Code No: 14011

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I-Semester (Backlog) Examination, July 2021

Subject: Building Planning and Drawing

Time: 2 hours **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1 Differentiate between English bond and Flemish bond.
2 Draw the conventional sign for sand and plaster.
3 Draw the isometric view of a queen closer.
4 Draw the isolated footing of ashlar fine masonry.
5 Draw a line diagram of compound fink truss of 10 m span.
6 Sketch the elevation of a glazed window?
7 List the various type of footings
8 What you mean by baluster and balustrade in staircase?
9 What are the important aspects of building?
10 What are the principle of building planning?

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 Draw the plan and isometric view of wall junction for one and a half brick wall in flemish bond. Draw minimum 4 layers.

12 Draw front elevation and sectional elevation of a paneled and glazed door of 1.2m x 2.1m to a scale of 1: 50.

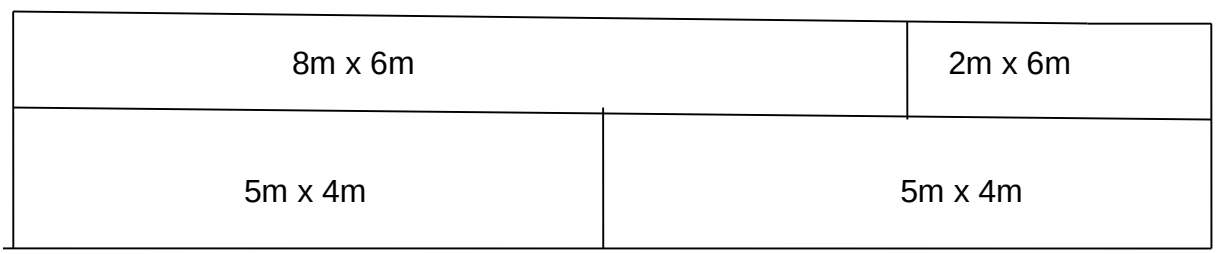
13 Draw the elevation and sectional plan of random rubble masonry.

14 Draw the front and sectional elevation of a dog legged staircase in a residential block to reach a floor height of 3.1m.

15 Draw the plan and elevation of a isolated RCC column stepped footing of foundation in a residential building.

16 What are the steps involved in developing the line diagram of a building.

17 The line diagram of a building is shown in the figure below. Draw plan and sectional elevation to a scale of 1: 50 and locate doors and windows. Take thickness of wall as 0.3m



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OU - 1607 OU - 1607

Code No: 14016

FACULTY OF ENGINEERING

BE II/IV (EEE/EIE) I-Semester (Backlog) Examination, July 2021

Subject: Electronic Engineering-I

Time: 2 Hours **Max .Marks: 75**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any seven questions. **(7x3=21 Marks)**

1 Define Zener and Avalanche breakdown in diodes?
2 Explain working of pn-junction Diode under forward bias?
3 Compare CE, CB and CC configurations of BJT amplifier?
4 What are the criteria for the location of Q-point?
5 Compare JFET and MOSFET?
6 Briefly write about biasing of Enhancement MOSFET?
7 Three identical amplifier stages are connected in cascade with 20db gain for each stage. What is overall gain?
8 What is Darlington pair –explain briefly?
9 Write briefly about distortions in amplifiers?
10 What are the disadvantages of transformer couple amplifier?

PART – B

Answer any three questions. **(3x18= 54 Marks)**

11 Draw a full wave rectifier with inductor filer and explain working with waveforms. Derive expression for its ripple factor?

12 Calculate voltage again, current gain, input resistance and output resistance for a CE BJT amplifier if R_L=5KΩ hie=1KΩ, hfe=50, hre=hoe=0? Derive the formulae used in calculations?

13 (a) Explain Source self-bias of JFET?
(b) For a CS FET amplifier derive expressions for voltage gain and output resistance?

14 (a) State and explain Miller's theorem?
(b) Draw circuit of a bootstrap amplifier and explain its working.

15 Derive mid-frequency and high frequency gains of transformer coupled amplifier amplifier?

16 (a) Explain characteristics of DIAC and TRAIC?
(b) Explain temperature dependence of V-I characteristics of diodes?

17 Write short notes on;
(a) Differences amplifier
(b) Bandwidth of cascaded amplifier stages
(c) Characteristics of UJT

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Code No.14024

FACULTY OF ENGINEERING

B. E. (2/4) (ECE) I– Semester (Backlog) Examination, July 2021

Subject: Electromagnetic Theory

Time: 2 hours **Max. Marks: 75**

Note: (Missing data, if any, may be suitably assumed)

PART – A

Answer any seven questions. **(7 x 3 = 21 Marks)**

1. Define Coulomb's Law for n-point charges? What are the limitations?
2. State and prove Laplace & Poisons equations?
3. Convert the vector F = (4ax-2ay-4 az); located at A(2,3,5) in to cylindrical coordinates.
4. Define Biot Savart's law?
5. State and prove Ampere's circuital law?
6. State Maxwell's equations in integral form?
7. Define Stokes theorem?
8. Describe Magnetic Boundary Conditions?
9. Define EM Wave Polarisation?
10. Show that free space impedance is 3770hms?

PART – B

Answer any three questions. **(3 x 18 = 54 Marks)**

11. a) Derive an expression for Potential Gradient.
    b) Determine Electric field E at at the origin due to a point charge of 54.9nC located at (-4,5,3)m in Cartesian coordinates.

12. a) State and prove Integral form of Gauss's Law?
    b) Two large sheets of charge distribution are located at x=0 and x=a; in free space, the surface charge densities of sheets are P_{s1}=6.0μC&P_{s2}=3μC. Find electric field intensity in all regions?

13. a) Starting from fundamentals derive Maxwell's equations for time varying fields?
    b) State and prove with example Amperes inconsistency circuital law?

14. a) Define Complex Poynting Vector and Instantaneous Pointing vector and obtain expressions for it?
    b) The phase constant of a Uniform plane EM wave travelling in a perfect dielectric medium as 10rad/m. Calculate the phase velocity, wavelength, frequency, and intrinsic impedance of the field? Permittivity and permeability's of the medium are 4.8 and 1 respectively.

15. a) State and prove Poynting theorem? Define complex pointing vector?
    b) Derive an expression for Reflection Coefficient and Transmission Coefficient when a plane wave is normally incident on a conductor?

16. a) Define Scalar & Vector Magnetic Potentials and obtain expressions for it?
    b) Derive an expression for propagation constant in free space?

17. a) Write short notes on Electro static boundary conditions?
    b) Derive an expression for electric field intensity at a point in space for a finite length line charge?

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Code No. 14028

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/AE) I-Semester (Backlog) Examination, July 2021

Subject : Mechanics of Materials

Time: 2 hours **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

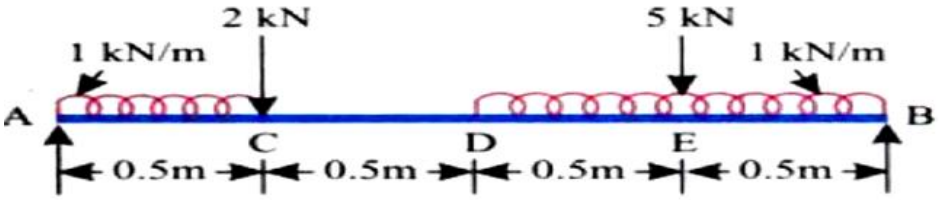
1 Define Hardness and toughness of material.
2 Explain Bulk modulus and Modulus of Rigidity.
3 What are the assumptions made in the theory of simple bending?
4 Draw the Shear force and bending moment for cantilever of length 'L' carrying a point load 'W' at the free end.
5 A solid steel shaft is to transmit a torque of 10 KN-m. If the shearing stress is not to exceed 45MPa. Find the minimum diameter of the shaft.
6 Define Spring Stiffness.
7 What is the ratio of maximum shear to average shear of a rectangular section?
8 Write importance of Mohr's circle of stresses.
9 Write down the importance of Rankine's constant and reduction factor of a column.
10 Differentiate between thick and thin cylinders.

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 A steel tube of 30mm external diameter and 20mm internal diameter encloses a copper rod of 15mm diameter to which it is rigidly joined at each end. If at a temperature of 10^0C there is no longitudinal stress, calculate the stresses in the rod and tube when the temperature is raised to 200^oC. take E for steel and copper as $2.1x10^5$ N/mm^2 and $1x10^5$ N/mm^2 respectively. The value of co-efficient of linear expansion for steel and copper is given as $11x10^{-6}$ per ^{0}C and $18x10^{-6}$ per ^{0}C respectively.

