H.T.No										

21 MAY 2018

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

17EC01-ELECTRICAL CIRCUITS AND NETWORKS

(ECE & EIE)

Time : 3 hours Max. Marks : 60

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

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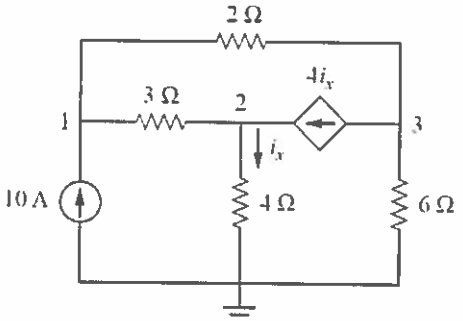
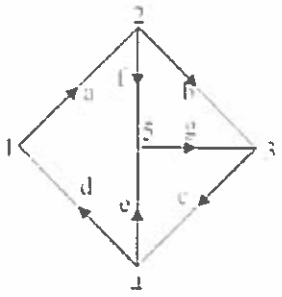
UNIT-I

1(a) Find the voltages at the three non-reference nodes in the circuit of Figure.



[6M]

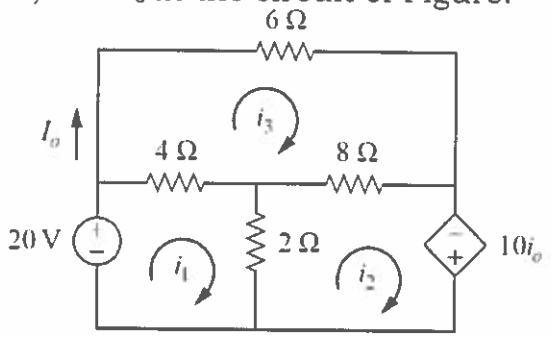
(b) Find fundamental tie-set and cut-set matrix for the graph and its tree shown in figure.



[6M]

(OR)

2(a) Using mesh analysis, find I_0 in the circuit of Figure.



[6M]

(b) Explain the following terms with reference to network topology with an example
i) Twig ii) Link iii) Oriented graph iv) Incident matrix. [6M]

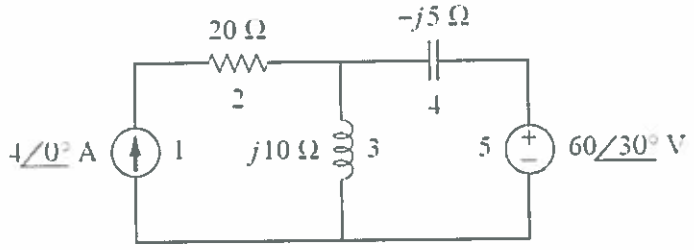
UNIT-II

3(a) Show that power consumed in a purely inductive circuit is zero when sinusoidal voltage is applied across it. [6M]

(b) Two identical coupled coils have an equivalent inductance of 80 mH when connected series aiding and 35 mH in series opposing. Find L_1, L_2, M and K. [6M]

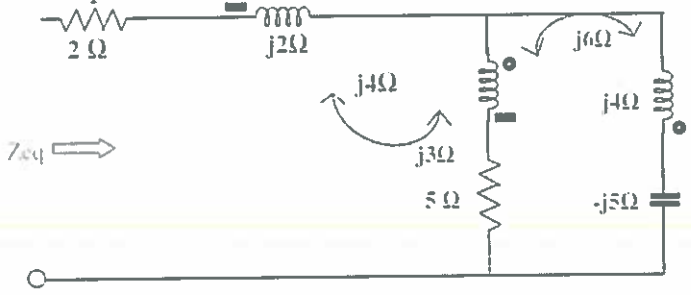
(OR)

4(a) Determine the average power generated by each source and the average power absorbed by each passive element in the circuit of Figure



[6M]

(b) Find equivalent impedance of the network shown in Figure below.

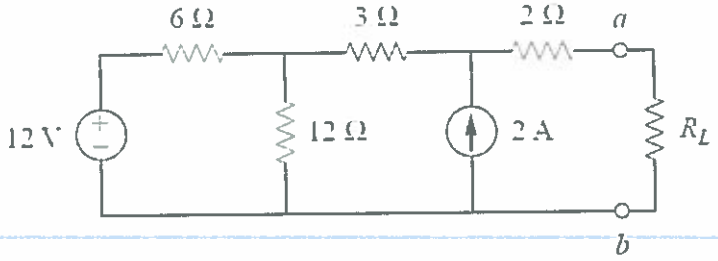


[6M]

UNIT-III

5(a) A series RLC circuit has R=15 Ohms L=40mH and c=40 microfarads. Determine the resonant frequency and also calculate at resonance (i) current (ii) power supplied by source (iii) voltage drops across various elements if the applied voltage is 75 volts. [6M]

(b) For the network shown in figure, find the value of R_L for maximum power transfer. Also find the maximum power transferred to R_L.



