Code No. 11379/CBCS

FACULTY OF ENGINEERING

B.E. II-Semester (CBCS) (Suppl.) Examination, November /December 2018

Subject : Engineering Chemistry-II

Time: 3 Hours **Max. Marks: 70**

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

PART-A (10x2 =20 Marks)

1 Define the terms (i) equivalent conductance and (ii) Molar conductance.
2 Represent glass electrode and mention its use.
3 Explain the concept of fuel cells
4 Differentiate primary and secondary batteries
5 What is pilling-Bed worth rule? Explain
6 Explain tinning method
7 What are the characteristics of a good fuel?
8 Why are gaseous fuel more advantageous than solid fuels?
9 What is layered composite? Provide one example of layered composite
10 Explain importance of "atom economy" with a suitable example.

PART-B (5x10=50 Marks)

11. a) At 298K, The solution of 0.1M KCl and 0.1M $AgNo_3$ gave the resistance of 337.6 and 397.9 ohms respectively. Calculate (i) the cell constant (ii) equivalent conductance of 0.1M Ag NO_3, given conductivity of 0.1M KCl = $1.286x10^{-3}$ $S\text{-}cm^{-1}$
    b) Define the term Single electrode potential. How do you determine the electrode potential of Zn/Zn2+ using potentiometer? Explain.

12 a) Explain H_2-O_2 fuel cell with diagram and cell reaction
    b) What are Lithium ion batteries? Explain its advantages and applications.

13 a) What is meant by electrochemical corrosion? Explain its mechanism.
    b) Write a note on cathodic protection by impressed current method.

14 a) Calculate the volume of air required for complete combustion of $1m^3$ of gaseous fuel having the composition : CO=46%, CH_4=10%, H_2 = 4%, C_2H_2= 2.0%, N_2 = 1.0% and remaining being CO_2.
    b) Explain the terms (i) Knocking (ii) Octane number (iii) Cetane number

15 a) Differentiate between fibre and particle-reinforced composites.
    b) Explain the moleculer ordering in liquid crystals and mention their applications.

16 a) Derive Nerst equation and explain its use.
    b) Write a note on photovoltaic cells.

17 a) What are the various factors effecting rate of corrosion? Explain.
    b) Explain ultimate analysis of coal and mention its significance.

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Code No. 11010

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I - Semester (Backlog) Examination, November / December 2018

Subject : Building Planning and Drawing

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

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

PART – A (25 Marks)

1 Draw the conventional sign for ceramic tiles and wood. (3)
2 How English bond is stronger than Flemish bond? (2)
3 Draw the isometric view of a brick. (3)
4 Draw the isolated footing of random rubble masonry. (2)
5 Draw a line diagram of queen post truss of 10 m span. (3)
6 Sketch the elevation of a fully paneled window? (2)
7 List the various type of roof trusses. (3)
8 What you mean by rise and tread in staircase ? (2)
9 What are the important points to be considered while locating door and Window? (3)
10 What are the aspect 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 flemish bond. Draw minimum 3 layers. (10)

12 Draw front elevation and sectional elevation of a fully glazed door of 1.2m x 2.1m to a scale of 1: 50. (10)

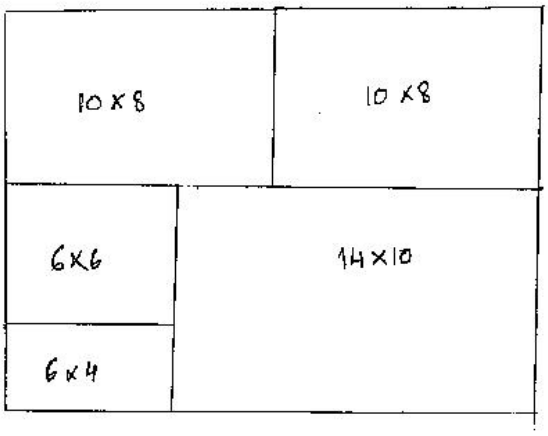
13 Sketch an RCC slab and also show the reinforcement details of 4m x 5m with 150 mm thickness. (10)

14 Draw the front and sectional elevation of a open well staircase in a residential block to reach a floor height of 3.1m. (10)

15 Draw the plan and elevation of a isolated RCC column footing of foundation in a residential building. (10)

16 Draw the elevation of a king post truss. (10)

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 300mm. (10)



