



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

TIME TABLE

TIME :10.00 AM to 01.00 PM

A.Y. 2020-21

| DATE | ASE | CE | CSE | ECE | EEE | EIE | IT | ME |
|---------------------------|--|--|--|--|--|--|--|--|
| 01-09-2021 (Wednesday) | 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 |
| 03-09-2021 (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 |
| 07-09-2021 (Tuesday) | 17FE13 - Engineering Physics | 17FE13 - Engineering Physics | 17FE15 - Engineering Chemistry | 17FE15 - Engineering Chemistry | 17FE12 - Applied Physics | 17FE15 - Engineering Chemistry | 17FE15 - Engineering Chemistry | 17FE13 - Engineering Physics |
| 09-09-2021 (Thursday) | 17CI01 - Computer Programming | 17CI01 - Computer Programming | 17CI01 - Computer Programming | --- | 17CI01 - Computer Programming | 17CI01 - Computer Programming | 17CI01 - Computer Programming | 17CI01 - Computer Programming |
| 14-09-2021 (Tuesday) | 17ME01 - Engineering Graphics | 17CE01 - Building Materials and Construction | 17EC02 - Electronic Devices and Circuits | 17EC02 - Electronic Devices and Circuits | 17ME50 - Basic Engineering Mechanics | --- | 17EC02 - Electronic Devices and Circuits | 17ME01 - Engineering Graphics |
| 15-09-2021 (Wednesday) | --- | --- | --- | 17EC01 - Electrical Circuits and Networks | --- | 17EC01 - Electrical Circuits and Networks | --- | --- |

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

Date: 10-08-2021

4/11
CONTROLLER OF EXAMINATIONS

Principal
2/10/21

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

1 SEP 2021

H.T.No

R17

**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

| Q.No | Questions | Marks | CO | BL |
|-------------|--|-------|-----|----|
| 1(a) | Evaluate Abdul Kalam's first presidential speech for a developed India. | 4M | CO1 | L4 |
| (b) | Write a paragraph on "Make in India". | 4M | CO1 | L2 |
| (c) | Identify the ' Part of speech ' of the Italicized word in the following sentences: (i) The rain made the grass <i>wet</i> . (ii) He was very <i>rude</i> about my driving. (iii) She was running high <i>temperature</i> . (iv) Choose the lesser of the two evils. (v) She was angry <i>but</i> she said nothing. (vi) There is something <i>under</i> the bed. (vii) I have <i>other</i> things to attend to. (viii) They went <i>into</i> the hall. | 4M | CO1 | L2 |
| (OR) | | | | |
| 2(a) | How is the concept of a Christmas angel depicted in the story "Double Angels"? | 4M | CO1 | L1 |
| (b) | Write a paragraph on "Pollution". | 4M | CO1 | L2 |
| (c) | Change the word as directed by using Prefix/Suffix. (i) modest(noun) (ii) responsible (opposite) (iii) humility(adjective) (iv) clear (adverb) | 4M | CO1 | L2 |
| 3(a) | Briefly describe Nadella's thoughts on innovation and its importance in Microsoft. | 4M | CO2 | L2 |
| (b) | Write a letter to your class teacher requesting him/her to organize a Two-day workshop on 'Internet of Things'. Give reasons for your proposal. | 4M | CO2 | L3 |
| (c) | Identify the verbs and say whether they are 'Transitive/Intransitive/Gerund'. (i) Ravi <i>explained</i> the concept clearly. (ii) Teacher <i>gives</i> the instructions. (iii) Trekking is an exciting activity. (iv) The baby <i>cries</i> for milk. | 4M | CO2 | L2 |
| (OR) | | | | |
| 4(a) | Depict the spirit of regret and longing in the poem "The road not taken". | 4M | CO2 | L4 |
| (b) | Assuming you as the lab in charge, Write a letter to a scientific company ordering required chemicals, burette, pipette, conical flasks etc. to run the chemistry laboratory for I B.Tech students. | 4M | CO2 | L3 |
| (c) | Write the meanings of the 'Phrasal verbs' given below: (i) Call off (ii) come up with (iii) die down (iv) ask for | 4M | CO2 | L1 |

17FE01-PROFESSIONAL COMMUNICATION-I

| | | | | |
|-------------|---|----|-----|----|
| 5(a) | How has the modern technology evolved to be inhuman? What were the suggestions made by the writer to give it a human face? | 4M | CO3 | L2 |
| (b) | Write an email to the manager of Bajaj electrical company (bajaj_elec@gmail.com) complaining about the malfunctioning of recently bought washing machine requesting him to send a service engineer to your house immediately. | 4M | CO3 | L3 |
| (c) | i. Write the 'Synonyms' of the following: a. amicable b. bankrupt ii. Write the 'Antonyms' of the following: a. Often b. argument iii. Fill the blanks with appropriate verb forms. a. He ____ (repair) the radio when I met him. b. They _____ (work) all day yesterday. | 4M | CO3 | L2 |
| (OR) | | | | |
| 6(a) | How according to Wordsworth is the knowledge acquired by the poet and by the scientist different? | 4M | CO3 | L1 |
| (b) | Prepare a memo considering yourself as the manager of a famous industry addressing the supervisor to advise the workers to take precautions (wearing helmet, eye wear, gloves, shoe and other protective gear) while working in the factory. | 4M | CO3 | L3 |
| (c) | Complete the sentences with an appropriate word chosen from the two in brackets. (i) I am totally _____ (uninterested/disinterested) in grammar; it is really dull. (ii) We needed to order some more _____ (stationery/stationary). (iii) The ball was _____ (passed/past) to the new striker who was lurking at the far post. (iv) I am no longer _____ dependent/dependant) on my parents for financial support. | 4M | CO3 | L2 |
| 7(a) | What is the central theme in Ruskin Bond's story "The boy who broke the bank". | 6M | CO4 | L2 |
| (b) | Expand the proverb on listening skills "Listening requires more intelligence than speaking". | 6M | CO4 | L2 |
| (OR) | | | | |
| 8(a) | How does bad listening skills bring down the bank in the story "The boy who broke the bank" ? | 6M | CO4 | L4 |
| (b) | Expand the proverb on interview skills "two heads are better than one". | 6M | CO4 | L2 |
| 9(a) | How does Skavinski happen to appear for the interview in the story "The lighthouse Keeper of Aspinwall"? | 6M | CO5 | L2 |
| (b) | Imagine you have completed your M.Tech course and you are applying for the post of Asst. Prof. in JNTUK. Write a Résumé with covering letter to the Registrar of the University. | 6M | CO5 | L3 |
| (OR) | | | | |
| 10(a) | Evaluate the interview skills exhibited by Skavinski in "The lighthouse keeper of Aspinwall". | 6M | CO5 | L4 |
| (b) | Write a Résumé with a covering letter to the manager of Microsoft (India) for the post of computer analyst. | 6M | CO5 | L3 |

