Code No. 3010/S

# FACULTY OF ENGINEERING

**B.E. 2/4 (Civil) I-Semester (Suppl.) Examination, May / June 2017**

**Subject : Building Planning and Drawing**

**Time : 3 hours** **Max. Marks : 75**

***Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.***

**PART – A** (25 Marks)

| | | |
|---|---|---|
| 1 | Draw the conventional symbol for existing brick and wood. | 3 |
| 2 | Draw a plan and elevation of a square footing for reinforced concrete column. | 3 |
| 3 | Sketch the elevation of a fully paneled window. | 3 |
| 4 | Draw a line diagram of queen post truss. | 3 |
| 5 | Draw the isometric view of king closer. | 3 |
| 6 | What are the different types of stair case? | 2 |
| 7 | What are the important points to be considered while locating a door and a window? | 2 |
| 8 | Differentiate header bond and stretcher bond. | 2 |
| 9 | What are the principles of planning? | 2 |
| 10 | What are the aspects of building planning? | 2 |

**PART – B** (50 Marks)

11 Draw the plan and isometric view of wall junction for one and a half brick wall in English bond. Draw minimum 3 layers. 10

12 Draw to a suitable scale, elevation and section of a glazed door of 1.2m x 2.1m. 10

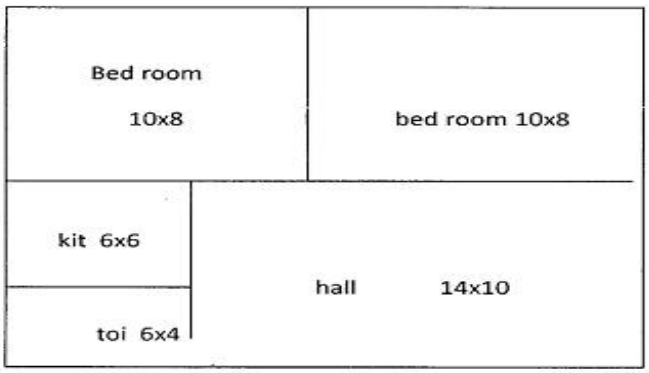
13 Draw a plan and elevation of spiral stairs to a suitable scale. 10

14 Draw the elevation and details of king post truss of span of 15 m. 10

15 Draw a plan and elevation of wall foundation to a suitable scale. 10

16 Draw a plan and sectional elevation along shorter span of an RCC roof slab of size 4.0 x 6.0 m, to a suitable scale. 10

17 The line diagram of a building is shown in the figure. Draw plan and elevation to a suitable scale and locate doors and windows at appropriate locations. Take thickness of wall as 300mm. 10

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**Code No. 3018/S**

# FACULTY OF ENGINEERING

**B.E. 2/4 (EE/Inst.) I – Semester (Suppl.) Examination, May / June 2017**

**Subject: Electronic Engineering – I**

**Time: 3 Hours** **Max.Marks: 75**

**Note: Answer all questions from Part – A and any five questions from Part – B.**

## PART – A (25 Marks)

1 Find the ac resistance for a semiconductor diode having a forward bias of 200 mV and reverse saturation current of 1μA at room temperature. 2

2 Calculate the band gap energy of silicon at $450^{o}$ K. 2

3 Define the following terms: 2

a) Ripple factor

b) Transformer Utilization Factor

4 Draw the circuit of bridge rectifier and explain its advantages over other rectifiers. 2

5 Define ~ and for a transistor and derive the relation between them. 3

6 What is early effect? 3

7 Derive the expression for the stability factor. 3

8 How does TRIAC differs from an SCR? 3

9 In a JFET the $I_D$ changes from 1.2 mA to 1.5 mA when $V_{GS}$ is varied from -4.2 V to -4.10V keeping the $V_{DS}$ constant. Determine $g_m$ for a given JFET. 2