12 Draw the shear force and bending moment diagrams for a beam as shown in below:



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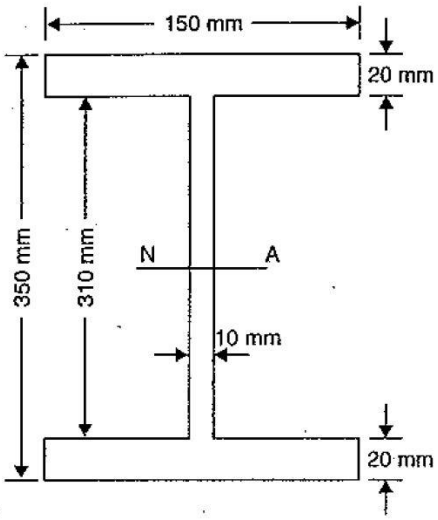
13 A hollow shaft is to transmit 300KW power at 80 r.p.m if the shear stress is not to exceed 60 N/mm^2 and the internal diameter is 0.6 of the external diameter, find the external and internal diameters assuming that the maximum torque is 1.4 times of the mean torque.

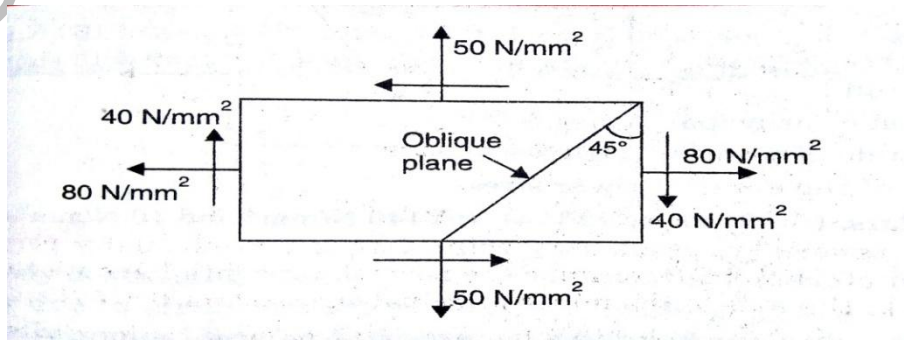
14 An I section beam as shown in the below figure is subjected to a shear force of 40KN find the maximum shear stress developed in the I-section. Also draw the shear stress distribution.



15 A closed cylindrical shell 3m long, 15mm thick and it has an internal diameter of 1m. Calculate the circumferential and longitudinal stresses induced and also calculate changes in the dimensions of the shell, if it is subjected to an internal fluid pressure of $1.5N/mm^2$. Take E = 2 X 10^5 N/mm^2. And Poisson's ratio as 0.3.

16 A hollow cylindrical cast iron column is 4m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250KN with a factor of safety as 5. Take the internal diameter as 0.8 times the external diameter. Take $\sigma = 550N/mm^2$. And $\alpha = 1/1600$ in Rankine's formula.

17 A point in a strained material is subjected to stresses as shown in below figure. Using Mohr's circle method, determine the normal, tangential and resultant stresses across the oblique plane.



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Code No. 14035

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I-Semester (Backlog) Examination, July 2021

Subject : Data Structures Using C++

Time: 2 hours **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1 Show that $2n^2+8n+4 = O(n^2)$.
2 Write Abstract data type for polynomial.
3 Illustrate the role of stack in function calls processing.
4 Convert the given infix expression into postfix notation: 10-2+3/(6+2)*4
5 Represent the expression $5x^3 + 4x^2+3x+10$ using Linked list.
6 Compare singly linked list and doubly linked list.
7 Write the recursive function for Postorder traversal of a binary tree.
8 What is Splay tree? Where it is used in real world?
9 Write any two applications of Depth first traversal.
10 Compute worst case time complexity of Insertion sort.

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Write a function for matrix multiplication of size m X n and find the time complexity of it using tabular method.
(b) Explain with an example how a sparse matrix can be efficiently stored.

12 (a) Write functions to perform insertion and deletion operations on queue which is implemented using linked list.
(b) Design an function for infix to postfix expression conversion, showing the stack content and output expression after each operator read from the given input expression.
(a+b*10) – (e*f+g)/h+i

13 Write a function to compute the result of the addition of two polynomials. Assume that the polynomials are represented as linked lists.

14 (a) What is the significance of B-Tree? Construct a B-tree of order 4 for the following data 35, 10, 15, 20, 16, 55, 62, 12, 28, 14, 38, 65, 75
(b) Apply modulo division and quadratic probing to perform hashing for the below elements. Hash table size is 9. 246, 290, 163, 190, 133, 152, 245.

15 Write and explain the Quick sort algorithm with an example and analyse its time complexity.

16 (a) Explain the space and time complexities of an algorithm with example.
(b) Show the content of the stack while converting the given infix expression into postfix expression after considering the each element of infix expression. 2 + 4 / 5 + (4 - 5) * 2 / 3 - 6

17 (a) Construct an AVL tree by specifying the type of the rotations performed while inserting elements 10, 25, 45, 12, 20, 15, 25
(b) Show how Heap sort algorithm works on the input:
24, 32, 48, 57, 12, 18, 91, 6, 9, 84

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Code No. 14040

FACULTY OF ENGINEERING

B.E. 2/4 (I.T) I – Semester (Backlog) Examination, July 2021

Subject: Micro Electronics

Time: 2 hours **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1 State the properties of a semiconductor.
2 Draw the circuits of positive and negative clippers and explain.
3 Define Base-width modulation.
4 Compare BJT and FET.
5 Derive the loop gain of a feedback amplifier.
6 What is piezo-electric effect?
7 Implement op-amp as a VCCS.
8 What are the characteristics of an ideal op-amp?
9 Define Noise Margin.
10 Draw a CMOs inverter.

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 Explain the operation of a PN junction diode under No bias, forward bias and reverse bias conditions.

12 Explain the structure of an n-channel MOSFET and discuss its operation.

13 a) Explain the operation of a colpitts oscillator.
b) Draw series-series and shunt-shunt feedback topologies.

14 Explain how square wave and triangular wave forms are generated using an op-amp.

15 a) Implement AND and OR gates using CMOS logic.
b) Explain the features of CMOS logic.

16 a) Discuss the operation of BJT as an amplifier.
b) Implement op-amp as an integrator.

17 Write notes on the following:
a) VTC of CMOS Invertor
b) Clamping circuits.

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Code No.14520/CBCS

FACULTY OF ENGINEERING

B.E. (CIVIL) III-Semester CBCS (Backlog) Examination, July 2021

Subject : Fluid Mechanics – I

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 What is fluid? What is the difference between practical and ideal fluids.
2 A driver works at a depth of 50 m below the free surface. Find the pressure intensity at this depth if sea water weights 10 KN/m^3.
3 Differentiate between Lagrangian method and Eulerian method of describing fluid flow.
4 What is the relation between circulation and rotation of a fluid particle.
5 Differentiate between local acceleration and convective acceleration.
6 Define kinetic energy factor and write its formulae.
7 Distinguish between small orifice and large orifice.
8 Differentiate between clear, depressed and clinging nappes.
9 Differentiate between isothermal, adiabatic and isentropic process.
10 Define Mach number and state its significance.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 a) Define surface tension and capacity. Derive an expression between surface tension and pressure inside a droplet of liquid in excess of outside pressure.
b) A trapezoidal channel 2.0 m wide at the bottom and 1.0 m deep has side slopes 1:1. Determine i) Total pressure and 2) the centre of pressure on the vertical gate closing the channel when it is full of water.

12 a) Define the following.
i) Steady and unsteady flow ii) Uniform and non uniform flow
iii) Rotational and irrotational flows iv) 3D, 2D and 1 D flows.
b) Define flownet and explain its significance, uses and limitations.

13 a) Derive an expression for 3D continuity equation in Contesian coordinates. State the assumptions.
b) A pipeline is in 15 cm diameter and is at an elevation of 100.0 m at section A. at section B it is at an elevation of 107.0 m and has a diameter of 30 cm. when a discharge of 50 lps of oil of specific gravity 0.85 is passed through this pipe the pressure at section A is 30 Kpa. The energy loss in the pipe is 2.0 m. Calculate
the pressure at B when the flow is (i) A to B and (ii) B to A.