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

17ME01-ENGINEERING GRAPHICS

(ASE&ME)

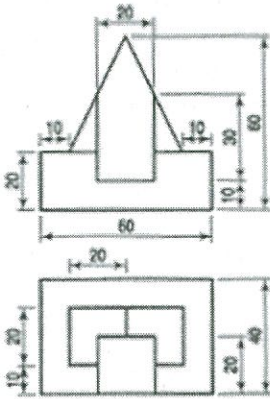
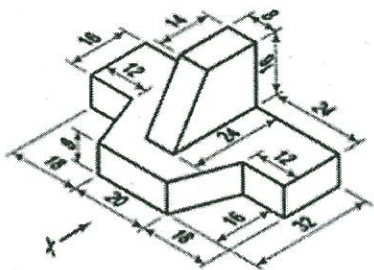
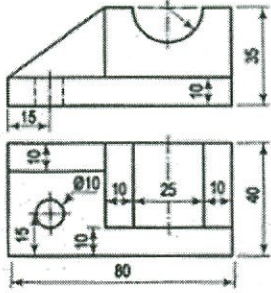
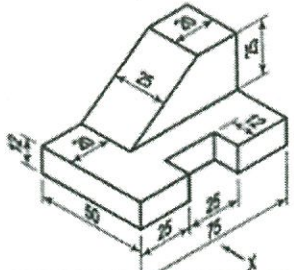
Time : 3 hours

Max.Marks : 60

Answer one question from each unit

All questions carry equal marks

| Q.No | Questions | Marks | CO | BL |
|-------------|---|-------|-----|----|
| 1(a) | Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is $2/3$. | 6M | CO1 | L1 |
| (b) | Construct a parabola when the distance of the focus from directrix is 50 mm. | 6M | CO1 | L1 |
| (OR) | | | | |
| 2(a) | Construct an ellipse through concentric circles method with major axis as 120 mm and minor axis as 80mm. | 6M | CO1 | L1 |
| (b) | Construct a parabola with base 80 mm and length of axis 60 mm through rectangle method. | 6M | CO1 | L1 |
| 3(a) | A point A is 40mm above the H.P. and 30 mm in front of the V.P. Draw its projections. | 6M | CO2 | L2 |
| (b) | A line PQ, 90 mm long, is in the H.P. and makes an angle of 30° with the V.P. Its end P is 25 mm in front of the V.P. Draw its projections | 6M | CO2 | L2 |
| (OR) | | | | |
| 4(a) | A point P is 50 mm from both the reference planes. Draw its projections. | 6M | CO2 | L2 |
| (b) | The length of the top view of a line parallel to the V.P. and inclined at 45° to the H.P. is 50 mm. One end of the line is 12 mm above the H.P. and 25 mm in front of the V.P. Draw the projections of the line and determine its true length. | 6M | CO2 | L2 |
| 5(a) | An equilateral triangle of 50 mm side has its V.T. parallel to and 25 mm above xy. It has no H. T. Draw its projections when one of its sides is inclined at 45° to the V.P. | 6M | CO3 | L2 |
| (b) | A regular pentagon of 25 mm side has one side on the ground. Its plane is inclined at 45° to the H.P. and perpendicular to the V.P. Draw its projections and show its traces. | 6M | CO3 | L2 |
| (OR) | | | | |
| 6(a) | A square ABCD of 50 mm side has its corner A in the H.P., its diagonal AC inclined at 30° to the H.P. and the diagonal BO inclined at 45° to the V.P. and parallel to the H.P. Draw its projections. | 6M | CO3 | L2 |
| (b) | Draw the projections of a circle of 50 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45° to the H.P. and the top view of the diameter AB making 30° angle with the V.P. | 6M | CO3 | L2 |
| 7(a) | Draw the projections of a hexagonal pyramid, base 40 mm side and axis 60 mm long, having its base on the H.P. and one of the edges of the base inclined at 45° to the V.P. | 6M | CO4 | L3 |
| (b) | Draw the projections of a pentagonal prism, base 25 mm side and axis 50 mm long, resting on one of its rectangular faces on the H.P., with the axis inclined at 45° to the V.P. | 6M | CO4 | L3 |
| (OR) | | | | |

| | | | | |
|-------|---|----|-----|----|
| 8(a) | A hexagonal prism has one of its rectangular faces parallel to the H.P. Its axis is perpendicular to the V.P. and 35 mm above the ground. Draw its projections when the nearer end is 20 mm in front of the V.P. Side of base 25 mm long; axis 50 mm long. | 6M | CO4 | L3 |
| (b) | A hexagonal prism, base 40 mm side and height 40 mm has a hole of 40 mm diameter drilled centrally through its ends. Draw its projections when it is resting on one of its corners on the H.P. with its axis inclined at 60° to the H.P. and two of its faces parallel to the V. P. | 6M | CO4 | L3 |
| 9(a) | The orthographic projections of the object is shown in figure below. Draw the isometric view of the object.  | 6M | CO5 | L4 |
| (b) | Construct (i) Front view. (ii) Top view. (iii) Side view from the left of the given isometric view of the component.  | 6M | CO5 | L4 |
| (OR) | | | | |
| 10(a) | The orthographic projections of the object is shown in figure below. Draw the isometric view of the object.  | 6M | CO5 | L4 |
| (b) | Construct (i) Front view. (ii) Side view from the left. (iii) Top view from the given isometric view of the component.  | 6M | CO5 | L4 |