10 Draw the V-I characteristics of N-channel enhancement MOSFET. 3

## PART – B (5x10 = 50 Marks)

11 a) Explain V-I characteristics of p-n junction diode. Discuss the temperature dependence of p n characteristics. 5+3

b) What is Zener breakdown? 2

12 a) A diode with a forward voltage 0.7 volts is connected as half wave rectifier. The load resistance is 500 ohms and rms ac input is 22 volts. Determine the peak output voltage, peak load current and diode peak inverse voltage. 5

b) Draw a neat block diagram of a general purpose CRT and explain function of each block. 5

13 a) Draw and explain output characteristics of common base configuration for npn transistor. 5

b) What is operating point? Derive stability factor for collector to base bias and emitter bias circuits? 5

**…2**

14 a) A transistor has its h-parameters given by 1 KΩ, 50, $2.50 \times 10^{-4}$ and 25 μA/V in common emitter configuration using a load resistance of 5 KΩ and a source resistance of 1 KΩ. Calculate $A_V$, $A_{vs}$, $A_{Is}$, $A_{IS}$, $R_i$ and $R_o$. 6

b) Draw the block and symbolic representation for UJT. Sketch the V-I characteristics of UJT. 4

15 a) Draw the structure of a JFET and explain its principle of operation with neat diagrams along with the V-I characteristics. Define pinch-off voltage and mark it on the characteristics. 6

b) Explain the difference between construction of an enhancement type MOSFET and depletion type MOSFET. 4

16 a) Explain the working principle of SCR. 5

b) Draw the circuit diagram of TRIAC and explain its characteristics. 5

17 Write any two of the following: 10

a) Junction breakdown in diodes
b) LLC and CLC filters
c) BJT as an amplifier
d) Tunnel diode.

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**Code No. 3024/S**

# FACULTY OF ENGINEERING

## B.E. 2/4 (ECE) I - Semester (Suppl.) Examination, May /June 2017

**Subject : Electromagnetic Theory**

**Time : 3 Hours** **Max. Marks: 75**

***Note: Answer all questions from Part-A and answer any five questions from Part-B.***

### PART – A (25 Marks)

1 Describe the three orthogonal surfaces that define the cylindrical coordinates of a point. (3)

2 Given a vector function $F = a_x(3y - c_1z) + a_y(c_2x - 2z) - a_z(c_3y + z)$, determine the constants $c_1$, $c_2$ and $c_3$ if 'F' is irrotational. (2)

3 Define Electric scalar potential. (1)

4 What is the basis of Magnetic Scalar Potential? (2)

5 State Biot-Savart's Law. (2)

6 Write the integral form of Maxwell's equations, and identify each equation with proper experimental law. (4)

7 What are boundary conditions ? How do boundary conditions arise and how are they derived? (3)

8 What is the inconsistency in Ampere's Law? How it is rectified by Maxwell? (3)

9 A microwave oven operates at 2.45GHz. Assuming $\sigma = 1.1 \times 10^6$ ℧/m and $\mu_1 = 600$ for the stainless steel interior find the depth of penetration. (3)

10 What is the consequence of a Wave incident on a Perfect Conductor? (2)

### PART – B (50 Marks)

11 (a) Determine the Electric field intensity of an infinitely long straight, line charge of uniform density $\rho_L$ in air. (5)

(b) Point charge 1mC and -2mC are located at (3, 2, -1) and (-1, -1, 4), respectively. Calculate the electric force on a 10nC charge located at (0, 3, 1) and the electric field intensity at that point. (5)

12 (a) A point charge 5nc is located at (-3, 4, 0) while line y =1, z = 1 carries uniform charge 2nc. (6)

(i) If V = 0V at O(0, 0, 0), find V at A (5, 0, 1).