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14 a) Derive an expression for discharge through horizontal venturimeter.

b) The diameter of pipe bend is 30 cm at inlet and 15 cm at outlet and the flow is turned through 120^0 in a vertical plane. The axis at inlet is horizontal and the centre of the outlet section is 1.5 m below the centre of the inlet section. Total volume of water in the bend is 0.9 m^3. Neglect the losses, calculate magnitude and direction of force exerted on the bend by water flowing through it at 250 L/S and when the inlet pressure is 0.15 N/mm^2.

15 a) Derive Bernouli's expression for adiabatic process.

b) A supersonic plane flies at 1900 KMPH in air having a pressure of 28.5 Kpa and density of 0.44 Kg/m^3. Calculate the (i) temperature, (ii) pressure and (iii) density of air at the stagnation point on the nose of the plane.
Take K = 1.4 and R = 287 $J/(Kg.^0K)$

16 a) Explain Micro manometer with neat sketch.

b) A flow is described by the stream function $\Psi = 3.5xy$. Locate the point at which the velocity vector has magnitude of 4 units and makes an angle of 150^0 with the X – axis.

17 a) Differentiate between Notch and Weir. Derive an expression for Cipolletti weir.

b) Explain the Mach cone and Mach angle with neat sketches. State their importance.

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OU - 1607 OU - 1607

Code No. 14528/CBCS

FACULTY OF ENGINEERING

B. E. III – Semester (CBCS) (EE/Inst.) (Backlog) Examination, July 2021

Subject: Electro Magnetic Fields

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. Define vector product of two vectors.
2. State the Gauss's law for electrostatic fields.
3. Write the Poisson's and Laplace equations.
4. State and explain Uniqueness theorem.
5. Give the force on a current element.
6. A solenoid with air core has 500 turns of wire. Its length is 750 mm and core radius is 50mm. What is its inductance?
7. Write Maxwell's equations for time varying fields in point form.
8. Explain why Ampere's law is not consistent with the time varying fields.
9. What do you understand by skin depth?
10. Calculate the characteristics impedance of free space.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. (a) State and explain Coulomb's law.
    (b) Calculate field intensity at point (1,2,3)m due to a charge of 12 nC at (2,3,4)m.

12. (a) Derive the boundary conditions for perfect dielectric materials.
    (b) Show that $\nabla . \bar{j} + \frac{\partial \rho_v}{\partial t} = 0$ as per the principle of conservation of charge.

13. (a) Obtain the magnetic field intensity due to an infinite long current carrying conductor using Ampere's circuital law.
    (b) Explain about magnetic boundary conditions.

14. (a) Discuss the conduction, convection and displacement current densities.
    (b) State and explain Maxwell's equations for static fields in integral form.

15. Explain Poynting theorem and derive Poynting vector.

16. (a) Derive the expression for Lorentz force equation.
    (b) Obtain the expression for energy stored in a static electric field.

17. (a) Explain the concept of electric field intensity and derive potential gradient.
    (b) Derive the wave equation for free space.

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OU - 1607 OU - 1607

Code No: 14534/CBCS

FACULTY OF ENGINEERING

BE III-Semester (ECE) (CBCS) (Backlog) Examination, July 2021

Subject: Switching Theory & Logic Design

Time: 2 Hours **Max .Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions. **(5x2=10 Marks)**

1 Convert the binary number 11011101 to gray code.
2 Define the Boolean function.
3 Prove that NAND gates are universal gates.
4 What do you mean by weighted code? Given examples.
5 What is a multiplexer?
6 Find the two compliment of $(1010)_{2.}$
7 Compare combinational and sequential circuits.
8 Give the Excitation table for J-K Flip-flop.
9 Explain about mealy state machine.
10 What is a state diagram?

PART – B

Answer any four questions. **(4x15=60 Marks)**

11 (a) Convert the following numbers into decimal numbers.
i) $(1011011101101110)_2$ ii) $(A0CB.EE)_{16}$
(b) For the given Boolean function

$$F = (\bar{x}yz + x\bar{y}\bar{z} + \bar{w}xy + w\bar{x}y + wxy)$$

simplify the function to minimal literally using Boolean algebra.

12 (a) Reduce the function using Quine-McCluskey tabular method
f(A,B,C,D)=Σm(0,2,3,4,5,10,11,13)
(b) State De Morgan's law.

13 (a) Design 4-bit digital comparator and explain with neat sketch.
(b) Explain about 4 bit Carry-look a head adder.

14 (a) What is meant by 'edge triggered? Differentiate SR-FF and JK-FF with their functional operation and excitation tables.
(b) Draw and explain the circuit diagram of positive edge triggered J-K flip-flop using NOR gates with its truth table. How race around conditions are eliminated?

15 Design a Mod-10 counter using RS flip-flops.

16 (a) Realize the function f(A,B,C,D)=Σ(1,2,5,6,7,8,10,14,15) using i) 8:1 MUX ii) 4:1 MUX
(b) Reduce the following function using k-map technique
F(A,B,C,D)=ΠM(1,2,3,5,6,7,8,9,12,13)

17 (a) Deign a circuit to convert BCD to seven segment decoder Logic.
(b) Explain about static hazards.

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OU - 1607 OU - 1607

Code No: 14538/CBCS

FACULTY OF ENGINEERING

BE III-Semester (M/P) (CBCS) (Backlog) Examination, July 2021

Subject: Fluid Mechanics

Time: 2 Hours **Max .Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions. **(5x2=10 Marks)**

1 Differentiate kinematic viscosity and dynamic viscosity.
2 Distinguish between absolute and gauge pressures.
3 Demonstrate and write the relation of continuity equation.
4 Define the following; i) Velocity potential function, Stream function.
5 Derive Bernoulli's Equation from Euler's equation.
6 What are TEL and HGL? Explain.
7 Explain about Pitot tube.
8 Briefly explain the characteristics of laminar boundary layer.
9 An airplane travels at 800 Km/hr at sea level where the temperature 15°C. how fast would the airplane be flying at same Mach number at an altitude where the temperature is -40° C?
10 Find the velocity of flow of an oil through a pipe, when the difference of mercury level in a differential U-tube manometer connected to the two tappings of the pitot –tube is 100mm take C=0.98 and sp.gr.of oil=0.8.

PART – B

Answer any four questions. **(4x15=60 Marks)**

11 (a) Explain Newton's law of viscosity.
(b) The space between two square parallel plates is filled with oil. Each side of the plate is 75 cm. The thickness of the oil film is 10 mm. The upper plate which moves at 3 m/s requires a force of 100 N to maintain the speed. Determine: (i) The dynamic viscosity of the oil. (ii) The kinematic viscosity of the oil, if the specific gravity of the oil is 0.9.

12 (a) Classify the flow measurement devices.
(b) A ventured meter with 150 mm diameter at inlet and 100 mm at throat is laid with its axis horizontal and is used for measuring the flow of oil of specific gravity 0.9. The oil mercury differential manometer shows a gauge difference of 200 mm. calculate discharge. Assume the coefficient of discharge for the venture meter as 0.98.

13 Derive Euler's equation of motion along a stream line and integrate it to obtain Bernoulli's equation. State all assumptions made.

14 (a) Express the relation and its importance of Reynolds number.
(b) A pipe of diameter 20 cm and length 10,000 m is laid at a slope of 1 in 200. An oil of Specific gravity = 0.9 and μ=1.I5 poise is pumped up at the rate of 20 litres per second. Find the head lost due to friction. Also find the power required to pump the oil.

15 (a) Explain the concept of boundary layer theory across a flat plate.
(b) A small pipe line 10 cm in diameter and 1000 m long carries water at the rate of 7.5 lts/sec. If the kinematic viscosity of water is 0.02 stokes, calculate the head lost wall shearing stress, centerline velocity, shear stress and velocity at 4 cm from centerline and thickness of the laminar sub layer.

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16 Find the Mach number when a aero plane is flaying at 1100 km/hr through still air having a pressure of 7 N/cm^2 and temperature of -5 ^oC. Wind velocity may be taken as zero. Take k=1.4, R=287 J/kg ^ok. Also calculate the pressure temperature and density of air at stagnation point on the nose of the plane.