[6M]

(OR)

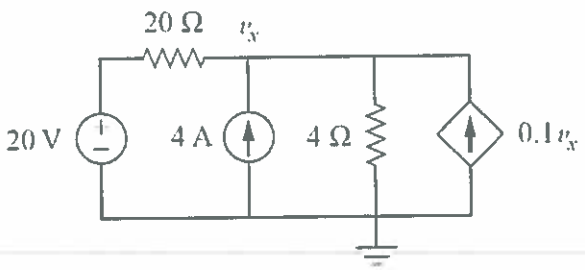
6(a) The bandwidth of a series resonant circuit is 400 Hz.

i) If the resonant frequency is 4000 Hz, what is the value of Quality factor (Q_s)?

ii) If R=10 Ω, what is the value of X_L at resonance?

iii) Find the inductance L and capacitance C of the circuit. [6M]

(b) Use superposition to find V_x in the circuit of Figure.



[6M]

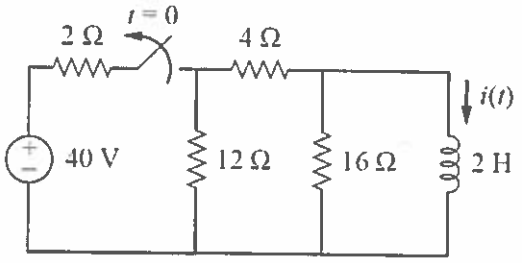
UNIT-IV

7(a) A series RL circuit with parameters R= 5 ohms and L = 10H is supplied by a source of 20V. Obtain the expression for current using differential equation approach. [6M]

(b) A coil of resistance 5Ω and inductance 5H is switched on to a 12V DC supply. Calculate the rate of rise of current at t=0 and t=2 τ where τ =L/R. Also find the steady state value of current in the circuit. [6M]

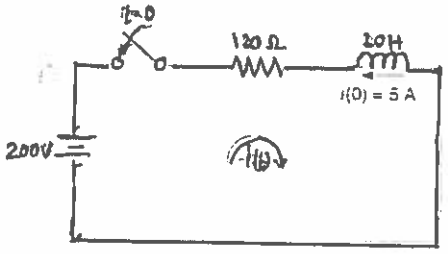
(OR)

8(a) The switch in the circuit of Figure has been closed for a long time. At t=0, the switch is opened. Calculate i(t) for t>0



[6M]

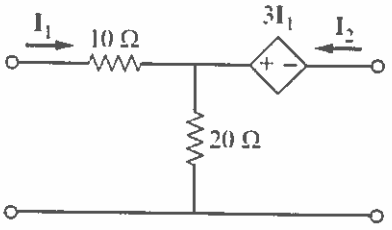
(b) In the circuit shown in the figure find the equation of current and sketch it. Also find the initial rate of growth of current.



[6M]

UNIT-V

9(a) Find the transmission parameters for the two-port network in Figure.

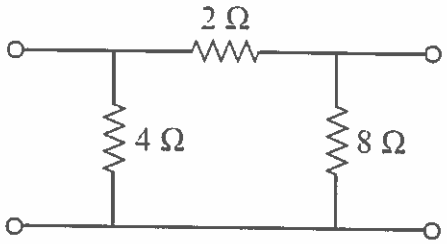


[6M]

(b) Why Z-parameters are known as open circuit parameters and Y-parameters are known as short circuit parameters? Explain. [6M]

(OR)

10(a) Obtain the y parameters for the network shown.



[6M]

(b) Draw the pole-zero diagram of the following network functions.

i. $F(s)=\dfrac{s^2+4}{s^2+6s+4}$

ii. $F(s)=\dfrac{5s-12}{s^2+4s+13}$

iii. $F(s)=\dfrac{s+1}{(s^2+2s+2)^2}$

[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

17ME50-BASIC ENGINEERING MECHANICS

(EEE)

Time: 3 Hours | Max. Marks : 60

Answer one questions from each unit

All questions carry equal marks

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UNIT-I

1(a) State and prove Lami's theorem. [6M]

(b) The 90 kg man, whose centre of gravity is at G, is climbing a uniform ladder as shown in Figure. The length of the ladder is 5 m, and its mass is 20 kg. Friction may be neglected. (i) Compute the magnitudes of reactions at A and B for x = 1.5 m. (ii) Find the distance x for which the ladder will be ready to fall.

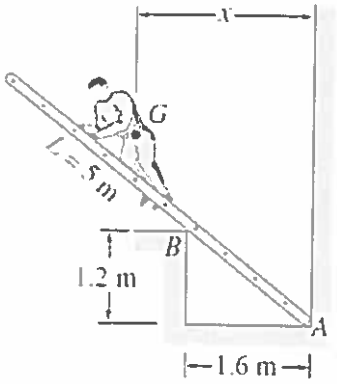


Fig. [6M]

(OR)

2(a) Forces of 2, 3, 4, 5 and 6 kN are acting at one of the angular points of a regular hexagon towards the other angular points taken in order. Find the resultant of the system of forces. [6M]

(b) Two smooth circular cylinders each of weight W = 100 N and radius r = 6 cm are connected at their centres by a string, AB of length L= 16 cm and rest upon a horizontal plane, supporting above them a third cylinder of weight Q = 200 N and radius r = 6 cm as shown in Figure. Find the force induced in the string AB and the pressures produced on the floor at the points of contact D and E.