(ii) If V = 100 V at B (1, 2, 1) find V at C (-2, 5, 3)

(b) Derive the expression for the energy density in electrostatic field. (4)

13 (a) Determine the capacitance per unit length between two long parallel, circular wires of radius 'a'. The axes of the wires are separated by a distance 'D. (5)

(b) State and prove uniqueness theorem. (5)

14 (a) Explain the nature of line, surface and volume current distribution as applicable to static magnetic fields. List out the expressions for the magnetic field intensity in these three cases. (5)

(b) An infinitely long straight conducting rod of radius 'a' carries a current of 'I' in +z direction using Ampere's circuital law find 'H' in all regions. (5)

15 (a) From the Maxell's curl's equation derive the wave equations for an Electro-magnetic wave in conducting media. (5)

(b) In an medium $E = 16e^{-x/20} \sin (2x10^8t-2x)i_z$ V/m. Find the direction of propagation, the propagation constant, wavelength, speed of the wave and skin depth. (5)

16 (a) What is Lorentz's condition? Show that time varying Electric scalar potential and magnetic vector potential satisfy wave equation if Lorentz's condition is assumed. (6)

(b) A sinusoidal electric intensity of amplitude 250 (V/m) and frequency 1(GHz) exists in a lossy dielectric that has a relative permittivity of 2.5 and a loss tangent of 0.0001. Find the average power dissipated in the medium per cubic meter. (4)

17 (a) State and prove Poynting Theorem. (5)

(b) Discuss the determination of the reflected and transmitted wave fields of a uniform plane wave incident normally onto a plane boundary between two material media. (5)

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**Code No. 3030 / S**

# FACULTY OF ENGINEERING

**B.E. 2/4 (M / P / A.E.) I – Semester (Suppl.) Examination, May / June 2017**

**Subject: Mechanics of Materials**

**Time: 3 Hours** **Max.Marks: 75**

**Note: Answer all questions from Part A. Answer any five questions from Part B.**

## PART – A (25 Marks)

1 Write the difference between elasticity and plasticity. 3
2 Write the relation between E, K and g . 3
3 Find the max BM of a simply supported beam subjected to UDL 20 KN/m throughout the span of 20 M. 3
4 Write down the assumption made in theory of pure bending. 3
5 Write down the limitation of double integration method. 3
6 Define modulus of rupture and shear rigidity. 2
7 What is the ratio of maximum shear to average shear of a rectangular section? 2
8 Write the demerits of Mohr's circle. 2
9 Write down the importance of Rankin's constant and reduction factor of a column. 2
10 State principle of super position. 2

## PART – B (5x10 = 50 Marks)

11 Derive $E = \frac{9KG}{3K+G}$ from the fundamentals. where 'K' is Bulk modulus, 'G' shear modulus, 'E' Young's modulus. 10

12 Draw SFD and BMD of a cantilever beam of span 10 Meters subjected to an UDL of 20 KN/m upto 2 M from the free end and a point load of 30 KN is acting at mid point of a cantilever beam. 10

13 Find the max. deflection of a simply supported beam of span 12 m subjected to two point loads of 10 KN and 5 KN at a distance of 2 m and 6 m from left support. 10

14 At a certain section of a shaft of 100 mm in dia there is twisting moment of 50 KNm and BM of 75 KNm. Determine the principal stresses in the shaft at the section and specify the position of the plane on which they act. 10

15 An I-section beam, has 200 mm wide flanges and an overall depth of 500 mm. Each flange is 25 mm, thick, while the web is 20 mm thick. At a certain section the shear force is 50 KN. Draw shear stress distribution diagram. 10

16 A cylindrical air receiver for a compressor is 2 M internal diameter and made of 12 mm thick, if the hoop stress is not to exceed 95 MPa and axial stress is not to exceed 65 MPa find the maximum safe air pressure. 10