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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 | CO | BL |
|-------------|---|-------|-----|----|
| 1. | What are the different types of operators? Explain with suitable examples. | 12M | CO1 | L1 |
| (OR) | | | | |
| 2(a) | Discuss various Input and Output statements with suitable examples. | 6M | CO1 | L2 |
| (b) | Write a C program to find given number is prime or not. | 6M | CO1 | L3 |
| 3(a) | Define an array. How one dimensional array is declared and initialized? Give suitable example. | 6M | CO2 | L1 |
| (b) | Write a C program to count number of vowels, number of digits and number of other symbols in a given line of text. | 6M | CO2 | L3 |
| (OR) | | | | |
| 4(a) | Write a C program to check whether the given string is palindrome or not. | 6M | CO2 | L3 |
| (b) | Write a C program to transpose a matrix. | 6M | CO2 | L3 |
| 5. | What is a storage class? Explain about storage classes available in C. | 12M | CO3 | L1 |
| (OR) | | | | |
| 6(a) | Write a function to return the GCD of two positive numbers using recursion. | 6M | CO3 | L3 |
| (b) | Demonstrate the pointer arithmetic operations with example program. | 6M | CO3 | L3 |
| 7(a) | Describe passing of structures in functions with example. | 6M | CO4 | L2 |
| (b) | Explain how members of a union are accessed with example. | 6M | CO4 | L1 |
| (OR) | | | | |
| 8(a) | Differentiate between structure and unions. | 6M | CO4 | L2 |
| (b) | Write a program to read records of 10 employees and find their average salary. | 6M | CO4 | L3 |
| 9(a) | Write a C program which reads a character from keyboard until EOF found. How do you enter EOF from the keyboard to terminate the input? | 6M | CO5 | L3 |
| (b) | What are the steps involved in file operations? | 6M | CO5 | L1 |
| (OR) | | | | |
| 10(a) | Explain unformatted file I/O functions. | 6M | CO5 | L2 |
| (b) | What are the error handling functions in files? | 6M | CO5 | L1 |

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

17FE13-ENGINEERING PHYSICS

(ASE,CE&ME)

Time : 3 hours

Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

| Q.No | Questions | Marks | CO | BL |
|-------------|--|-------|-----|----|
| 1(a) | Explain the formation of Newton's rings. Deduce the expression for radius of curvature of Plano convex lens. | 6M | CO1 | L1 |
| (b) | Estimate the thickness of air film corresponding to 10 th dark ring in Newton's rings experiment viewed normally by a reflected light of wavelength 500 nm. | 6M | CO1 | L3 |
| (OR) | | | | |
| 2(a) | Demonstrate diffraction due to a single slit. Establish the conditions for maxima and minima. | 6M | CO1 | L2 |
| (b) | Define resolving power of grating. Obtain the expression for it. | 6M | CO1 | L1 |
| 3(a) | Illustrate the theory of double refraction. | 6M | CO2 | L1 |
| (b) | Derive the expression for thickness of a quarter wave plate. | 6M | CO2 | L3 |
| (OR) | | | | |
| 4(a) | List out the characteristics of laser. | 6M | CO2 | L1 |
| (b) | Demonstrate the construction and working of He-Ne laser. | 6M | CO2 | L2 |
| 5(a) | Explicate the Davisson-Germer's experiment to confirm the wave nature of electrons. | 6M | CO3 | L2 |
| (b) | An electron passes through a potential difference of 100 V. Evaluate the de-Broglie wavelength, momentum and velocity of electrons. | 6M | CO3 | L3 |
| (OR) | | | | |
| 6(a) | Define Miller indices. Describe the procedure to determine the Miller indices. | 6M | CO3 | L1 |
| (b) | The intercepts of a given plane along X and Y-axes are 3a and 4b. If the plane is parallel to Z-axis, calculate the Miller indices of the plane. | 6M | CO3 | L3 |
| 7(a) | Define Ferro magnetic materials. Summarize the properties of Ferro magnetic materials. | 6M | CO4 | L1 |
| (b) | Compare soft and hard magnetic materials. | 6M | CO4 | L2 |
| (OR) | | | | |
| 8(a) | Illustrate hysteresis in Ferro magnetic materials. | 6M | CO4 | L1 |
| (b) | The relative permeability of a magnetic material is 2.5. Determine the values of susceptibility and permeability of the material. | 6M | CO4 | L3 |
| 9(a) | State and explain Meissner effect. | 6M | CO5 | L1 |
| (b) | Distinguish between type-I and type-II superconductors. | 6M | CO5 | L2 |
| (OR) | | | | |
| 10(a) | Summarize the general properties of superconductors. | 6M | CO5 | L2 |
| (b) | Mention the applications of superconductors. | 6M | CO5 | L1 |

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

17FE04-DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA

(AE,CE,ECE,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 | CO | BL |
|-------------|---|-------|-----|----|
| 1(a) | Solve $(y \cos x + \sin y + y)dx + (\sin x + x \cos y + x)dy = 0$. | 6M | CO1 | L1 |
| (b) | The number N of bacteria in a culture grew at a rate proportional to 'N'. The value of N was initially 100 and increases to 332 in one hour. What would be the value of N after $1\frac{1}{2}$ hours? | 6M | CO1 | L3 |
| (OR) | | | | |
| 2(a) | Solve $y(1+xy)dx + x(1-xy)dy = 0$. | 6M | CO1 | L2 |
| (b) | Find the orthogonal trajectories of family of curves $r = \frac{2a}{1+\cos\theta}$ | 6M | CO1 | L3 |
| 3(a) | Solve $(D^3 - 5D^2 + 8D - 4)y = e^{2x}$ | 6M | CO2 | L2 |
| (b) | Using method of variation parameters, evaluate the complete solution of $(D^2 + 9)y = \tan 3x$. | 6M | CO2 | L3 |
| (OR) | | | | |
| 4(a) | Find the general solution of the differential equation $(D^2 + 4D + 4)y = 4\cos x + 3\sin x$. | 6M | CO2 | L2 |
| (b) | Solve $(D^2 + 4D + 4)y = e^{-x} \sin 2x$ | 6M | CO2 | L2 |
| 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 | L2 |
| (b) | Find the Partial differential equation by eliminating the arbitrary constants a and b from $z = a \log \left[\frac{b(y-1)}{1-x} \right]$ | 6M | CO3 | L3 |
| (OR) | | | | |
| 6(a) | Find the Taylor's series expansion of $e^x \cos y$ in the neighborhood of the point $(1, \frac{\pi}{4})$. | 6M | CO3 | L1 |
| (b) | Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$. | 6M | CO3 | L2 |
| 7(a) | Reduce the matrix A to canonical form, if $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{bmatrix}$ and find its rank. | 6M | CO4 | L2 |