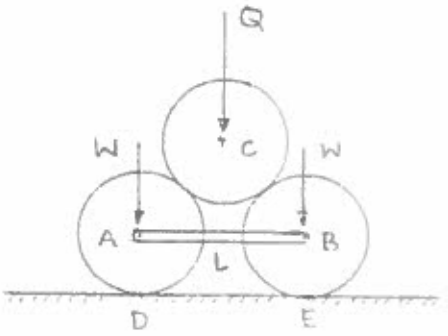


Fig. [6M]

UNIT-II

3(a) Define static friction, kinetic friction and state the laws of solid friction. [6M]

(b) Two rectangular blocks of weights W1 and W2 are connected by a flexible cord and rest upon a horizontal and an inclined plane, respectively with cord passing over a pulley as shown in Figure. In the particular case where W1=W2 and coefficient of static friction μ is the same for all contiguous surfaces. Find the angle α of the inclination of the inclined plane at which motion of the system will impend. Neglect friction in the pulley.

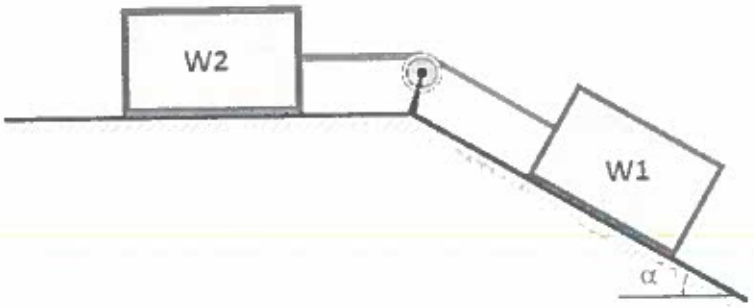


Fig. [6M]

[OR]

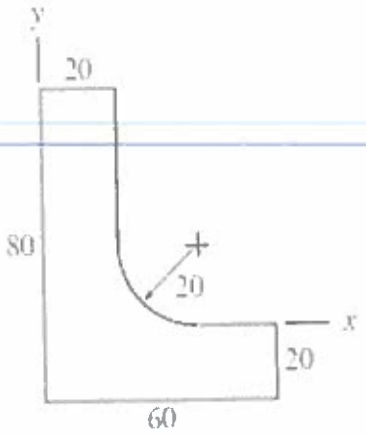
4(a) Prove that the angle of friction is equal to the angle of the inclined plane, when a solid body of weight W placed on the inclined plane and it is about to slide down. [6M]

(b) A ladder 5m long and 250 N weight is placed against a vertical wall in a position where its inclination to the vertical is 30^0. A man weighing 800 N climbs the ladder. At what position will he induce slipping? The co-efficient of friction for both the contact surfaces of the ladder (i.e., with the wall and the floor is 0.2). [6M]

UNIT-III

5(a) Derive the expression for the moment of inertia of a rectangular section about an axis passing through the C.G. of the section and parallel to the base. [6M]

(b) Calculate the centroidal coordinates of the plane region shown in Figure.



Dimensions in mm

Fig. [6M]

[OR]

6(a) Derive the expression for moment of moment of inertia of a semi circular section about an axis passing through the C.G. of section and parallel to the diameter. [6M]

(b) Determine the centroid of quarter circular plane lamina of radius 'r'. [6M]

UNIT-IV

7(a) Differentiate between centre of gravity and centroid. Also define radius of gyration and write its significance. [6M]

(b) Determine the moment of a inertia of a rectangular plate of size a×b and thickness't' about its centroidal axes. [6M]

[OR]

8(a) Determine the centre of gravity of solid hemisphere of radius 'r' from its diametral axis. [6M]

(b) Find the moment of inertia of circular plate of radius 'r' and thickness 't' about its centroidal axis. [6M]

UNIT-V

9(a) A stone is dropped into a well is heard to strike the water in 4 seconds. Find the depth of the well, assuming the velocity of sound to be 335 m/sec. [6M]

(b) A particle is projected from a point on an inclined plane with a velocity of 40 m/s. The angle of projection and angle of the plane are 50^0 and 20^0 to the horizontal respectively. If the motion of the particle is up the plane determine (i) time of flight (ii) range of the projectile up the plane (iii) angle of projection for maximum range up the plane (iv) maximum range up the plane. [6M]

[OR]

10(a) The elevator in an office building starts from ground floor with an acceleration of 0.6 m/sec^2 for 4 seconds. During the next 8 seconds, it travels with uniform velocity. Then suddenly power fails and elevator stops after 3 seconds. If floors are 3.5 m apart, find the floor near which the elevator stops. Assume the retardation is uniform. [6M]

(b) A projectile is fired at an angle 'θ' with the horizontal with a velocity 'u'. Derive the expression for the greatest height attained and the horizontal range. [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