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Code No. 11018

FACULTY OF ENGINEERING

B.E. 2/4 (EEE/Inst.) I Sem. (Backlog) Examination, November/December 2018

Subject: Electronic Engineering – I

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

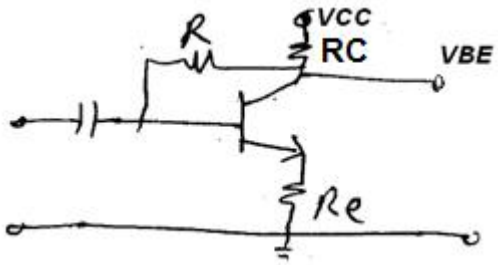
Note: Answer All Questions from Part – A & Any Five Questions from Part – B

Part – A (25 Marks)

1. For a Silicon diode reverse saturation current is 10 micro-amps, calculate forward current if voltage applied in 0.2V? 2
2. What are the limitations of Zener Voltage regulator? 3
3. What are the applications of Light emitting diodes? 2
4. Define peak inverse voltage and transformer utilization factor for a rectifier? 3
5. What is Early effect in BJT? 2
6. What is a HEAT-SINK, where it is used? 3
7. Draw h- parameter model for CB configuration of BJT? 2
8. Compare DIAC & TRIAC? 3
9. Compare JFET & BJT 2
10. Draw transfer characteristics of JFET and define pinch-off voltage? 3

Part – B (50 Marks)

11. a) Derive Diode current equation under forward bias? 5
    b) Explain breakdown in diodes? 5
12. Draw and explain the circuit diagram of full wave rectifier with inductor filter. Derive expression for ripple factor? 10
13. For the circuit shown find 'R' and Stability factor 'S' if = 45 V_{BE} = 0.7v, Vcc = 22v Rc = 8k, V_{CE} = 5v and Re = 250 ohms? 10



14. Derive expressions for current gain, input resistance, voltage gain and output resistance of a CCBJT amplifier. Calculate the same if load resistance is 4 kΩ, source resistance is 1 kΩ. Assume suitable values of h-parameters? 10

Contd…2

15. a) Explain V-I characteristics of JFET for CS – configuration? 5

    b) Explain construction of enhancement MOSFET. How it differs from depletion MOSFET? 5

16.a) Explain PN-Junction characteristics under forward and reverse bias? 5

    b) Explain working of a bridge rectifier with waveforms? 5

17. Write short notes on:

    a. Bias stabilization techniques 4

    b. SCR & CCD 4

    c. Transistor as an amplifier 2

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Code No. 11024

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Backlog) Examination, Nov. / Dec. 2018

Subject: Electromagnetic Theory

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. Determine the components of B = ($2a_x$ - a_y + $2a_z$) in spherical coordinates at P(1, ®/2 , π). (2.5)
2. State Divergence Theorem. (2.5)
3. State and explain Poisons equation. (2.5)
4. Define Biot-savart's Law? And what are its limitations. (2.5)
5. State Stokes Theorem. (2.5)
6. Describe Maxwell's equations in point form and Integral form. (2.5)
7. State and explain different types of Polarization. (2.5)
8. Define Poynting Vector and mention its applications. (2.5)
9. Define Reflection Coefficient and Transmission Coefficients. (2.5)
10. Describe significance of Displacement Current. (2.5)

PART – B (50 Marks)

11 a) State Coulomb's Law for n-point Charges. (5)

b) A Circular disc of radius 5mts carries a uniformly distributed charge of 1250Π μC ; Determine force on a 100 μC; charge located at a height of 2mts along the axis of disc. (5)

12 a) Show that Electric Field intensity is equal to negative gradient of potential. (5)

b) Determine the distance at which the absolute potential due to a 120nC point charge equal to 1K when in Vacuum and in medium with ϵr =4. (5)

13 a) Describe in detail Magnetic Boundary conditions. (5)

b) Determine the voltage across each Dielectric in the Capacitor having dimensions 3mm thickness upper plate and 1mm lower plate thickness with $1mt^2$ as overall area; with ϵo = 1 ; ϵr =5 ; with potential applied V = 300volts. (5)

14 a) Define Displacement Current and hence derive an expression for it. (5)

b) In a material for which σ = 6 S/m; and ϵr =1 ; the electric field intensity E = 300Sin(10^{10}v) t volts/mt ; Determine the conduction and displacement current densities and the frequency at which they have equal magnitudes. (5)

15 a) State and prove Poynting Theorem? And hence derive complex pointing vector. (5)

b) Show that perpendicular polarization the reflection coefficient is

$\Gamma = \{ [\sqrt{\epsilon r1}\ \cos(\theta i) - \sqrt{\epsilon r2}\cos(\theta t)] / [\sqrt{\epsilon r1}\ \cos(\theta i) + \sqrt{\epsilon r2}\ \cos(\theta t)] \}$ (5)