17FE04-DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA

| | | | | |
|-------------|---|-----|-----|----|
| (b) | Test whether the following system of equations are $3x+3y+2z=1, x+2y=4, 10y+3z=-2, 2x-3y-z=5$ consistent or not? If consistent, solve them completely. | 6M | CO4 | L3 |
| (OR) | | | | |
| 8(a) | Solve the system of homogeneous equations $x + 3y + 2z = 0, 2x - y + 3z = 0, x + 17y + 4z = 0$. If consistent, solve them completely. | 6M | CO4 | L3 |
| (b) | Find the non-singular matrices P and Q such that PAQ is in the normal form for A, Where $A = \begin{bmatrix} 1 & -1 & -1 \\ 1 & 1 & 1 \\ 3 & 1 & 1 \end{bmatrix}$. Hence find the rank of the matrix A. | 6M | CO4 | L2 |
| 9. | Verify Cayley- Hamilton theorem for $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$ and hence find A^4 . | 12M | CO5 | L3 |
| (OR) | | | | |
| 10(a) | Find the Eigen values and the corresponding Eigen vectors of $A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$ | 6M | CO5 | L2 |
| (b) | Show that the eigen values of a triangular matrix are its principal diagonal elements. | 6M | CO5 | L1 |

H.T.No

14 SEP 2021

R17

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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

| Q.No | Questions | Marks | CO | BL |
|-------------|---|-------|-----|----|
| 1(a) | Discuss the geological classification of rocks in detail. | 6M | CO1 | L1 |
| (b) | Explain in detail blasting process. | 6M | CO1 | L1 |
| (OR) | | | | |
| 2(a) | Describe the kiln burning process of brick. | 6M | CO1 | L1 |
| (b) | Explain the dressing of stone in detail. | 6M | CO1 | L1 |
| 3(a) | Describe the cement manufacturing process with flow chart in dry process. | 6M | CO2 | L2 |
| (b) | Compare different types of hydraulic limes. | 6M | CO2 | L2 |
| (OR) | | | | |
| 4(a) | State the characteristics and uses of lime. | 6M | CO2 | L2 |
| (b) | Discuss precautions in handling of lime. | 6M | CO2 | L1 |
| 5(a) | Discuss and draw the elevation and plan of English bond. | 6M | CO3 | L2 |
| (b) | Compare brick masonry and stone masonry. | 6M | CO3 | L2 |
| (OR) | | | | |
| 6(a) | Explain the defects in brick masonry. | 6M | CO3 | L1 |
| (b) | Explain and mention the purpose of tools used for brick laying. | 6M | CO3 | L2 |
| 7(a) | Distinguish between load bearing wall and partition wall. | 6M | CO4 | L2 |
| (b) | State the advantages and disadvantages of flat roofs. | 6M | CO4 | L2 |
| (OR) | | | | |
| 8(a) | Explain the terms rise and tread of stairs. Give the desirable relationship between them. | 6M | CO4 | L1 |
| (b) | Distinguish between terrazzo flooring and mosaic flooring. | 6M | CO4 | L2 |
| 9(a) | Describe the defects caused in timber due to fungi. | 6M | CO5 | L2 |
| (b) | State the characteristics of an ideal paint. | 6M | CO5 | L2 |
| (OR) | | | | |
| 10(a) | Explain briefly about the constituents of paints. | 6M | CO5 | L1 |
| (b) | Distinguish between natural seasoning and kiln seasoning of timber. | 6M | CO5 | L2 |

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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) | For a silicon carrier concentration at absolute temperature is $1.5 \times 10^{10}/\text{cm}^3$, mobility of free electrons $\mu_n = 1300 \text{cm}^2/\text{V}\cdot\text{sec}$ and $\mu_p = 500 \text{cm}^2/\text{V}\cdot\text{sec}$. Number of silicon atoms per unit volume is 5×10^{22} . Determine the conductivity in case of intrinsic condition at temperature of 300K and conductivity when donor impurities doped 1 in 10^8 | 6M | CO1 | L3 |
| (b) | Memorize the conductor, insulator and semiconductor type of materials based on energy band theory. | 6M | CO1 | L1 |
| (OR) | | | | |
| 2(a) | What is Fermi level, Identify the Fermi level position in intrinsic type semiconductors using energy band diagram. | 6M | CO1 | L2 |
| (b) | Identify the Fermi level position in N-type and P-type semiconductors using energy band diagrams. | 6M | CO1 | L2 |
| (OR) | | | | |
| 3(a) | Derive an expression for Diffusion capacitance in a PN junction diode. | 6M | CO2 | L2 |
| (b) | The reverse saturation current of Germanium p-n junction diode is $6\mu\text{A}$. Calculate the diode current when diode is connected in forward bias at a forward voltage of 0.4V at room temperature. | 6M | CO3 | L1 |
| (OR) | | | | |
| 4. | Interpret the operation of PN junction diode under forward and reverse bias conditions with characteristics. | 12M | CO2 | L2 |
| (OR) | | | | |
| 5(a) | Define Filter and derive the expression for ripple factor of a Full wave rectifier using L filter. | 6M | CO4 | L3 |
| (b) | Compare the Half-wave rectifier and full wave rectifier in terms I_{DC} , V_{DC} , I_{RMS} , V_{RMS} , Ripple factor, Rectifier efficiency. | 6M | CO4 | L1 |
| (OR) | | | | |
| 6(a) | Sketch the Full wave rectifier circuit and summarize its operation with applied sinusoidal signal as input. | 6M | CO4 | L2 |
| (b) | A Full wave rectifier is supplied from a 230V, 50Hz supply with a step down ration of 5:1 to a resistive load of $1\text{K}\Omega$, diode forward resistance is 75Ω and transformer secondary resistance is 10Ω . Estimate maximum, average, rms values of current, DC output voltage. | 6M | CO3 | L3 |