17ME01-ENGINEERING GRAPHICS

(AE & ME)

Time : 3 hours Max. Marks : 60

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

****

UNIT-I

1(a) Two fixed points are 120 mm apart. A point P moves in such way that sum of its distance from two fixed points is always constant and equal to 160 mm. Trace the path of the point and the name the curve. [6M]

(b) Draw an epicycloid of a circle of 40 mm diameter which rolls outside another circle of 200 mm diameter for one revolution and also draw a tangent and normal at a point 90 mm from the centre of the base circle. [6M]

(OR)

2(a) Construct a conic when the distance between its focus and directrix is equal to 40 mm and its eccentricity is one. Draw a tangent a point on the upper half of the curve located 60 mm from the focus. [6M]

(b) A circle having a 50 mm diameter rolls within a circle with a 150 mm diameter with internal contact. Draw the locus of a point lying on the circumference of the rolling circle for its complete turn. Name the curve. Also draw a tangent and a normal to the curve, at a point that is 40 mm from the centre of the bigger circle. [6M]

UNIT-II

3(a) Draw the projections of the following points
(i) A is 25 mm above HP and 35 mm in front of VP
(ii) B is 30 mm below HP and 45 mm behind VP
(iii) C is 15 mm below HP and 15 mm in front of VP [6M]

(b) A line AB of 75 mm long has its end 'A' 20 mm above H.P and 15 mm in front of V.P. The line is inclined at 30^0 to H.P. and 45^0 to V.P. Draw the projections & find the traces. [6M]

(OR)

4(a) State the position of the points
(i) The front view of which lies on the reference line and the top view 50 mm below it.
(ii) The front view of which lies on the reference line and the top view 50 mm above it.
(iii) The top view of which lies on the reference line and the front view 50 mm below it. [6M]

(b) The midpoint of a straight line AB is 60 mm above HP and 50 mm in front of VP. The line measures 80 mm and inclined at 30^0 to HP and 45^0 to VP. Draw its projections. [6M]

UNIT-III

5(a) Draw the projections of a regular pentagon of 40 mm side, having its surface inclined at 45^0 to the HP. [6M]

(b) A thin $30^0 - 60^0$ set square has its longest edge in the HP and inclined at 45^0 with the VP. Draw its projections. [6M]

(OR)

6. A circular plate of negligible thickness and 50 mm diameter appears as an ellipse in the front view, having its major axis 50 mm long and minor axis 30 mm long. Draw its top view when the major axis of the ellipse is horizontal. [12M]

UNIT-IV

7(a) A cube of edge length 35 mm rests on HP on one of its corners with a solid diagonal perpendicular to the VP. Draw its projections. [6M]

(b) Draw the projections of a cone, base 30 mm diameter and axis 50 mm long, resting on HP on a point of its base circle with the axis making an angle of 45^0 with HP. [6M]

(OR)

8. A pentagonal pyramid, base 25 mm side and axis 50 mm long has one of its triangular faces in the VP and the edge of the base contained by that face makes an angle of 30^0 with the HP. Draw its projections. [12M]

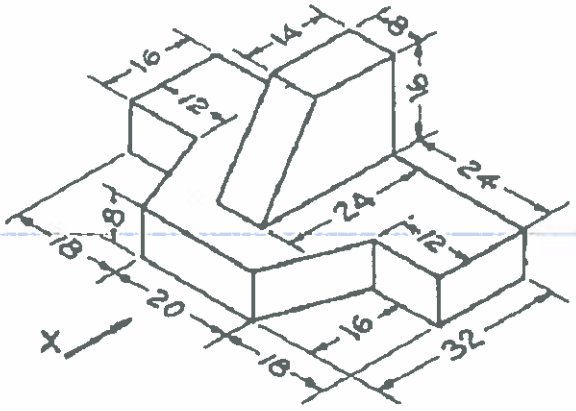
UNIT-V

9(a) Draw the isometric view of a triangular prism side of base 60 mm height 70 mm surmounted by a triangular pyramid whose base coincides with the top of the prism and whose height is 60 mm. [6M]

(b) A square pyramid of 30 mm base sides and 50 mm long axis, is centrally placed on the top of a Cube of 50 mm long edges. Draw isometric view of the pair. [6M]

(OR)

10. Convert the isometric view of the picture shown in the figure in to orthogonal projection of all three views.



[12M]

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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

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UNIT-I

1. State and explain continuity equation and derive the expression involved in it. [12 M]

(OR)

2. For a silicon carrier concentration at absolute temperature is $1.5X10^{10}$/ cm^3, mobility of free electrons μ_n = 1300 cm^2/V.Sec and μ_p = 500 cm^2/V.Sec. Number of silicon atoms per unit volume is $5X10^{22}$ [12 M]
(i). Find the conductivity in case of intrinsic condition at temperature of 300K.
(ii). Find the conductivity of donor impurity of 1 in 10^8
(iii). Find the conductivity of acceptor impurity of 1 in $5X10^7$
(iv). With both the above impurities present simultaneously.

