and inclinations with the principal planes. Also, locate its traces.	6M	CO2	L2
<b>(OR)</b>				
4(a)	Draw the projections of the following points on a common XY-line: (i) Point A, 20mm above HP. And 25mm behind VP (ii) Point B, 15mm below HP. And 35mm in front of VP.	6M	CO2	L1
(b)	The end projectors of a line PQ are 40 mm apart while those drawn for its H.T. and V.T. are 65 mm apart. The H.T. is 30 mm in front of the V.P. and V.T. is 45mm above the H.P. Draw the projections of PQ, if its end P is 10 mm above the H.P. Also, determine its true length and inclinations with the reference planes.	6M	CO2	L3
5(a)	An equilateral triangle with 60 mm long edge rests on a corner in the VP such that the edge opposite to that corner is perpendicular to HP. The surface of the plane is inclined at $45^\circ$ to the VP. Draw its projections.	6M	CO3	L2
(b)	A hexagonal plane of 30 mm side is resting on one edges in V.P. Its surface makes an angle of $45^\circ$ to V.P and perpendicular to HP. Draw the projections.	6M	CO3	L2
<b>(OR)</b>				



6(a)	Draw the projections of a square of 30 mm side resting with one of its edges on VP, such that the surface is inclined at $30^\circ$ to the VP.	6M	CO3	L2
(b)	A Rhombus of diagonals 120 mm & 80 mm is resting on one of its corners in H.P such that the longer diagonal is inclined at $30^\circ$ to H.P and the shorter diagonal is parallel to both the planes.	6M	CO3	L2
7.	A triangular prism of base side 40 mm and height 50 mm has its axis inclined at $40^\circ$ to VP and has a base edge on VP, inclined at $50^\circ$ to HP. Draw its projections.	12M	CO4	L3
(OR)				
8.	Draw the projections of a right cylinder of diameter 45mm and axis 60mm when its axis makes an angle of $30^\circ$ with the HP and $45^\circ$ with the VP.	12M	CO4	L3
9(a)	Draw isometric view of a cylinder of base diameter 55 mm and axis length 65 mm when the axis of the cylinder is (i) vertical (ii) horizontal.	6M	CO5	L2
(b)	Draw the following figure. All dimensions are in mm. (i) front view (ii) top view (iii) side view.	6M	CO5	L3
(OR)				
10.	Draw the isometric view of the given figure. All dimensions are in mm.	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. (I Semester) ~~Regular~~/Supplementary Examinations

**17EC01-ELECTRICAL CIRCUITS AND NETWORKS**

(EIE)

Time : 3 hours

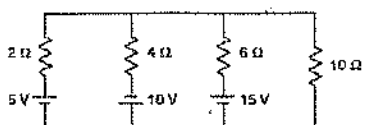
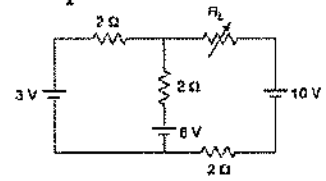
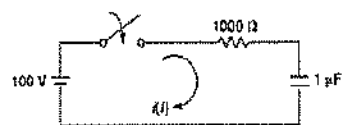
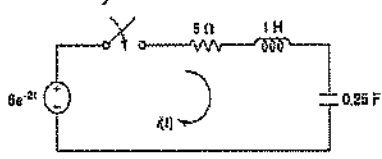
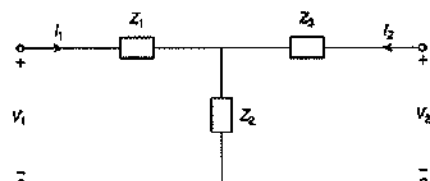
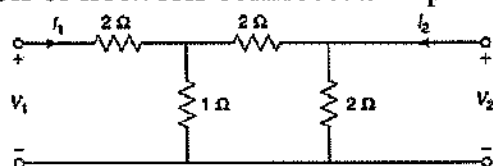
Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	<p>(i) Find the voltage drop across each resistors (<math>5\Omega, 10\Omega, 7.5\Omega</math>)</p> <p>(ii) Find the current passing in resistors (<math>20\Omega, 10\Omega</math>)</p>	6M	CO1	L1
(b)	<p>Apply supermesh analysis on a given circuit and determine the currents.</p>	6M	CO2	L3
<b>(OR)</b>				
2(a)	Illustrate the concept of source transformation technique with necessary circuit diagrams.	6M	CO1	L3
(b)	<p>Determine the equivalent capacitance between A and B from the given circuit.</p>	6M	CO1	L3
3(a)	Demonstrate the behavior pure capacitor in an AC circuit using necessary diagram.	6M	CO1	L3
(b)	<p>Calculate the Average value, R.M.S value, Form factor and Peak factor of the given signal.</p>	6M	CO1	L3
<b>(OR)</b>				
4(a)	Explain self inductance and mutual inductance of magnetic circuits.	6M	CO1	L1
(b)	Summarize the concept of coupled circuit and draw electrical equivalent circuits.	6M	CO1	L2
5(a)	Derive an expression for the bandwidth of series RLC circuit.	6M	CO4	L3