17EC02-ELECTRONIC DEVICES AND CIRCUITS

| | | | | |
|-------------|---|----|-----|----|
| 7(a) | Summarize the operation of transistor using common Base configuration with its input and output characteristics. | 6M | CO2 | L2 |
| (b) | Recall the symbols of NPN transistor, PNP transistor, n channel JFET, p channel JFET, Enhancement mode n channel MOSFET and Depletion mode n channel MOSFET. | 6M | CO3 | L1 |
| (OR) | | | | |
| 8(a) | Mention various regions of operation for a transistor and draw the output characteristics of CE configuration mark the regions. | 6M | CO2 | L1 |
| (b) | A transistor has Base current $I_B = 100\mu A$ and Collector current $I_C = 2mA$. Estimate the following parameters: (i) β of the transistor (ii) α of the transistor (iii) Emitter current I_E (iv) If I_B changes by $+25\mu A$ and I_C changes by $+0.6mA$, find the value of β . | 6M | CO3 | L3 |
| 9(a) | Draw the circuit of Self bias and derive the expression for stability factor S. | 6M | CO2 | L2 |
| (b) | Discuss Sensistor compensation technique for stable operation of BJT. | 6M | CO4 | L2 |
| (OR) | | | | |
| 10(a) | Construct Collector to base bias circuit and derive the expression for Q-point parameters and stability factor S. | 6M | CO2 | L2 |
| (b) | For a Fixed bias circuit with $V_{CC} = 22.5V$, $R_C = 5.6K\Omega$, $R_B = 90K\Omega$, $\beta = 55$, $V_{BE} = 0.6V$. The transistor operates in active region. Determine the operating point and stability factor S. | 6M | CO3 | L3 |

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B. Reddy Nagar :: Mylavaram – 521230 :: Krishna Dist.: A.P.

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) | Explain the construction of Nickel – Cadmium battery. Prove it's reversible nature by writing cell reactions. Draw a neat diagram. | 6M | CO1 | L2 |
| (b) | How reserve battery is different from primary and secondary batteries? Explain the construction working of magnesium copper reserve battery. | 6M | CO1 | L2 |
| (OR) | | | | |
| 2(a) | Justify the statement “calomel electrode is reversible with respect to chloride ions”. Draw a neat diagram of calomel electrode. | 6M | CO1 | L4 |
| (b) | Summarize applications of electro chemical series. | 6M | CO1 | L2 |
| 3(a) | Differentiate electro chemical series and galvanic series. | 6M | CO2 | L2 |
| (b) | How does concentration cell corrosion occur? Explain with an example. | 6M | CO2 | L2 |
| (OR) | | | | |
| 4(a) | How nature of metal influences rate of corrosion? | 6M | CO2 | L2 |
| (b) | State pilling bed worth rule and explain the concept of passivity and give the reasons for passivity. | 6M | CO2 | L2 |
| 5(a) | Discuss preparation properties and applications of BUNA-S. | 6M | CO3 | L2 |
| (b) | How does conduction occur polymers? Explain the process of conduction in extrinsic conducting polymers. | 6M | CO3 | L2 |
| (OR) | | | | |
| 6(a) | What are the various techniques applied to prepare nano materials using sol-gel method? | 6M | CO3 | L3 |
| (b) | Explain processing of natural rubber. How to make it into useful form? Write the structure of vulcanized rubber. | 6M | CO3 | L2 |
| 7(a) | Define the term liquid crustal. How to identify liquid crystals? | 6M | CO4 | L2 |
| (b) | How lyotropic liquid crystals are formed? Outline applications of liquid crystals. | 6M | CO4 | L2 |
| (OR) | | | | |
| 8(a) | Mention any three applications of each for fluorescence and phosphorescence. | 6M | CO4 | L1 |
| (b) | Explain photosentization and bioluminance with suitable examples. | 6M | CO4 | L1 |
| 9(a) | Analyze the titration curve of strong acid and strong base using conductometry. | 6M | CO5 | L4 |
| (b) | What is potentiometry? Analyze the potentiometric curve of oxidation – reduction titration to decide end point of titration. | 6M | CO5 | L4 |
| (OR) | | | | |
| 10(a) | List out the applications of I.R spectroscopy. | 6M | CO5 | L2 |
| (b) | Explain the terms: (i) chromophore (ii) auxochrome with examples. | 6M | CO5 | L1 |

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

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

| S.No | Questions | Marks | CO | BL |
|-------------|--|-------|-----|----|
| 1(a) | Solve the equation $\left(3x^2y + \frac{y}{x}\right)dx + (x^3 + \log x)dy = 0$ | 6M | CO1 | L3 |
| (b) | Show that the family of parabolas $y^2 = 2cx + c^2$ is self-orthogonal. | 6M | CO1 | L3 |
| (OR) | | | | |
| 2(a) | Solve the equation $\left(xy^2 - e^{\frac{1}{x^3}}\right)dx - x^2ydy = 0$ | 6M | CO1 | L3 |
| (b) | A body is heated to 110°C and placed in air at 10°C . After 1 hour its temperature is 60°C . How much additional time is required for it to cool to 30°C ? | 6M | CO1 | L3 |
| 3(a) | Find the complete solution of the equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$ | 6M | CO2 | L3 |
| (b) | Select an appropriate method and find the complete solution of the equation $(D^2 + 1)y = \cos ecx \cdot \cot x$. | 6M | CO2 | L4 |
| (OR) | | | | |
| 4(a) | Find the complete solution of the equation $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 3y = \sin 3x \cos 2x$ | 6M | CO2 | L3 |
| (b) | Select an appropriate method and find the complete solution of the equation $(D^2 - 2D + 1)y = e^x \log x$ | 6M | CO2 | L4 |
| 5(a) | Calculate the value of $J\left(\frac{u,v,w}{x,y,z}\right)$, where $u = \frac{yz}{x}, v = \frac{zx}{y}, w = \frac{xy}{z}$. | 6M | CO3 | L2 |
| (b) | Explain in detail the procedure of Lagrange's method of undetermined multipliers and mention one advantage and one disadvantage of this method. | 6M | CO3 | L2 |
| (OR) | | | | |
| 6(a) | Determine whether the functions are functionally dependent or not. If dependent find the functional relation between them $x = \frac{3u^2}{2(v+w)}, y = \frac{2(v+w)}{3(u-v)^2}, z = \frac{u-v}{u}$. | 6M | CO3 | L3 |