UNIT-II

3 (a) Summarize the avalanche, zener break down of p-n junction diode [6M]
(b) The reverse saturation current of Silicon p-n junction diode is 10μ Amps. Calculate the diode current for forward bias voltage of 0.6V at 25°C. [6M]

(OR)

4(a) Identify various current components in a p-n junction diode. [6M]
(b) Illustrate the operation, characteristics of LED. [6M]

UNIT-III

5. A half wave rectifier is supplied from a 230V, 50Hz supply with a step down ration of 3:1 to a resistive load of 10KΩ. the diode forward resistance is 75Ω and transformer secondary resistance is 10Ω. Estimate maximum, average, rms values of current, d.c output voltage, efficiency and ripple factor of the circuit. [12M]

(OR)

6. Illustrate the need of filter and derive the expression for ripple factor of a full wave rectifier using L-C filter. [12M]

UNIT-IV

7(a) Derive the expression for trans conductance (g_m) of JFET. [6M]
(b) The common base dc current gain of transistor is 0.967. If the emitter current is 10mA, estimate the base current I_B. [6M]

(OR)

8(a) Analyze the drain and transfer characteristics of JFET. [6M]
(b) A transistor has base current I_B = 100μ A and collector current I_C= 2mA. Estimate the following parameters. [6M]
(i).β of the transistor
(ii). α of the transistor.
(iii). Emitter current I_E
(iv). If I_B changes by +25μA and I_C changes by +0.6mA, find the value of β.

UNIT-V

9. A CE transistor amplifier with 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, determine the values of resistors R_E, R_1, R_2. [12M]

(OR)

10. Draw the circuit of voltage divider bias and derive the expression for stability factor S, S^I & S^{II}. [12M]

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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

(AE, CE,CSE, EEE, EIE, IT & 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) What are various data types and their sizes (in bytes) provided in C language? [6M]

(b) Develop a C program to print the Fibonacci sequence up to n. [6M]

(OR)

2(a) Illustrate the usage of switch statement with an example. [6M]

(b) Develop a C program to verify whether the given integer is strong number or not. [6M]

UNIT-II

3(a) Develop a C program to perform addition of 2 matrices. [6M]

(b) Develop a C program to display the length of a string without using any string handling function. [6M]

(OR)

4(a) Develop a C program to multiply two matrices. [6M]

(b) Develop a C program to read a 3x3 matrix and find the sum of its diagonal elements. [6M]

UNIT-III

5. Demonstrate parameter passing techniques in functions with suitable examples. [12M]

(OR)

6(a) Develop a C program to calculate the factorial of an integer using non recursive function. [6M]

(b) Distinguish between malloc() and calloc(). [6M]

UNIT-IV

7(a) Develop a C program to create a structure definition for an Employee. Read the details of Five employees and find the average salary. [6M]

(b) Demonstrate how structure elements are accessed using pointers with a suitable example. [6M]

(OR)

8(a) Explain how to initialize and access members of a structure with an example program. [6M]

(b) Differentiate structure and union with suitable examples. [6M]

UNIT-V

9(a) What is a file? Explain different modes in which a file can be opened in a C program. [6M]

(b) Develop a C program to copy the text data of one file into another file. [6M]

(OR)

10(a) Differentiate fgetc() and fgets() with suitable example. [6M]

(b) Develop a C program to merge the text data of two files into another file. [6M]

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15 MAY 2018

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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

17FE15-ENGINEERING CHEMISTRY

(CSE, ECE, EIE & IT)

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) Construct Nickel- Cadmium battery. Draw a neat diagram. Explain chemical reactions. [6M]

(b) Derive Nernst equation. [6M]

(OR)

2(a) Define the terms standard electrode potential, primary cell, secondary cell. [6M]

(b) Design Hydrogen – Oxygen fuel cell. Explain its working. Draw a neat diagram. [6M]

UNIT-II

3(a) State the principle of cathodic protection. Explain sacrificial anodic protection to control corrosion. [6M]

(b) How the following factors influence rate of corrosion?
(i) purity
(ii)position in galvanic series
(iii)Relative areas of cathode and anode. [6M]

(OR)

4(a) How does galvanic corrosion occur? Explain with an example. [6M]

(b) Explain the process of electroplating. [6M]

UNIT-III

5(a) Discuss any four applications of nano materials. [6M]

(b) Write about addition and condensation polymerizations. [6M]

(OR)

6(a) What are conducting polymers? Write about intrinsic conducting polymers. [6M]

(b) How to prepare Thiokol? Write about its properties and applications. [6M]

UNIT-IV

7(a) What is meant by
(i)Bioluminescence (ii)Photosensitization. [6M]

(b) State the following laws
(i)Grothers – Droper law (ii)Stark – Einstein law. [6M]

(OR)

8(a) Write short notes on thermotropic liquid crystals. [6M]

(b) Discuss applications of liquid crystals. [6M]

UNIT-V

9(a) Explain the following with respect to U.V visible spectroscopy.
(i)Bathochromic shift (ii)Hypsochromic shift (iii)Hyperchromic shift. [6M]

