Code No: 14011 / BL

FACULTY OF ENGINEERING

BE 2/4 (Civil) I-Semester (Backlog) Examination, October 2021

Subject : Building Planning and Drawing

Time: 2 Hours **Max marks: 75**

Missing data, if any, may be suitably assumed

PART - A

Note: **Answers any Seven questions**. **(7x3=21 Marks)**

1. Draw the conventional sign for Wood and Concrete.
2. Draw the isometric view of a Brick
3. Give standard doors and windows sizes for an institutional building.
4. Differentiate between RC sheet roof and shell roof.
5. Draw the plan of $1^{1/2}$ brick English bond for two layers
6. List various types of Stairs
7. What is the importance of elevation of a building for given section?
8. Draw the cross section of walls of ashlar masonry
9. How is glazed door different from paneled door.
10. Draw plan of one bed room residential building.

PART - B

Note: Answers any Three questions. **(3x18=54 Marks)**

11 Draw the isometric view of $1^{1/2}$ brick Flemish bond for minimum number of four layers.

12 Draw the plan and elevation of a partially paneled door to a scale of 1:40, for 1.2m x 2.1m.

13. Draw the plan, elevation and sectional elevation of a glazed window of size 1.0m x 1.2m to a scale 11:40.

14. Draw the sectional elevation of a RCC slab of 150mm thick in both directions of span 4m x 5m.

15. For a suitable plan draw the sectional elevation for a stair case to a scale of 1 : 50.

16. a) Sketch elevation for a 3-bed room residential building
    b) Draw a neat Dog – legged stair and mention its parts.

17 For the given line diagram in Figure 1 develop the Plan of a residential building. Take the thickness of all walls as 300mm. Provide the doors and windows at appropriate locations.

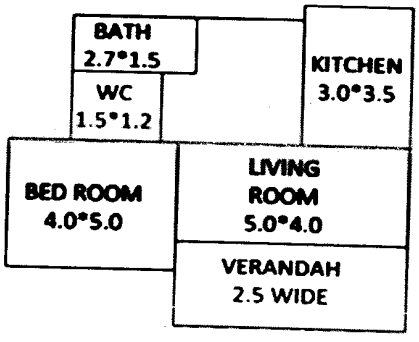

Figure 1

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Code No. 14016/CBCS

FACULTY OF ENGINEERING

B.E. 2/4 (EEE/EIE)) I-Semester (Backlog) Examination, October 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 ripple factor, regulation and efficiency of a rectifier.
2 What are the applications of Diode?
3 Explain how transistor works as amplifier.
4 What are the advantages of h-parameters?
5 Compare JFET and BJT.
6 Briefly write about source self bias of JFET.
7 State and explain Miller's theorem.
8 What is Bootstrap circuit – explain briefly?
9 Write briefly about classification of amplifiers.
10 What are the advantages of transformer coupled amplifier?

PART – B

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

11 Draw a Halfwave rectifier with pi-section filter and explain working with waveforms. Derive expression for its ripple factor.

12 Calculate voltage gain, current gain, input resistance and output resistance for a CE BJT amplifier with emitter resistance if R_E = 2KΩ, R_L= 5KΩ hie = 1KΩ, hfe = 50, hre=hoe=0? Derive the formulae used in calculations.

13 (a) Explain biasing for zero drift in drain current of JFET.
(b) Explain V-I characteristics of Depletion mode MOSFET.

14 Draw circuit of emitter coupled difference amplifier and derive expressions for common mode gain and difference mode gin.

15 Evaluate the effect of emitter bypass capacitor on low frequency response of common emitter BJT amplifier.

16 (a) Explain working and characteristics of UJT.
(b) Explain Zener and Avalanche breakdown in diodes.

17 Write short notes on the following:
(a) Bias stability
(b) Step response of amplifier
(c) DIAC & TRAIC

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Code No. 14024/BL

FACULTY OF ENGINEERING

B.E. (ECE) II/IV – I Semester (Backlog) Examination, October 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. **(7x3 = 21 Marks)**

1. Determine the magnitude of force between charges 3 $X10^{-4}$ C. at (1,2,3) and (-10^{-4}) C at Q(2,0,5) in Vacuum.
2. Define Gauss's Law of Divergence?
3. Show that Energy Stored in a Capacitor is **0.5 εE^2** Joules?
4. State and prove Biot-Savart's Law?
5. State and prove pointing Theorem? What is its significance?
6. Define Brewster's angle?
7. Describe various types of Polarization?
8. Define Skin Depth and Loss tangent?
9. Define Amperes Circuital Law?
10. Compare different types of Electric and magnetic potentials?