**17EC01-ELECTRICAL CIRCUITS AND NETWORKS**

(b)	Determine the current passing through the $10\Omega$ using Millman's theorem. 	6M	CO4	L3
<b>(OR)</b>				
6(a)	State and prove the maximum power transfer theorem with a simple circuit.	6M	CO2	L2
(b)	Determine the current through resistance $R_L$ and maximum power using maximum power transfer theorem. 	6M	CO2	L3
7(a)	Illustrate the transient response of series RC circuit having DC excitation.	6M	CO3	L3
(b)	Find the transient current $i(t)$ , $(di/dt)$ and $(d^2i/dt^2)$ at $t=0^+$ for a given circuit. 	6M	CO3	L3
<b>(OR)</b>				
8(a)	Describe the expression for $i(t)$ for R-L-C circuit using Laplace transform and inverse Laplace transform.	6M	CO3	L2
(b)	Determine the current $i(t)$ assuming zero initial conditions in the network elements, when switch is closed at $t=0$ . 	6M	CO3	L3
9(a)	Describe about the open circuit impedance parameters of two-port network.	6M	CO1	L2
(b)	Solve the Z Parameters of the network shown in figure. 	6M	CO1	L3
<b>(OR)</b>				
10(a)	Classify different types of interconnections of two-port network with resultant parameters.	6M	CO4	L1
(b)	Calculate resultant transmission parameters of two identical section of network connected in parallel. 	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. (I Semester) **Regular**/Supplementary Examinations

**17ME50-BASIC ENGINEERING MECHANICS**

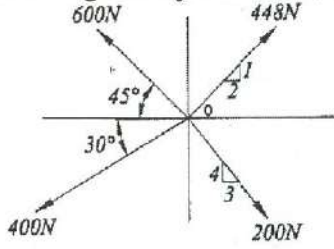
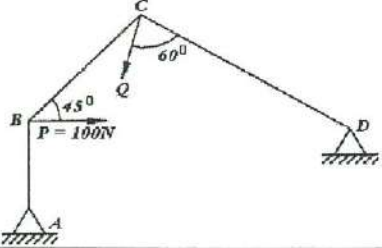
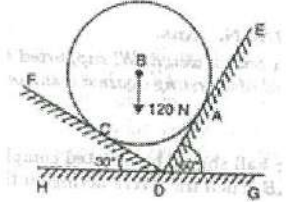
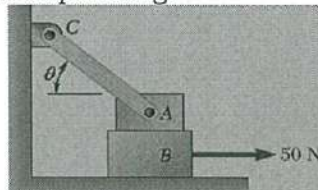
(EEE)

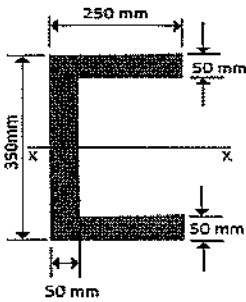
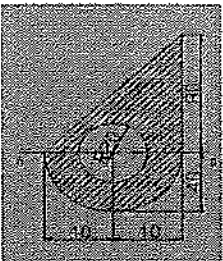
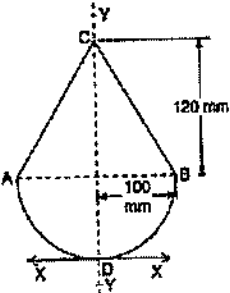
Time : 3 hours