17 write a short note on:

(a) Stream line Streek line and Path line

(b) Bourdon tube pressure gauge

(c) Laminar flow and turbulent flow

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OU - 1607 OU - 1607

Code No: 14543/CBCS

FACULTY OF ENGINEERING

BE III-Semester (AE) (CBCS) (Backlog) Examination, July 2021

Subject: Automotive Engineering Drawing

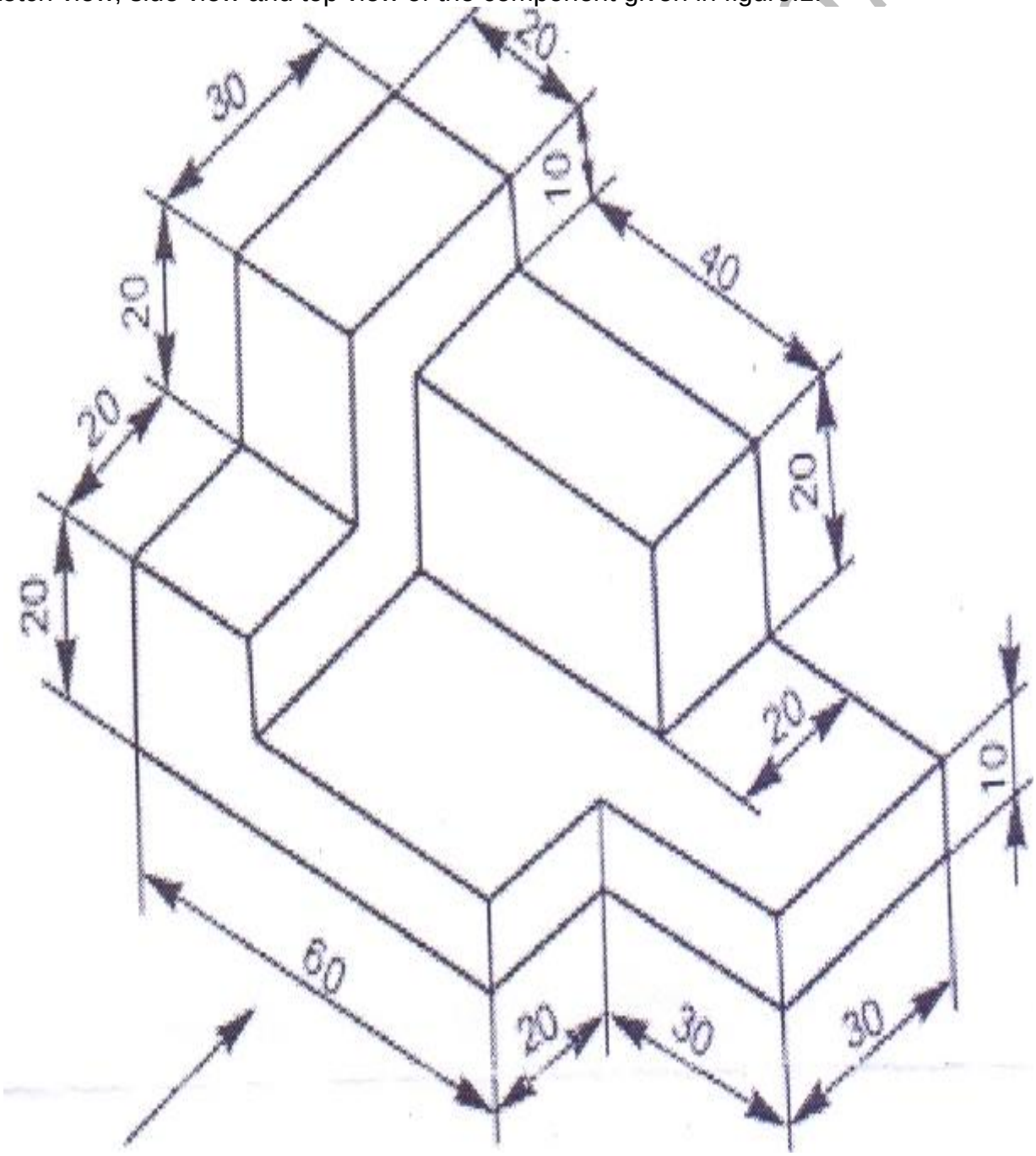
Time: 2 Hours **Max .Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any two questions. **(2x5=10 Marks)**

1 Sketch the (a) visible lines (b) hidden lines (c) out lines
2 Differentiate between lap joint and butt joint.
3 What is a cotter and when is it used?
4 Sketch a Hexagonal bolt and nut with by taking D=20mm and L=80mm.
5 Sketch view, side view and top view of the component given in figure.1.



PART – B

Answer two questions from figure 2. **(2x30=60 Marks)**

6 Assemble all the components shown in figure 2 to form Connecting rod assembly and Draw.

(a) Full section front view

(b) Top view

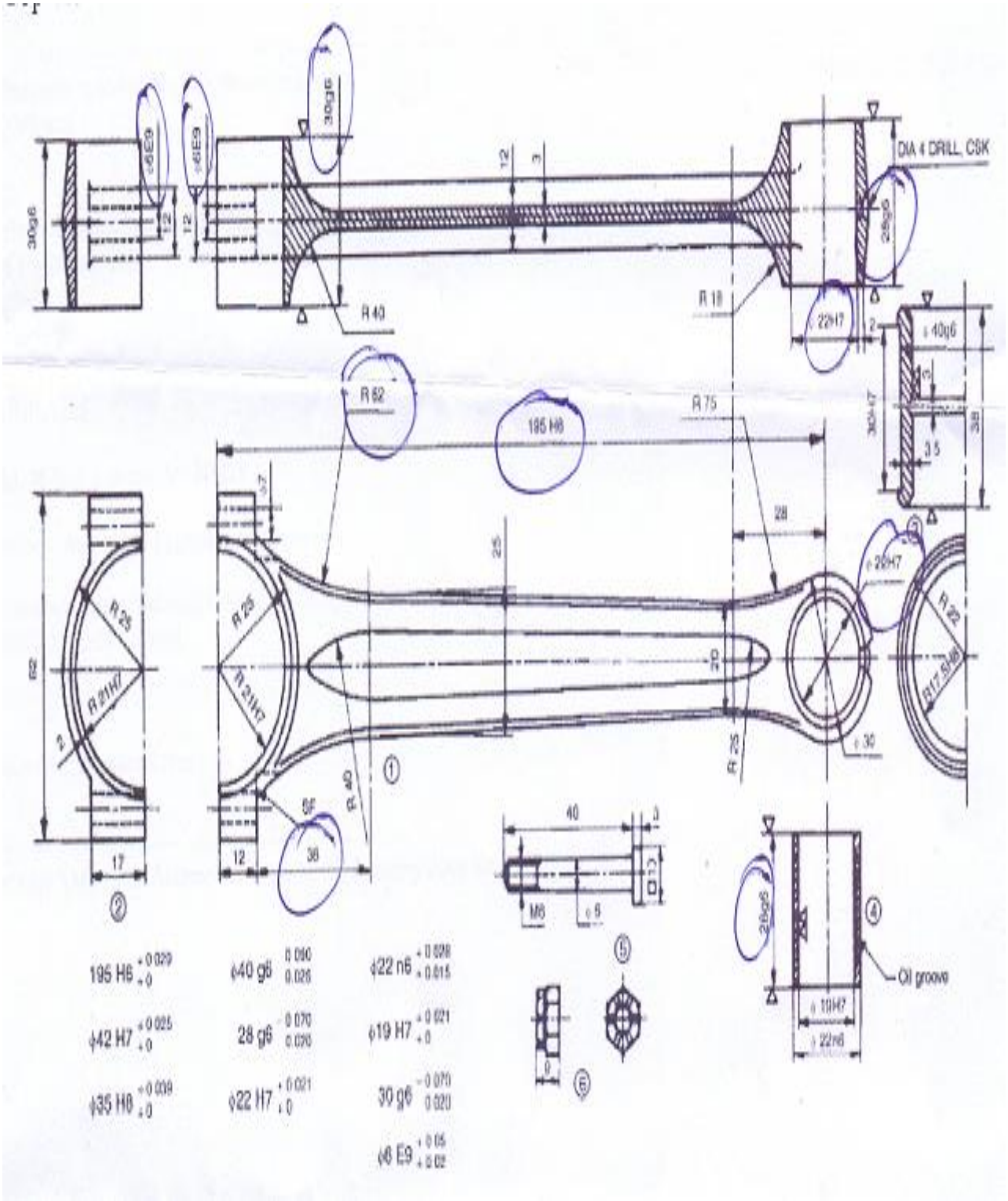


Figure. 2.