PART – B

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

11. (a) Given the field E = ($25x^2y\ a_z + 5\ x^3\ a_y$) V/m. find the equation of the streamline that passes through point P(2,3,-4)?
    (b) A point Charge Q_A=1μC is located at B(0,0,-1); Find Er, Eθ and EΦ at point P(1,2,3)?
12. (a) Given the potential field V = 100 (√r) V. in free space. Find E and D?
    (b) Derive an expression for Electric flux density starting from Coulomb's law?
13. (a) Show that Capacitance of Coaxial Capacitor C = [$2\pi\varepsilon L$/ ln (b/a)] farads?
    (b) Determine the Capacitance of a Spheres having two dielectric layers which has dielectric material $\varepsilon = \varepsilon_1$; from r = a; to r = r_1; and $\varepsilon = \varepsilon_0$ from r = r_1 to r = ∞.
14. (a) State and prove Laplace equation? In what region it is valid? Discuss.
    (b) Prove that P = E X H Watts/mt^2?

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15. A 150MHz Uniform Plane wave in free space is travelling in the a_x direction. The Electric field intensity has a maximum amplitude of (200 a_y + 400 a_z)V/m at P(10,30, -40) at t = 0; find the following : Angular frequency (W); b. Beta; c. wavelength (λ); d. intrinsic impedance (η) and E(x,y,z,t). (10)

16. (a) For Uniform plane wave in fresh lake water having ó = 10^{-3} mhos/mt. ε_r = 80; μ =1; find (α) alpha, (β) beta, (γ) gamma, (ʎ) and ŋ(impedance).?

    (b) Derive expression for α, β, γ, and ŋ for a Uniform plane wave travelling in good conductors?

17. Write short notes on the following?

    (a) Elliptical and Circular Polarization?

    (b) Obtain an expression for Reflection Coefficient when Uniform Plane Wave incident normally on a plane boundary?

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Code No. 14028/BL

FACULTY OF ENGINEERING

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

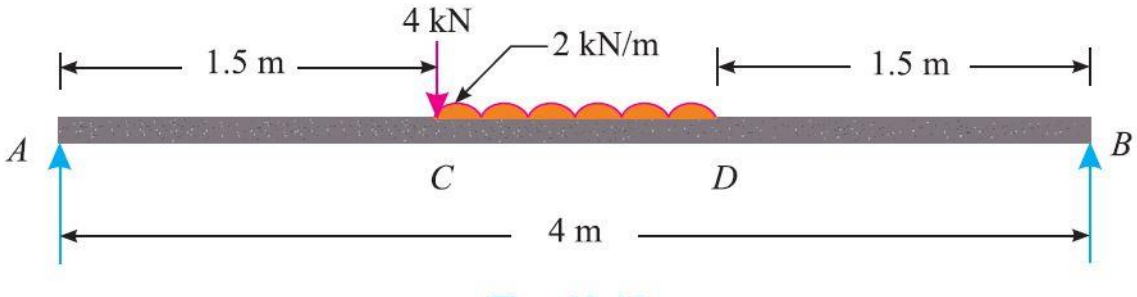
1 Define Poisson's ratio and Modular ratio
2 Draw stress-strain curve for ductile material.
3 Define point of contraflexure (POC)? How many POC are there for a cantilever beam subjected to UDL.
4 Find the maximum bending moment of a simply supported beam subjected to UDL 20 kN/m throughout the span of 20m.
5 Explain slope and deflection.
6 A cantilever beam of 3m span is subjected to a UDL of 10kN/m throughout the span find maximum slope and deflection.
7 Draw the shear stress distribution diagram for I- section.
8 Define Principal Plane and Principal Stress.
9 Define the terms: column, strut and crippling load.
10 Differentiate between thick and thin cylinders.

PART – B

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

11 A gun metal rod 22 mm diameter screwed at the ends passes through a steel tube 25mm internal diameter and 30mm external diameter. The temperature of the whole assembly is raised to 126^0C and the nuts on the rod are then screwed lightly home on the ends of the tube. Find the intensity of stress in the rod and the tube when the common temperature has fallen to 16^0C.
Coefficient of linear expansion for steel = 12 X 10^{-6} per ^{0}C
Coefficient of linear expansion for gun metal = 20 X 10^{-6} per ^{0}C
Modulus of elasticity for steel = 2.1 X 10^5 N/mm^2
Modulus of elasticity for gun metal = 0.94 X 10^5 N/mm^2.

