CODE No. 3010

FACULTY OF ENGINEERING

BE 2/4 (CSE) I Semester (Main) Examination, November / December 2016

Sub: Building Planning & Drawing.

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. Draw the conventional symbol for railway bridge, pipe line and ceramic tiles. (3)
2. Differentiate header bond and stretcher bond (2)
3. Stretch the splayed stretcher and three quarter bat. (3)
4. Name the different types of trusses. (2)
5. What is the difference between coursed rabble first sort and coursed ? rubble second sort ? (2) (2)
6. What are the different types of stair case ? (2)
7. What are the important points to be considered while locating a door and window. (2)
8. Draw a plan and elevation of a square footing for reinforced concrete column (3)
9. Give the relation between (3)
   (i) height and width of a door
   (ii) rise and tread.
10. What are the aspects of building planning ? (3)

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 1.2mx2.1m. (10)

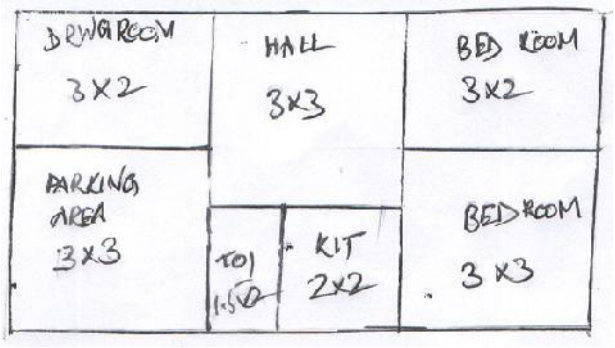
13. Draw a plan and elevation of spiral stairs to a suitable scale. (10)

14. Draw of king post truss of span of 10m. (10)

15. Draw a plan and elevation of stepped footing and sloped footing. (10)

16. Draw a plan and elevation of wall foundation to a suitable footing. (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. Take thickness of wall 300 mm.



***

Code No. 3024

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (Main) Examination, November / December 2016

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 Spherical coordinates of a point. (3)
2 State the divergence theorem. (3)
3 Point charges 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. (3)
4 State Gauss law for the Magnetic Field. (2)
5 State Ampere's Circuital law. (2)
6 What are the different ways in which an emf is induced around a loop? (4)
7 What is a Uniform Plane Wave? (2)
8 What is the significance of the intrinsic impedance of Free Space? What is its value? (2)
9 What is loss tangent? Discuss its significance. (2)
10 What is the Poynting Vector? What is the physical interpretation of the Poynting Vector over a closed surface? (2)

PART – B (50 Marks)

11 (a) Point charges Q_1 and Q_2 are respectively located at (4, 0, -3) and (2, 0, 1). If Q_2 = 4nc. Find Q_1 such that (5)
(i) The E at (5, 0,6) has no Z-Component
(ii) The force on a Test charge at (5, 0, 6) has no X-Component
(b) Obtain a formula for the electric field intensity on the axis of a circular disk of radius 'b' that carries a uniform surface charge density ρ_S. (5)

12 (a) A uniform line of length 2m with total charge 3nC is situated coincident to the z-axis with its center point 2m from the origin. Find electric potential 'V' at a point on the x-axis 2m from the origin. (6)
(b) Derive the expression for the energy density in electrostatic field. (4)

13 (a) State and prove Uniqueness Theorem. (5)
(b) 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)

14 (a) Find the magnetic field intensity at the center of a square loop, with side 'w' carrying direct current 'I'. (4)
(b) Obtain the magnetic vector potential due to a long straight conducting wire carrying a current 'I' in +z direction. (6)

..2

15 (a) What is Lorentz's condition? Show that time varying electric scalar potential and magnetic vector potential satisfy wave equations if Lorentz's condition is assumed. (5)

(b) Discuss the electromagnetic boundary conditions between two lossless media. (5)

16 (a) From the Maxwell's curl's equation derive the wave equations for an Electromagnetic wave in conducting media. (5)

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

17 (a) State and prove poynting theorem. (5)

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

*****

CODE No. 3030

FACULTY OF ENGINEERING

BE 2/4 (M/P/A.E) I Semester (Main) Examination, November / December 2016

Sub : Mechanics of Materials

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 Define toughness and Poisson's ratio. (2)
2 Explain hoop stress due to temperature. (2)
3 What is meant by elastic profile and B.M of a beam. (2)
4 Find the sectional modulus of a square section whose side is 40mm. (2)
5 Write the difference between aspect ratio and modular ratio. (2)
6 Explain equivalent torque and equivalent B.M. (3)
7 What is importance of angle of helix of a helical spring ? (3)
8 Write down the limitations of Mohr's circle. (3)
9 Write a short note on state of simple shear. (3)
10 Explain Kern of section with example. (3)

PART – 'B' (50 Marks)

11 Derive pure flexural equation $\frac{M}{I} = \frac{\sigma}{Y} = \frac{E}{R}$. (10)

12 A cantilever projecting 2.5m from a wall is loaded with a UDL of 80KN. Determine the moment of inertia of the beam section, if the deflection of beam at the free end be 8mm. Take E = 200Gpa. Also determine slope at the free end.(10)