(b) Define the term I.R spectroscopy. Describe various molecular vibrations responsible for I.R absorption. [6M]

(OR)

10(a) State the principle of conductometric titrations and give its advantages. [6M]

(b) State the principle of potentiometry. Give its advantages. [6M]

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

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) Illustrate the working principle of Michelson Interferometer. [6M]

(b) Derive the equations for bright and dark fringes in thin parallel film by reflected light. [6M]

(OR)

2(a) Define diffraction grating. Mention the characteristics of a grating. Find the highest order that can be seen with a grating having 15000 lines per inches. The wavelength of light used is 6000 A°. [6M]

(b) Deduce the expression for resolving power of a Telescope. [6M]

UNIT-II

3(a) State and explain Brewster's law. Prove that the reflected and refracted light rays are perpendicular. Estimate the Brewster's angle for a glass plate of refractive index 1.5. [6M]

(b) Design the quarter wave and half wave plates to find the thickness of the plate. When a Plane polarized light passes through a quartz plate with its axis parallel to the face (given μ_e = 1.553, μ_o = 1.542; λ = 5.5x10^{-5} cm). Evalulate the thickness of the plate. [6M]

(OR)

4(a) Explain the construction and working of He – Ne gas Laser. [6M]

(b) List out the applications of lasers. [6M]

UNIT-III

5(a) Derive time independent Schrodinger wave equation for a free particle. [6M]

(b) Describe the Davisson – Germer experiment to verify the matter waves. [6M]

(OR)

6(a) Write the Fermi Dirac distribution function. Discuss how the Fermi function varies with temperature. Electrons in a metal have a Fermi velocity of 2x10^{6}m/s. Calculate the Fermi energy of the electrons in the metal in electron volts. [6M]

(b) Estimate an expression for electrical conductivity in a metal based on classical free electron theory. [6M]

UNIT-IV

7(a) Derive the equations for drift current and diffusion current in a semiconductor. [6M]

(b) Explain Hall effect in semiconductors and estimate the expression for Hall coefficient. [6M]

(OR)

8(a) Write a note on LED. [6M]

(b) Describe a Solar Cell and write the V- I characteristics of a solar cell. [6M]

UNIT-V

9(a) Define Dielectric constant, Electric dipole moment (μ), Polarization (P) and polarizability (α). Calculate the electronic polarizability of an isolated Se atom. Atomic radius of Se atom is 0.12 nm. Given ϵ_0= 8.85x10^{-12} Fm^{-1}. [6M]

(b) Narrate Ionic polarization in dielectric materials. [6M]

(OR)

10(a) Write a note on Dielectric loss and Dielectric break down. [6M]

(b) List out the applications of Dielectric materials. [6M]

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15 MAY 2018

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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

17FE13 -ENGINEERING PHYSICS

(AE,CE&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 would you explain the interference from thin parallel films due to reflected light? [6M]

(b) Summarize the necessary conditions for obtaining interference fringes. 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. [6M]

(OR)

2(a) Derive an expression for the radius of Airy's disc in the diffraction pattern due to a circular aperture. [6M]

(b) Determine the resolving power of a diffraction grating. [6M]

UNIT-II

3(a) Write a note on double refraction. [6M]

(b) Illustrate the working principle of Laurent's Half shade Polarimeter. [6M]

(OR)

4(a) Explain the Absorption, Spontaneous emission and Stimulated emission processes with neat diagrams. [6M]

(b) Derive the expression for energy density of radiation in terms of Einstein coefficients. [6M]

UNIT-III

5(a) Derive time independent Schrodinger wave equation for a free particle. [6M]

(b) Explain the physical significance of wave function.
Find the energy of the electron moving in a one dimensional infinitely deep potential box of 0.1nm width. [6M]

(OR)

6(a) Show that FCC crystals are more closely packed than BCC and simple cubic crystals. [6M]

(b) Explain Bragg's law of X-ray diffraction. [6M]

UNIT-IV

7(a) Show that $\mu_r = 1 + x$.
A paramagnetic material has a magnetic field intensity of 10^4 A/m. If the susceptibility of the material at room temperature is 3.7×10^{-3}, calculate the magnetization and flux density in the material. [6M]

(b) Derive the magnetic dipole moments due to orbital and spin motions of an electron. [6M]

(OR)

8(a)	Distinguish between Soft and Hard magnetic materials.	[6M]
(b)	Illustrate the terms magneto static energy, domain walls,magneto striction energy.	[6M]

UNIT-V

9(a)	Distinguish between type I and type II superconductors.	[6M]
(b)	Describe Josephson effects.	[6M]

(OR)

10(a)	Explain SQUID, cryotron.	[6M]
(b)	Describe the properties of super conducting materials.	[6M]

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11 MAY 2018

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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

17FE05-DIFFERENTIAL EQUATIONS AND NUMERICAL APPLICATIONS

(CSE)

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) Solve the ODE $\left(y^4+2y\right)dx+\left(xy^3+2y^4-4x\right)dy=0$ [6M]