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Code No. 14546/CBCS

FACULTY OF ENGINEERING

B. E. (CSE) III – Semester (CBCS) (Backlog) Examination, July 2021

Subject: Logic and Switching Theory

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. Simplify the Boolean expression to a minimum number of literals xyz′+x′yz+xyz+x′yz.′
2. Define minterm and maxterm.
3. Draw the NAND logic diagram for the following expression
   F = A(CD+B)+BC′
4. Realize XOR using NOR gates.
5. Differentiate decoder and demultiplexer.
6. Realize 4x16 decoder with two 3x8 decoders.
7. Using PROM realize the following expression.
   $F_1(a,b,c) = \Sigma m(0,1,3,5,7)$
   $F_2(a,b,c) = \Sigma m(1,2,5,6)$
8. Write the differences between latch and flip-flop.
9. What are the applications of counters?
10. Write the basic rules for making state assignment.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. (a) Express the function in sum of products and product of sum.
    F(x,y,z)=x′+x(x+y′) (y+z′)
    (b) Find the complement of the function given in sum of minterms and draw the logic diagram.
    $F(x,y,z) = \Sigma m(0,3,6,7)$

12. Simplify using karnangh map method.
    $F(v,w,x,y,z) = \Sigma m(1,2,6,7,9,13,14,15,17,22,23,25,29,30,31)$
    and draw the logic diagram.

13. Simplify the following expression to sum of products using Quine McClusky method.
    $F(A,B,C,D) = \Sigma m(0,1,3,7,8,9,11,15)$

14. (a) Design a 4-bit priority encoder circuit.
    (b) Realize full adder and draw the circuit using NAND gates only.

15. Implement the combinational circuit defined by the functions.
    $F_1(A,B,C) = \Sigma m(3,5,6,7)$
    $F_2(A,B,C) = \Sigma m(0,2,4,7)$ using a 3x4x2 PLA.

16. Obtain the logic diagram, state table and state diagram for the following flip flop input equation have input X and output Y.
    $D_A = (AX+BX)$
    $D_B = (A'X)$
    $Y = (A+B)X'$

17. Write short notes on:
    (a) Ripple Carry Adder.
    (b) Equivalence Function.
    (c) Sequence Detector.

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OU - 1607 OU - 1607

Code No. 14551 / CBCS

FACULTY OF ENGINEERING

B.E. (I.T) III – Semester (CBCS) (Backlog) Examination, July 2021

Subject: Environmental Studies

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 Write a note on Salinity.
2 What are the causes of land degradation?
3 Write a note on bioaccumulation.
4 Define Noise pollution and write about its effects.
5 Write a note on Detritus food chain.
6 Explain Biomass energy.
7 Write a note on loss of biodiversity.
8 "Think Globally act locally" Throw light on it.
9 Define Earthquake with examples.
10 Write a note on Coral reefs and explain why they are exploited by human beings.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 a) Explain Ecological Pyramids.
b) Write a detail note on imp-acts of Pesticides.

12 a) Describe salient features of Wild Life Protection Act.
b) What are the issues involved in the enforcement of Environmental Laws?

13 a) Illustrate using diagrams. Explain energy flow in Ecosystem.
b) Explain causes and effects of Air Pollution and which equipments are suitable to control Air Pollution.

14 a) Explain advantages and disadvantages of any four Renewable Energy Resources.
b) Write a note on Land resources.

15 a) Define Solid Waste Management. Write a detail note on Solid Waste Management methods.
b) Discuss Watershed Management.

16 a) Define Biodiversity. Explain the threats to biodiversity.
b) What kind of role technology can play for the protection of Environment?

17 a) Write a detail note on water resources. Explain the uses and over utilization of water.
b) Write a note on any two :
i) Effects of Eutrophication
ii) Endemic species of India
iii) Water conservation.

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OU - 1607 OU - 1607

Code No. 15020/AICTE

FACULTY OF ENGINEERING

B. E. (Civil) III – Semester (AICTE) (Main & Backlog) Examination, July 2021

Subject: Surveying & Geomatics

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. The magnetic bearing of a line is $145^0 30'25"$. What is the true bearing of the line if the magnetic declination is $2^0 45'15"$E?
2. What are the advantages of plane table surveying?
3. What is a non-transit theodolite?
4. What is trigonometric levelling?
5. Enumerate the problems in setting out simple curves.
6. What is a reverse curve?
7. What are the applications of Total station in civil engineering?
8. Write Simpson's rule.
9. What is remote sensing?
10. What are the advantages of photogrammetry?

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. (a) Write about survey stations and survey lines.
    (b) The following bearing were observed in running a closed traverse.

Line	F.B	B.B
AB	$75^0 5'$	$254^0 20'$
BC	$115^0 20'$	$296^0 35'$
CD	$165^0 35'$	$345^0 35'$
DE	$224^0 50'$	$44^0 5'$
EA	$304^0 50'$	$125^0 5'$

Determine the correct magnetic bearings.

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12. The following lengths and bearings were recorded in running a theodolite traverse in the counter clockwise direction, the length of CD and bearing of DE having been omitted.

Line	Length in m	R.B
AB	281.4	S $69^0$11' E
BC	129.4	N $21^0$49' E
CD	?	N $19^0$34' W
DE	144.5	?
EA	168.7	S $74^0$24' W

Determine the length of CD and the bearing of DE.

13. Calculate the data necessary for setting out a 4^0 curve by tangential deflection angles method between two tangent straights BA and BC with the deflection angle ABC is 146^0, chainage of P.I is 1240m and peg interval is 30m.

14. What is GIS? What are its objectives? What are its components? Write a note about data structures.

15. What is aerial photogrammetry? What are its principles? What are the different types of photographs?

16. The following consecutive readings were taken with a level and 5 metre levelling staff on continuously sloping ground at a common interval of 25m. 0.450, 1.120, 1.875, 2.905, 3.685, 4.500, 0.520, 2.150, 3.205 and 4.485. the R.L of the change point was 250.00. Calculate the R.L's of the points by rise and fall method and also the gradient of the line joining the first and last point.

17. (a) Explain the temporary adjustments of a theodolite.
    (b) Explain the procedure for measuring horizontal angles by repetition method.

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OU - 1607 OU - 1607

Code No. 15027/AICTE

FACULTY OF ENGINEERING

BE III – Semester (AICTE)(EEE) (Main & Backlog) Examination, July 2021

Subject: Electrical Circuit Analysis

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 Write the volt-ampere relations of R, L, C parameters.
2 Define the quality factor. What is its significance?
3 State the maximum power transfer theorem.
4 What is duality? What are dual quantities?
5 Obtain the initial condition of RL series circuit and define the time constant.
6 What do you mean by free response and forced response?
7 Define convolution integral and Inverse Laplace transform
8 What is the Laplace transform?
9 Differentiate between driving point functions and transfer functions.
10 Write the relationship equations of Z- Parameters in terms of Y-parameters

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 (a) A resistance of 10Ω is connected in series with an inductance of 100mH and a capacitance of 153μF across an A.C. Supply of 200V, 50Hz. Find
(i) Active Power
(ii) Reactive Power
(iii) Apparent Power
(iv) Draw the complete vector Diagram.
(b) Show that the resonant frequency is the geometrical mean of two half power frequencies.

12 (a) State and explain superposition theorem.
(b) For the circuit shown in figure-1 below, find voltage across Points "AB" applying superposition theorem.

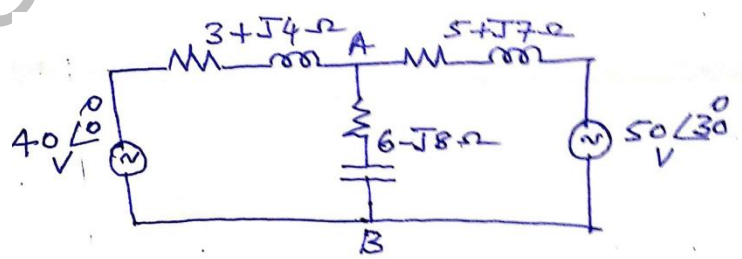

FIGURE-1

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13 (a) Evaluate the initial condition of RLC series circuit, when switch is closed at $t=0^+$

(b) In the circuit of figure-2 shown below, find i, di/dt and d^2i/dt^2 when switch is closed at $t = 0^+$

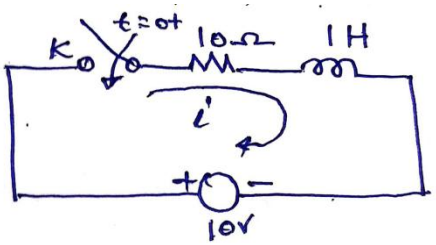

FIGURE-2

14 (a) State, explain and obtain the expression using initial value theorem.