Max.Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the following terms. (i) Rigid body (ii) Dynamics (iii) Couple.	6M	CO1	L1
(b)	Evaluate the resultant force of given system of forces as shown in figure. 	6M	CO1	L3
<b>(OR)</b>				
2(a)	Three bars lying in one plane hinged at their ends are shown in figure. They are subjected to force P and Q applied at B and C. If P = 100 N, determine the value of force Q is necessary to keep the system of bars in equilibrium. 	6M	CO1	L3
(b)	A solid sphere of radius 250mm and weight 120N rests in between two inclined planes as shown in figure below. Determine the reactions at points A and C. Assume the plane surfaces are smooth. 	6M	CO1	L3
3(a)	A body is weighing 500N rests on a rough horizontal plane is subjected to a horizontal force P. Determine the frictional force developed in the surface if coefficient of friction is 0.3 and if P is applied at an angle of 20° with horizontal.	6M	CO2	L3
(b)	Define friction and write laws of friction.	6M	CO2	L2
<b>(OR)</b>				
4.	The 8-kg block A is attached to link AC and rests on the 12-kg block B. Knowing that the coefficient of static friction is 0.20 between all surfaces of contact and neglecting the mass of the link, determine the value of $\theta$ for which motion of block B is impending. 	12M	CO2	L4

5(a)	Write a short note on (i) Centroid (ii) Moment of inertia (iii) Radius of gyration.	6M	CO3	L1
(b)	Find the centroid of the following C-section. 	6M	CO3	L3
(OR)				
6(a)	Determine the Moment of Inertia of a triangle of base 'b' and altitude 'h' with respect to (i) an axis coinciding with its base (ii) a centroidal axis parallel to its base.	6M	CO3	L2
(b)	Find the moment of inertia of the shaded area as shown in figure about the axis AB. 	6M	CO3	L3
7(a)	A body consists of a right circular solid cone of height 120mm and radius 100mm placed on a solid hemisphere of radius 100mm of the same material. Find the position of centre of gravity of the body. 	6M	CO4	L3
(b)	Derive an expression for mass moment of inertia of a rectangular plate about centroidal axes.	6M	CO4	L2
(OR)				
8(a)	State and prove Parallel axis theorem.	6M	CO4	L2
(b)	Calculate the moment of inertia of a steel sphere 350mm diameter with respect to a centroidal axis. The density of steel is 7830kg/m <sup>3</sup> .	6M	CO4	L3
9(a)	A car starts from rest and moves with a constant acceleration of 1.5m/s <sup>2</sup> until it achieves a velocity of 25m/s. It then travels with constant velocity for 60 seconds. Determine the average speed and the total distance travelled.	6M	CO5	L3
(b)	Ball A is thrown vertically upward from the top of a 30m high building with an initial velocity of 5 m/s. At the same instant another ball B is thrown upward from the ground with an initial velocity of 20 m/s. Determine the height from the ground and the time at which they pass.	6M	CO5	L3
(OR)				
10.	Derive the expressions for the following in projectile motion (i) General equation of projectile motion (equation of trajectory) (ii) Time of flight (iii) Max. height reached by projectile and time (iv) Range.	12M	CO5	L2

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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

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

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

**17EC02-ELECTRONIC DEVICES AND CIRCUITS**

(CSE,ECE&IT)