17FE05-DIFFERENTIAL EQUATIONS AND NUMERICAL APPLICATIONS

| | | | | |
|-------------|--|-----|-----|----|
| (b) | Examine the function $f(x, y) = x^4 + y^4 - x^2 - y^2 + 1$ for extrema. | 6M | CO3 | L3 |
| 7(a) | Form the partial differential equation from $xyz = f(x + y + z)$ | 6M | CO4 | L2 |
| (b) | Find the complete solution of $(y^2 + z^2)p - xyq = -zx$. | 6M | CO4 | L3 |
| (OR) | | | | |
| 8(a) | Find the differential equation of all spheres of fixed radius having their centres in the xy-plane. | 6M | CO4 | L2 |
| (b) | Solve the equation $p - q = \log(x + y)$. | 6M | CO4 | L3 |
| 9. | Using Taylor series method, compute the value of $y(0.2)$ correct to 3 decimal places from $\frac{dy}{dx} = 1 - 2xy$, given that $y(0) = 0$, and compare this value with value obtained from its analytical solution. (take $h = 0.1$). | 12M | CO5 | L3 |
| (OR) | | | | |
| 10. | By applying R-K method find $y(0.2)$ from $\frac{dy}{dx} = y - x$, $y(0) = 2$, taking $h = 0.1$. | 12M | CO5 | L3 |

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

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

17EC01-ELECTRICAL CIRCUITS AND NETWORKS

(ECE & EIE)

Time : 3 hours

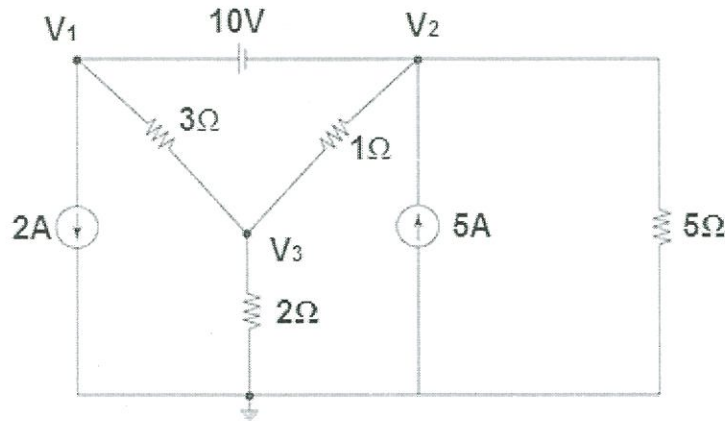
Max. Marks : 60

Answer one question from each unit.

All questions carry equal marks

UNIT-I

- 1(a) Determine the power delivered by 5A current source.



[6M]

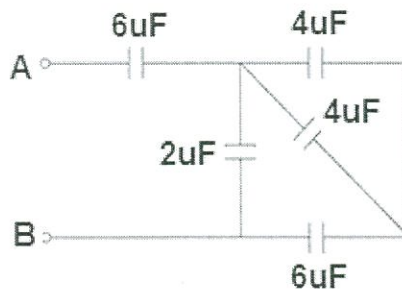
- (b) Write the procedure for applying mesh analysis and nodal analysis.
(OR)

[6M]

- 2(a) Illustrate the concept of source transformation technique.

[6M]

- (b) Compute the equivalent capacitance between A and B terminals.



[6M]

UNIT-II

- 3(a) Illustrate the concepts of self-inductance and mutual inductance.

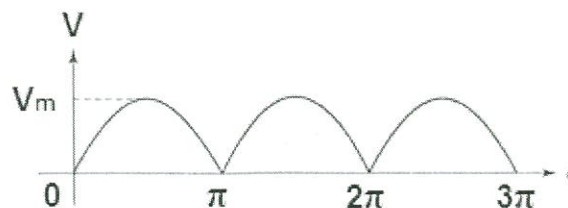
[6M]

- (b) Demonstrate dot convention used in magnetic coupled circuits.

[6M]

(OR)

- 4(a) Estimate average value, R.M.S value, form factor and peak factor for the given signal.



[6M]

- (b) Derive the equivalent impedances for parallel aiding and parallel opposing coupled circuits.

[6M]

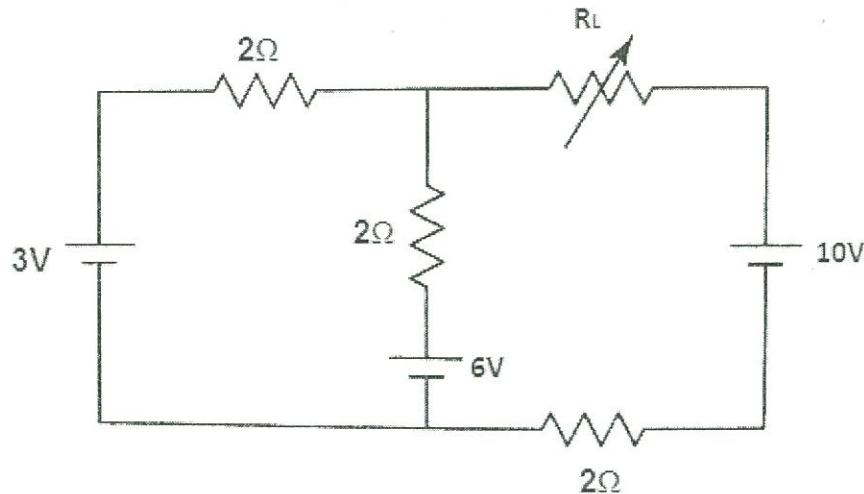
17EC01-ELECTRICAL CIRCUITS AND NETWORKS

UNIT-III

- 5(a) Compare series resonance and parallel resonance circuits. [6M]
 (b) Determine total impedance of the circuit in a RLC series circuit with $R=12\Omega$, $L=0.15H$ and $C=22\mu F$ at (i) Resonant frequency (ii) 10Hz below resonant frequency. (iii) 10Hz above resonant frequency. [6M]

(OR)

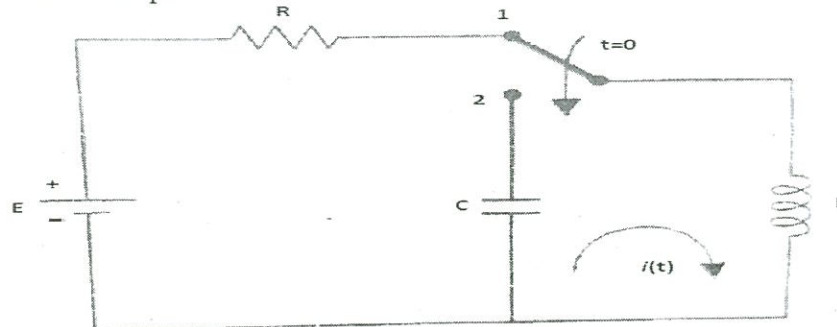
- 6(a) State and write the procedure for maximum power transfer theorem to apply any circuit. [6M]
 (b) Find the value of resistance R_L using maximum power transfer theorem and also calculate maximum power.