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



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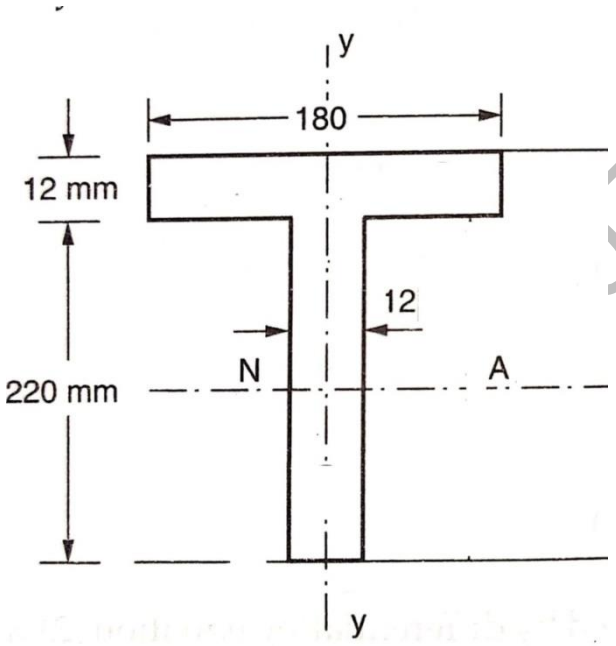
13 A cantilever of length (L) carries a point load (W) at a distance 'a' from the fixed end find the slope and deflection at the free end.

14 Calculate the shear stress at the neutral axis and at the junction of the web and the flange for T-section as shown in below. Also draw the shear stress distribution diagram.



15 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 σ = 550N/mm^2. And α =1/1600 in Rankine's formula.

16 A solid aluminium shaft 1m long and 50mm diameter is to be replaced by a hollow shaft of the same length and the same outside diameter, so that the hollow shaft could carry the same torque and have the same angle of twist. What must be the inner diameter of the hollow shaft? Take modulus of rigidity for the aluminium as 28GPa and that for steel as 85GPa

17 A hollow shaft, having an internal diameter 50% of its external diameter transmits 600KW at 150 r.p.m. Determine the external and internal diameter of the shaft if the shear stress is not to exceed 65N/mm^2 and the twist in a length of 3m should not exceed 1.4 degrees. Assume maximum torque is 1.2 times of the mean torque and modulus of rigidity = 1 X 10^5 N/mm^2.

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Code No. 14035/BL

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I-Semester (Backlog) Examination, October 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 Given the base address of an integer array as 4000 and size as 5X4. Determine the address of a[2][2] as per column major mapping. Assume each integer occupies two bytes and each address location corresponds to one byte.

2 Given Polynomial1: $3x^2+5x$ and Polynomial2: $5x^3+6x+10$. Represent the polynomials using arrays.

3 What is a Queue data structure? What is the principle on which Queue works?

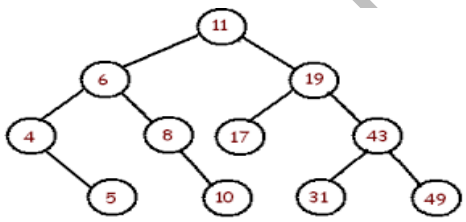
4 What is the final content of the Stack after evaluation of the expression 8/2+4*8/4-5+1?

5 Design the pseudo code to insert the elements at the end of a doubly linked list.

6 Explain Template Class Chain in C++.

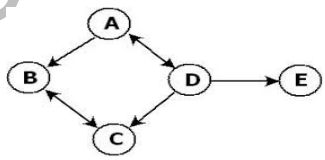
7 Is there any difference between Binary tree and B-Tree.

8 Write the Preorder traversal for the following binary search tree.



9 What is the principle based on which Merge sort works?

10 Represent the following graph using adjacency list



PART-B **(3X18=54 Marks)**

11 (a) Write a C++ program to perform insertion, deletion, reverse and display operations on arrays

(b) Explain the usage of the Sparse matrix with the help of the suitable example.

12 (a) Write the applications of stacks. Consider a stack of size 6. Show the contents of the stack step by step after each of the following operations. Also indicate the top of the stack.
PUSH (4), PUSH(5), PUSH(6), PUSH (3), PUSH(8), PUSH(1), PUSH(7)
POP(),POP(),POP(),POP(),POP()
What is the value of top when the stack is empty?

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(b) Write a C++ program to implement the PUSH, POP and Display operations on stack using arrays.

13(a) What is the need for a linked list? Explain the insertion and deletion operations on linked list with examples.

(b) Write a C++ program to insert the elements into the doubly linked such that the elements are inserted in sorted order. For example if the input list is 1, 3, 8. If element 5 is to be inserted in the list then the list becomes 1, 3, 5, 8.

14 (a) Differentiate between Full binary tree and Complete binary tree. Give an example.

(b) Write the algorithm for determining the height of a binary search tree.

15 (a) Write a C++ program to implement insertion sort.

(b) Explain Prim's Algorithm with a suitable example.

16 (a) Write a C++ program to reverse a given string using stack.

(b) Explain the Concept of Subtyping and inheritance in C++.

17 (a) Construct a Binary search tree with the elements 5, 10, 15, 2, 6, 3, 1, 8, 17, 20, 4. Determine the post order traversal for the constructed tree.

(b) Explain the working of Quick sort by considering the following numbers. 34, 6, 78, 5, 13, 57, 44, 23

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