(b) Obtain the Laplace transformation of $f(t)= 1-e^{-at}$, where 'a' being constant.

15 (a) Develop the relationship between Y-parameters in terms of h-parameters.

(b) For the circuit shown in figure-3, below find Z-parameters and Y-parameters

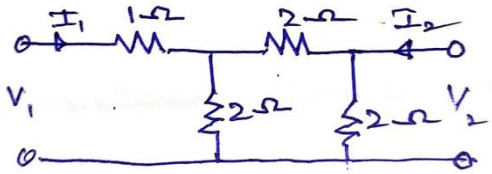

FIGURE-3

16 (a) Obtain an expression of 3-phase line power by using two watt meter method.

(b) Two watt meters are used to measure the power of 10hp 3 phase 50 Hz induction motor running at 90% on 0.8 P.F lagging. Find the readings of two watt meters and current taken by the motor if supply voltage is 400V, 50 Hz, 3 Phase.

17 Write Sort note on any two:

(a) Compensation theorem.

(b) Analysis of magnetically coupled circuit with Dot Convention.

(c) Conductance, Susceptance and admittance.

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OU - 1607 C - 1607

Code No. 15030/AICTE

FACULTY OF ENGINEERING

B.E. (AICTE)(EIE) III-Semester (Main & Backlog) Examination, July 2021

Subject : Network Theory

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 Define (a) Node (b) Loop (c) Mesh (d) Super node.

2 State superposition theorem.

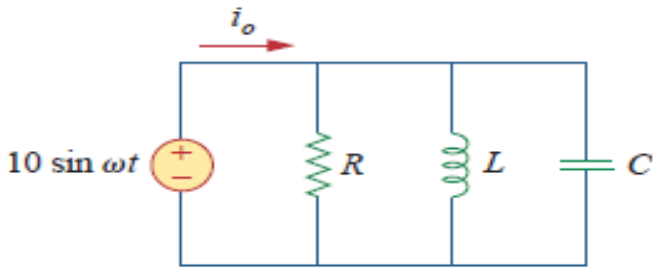
3 Define time constant of Circuit.

4 Define : (a) Unit Impulse (b) Unit Ramp function.

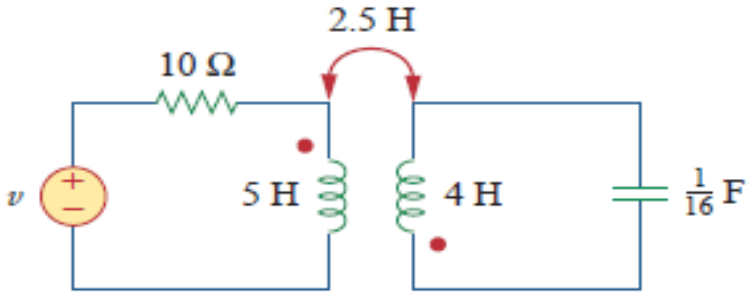
5 Find the amplitude, phase, period and frequency of the sinusoid.
$v(t)=12\cos(50t+10^{o})$

6 The voltage $v=12\cos(60t+30^{o})$ is applied to a 0.1H inductor. Find the steady-state current through the inductor.

7 In the circuit shown in the fig. . Find Quality factor and Bandwidth.
R=8kohm L=0.4mH C=8microF

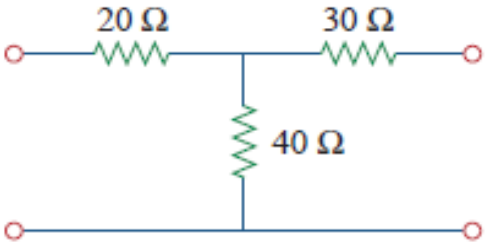


8 Determine coupling coefficient.



9 Define two port Network.

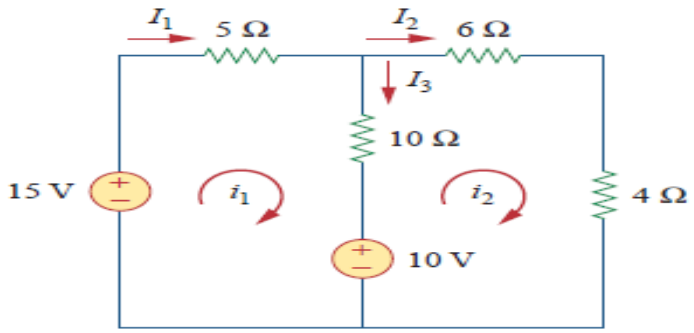
10 Determine Z_{11} for the circuit.



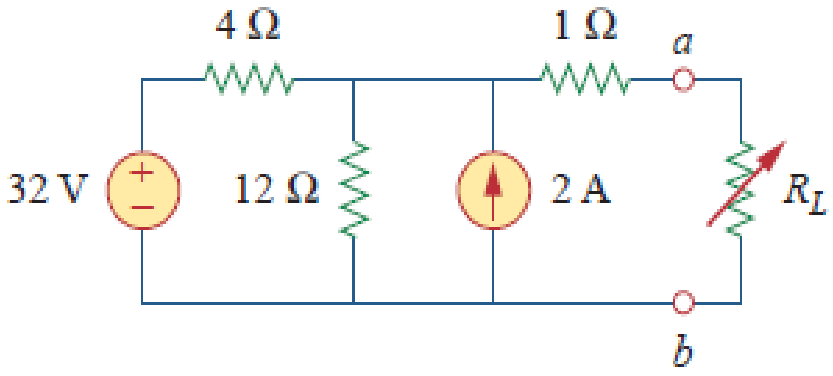
PART – B

Answer any four questions. **(4x15 = 60 Marks)**

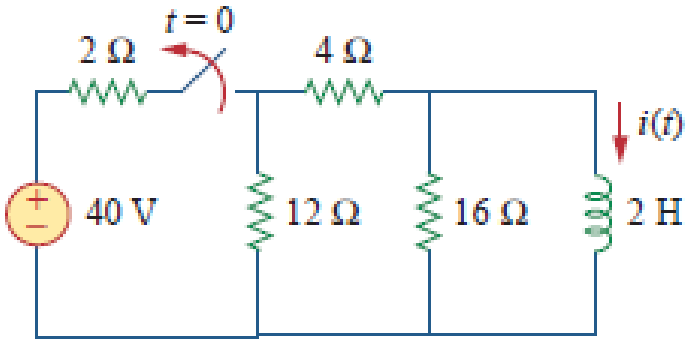
11 (a) For the circuit in fig. Find the branch currents I_1 I_2 and I_3 using mesh analysis



(b) Find the Thevenin equivalent of the circuit. Find the current through R_L = 36Ω

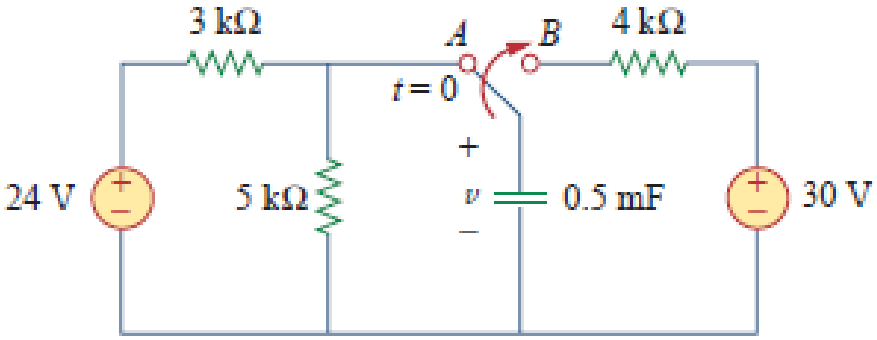


12 (a) The switch has been closed for a long time. At t=0, the switch is opened. Calculate i(t) fot t > 0.

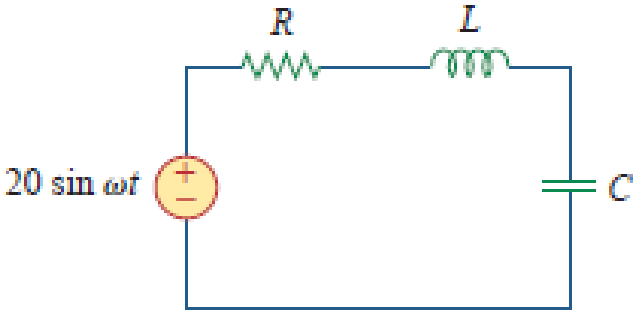


(b) Write short notes on Singularity Functions.