17 Write short notes on: 10
i) Euler's column theory
ii) Middle third rule
iii) Bars of uniform strength.

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**Code No. 3034/S**

# FACULTY OF ENGINEERING

## B.E. 2/4 (CSE) I - Semester (Suppl.) Examination, May/June 2017

**Subject : Data Structures Using C+ +**

**Time : 3 Hours** **Max. Marks: 75**

***Note: Answer all questions from Part-A and answer any five questions from Part-B.***

### PART – A (25 Marks)

1 Specify the ADT for an Array. (2)
2 List additional factors that may influence the space complexity of a program. (3)
3 Identify two real world examples of the applications of a stack. (2)
4 Give the conditions for identifying a circular queue to be full and empty, when implemented using an array. (3)
5 When do a pointer in a circular linked list node has a "NULL" valve in it. Justify. (2)
6 Sparse matrix implementation is benefits using a linked list. Explain why? (3)
7 Worst case time complexity while using the technique hashing is 0(1) or 0(n). Justify. (2)
8 Differentiate between BST, AVL and Red black trees. (3)
9 Justify the data structure used for computing BFS in a graph. (2)
10 Summarize the different internal sorting algorithm. (3)

### PART – B (50 Marks)

11 Define Asymptotic notations. Elaborate the role of them in choosing the right algorithm and performance measurement. (10)

12 (a) Write an algorithm to demonstrate the operations of a stack. (5)
(b) Write an algorithm to implement a queue using 2 stacks. (5)

13 Explain the ADT of a doubly linked list and illustrate the process of insertion and deletion operations, demonstrating full and empty conditions. (10)

14 (a) Construct a binary search tree for the following integers. (5)
10, 4, 9, 20, 30, 26, 29, 27, 25
(b) Delete the following nodes and show the restructuring of BST (5)
4, 15, 26, 20, 10

15 Compare Prim's and Kruskal's algorithm for finding minimum cost spanning tree. (10)

16 (a) Write an algorithm to represent a lower triangle and tridiagonal matrix using arrays. (5)
(b) Explain few applications of queues. (5)

17 Write short notes on the following: (10)
(a) Heap
(b) Equivalence classes
(c) Graphs Representation

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**CODE No. 3040/S**

# FACULTY OF INFORMATICS

**BE 2/4 (IT) I Semester (Suppl.) Examination, May / June 2017**

**Sub: Micro Electronics.**

**Time : 3 Hrs.** **Max. Marks : 75**

**Note : Answer All Questions From Part- A and Any Five Questions from Part-B.**

PART – 'A' (25 Marks)

1. List different types of diode models. (2)
2. What is ripple factor ? What is its value for HW and FW rectifier without Filter ? (3)
3. Define $\alpha$ and $\beta$. (2)
4. Using potential barrier diagram define 'early effect' (3)
5. Distinguish between negative/degenerative and positive/regenerative feedback. (3)
6. Define loop gain. (2)
7. What are the ideal characteristics of an ideal op. Amp. (2)
8. Draw the circuit of an op. Amp. As summer, for adding two voltages. (3)
9. List different types of logic families. (2)
10. Define Noise Margins for logical '0' and logical 'l' state (ie $NM_L$ and $NM_H$) (3).

**PART – B** (50 Marks)

11. a) Explain the behavior of p-n junction diode under forward and Reverse biased conditions. (5)
    b) Draw a 2-way clipper circuit and explain. (5)

12. a) Draw the input and output characteristics of a transistor under CE Configuration and explain. (5)
    b) Why biasing is required ? How do you fix the Q-point. (5)

13. a) What is the significance of Barkhausan's criteria for oscillations. (4)
    b) With a neat circuit diagram explain the working of R.C. phase shift oscillator. (6)

14. a) Draw a comparator circuit using an op. Amp. And explain. How Do you construct a zero level detector using comparator ? (5)
    b) Explain with a suitable diagram how an op. Amp. can be used as a mono-stable multi-vibrator. (5)

15. a) Give the general structure of CMOS logic circuit and explain (5)
    b) Design a CMOS for the expression f=[a+be]'. (5)

16. a) Draw the circuit of a full wave rectifier and explain its operation. Draw the input and output wave forms. Derive expressions for Its average value, rms value of output voltage and current, ripple factor. (6)
    b) Explain the MOSFET model in linear and saturation region. (4)

17. Write detailed notes on the following :
    (a) Class B push pull amplifier. (5)
    (b) Hybrid model and its application. . (5)

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