(b) If the temperature of the air is 30°c and the substance cools from 100° to 60° in 15 minutes, find when the temperature will be 40°c. [6M]

(OR)

2(a) Solve for the particular solution of $2\sin y^2dx+xy\cos y^2dy=0, y(2)=\sqrt{\frac{\pi}{2}}$. [6M]

(b) The rate at which bacteria multiply is proportional to the instantaneous number present. If the original number doubles in 2 hours, in how many hours will it triplicate? [6M]

UNIT-II

3(a) Solve $\left(D^2-4D+4\right)y=8x^2e^{2x}\,Sin\,2x$ [6M]

(b) Solve the ODE by variation of parameters method $y^{11}-6y^1+9y=\frac{e^{3x}}{x^2}$. [6M]

(OR)

4(a) Solve $\left(D^2-1\right)y=x\,Sin\,x+\left(1+x^2\right)e^x$ [6M]

(b) Solve $\frac{d^2y}{dx^2}-2\frac{dy}{dx}+4y=e^x\,Sin\frac{x}{2}$ [6M]

UNIT-III

5(a) Show $\frac{\partial^2u}{\partial\theta^2}+\frac{\partial^2u}{\partial\phi^2}=4xy\frac{\partial^2u}{\partial x\partial y}$ if $x+y=2e^{\theta}\cdot\mathrm{Cos}\phi,\ x-y=2ie^{\theta}\cdot\mathrm{Sin}\phi$ [6M]

(b) Given $x+y+z=a$, find the maximum value of $x^m\,y^n\,z^p$ by Lagrange method. [6M]

(OR)

6(a) If $x=a\,Cosh\xi\,Cos\eta,\ y=a\,Sinh\xi\,Sin\eta$ show that $\frac{\partial(x,y)}{\partial(\xi,n)}=\frac{1}{2}a^2\left(Cosh\,2\xi-Cos2\eta\right)$. [6M]

(b) If $u=f(x,y)$ and $x=r\,Cos\theta,\ y=r\,Sin\theta$ then show that

$$\left(\frac{\partial u}{\partial x}\right)^2+\left(\frac{\partial u}{\partial y}\right)^2=\left(\frac{\partial u}{\partial r}\right)^2+\frac{1}{r^2}\left(\frac{\partial u}{\partial\theta}\right)^2$$ [6M]

UNIT-IV

7(a) Form the Partial Differential equation from $z=e^{ax+by}f(ax-by)$ by elimination of the arbitrary function. [6M]

(b) Solve the PDE $p+3q=5z+\tan(y-3x)$ by Lagrange method. [6M]

(OR)

8(a) Form the Partial Differential equation from z = y f(x) + x g(y) by elimination of the arbitrary functions. [6M]

(b) Solve the PDE $(x^2-yz)p+(y^2-zx)q=z^2-xy$ by Lagrange method. [6M]

UNIT-V

9(a) Solve the ODE $\frac{dy}{dx}=x+y^2, y(1)=1$ by Taylor's method at x=1.1 and 1.2 upto 4th place after the decimal. [6M]

(b) Estimate the value at x = 1.2 by solving the ODE $\frac{dy}{dx}=2x-y, y(1)=3$ by Picard's method of successive approximation upto 3rd approximation. [6M]

(OR)

10(a) Utilise the Euler's method solve the ODE $\frac{dy}{dx}=2x-y, y(0)=3$ at x=1.0 by taking the step size h=0.25 and compare with analytical solution. [6M]

(b) Make use of fourth order Runge Kutta method to solve the ODE $\frac{dy}{dx}=x^2-y, y(0)=1$ at x=0.3 by taking the step size h = 0.1 [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

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
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UNIT-I

1(a) Solve $(y\cos x+\sin y+y)dx+(\sin x+x\cos y+x)dy=0$. [6M]

(b) Check that the system of parabolas $y^2=4a(x+a)$ is self-orthogonal. [6M]

(OR)

2(a) Solve $\left(x^2y^2+xy+1\right)ydx+\left(x^2y^2-xy+1\right)xdy=0$. [6M]

(b) 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]

UNIT-II

3(a) Find the general solution of the differential equation $(D^2+3D+2)y=\sin 3x$. [6M]

(b) Using method of variation parameters, evaluate the complete solution of $(D^2+4)y=\tan 2x$. [6M]

(OR)

4(a) Solve $(D^2+D)y=x^2+2x+4$. [6M]

(b) Find the general solution of $(D^3-D)y=e^x+e^{-x}$. [6M]

UNIT-III

5(a) If $x=r\cos\theta, y=r\sin\theta$, then show that $\frac{\partial(x,y)}{\partial(r,\theta)}.\frac{\partial(r,\theta)}{\partial(x,y)}=1$. [6M]

(b) Find the Maclaurin's series expansion of $e^x\sin y$ in the powers of x and y. [6M]

(OR)

6(a) Find the partial differential equation by the elimination of arbitrary functions from $z=f_1(x)f_2(y)$. [6M]

(b) Solve $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$. [6M]