16 a) A uniform plane wave travelling in free space is incident normally on a perfect conductor and perfect dielectric with ϵ_r =5 ; μ_r = 1; find standing wave ratio in each case. (5)

b) Show that the ratio of Electric vector to that of Magnetic vector is equal to 377ohms in free space. (5)

17 a) Write short notes on Electrostatic Boundary conditions. (5)

b) Distinguish between static Electric field and Magnetic field. (5)

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Code No. 11030

FACULTY OF ENGINEERING

B.E 2/4 (M/P/AE) I-Semester (Backlog) Examination, November /December 2018

Subject: Mechanics of Materials

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

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

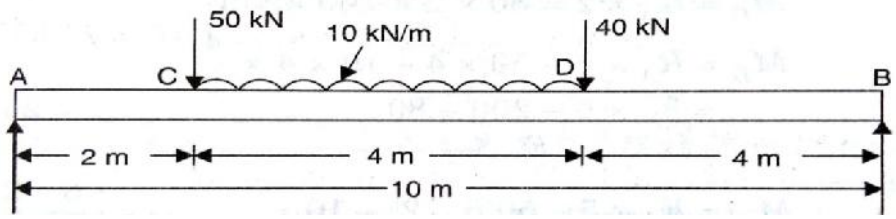
PART – A (25 Marks)

1. What is the relationship between E,G and K. [2]
2. The safe stress for a hollow steel column which carries and axial load of 2.1 X 10^3 KN is 125MN/m^2. If the external diameter of the column is 30cm, determine the internal diameter. [3]
3. Find the maximum bending moment of a simply supported beam of span 5m subjected to uniformly distributed load of 20KN/m throught the span. [2]
4. What are the various types beams with neat sketch. [3]
5. What do you mean by slope and deflection. Indicate by sketch. [2]
6. A solid shaft of 150mm diameter is used to transmit torque. Find the maximum torque transmitted by the shaft if the maximum shear stress induced in the shaft is 45 N/mm^2. [3]
7. Write a short note on Mohr's circle. With a help of a digram [2]
8. A rectangular beam 100mm wide and 150mm deep is subjected to a shear force of 30KN. Determine Average shear stress and maximum shear stress. [3]
9. What is the difference between thin and thick cylinder. - sketch [2]
10. What do you mean by section modulus and write down the section modulus formula for hollow rectangular section. [3]

PART-B (5 x10 = 50 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 200^0C. 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. 10

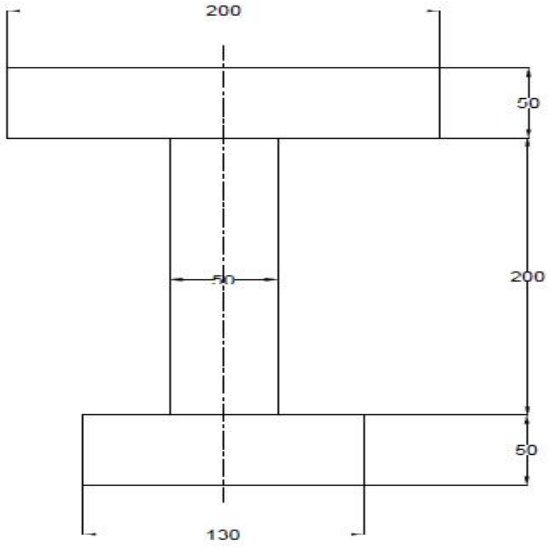
12. A beam is loaded as shown in below fig. find the reactions at A and B, and also draw shear force and bending moment diagrams. 10



13. A hollow shaft is to transmit 300KW power at 80r.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. 10

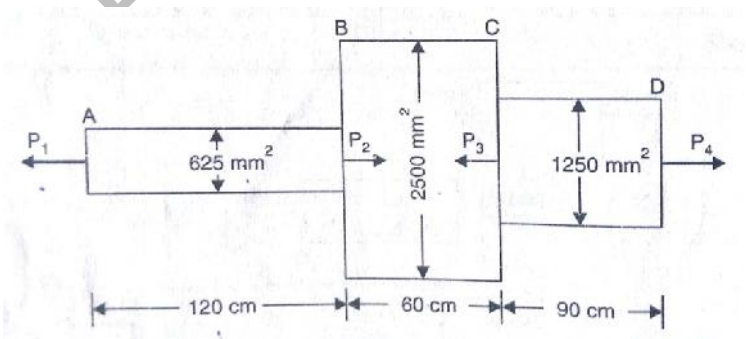
14. The shear force acting on a beam at an I-section with unequal flanges is 50KN . The section is shown in below figure. The moment of inertia of the section about N.A is 2.849 X 10^8 mm^4. Calculate the shear stress at the N.A and also draw the shear stress distribution over the depth of the section. 10

15.