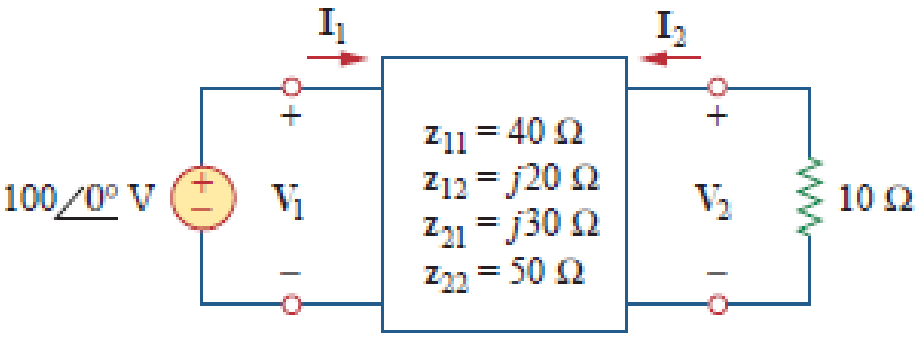
13 (a) Derive the v(t) for an RC circuit subjected to step Input voltage.
(b) The switch in fig. has been in position A for a long time. At t=0 , the switch moves B. Determine v(t) for t > 0 and calculate its value at t=1s and 4 s.



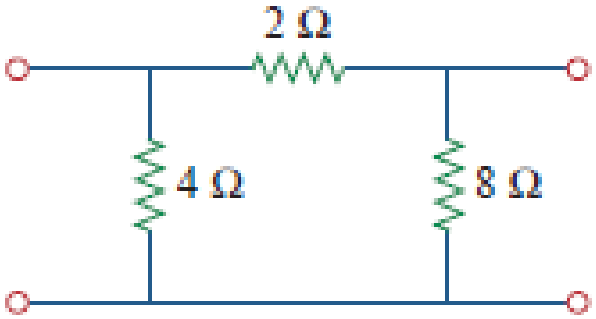
14 In the circuit of Fig, R=2ohm, L=1mH and C=0.4microF (a) Find the resonant frequency and the half-power frequencies. (b) Calculate the quality factor and bandwidth.



15 (a) Find I_1 and I_2 of the circuit shown in fig.

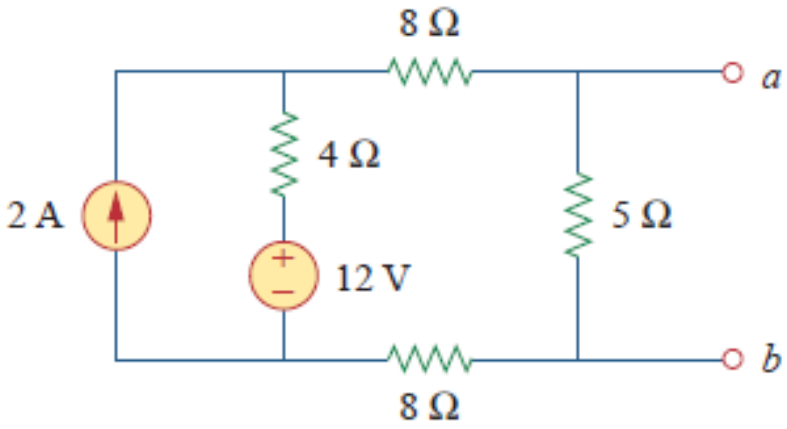


(b) Obtain the y parameter for the π network shown in fig.



16 (a) Write short notes on Average & RMS value of periodic time function.
(b) Write short notes on Power measured by 3- Wattmeter method.

17 (a) Find the Norton equivalent of the circuit shown below.



(b) Write shorts on
(i) Star-Delta transformation
(ii) Maximum Power Transfer Concept

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OU - 1607 OU -

Code No. 15032/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) III-Semester (AICTE) (Main & Backlog) Examinations, July 2021

Subject : Network Theory

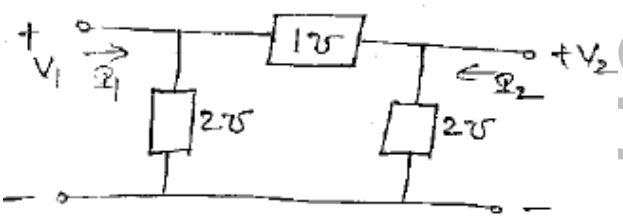
Time : 2 Hours **Max. Marks: 70**

Missing data, if any, may be suitably assumed

PART – A

Note: Answer any Five Questions. **(5x2= 10 Marks)**

1. Prove that for any two port Bilateral network AD-BC=1.
2. Compute the short circuit admittance parameters for the network below.

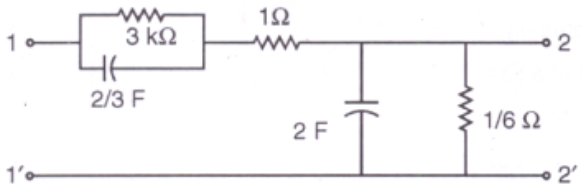


3. Define Image impedance and Iterative impedance of Asymmetrical network.
4. Determine the characteristic impedance for symmetrical T network having total series arm impedance of 200 Ω and shunt arm impedance of 800Ω.
5. Explain how to decide the value of m in m-derived filters.
6. What is a notch filter? List its applications and characteristics.
7. List the applications of Equalizer.
8. Design a symmetrical 'T' attenuator with α = 20 dB and Ro = 600Ω .
9. Check if the polynomial P(S) = $s^4 + 11s^3 + 39s^2 + 51s + 20$ is Hurwitz or not ?
10. Check if the given function $Z_2(s) = \frac{s^5 + 3s^3 + 4s}{2s^4 + 6s^2}$ is an LC Immitance or not.

PART – B

Note: Answer any Four Questions **(4x15= 60Marks)**

11. a) Calculate Y_{12} for the two-port network below.



b) Verify whether the network above is reciprocal or not.

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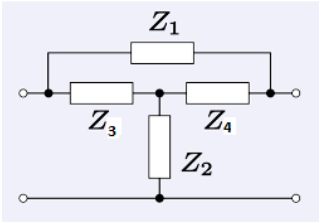
12. a) Determine image impedance, iterative impedance, image transfer constant & iterative transfer constant of L-network whose series arm is j200 Ω & shunt arm is –j600Ω.
    b) Calculate the image impedance of network below Where Z_1=20 Ω, Z_2=30 Ω, Z_3=35 Ω,Z4=25 Ω.



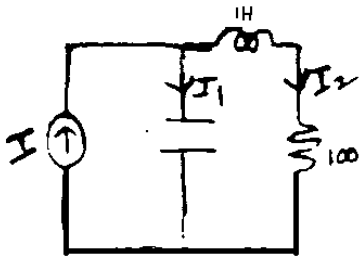
13. a) Design a composite low pass filters with a cutoff frequency 2KHZ and a nominal impedance of 600Ω with frequency of infinite attenuation is 2.1 KHZ.
    b) A filter has an inductor of 10mH in shunt arm and a capacitor of 1μF each in the series arm. Determine β and α.

14. a) Derive the design equations of Bridge -T Equalizer.
    b) Synthesize the second foster forms of $z(s) = \frac{(s^2+2)(s^2+4)}{s(s^2+3)}$.

15. a) Design the elements of asymmetrical T pad working between a source & load of 600 Ω & 150 Ω offering a loss of 2.4 neper.
    b) Write notes on Constant Resistance equalizer.

16. a) The unit response of a linear system is r(t) = $(2e^{-2t} - 1)$ u(t).Find the response of r(t) to the input f(t) = t u(t) with a neat sketch.

    b) Explain simple pole/zero, repeated pole/zero and complex pole/zero. Find the location of the I_2/I_1 In the s-domain for the below circuit.



17. Write short notes on
    a) Represent R, L, C elements in t-domain and s-domain analysis of electric circuit with equations.
    b) Amplitude equalizer.
    c) Positive real functions.