UNIT-IV

7(a) Reduce the matrix A to canonical form, if A = $\begin{bmatrix}1&2&3&0\\2&4&3&2\\3&2&1&3\\6&8&7&5\end{bmatrix}$ and find its rank. [6M]

(b) Test whether the following system of equations are consistent or not. If so, solve them completely
$3x+3y+2z=1, x+2y=4, 10y+3z=-2, 2x-3y-z=5$ [6M]

(OR)

8(a) Apply Echelon Form to find the rank of the matrix

$$A = \begin{bmatrix} 1 & 4 & 3 & -2 & 1 \\ -2 & -3 & -1 & 4 & 3 \\ -1 & 6 & 7 & 2 & 9 \\ -3 & 3 & 6 & 6 & 12 \end{bmatrix}$$ [6M]

(b) Find the non-singular matrices P and Q such that PAQ is in the normal form for A,

Where $A = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$. Hence find the rank of the matrix A. [6M]

UNIT-V

9. Verify Cayley- Hamilton theorem for $A = \begin{bmatrix} 2 & -1 & 2 \\ 1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and hence find

(i) A^{-1} (ii) A^4. [12M]

(OR)

10(a) Evaluate the Eigen values and the corresponding Eigen vectors of

$$\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$ [6M]

(b) If λ is an Eigen value of a non singular matrix A, then $\frac{|A|}{\lambda}$ is an Eigen value of the matrix $adjA$. [6M]

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9 MAY 2018

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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

17FE01-PROFESSIONAL COMMUNICATION – I
(Common to all branches)

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) Evaluate Abdul Kalam's first presidential speech for a developed India. [4M]

(b) Write a paragraph on "the use of Technology in modern days". [4M]

(c) i) Identify the **'Part of speech'** of the Italicized word in the following sentences:
   a. I had a ***sensation*** of falling, as if in a dream.
   b. He was very ***rude*** about my driving.
   c. The dam ***burst*** under the weight of water.
   d. A book is ***on*** the table.

   ii) Fill the blanks with appropriate **'articles'**.
   a. The cow is ..... mammal.
   b. He is .....boy who teased me.
   c. He is .... honest lawyer.
   d. He was .....first man to arrive. [4M]

(OR)

2(a) How is the concept of a Christmas angel depicted in the story "Double Angels"? [4M]

(b) Write a paragraph on "waste management". [4M]

(c) Change the word as directed by using Prefix/Suffix.
   a. Dark(noun) b.Visible (opposite) c. Father(adjective)
   d. speed (adverb) [4M]

UNIT-II

3(a) Briefly describe Nadella's thoughts on innovation and its importance in Microsoft. [4M]

(b) Write a letter to the Principal of your college requesting him to grant you leave for five days as you are going to attend a seminar in Chennai. [4M]

(c) Identify the verbs and say whether they are 'Transitive/ Intransitive/Gerund.
   a. Ram ***kicked*** the ball.
   b. Please ***taste*** the cake I have made.
   c. ***Trekking*** is an exciting activity.
   d. Dog ***barks*** at the thief. [4M]

(OR)

4(a) Depict the spirit of regret and longing in the poem "The road not taken". [4M]

(b) Write a letter to the principal of your college complaining against ragging by some seniors in the college premises. [4M]

(c) Write the meanings of the 'Phrasal verbs" given below:
   a. Call for b. come up c. fall out d. blow over [4M]

17FE01-PROFESSIONAL COMMUNICATION – I

UNIT-III

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]

(b) Write a letter to the manager of Bajaj electrical company complaining about the malfunctioning of recently bought washing machine requesting him to send a service engineer to your house immediately. [4M]

(c) i) Write the 'Synonyms' of the following:
a. seldom b. callous
ii) Write the 'Antonyms' of the following:
a. Transient b. Ambiguity.
iii) Fill the blanks with appropriate verb forms.
a. He ___ out five minutes ago. (go)
b. It _____ since early morning. (rain) [4M]

(OR)

6(a) How according to Wordsworth is the knowledge acquired by the poet and by the scientist different? [4M]

(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]

(c) Distinguish the pair of words given below writing their meanings.
a. Aisle/Isle b. allowed/aloud c. ate/eight d. ball /bawl [4M]

UNIT-IV

7(a) What is the central theme in Ruskin Bond's story "The boy who broke the bank". [6M]

(b) Expand the proverb on listening skills "Listening requires more intelligence than speaking". [6M]

(OR)

8(a) How does bad listening skills bring down the bank in the story "The boy who broke the bank"? [6M]

(b) Expand the proverb "two heads are better than one". [6M]

UNIT-V

9(a) How does Skavinski happen to appear for the interview in the story "The lighthouse Keeper of Aspinwall"? [6M]

(b) Expand the proverb on interview skills "whcre there is no vision, people perish"? [6M]

(OR)

10(a) Evaluate the interview skills exhibited by Skavinski in "The lighthouse keeper of Aspinwall". [6M]

(b) Write a Résumé with a covering letter to the manager of Microsoft (India branch) about the post of computer analyst. [6M]

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