13 Draw shear force diagram and BMD of a simple supported beam of span L=10m subjected to a UDL of 5KN/m. up to the distance of 3m from left support, and a point load of 10KN is applied at mid span. (10)

14 A semi elliptical leaf spring is to be made of seven steel plates 65mm wide and 6mm thick. Calculate the length of the spring so that it may carry a central load of 2.75KN, the stress is being limited to 160Mpa. Also calculate the deflection at the center of the spring. Take E = 200Gpa. (10)

15 A load of 300KN is applied on a short column 250mm x 250mm.The column is reinforced with steel bars of total area 5600mm^2 if the E_s= 15 E_c. Find the stress in the concrete and steel. If the stress in the concrete should not exceed 4Mpa. Find the area of steel required so that column may support a load of 600KN. (10)

16 Two planes AB and BC which are right angles to each other carry shear stress of 170Mpa. While these planes carry a tensile stress of 70Mpa and compressive stress of 35Mpa respectively. Determine principal plane and principal stress. Also determine main shear stress and planes on which it acts, by using Mohr's circle. (10)

17 Write a short note on the following: (10)
(a) Equivalent length of column.
(b) Compound cylinder subjected to fluid pressure
(c) Direct and bending stress.

***

CODE No. 3034

FACULTY OF ENGINEERING

BE 2/4 (CSE) I Semester (Main) Examination, November / December 2016

Sub: Data Structure Using C++

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. Write a recursive function call to compute n^1. Compare the space complexity of a recursive function call and that of anon recursive version. (3)
2. List the worst case time complexities in descending order (2)
   $O(n^2/ogn)$, $O(n)$, $O(n^2)$, $O(n/ogn)$, $O(2^n)$, $O(1)$
3. In the towers of Hanoi problem, how many worst case swaps would be done for reaching to a solution with 'k' discs. (2)
4. Given a infix expression, write the steps involved in converting to a prefix expression. (3)
5. Specify the template class for a chain. (2)
6. Given 2 polynomials $3x^2+2x-1$ & $4y^2+4x-y+1$, specify the struct rode which is used for creating linked list representation of polynomial addition. (3)
7. Given a binary tree of height 6, how many nodes will be present In a complete binary tree. (2)
8. Give the relation between heaps & priority queues with an example. (3)
9. Justify the data structure used for computing the DFS for graph. (3)
10. Write notes as "How fast can we search". (2)

PART – B (50 Marks)

11. a) Compare the various Asymptotic rotations used for analyzing the performance of any algorithm. (8)
    b) Explain the abstract data type for string. (2)

12. Justify the role of a data structure instrument in solving a mazing problem. (10)

13. a) Given a circular linked list specify the approach used for insertion & deletion without traversing the entire list. (5)
    b) Explain the various types of implementing a spars matrix. (5)

14. a) Given pre-order & in-order traversals of a binary tree as "CBFDGA" construct a binary tree. (5)
    b) List the steps involved in deleting a node in an AVL tree. (5)

15. Explain the working of quick sort algorithm, when the given numbers are aready sorted in the reverse orders. (10)

16. Write a program to implement a double ended queue using link list. (10)

17. Write short notes on any of the **three**. (10)

(a) Hasing. (b) Treaded Binary Trees.
(c) Tree sort (d) Link Queues.

. .

***

Code No. 3040

FACULTY OF INFORMATICS

B.E. 2/4 (IT) I - Semester (Main) Examination, November / December 2016

Subject : Micro Electronics

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	Distinguish between intrinsic and extrinsic semiconductors.	(3)
2	List the applications of a p-n junction diode.	(2)
3	Write the differences between a BJT and an FET.	(3)
4	Write the collector current equation in terms of β.	(2)
5	Derive an expression for the gain of the amplifier with feedback.	(3)
6	What are the basic building blocks of an oscillator?	(2)
7	Draw a inverter circuit using OP.Amp. and prove it.	(3)
8	List the advantages of op.Amp.	(2)
9	State the advantages and disadvantages of CMOS logic.	(3)
10	Define propagation delay.	(2)

PART – B (50 Marks)

11	(a) Explain clearly the formation depletion region in a p-n junction diode.	(5)
	(b) Explain how a zener diode can be used as voltage regulator.	(5)
12	(a) Draw the input and output characteristics of a transistor under CB configuration and explain.	(5)
	(b) Explain the principle of operation of JFET.	(5)
13	(a) Explain how noise can be reduced in negative feedback amplifiers.	(4)
	(b) With a suitable diagram explain the operation of push-pull amplifier.	(6)
14	(a) Draw a subtractor circuit using an op.Amp. and explain.	(4)
	(b) Explain with a suitable diagram how an op.Amp. can be used for the generation of square wave.	(6)
15	(a) Draw the VTC of a CMOS inverter and explain.	(5)
	(b) Design an XOR gate using CMOS logic.	(5)
16	(a) Compare the three amplifier configurations with reference to voltage and current gains.	(4)
	(b) Explain the operation of MOSFET in linear and saturation region.	(6)
17	Write short notes on the following:	
	(a) Cathode Ray Oscilloscope and its applications	(5)
	(b) Op.Amp. as an Instrumentation amplifier	(5)

*****