[6M]

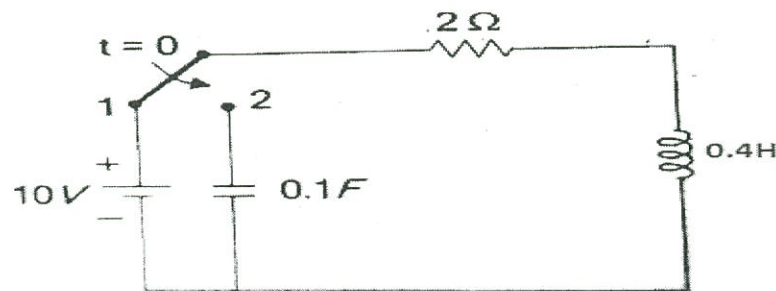
UNIT-IV

- 7(a) Evaluate an expression for $i(t)$ of the circuit shown in figure, the switch is closed to position-1 for a long time. At $t=0$, the switch is changed from position-1 to position-2. [6M]



[6M]

- (b) Evaluate the current response of the circuit shown in figure, the switch remains in position-1 for a long time. At $t=0$ the switch is closed to position-2. [6M]

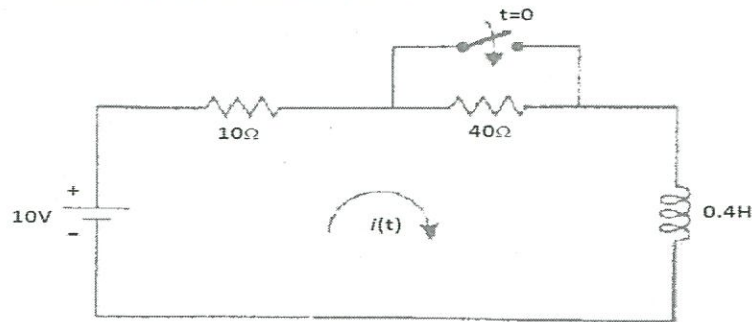


[6M]

(OR)

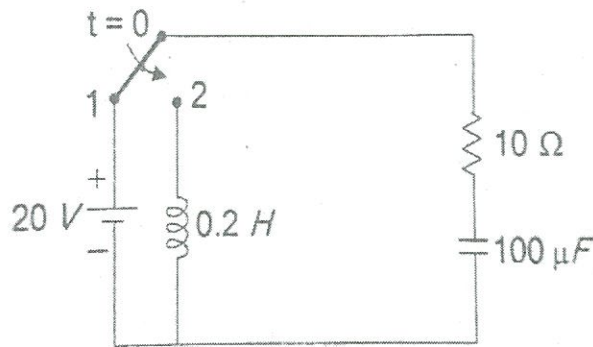
17EC01-ELECTRICAL CIRCUITS AND NETWORKS

- 8(a) Find $i(t)$ and sketch its response, when the switch is kept open for a long time and the switch is closed at $t=0$.



[6M]

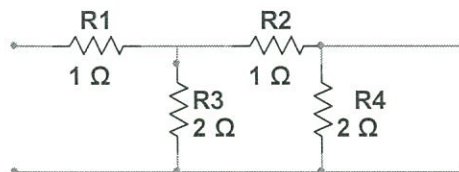
- (b) Evaluate the current response of the circuit shown in figure, the switch remains in position-1 for a long time. At $t=0$, the switch is closed to position-2.



[6M]

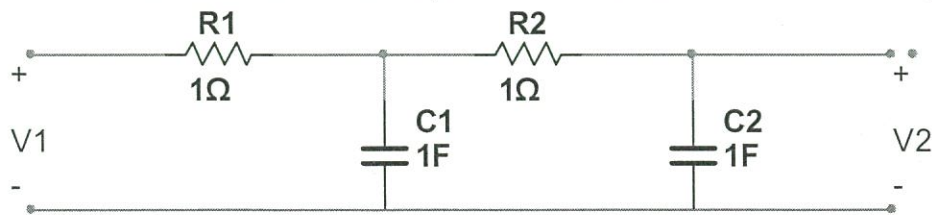
UNIT-V

- 9(a) Compute the Y- parameters for the network shown in figure.



[6M]

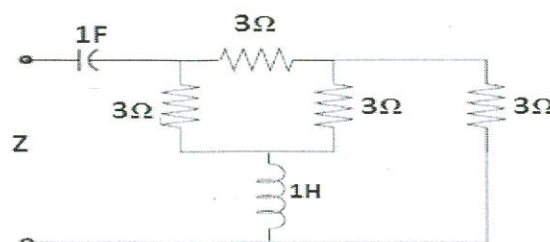
- (b) Compute the transfer function V_2/V_1 for the network shown in figure.



[6M]

(OR)

- 10(a) Demonstrate the Y-parameters can be obtained from H-parameters.
(b) Compute the driving point impedance at input terminals for the circuit shown below.