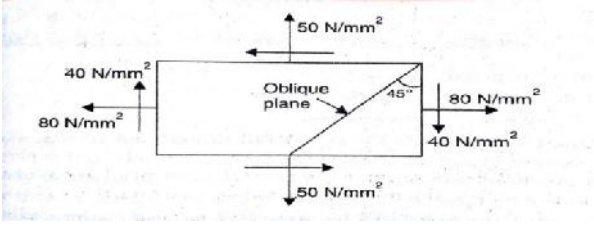


16. A compound cylinder is made by shrinking a cylinder of external diameter 300mm and internal diameter of 250mm over another cylinder of external diameter 250mm and internal diameter 200mm. The radial pressure at the junction after shrinking is 8 N/mm^2 find the final stresses set up across the section, when the compound cylinder is subjected to an internal fluid pressure of 84.5 N/mm^2. 10

17. A member ABCD is subjected to point loads P_1,P_2,P_3 and P_4 as shown in below figureCalculate the force P_2 necessary for equilibrium, if P_1 = 45KN, P_3 = 450KN and P_4 = 130KN. Determine the total elongation of the member, Take E= 2.1 X 10^5 N/mm^2. 10



18. 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. 10



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Code No: 11034

FACULTY OF ENGINEERING

BE 2/4 (CSE) I-Semester (Backlog) Examination, November /December 2018

Subject: Data Structures Using C++

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

Note: Answer All Questions From Part-A & Any Five Questions From Part-B.

PART-A (25 Marks)

1. Define Space complexity. How to calculate the space complexity? (3)
2. Differentiate linear and non linear data structures? (2)
3. What are the applications of stack? (3)
4. Evaluate the postfix expression 23+16*2/- (2)
5. Write advantages and disadvantages of double linked lists? (3)
6. Draw all possible AVL trees of height 3? (2)
7. Write any three disadvantages of binary search trees? (3)
8. What is the worst case of quick sort explain with an example? (2)
9. List applications of spanning trees? (3)
10. What is stable sorting? Give an example? (2)

PART-B (50 Marks)

11. What is sparse matrix? How is a sparse matrix best represented?
12. Using templates implement stack data structures?
13. Explain insert, delete, and search operations in single linked list?
14. a) Define AVL tree. Write a non recursive function to insert into AVL tree?
    b) Using AVL trees how trees can be balanced, explain with examples?
15. a) Write a function for insertion sort.
    b) Sort the following numbers using quick sort?
    45, 89,30,15,10,35,55,40
16. Explain Prims algorithm for finding minimal cost spanning trees?
17. Write short notes on
    a. M-way search trees
    b. Splay trees

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Code No. 11040

FACULTY OF ENGINEERING

B.E. 3/4 (IT) I – Semester (Backlog) Examination, November / December 2018

Subject: Micro Electronics

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	Define Cut-in Voltage and write its value for Ge and Si.	3
2	Distinguish between Conductor, Semiconductor and Insulator.	2
3	What is Pinchoff Voltage?	3
4	Write the collector current equation in terms of .	2
5	Give the Barkhausen conditions required to in order for sinusoidal oscillations to be sustained.	2
6	Define loop gain of a Feedback Amplifier.	3
7	List the advantages of Op-Amp.	2
8	List the properties of an Ideal Op-Amp.	3
9	Define propagation delay.	3
10	What is Noise Margin?	2

PART – B (50 Marks)

11	a)	Explain about conduction in semi-conductors.	4
	b)	Explain clearly the formation of depletion region in a PN junction diode.	6
12		Draw and explain the input and output characteristics of a transistor under CE configuration.	10
13		What is an oscillator? Explain the operation of an RC phase shift oscillator.	10
14	a)	Compare the amplifier configurations with reference to voltage and current gains.	5
	b)	Explain with a suitable diagram how an Op-Amp can be used as a comparator.	5
15	a)	Design an EX-OR gate using CMOS logic.	5
	b)	Explain the static and dynamic operation of CMOS inverter.	5
16	a)	Draw crystal oscillator and explain its operation.	6
	b)	Explain the operation of MOSFET as an amplifier and switch.	4
17		Write short notes on the following:	
	i)	Half-Wave Rectifier	5
	ii)	CCVS using Op-Amp.	5

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