Time : 3 hours

Max. Marks : 60

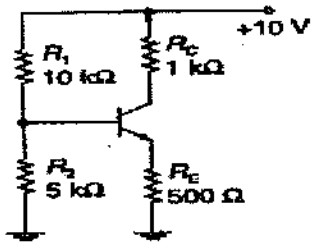
Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What are the characteristics of Insulators, Semiconductors and Conductors in terms of Conductivity and Resistivity?	6M	CO1	L1
(b)	Examine how the Fermi level lies in the middle of the energy gap in case of Intrinsic type semiconductors.	6M	CO1	L1
<b>(OR)</b>				
2(a)	Define Hall voltage and derive an expression for Hall voltage in semiconductors.	6M	CO1	L3
(b)	For a Silicon carrier concentration at absolute temperature is $1.5 \times 10^{10}/\text{cm}^3$ , mobility of free electrons $\mu_n = 1300 \text{ cm}^2/\text{VSec}$ and $\mu_p = 500 \text{ cm}^2/\text{VSec}$ . Number of silicon atoms per unit volume is $5 \times 10^{22}$ , calculate the conductivity intrinsic condition at temperature of 300K, when donor impurity of 1 in $10^8$ and when acceptor impurity of 1 in $5 \times 10^7$ .	6M	CO2	L3
3(a)	Analyze the operation of Diode under forward and reverse bias conditions.	6M	CO2	L4
(b)	What are the applications of PN junction diode and Zener diode?	6M	CO2	L1
<b>(OR)</b>				
4(a)	Find the value of DC resistance and AC resistance of a Ge diode at $25^\circ\text{C}$ with $I_0$ of $25 \mu\text{A}$ at an applied voltage of 0.2 V.	6M	CO3	L3
(b)	Derive an expression for Diffusion capacitance of a PN junction diode.	6M	CO3	L3
5(a)	Sketch the Bridge rectifier circuit and summarize its operation with applied sinusoidal signal as input.	6M	CO4	L2
(b)	Compare the Half-wave rectifier and full wave rectifier in terms of its current and voltage parameters.	6M	CO4	L3
<b>(OR)</b>				
6(a)	Determine the value of Inductance required to use in Full wave rectifier at operating frequency of 50 HZ, if the ripple factor is 10 % for Load resistance of $500 \Omega$ .	6M	CO4	L3
(b)	Obtain the ripple factor of a full wave rectifier using L filter.	6M	CO2	L2
7(a)	Classify the types of BJTs and FETs based on semiconductors.	6M	CO2	L4



# 17EC02-ELECTRONIC DEVICES AND CIRCUITS

(b)	Summarize the operation of transistor using common Emitter configuration with its input and output characteristics.	6M	CO2	L2
(OR)				
8(a)	A transistor has base current $I_B = 150\mu A$ and collector current $I_C = 2.2mA$ . Calculate the following parameters $\beta$ , $\alpha$ of the transistor and Emitter current $I_E$ .	6M	CO3	L3
(b)	Compare CB, CE and CC configurations of BJT and list the applications of BJT.	6M	CO3	L1
9(a)	For the circuit shown in the figure, determine the value of $I_C$ and $V_{CE}$ . Assume $V_{BE}=0.7V$ and $\beta=100$ . 	6M	CO3	L3
(b)	For a Fixed bias circuit, calculate $I_B$ , $I_C$ , and $V_{CE}$ , when $V_{CC}=10V$ , $V_{BE}=0.64V$ , $R_B = 200K\Omega$ , $R_C=1K\Omega$ and $\beta=50$ .	6M	CO3	L3
(OR)				
10(a)	Illustrate the Fixed bias circuit and derive the expression for Q-point parameters and stability factor S.	6M	CO4	L3
(b)	Analyze the behavior of the Diode compensation technique for $I_{CO}$ .	6M	CO3	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. (I Semester) ~~Regular~~/Supplementary Examinations

**17CI01-COMPUTER PROGRAMMING**

(ASE,CE,CSE,EEE,EIE,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)	Discuss about relational and logical operators with examples.	6M
(b)	Explain flow chart in programming.	6M
<b>(OR)</b>		
2.	Explain while and do while loops with example.	12M
3(a)	What is array? How to create and access array elements? Explain.	6M
(b)	What is string? Explain different string functions with examples.	6M
<b>(OR)</b>		
4(a)	Differentiate between string and array. What are the applications of an array? Discuss.	6M
(b)	Explain multi dimensional arrays.	6M
5(a)	What is an array of pointers and pointers to an array? Summarize the difference between both of them.	6M
(b)	What is a pointer? Explain address arithmetic with example.	6M
<b>(OR)</b>		
6(a)	Explain recursive functions.	6M
(b)	Explain dynamic memory management functions with example.	6M
7.	Write a program using structures to search a name in a record of ten mobile subscribers and print the name, address, bill number and amount of the searched record.	12M
<b>(OR)</b>		
8(a)	Differentiate between structure and union. Give an example usage.	6M
(b)	Write a program to calculate grade, average marks and total marks in a class of 60 students by using structure concept.	6M
9(a)	Write a program to store students information (id, name, address, marks) into a file and print the information from the file.	6M
(b)	Explain various standard library functions for handling files.	6M
<b>(OR)</b>		
10(a)	Write a 'C' program to count the number of characters in a file.	6M
(b)	What operations can be performed on binary files? Explain.	6M

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