[6M]

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

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

17ME50-BASIC ENGINEERING MECHANICS

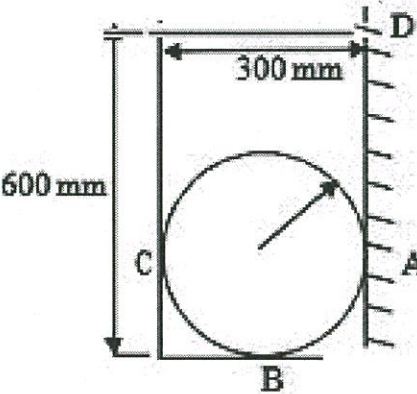
(EEE)

Time : 3 hours

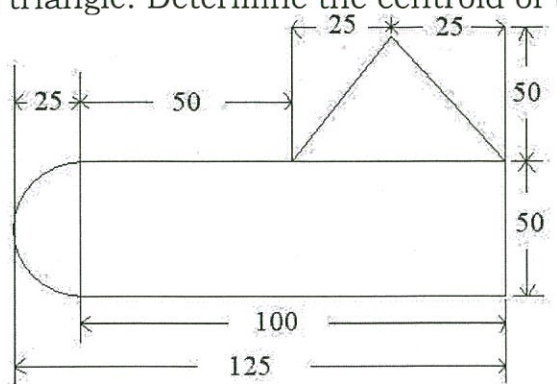
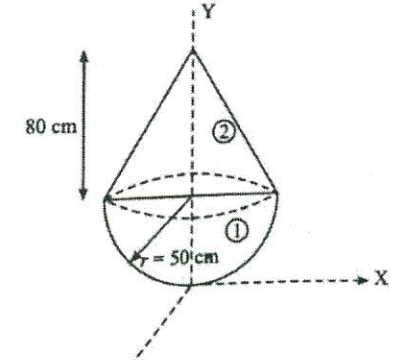
Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

| Q.No | Questions | Marks | CO | BL |
|-------------|--|-------|----|----|
| 1(a) | State and prove Varignon's theorem. | 6M | | |
| (b) | Two forces equal to $2P$ and P respectively act on a particle. If first be doubled and the second increased by $12N$ the direction of the resultant is unaltered, find the value of ' P '. | 6M | | |
| (OR) | | | | |
| 2. | <p>A 600 N cylinder is supported by the frame BCD as shown in figure. The frame is hinged at D. Determine reactions at A, B, C and D.</p>  | 12M | | |
| 3(a) | What is friction? State laws of friction. | 6M | | |
| (b) | A force of 250 N pulls a body of weight 500 N up an inclined plane, the force being applied parallel to the plane. If the inclination of the plane to the horizontal is 15° , find the coefficient of friction? | 6M | | |
| (OR) | | | | |
| 4. | A uniform ladder 5 m long weighs 300 N . It is placed against a wall making an angle 60° with floor. The coefficient of friction between the wall and the ladder is 0.25 and that between the floor and the ladder is 0.35 . The ladder in addition to its own weight has to support a man weighing 900 N at the top of the ladder. Calculate the horizontal force F to be applied to the ladder at the floor level to prevent slipping. | 12M | | |
| 5(a) | Determine the centroid of a uniform wire bent in the form of quadrant of the arc of a circle of radius r . | 6M | | |

17ME50-BASIC ENGINEERING MECHANICS

| | | | | |
|-------|--|-----|--|--|
| (b) | <p>A uniform lamina as shown in figure. consists of a rectangle, a semicircle & a triangle. Determine the centroid of the lamina.</p>  | 6M | | |
| (OR) | | | | |
| 6(a) | An isosceles triangle section ABC has a base of 100mm and 60mm height. Determine the moment of inertia of triangle about the base. | 6M | | |
| (b) | Distinguish between area moment of inertia, polar moment of inertia and mass moment of inertia. | 6M | | |
| 7. | Derive the expression for the mass moment of inertia of a solid sphere of radius R about its diametral axes. | 12M | | |
| | | | | |
| 8(a) | Discuss the procedure to find the location of the centre of gravity of a composite body. | 6M | | |
| (b) | <p>Determine the centre of gravity of the following figure .</p>  | 6M | | |
| 9(a) | Draw the motion curves of a particle in rectilinear motion. | 6M | | |
| (b) | A stone is dropped from the top of the tower 50 m high. At the same time another stone is thrown up from the foot of the tower with a velocity of 25 m/s. At what distance from the top and after how much time the two stones cross each other? | 6M | | |
| (OR) | | | | |
| 10(a) | Derive an equation for the path traced by a projectile when projected into space with a velocity 'u' at an angle 'α' with the horizontal. | 6M | | |
| (b) | A stone is projected upwards from the ground with velocity of 16 m/sec at an angle of 60° to the horizontal. With what velocity must another stone be projected at an angle of 45° to the horizontal from the same point in order: (i) to have same horizontal range (ii) to attain the same maximum height. | 6M | | |

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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

UNIT-I

- 1(a) Explain the construction and working of Michelson interferometer. [6M]
 (b) In a Michelson's interferometer 200 fringes cross the field of view when the movable mirror is displaced through 0.0589 mm. Evaluate the wavelength of monochromatic light used. [6M]

(OR)

- 2(a) Illustrate Fraunhofer diffraction due to the circular aperture. [6M]
 (b) In Fraunhofer diffraction pattern due to a circular aperture, the screen is at a distance of 100 cm from the lens. The aperture is illuminated by monochromatic light of wavelength 5893 Å. The diameter of the aperture is 0.1 mm. Estimate the radius of central bright disc. [6M]

UNIT-II

- 3(a) Interpret the theory of double refraction. [6M]
 (b) Explain the working of polarimeter. [6M]

(OR)

- 4(a) Deduce the relation between Einstein's coefficients. [6M]
 (b) Enumerate the basic requirements of laser. [6M]

UNIT-III

- 5(a) Derive the Schrodinger's time independent wave equation. [6M]
 (b) Write the physical significance of wave function. [6M]

(OR)

- 6(a) Classify the solids on the basis of band theory. [6M]
 (b) Estimate the temperature at which there is 1% probability of a state with energy 0.5 eV above the Fermi energy. [6M]

UNIT-IV

- 7(a) Describe the working of Light emitting diode and photo detector. [6M]
 (b) Distinguish between the direct and indirect band gap semiconductors. [6M]

(OR)

- 8(a) State Hall effect and derive the expression for it. [6M]
 (b) The Hall coefficient of a sample is $3.66 \times 10^{-4} \text{ m}^3 \text{C}^{-1}$. Its resistivity is $8.93 \times 10^{-3} \Omega \text{m}$. Find the values of mobility and density of electrons. [6M]

UNIT-V

- 9(a) Define electronic polarization and derive the expression for electronic polarizability. [6M]
 (b) The dielectric constant of He gas at NTP is 1.0000684. Calculate the electronic polarizability of He atoms if the gas has $2.7 \times 10^{25} \text{ atoms/m}^3$. [6M]

(OR)

- 10(a) Obtain the Clausius-Mosotti relation. [6M]
 (b) Write a short note on dielectric loss and dielectric breakdown. [6M]