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OU - 1607 OU - 1607

Code No. 15044/AICTE

FACULTY OF ENGINEERING

B.E. III-Semester (CSE) (AICTE) (Main & Backlog) Examination, July 2021

Subject: Operation Research

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. What is redundant constraint? Give an example
2. What is canonical form?
3. Show that the dual of a dual LPP is a primal problem
4. Distinguish between Primal and Dual LPP
5. What is degeneracy in transportation problem? How does it is overcome?
6. Assignment model is a special case of transportation model. Discuss.
7. What is present worth factor?
8. Define a) Pure strategy b) Mixed strategy
9. What is the Johnson's rule for n-jobs m-machines sequencing problem?
10. What are the different types of behaviors of the customer?

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. Use simplex method to solve the LPP

Max (Z) = 3X1 + 2X2
Subjected to X1 + X2 <= 4
X1 - X2<= 2
X1 , X2 >= 0

12. What is the difference between regular simplex method and dual simplex method? using dual simplex Method solve the following LPP

Max (Z) = $4X_1 + 2X_2$
Subjected to $X_1 - 2X_2 >= 2$
$X_1 + X_2 <= 8$
$X_1 - X_2 < = 10$
$X_1 , X_2 >= 0$

13. When passing is not allowed, solve the following problem giving an optimal solution.

Time for machines	Jobs			
	M1	M2	M3	M4
A	24	7	7	29
B	16	9	5	15
C	22	8	6	14
D	21	6	8	32

....2

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14. The cost of a machine is Rs 60,000. The following table gives the data on running the machine. Find the optimum period of replacement.

Year	1	2	3	4	5
Resale Value (Rs)	42,000	30,000	20,400	14,400	9,650
Cost of spares(Rs)	4,000	4,270	4,880	5,700	6,800
Cost of labour(Rs)	14,000	16,000	18,000	21,000	25,000

15. a) A Mobile repair man finds that the time spent on repairing has an exponential distribution with mean 30 min per unit. The arrival of mobile is Poisson with an average of 10 sets per day of 8 hr. What is expected idle time per day? Also find Length of the system.

b) Solve the following game and determine the value of the game

	B_1	B_2
A_1	5	1
A_2	3	4

16. Solve the following travelling salesman problem

	A	B	C	D
A	-	46	16	40
B	41	-	50	40
C	82	32	-	60
D	40	40	36	-

17. Obtain initial BFS by VAM

	D1	D2	D3	D4	Supply
S1	2	3	11	7	6
S2	1	5	6	1	4
S3	5	8	15	9	10
Demand	8	6	3	3	

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OU - 1607 OU - 1607

Code No.15146/AICTE

FACULTY OF ENGINEERING

B.E. III – Semester (AICTE) (CME) (Main) Examination, July 2021

Subject: Operations Research

Time: 2 Hours **Max.Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions. **(5x2=10 Marks)**

1 What is operations research?
2 Define degenerate solution?
3 What is duality?
4 What is the difference between the regular simplex method and dual simplex method?
5 Write a linear programming model of the transportation problem?
6 What is assignment problem?
7 Define maximin and minimax principles?
8 What is dominance property?
9 Discuss the applications areas of queuing theory?
10 Define balking?

PART – B

Answer any four questions. **(4x15=60 Marks)**

11 a) Solve graphically
Maximize $Z=6X_1+9X_2$ subject the constraints

$X_1+X_2\leq 12$
$X_1+5X_2\leq 45$
$3X_1+X_2\leq 30$
$X_1, X2\geq 0$

b) Solve by simplex method
Maximize $Z=3X_1+2X_2$ subject to the constraints

$-2X_1+X_2\leq 1$
$X_1\leq 2$
$X_1+X_2\leq 3$
$X_1, X2\geq 0$

12 a) Write the economic interpretation of the dual.
b) Using the dual simplex method
solve minimize $Z= X_1+2X_2+3X_3$ subject to the constraints

$X1-X2+X_3\geq 4$
$X_1+X_2+2X_3\leq 8$
$X_2-X_3\geq 2$
$X_1, X2, X_3\geq 0$

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13 a) Solve the transportation problem optimally

Destination

	1	2	3	4	Suppl y
1	3	1	7	4	300
2	2	6	5	9	400
3	8	3	3	2	500
Source	25	35	40	20	
Demand	0	0	0	0	

b) Five different jobs are to be assigned to 5 different operators such that total processing time is minimized.
Solve using Hungarian method

Operator

Job	1	2	3	4	5
1	10	12	15	12	8
2	7	16	14	14	11
3	13	14	7	9	9
4	12	10	11	13	10
5	8	13	15	11	15

14 a) A machine cost RS.12, 200. The scrap value is Rs.200. The maintenance costs of the machine are given below.

Year	1	2	3	4	5	6	7	8
Maintenance				120	180		320	
Costs	200	500	800	0	0	2500	0	4000

When should the machine be replaced?

b) Solve the following game

	B1	B2	B3
A1	1	7	2
A2	0	2	7
A3	5	1	6

15 a) Determine the optimal sequencing to complete the following tasks on two

Task	A	B	C	D	E	F	G	H	I
Machine 1	2	5	4	9	6	8	7	5	4
Machine 2	6	8	7	4	3	9	3	8	11

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b) A TV repair man finds that the time spent on repairing has an exponential distribution with mean 30 minutes per unit. The arrival of TV sets is poison with an average of 10 sets per day of 8 hours. What is his expected idle time per day? How many sets are there on the average?

16 a) Obtain an IBFS to the following transportation problem using Vogel's approximation method.

Suppl

	D1	D2	D3	D4	Y
S1	2	3	11	7	6
S2	1	5	6	1	4
S3	5	8	15	9	10
Demand	8	6	3	3	

b) Three jobs are to be done by 4 machines. Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table.

		M1	M2	M3	M4
Job	J1	18	24	28	32
	J2	8	13	17	19
	J3	10	15	19	22

What are the job assignments which will minimize the total cost?

17 a) Solve the following game using the graphical method

	B1	B2	B3	B4
A1	2	2	3	-2
A2	4	3	2	6

b) Solve the following game

	B1	B2	B3	B4
A1	20	15	12	35
A2	25	14	8	10
A3	40	2	10	5
A4	-5	4	11	0

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Code No. 15049 / AICTE

FACULTY OF ENGINEERING

B.E. (I.T) III – Semester (AICTE) (Main & Backlog) Examination, July 2021

Subject: Data Structures

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1 Define Data Structure. Write the characteristics of Data Structures.

2 Write an ADT for an Array.

3 Define single, double and circular linked lists.

4 Write the postfix expression of $A * B * (C - D) / (E - F)$.

5 State the difference between complete binary tree and full binary tree.

6 When is an undirected graph said to be 'connected'?

7 Give the complexities for the following sorting algorithms

a) Insertion sort b) Merge sort c) Quick sort d) Heap sort

8 Define polymorphism and function overloading.

9 Write about Threaded Binary Tree with an example.

10 What is Hash Function? List few Hash Function.

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11 Explain about space complexity and time complexity. Evaluate the time complexity for the following iterative function.

```
Line No.    Float sum (float *a  const int n)
1                               }
2                               float s = 0
3                               for (int  i = 0 ; i < n ; i++)
4                               S+ = a[ i ] ;
5                               return s;
6                               }
```

12 Write a C++ code to implement following operations on stack.
a) Push b) Pop c) Display d) Top

13 Define BST. Create a binary search tree with the following keys and perform in order, pre-order, post-order traversals on it.
30, 20, 25, 40, 35, 36, 32, 45, 42

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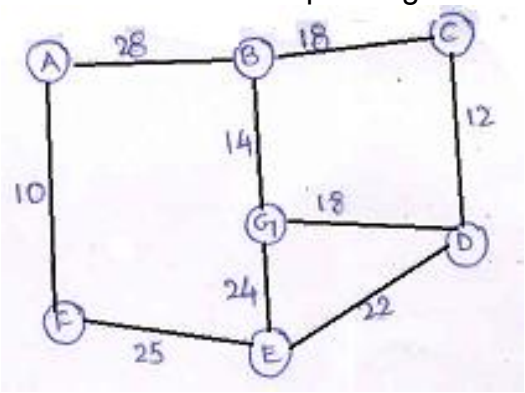
14 Explain prim's algorithm and find minimum cost spanning tree for the following graph.



15 Explain the working of quick sort. Sort the following sequence of keys using quick sort 66, 77, 11, 88, 99, 22, 33, 44, 55. Show different passes (Trace) indicating the pivot and the partitions formed specify its time complexity.

16 Write an algorithm to add and subtract two polynomials using linked list.

17 Write short notes on following:
   a) Collision handling techniques in hashing
   b) AVL Trees

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