

Hall Ticket Number :

**R-17**

**Code: 7G121**

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

**Data Structures**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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**UNIT-I**

- 1. a) What is a pointer? List out the advantages and disadvantages using a pointer. 7M
- b) Distinguish between call by value and call by reference by means of a program. 7M

**OR**

- 2. a) What is Dynamic Memory Allocation? Write syntax for malloc(), calloc() and free(). 7M
- b) Discuss command line arguments with an example. 7M

**UNIT-II**

- 3. a) Distinguish between Structure and Union and also mention their applications. 4M
- b) Explain Quick sort with the help of an example 10M

**OR**

- 4. a) Briefly explain File handling in C 10M
- b) Compare Linear search and Binary search. 4M

**UNIT-III**

- 5. a) What is stack? Specify any four applications where stacks are extensively used. 4M
- b) Write a routine to convert the following infix expression in to postfix expression:  
**a+b\*c/(e+f\*g)** 10M

**OR**

- 6. a) What is Queue? Specify any four applications where queues are extensively used. 4M
- b) Write a routine to implement circular queue. 10M

**UNIT-IV**

- 7. a) What is the difference between singly, doubly & circular linked lists? 7M
- b) Write a program to delete a node from the beginning of the linked list 7M

**OR**

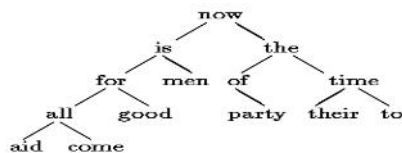
- 8. a) Write a program to create a singly linked list in sorted order. 7M
- b) Summarize doubly linked list. 7M

**UNIT-V**

- 9. a) Explain Array representation of Binary tree 7M
- b) Define Graph and explain various graph representations. 7M

**OR**

- 10. Write the in order, preorder, and post order sequence of nodes for the following binary tree



14M

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Code: 7GC24

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

**Engineering Mathematics-II**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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**UNIT-I**

1. Change the order of integration and evaluate  $\int_0^1 \int_{x^2}^{2-x} xy dx dy$  14M

OR

2. a) Evaluate  $\int_3^{-4} \int_1^{-2} \frac{y dx dy}{(x+y)^2}$  7M

OR

- b) Evaluate  $\int_0^3 \int_1^{-2} \frac{dx dy}{(x+y)^2}$  7M

OR

3. a) Find the Laplace transform of  $\int_0^1 \frac{dx}{x^2+1}$  7M

**UNIT-II**

- b) Evaluate  $\int_0^1 \frac{\cos 6t - \cos 4t}{t} dt$  by using Laplace transforms 7M

**UNIT-II**

OR

4. Express  $f(t) = \begin{cases} t^2, & 0 < t < 2 \\ 4, & t > 2 \end{cases}$  in terms of heavisides unit step function hence find its Laplace transform. 14M

**UNIT-III**

5. Use convolution theorem to evaluate  $L^{-1} \left[ \frac{s^2}{(s^2+a^2)^2} \right]$  14M

OR

6. Solve the differential equation  $y'' + y = e^{-2t} \sin t$ ,  $y(0) = 0$ ,  $y'(0) = 0$  using Laplace Transforms. 14M

**UNIT-IV**

7. a) Show that  $F = (e^x \cos y + yz)i + (xz - e^x \sin y)j + (xy + z)k$  is conservative over its natural domain and find potential function for it. 7M

- b) Find the unit outward normal to the surface  $(x-1)^2 + y^2 + (z+2)^2 = 9$  at the point (3,1,-4). 7M

OR

8. Find the work done in moving a particle in a force field  $\vec{A} = 3xyi - 5zj + 10zk$  along the curve  $x = t^2 + 1$ ,  $y = 2t^2$ ,  $z = t^3$  from  $t=1$  to  $t=2$ . 14M

**UNIT-V**

9. Verify Stokes theorem for the function  $\vec{f} = x^2i + xyj$ , integrated round the square in the plane  $z=0$ , whose sides are  $x=0$ ,  $y=0$ ,  $x=a$ ,  $y=a$ . 14M

OR

10. Verify Green's theorem for  $\int_C (y - \sin x)\pi dx + \cos^2 y dy$ , where  $C$  is the plane triangle enclosed by the lines  $y=0$ ,  $x=2$  and  $y=\pi x$ . 14M

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Hall Ticket Number :									
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<b>R-17</b>
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**Code: 7G321**

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

**Electronic Devices and Circuits**

( Common to EEE & ECE )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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<b>UNIT-I</b>
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1. a) Compare CB CE and CC Configurations of a BJT. 7M
- b) Explain DC load line analysis of a transistor. 7M

**OR**

2. a) Find the stability factor of a fixed bias silicon transistor with the following specifications:  $V_{CC} = 9V$ ,  $R_C = 3\text{ K Ohms}$ ,  $R_B = 8\text{ K Ohms}$ ,  $\beta = 50$ , and  $V_{BE} = 0.7\text{ V}$ . 7M
- b) What is meant by operating point of a Transistor? Explain its significance in amplification. 7M

<b>UNIT-II</b>
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3. With neat circuit diagram explain the principle of operation of JFET. Find out Transconductance of Common Source Configuration having its drain resistance  $r_d = 20\text{ K Ohms}$  and Amplification factor is 40. 14M

**OR**

4. a) Explain the operation of N channel MOSFET with necessary diagrams. 7M
- b) Explain Source self bias of a FET. 7M

<b>UNIT-III</b>
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5. a) Draw and explain AC and DC equivalent circuits of an amplifier. 7M
- b) What are the various parameters of an amplifier? Explain the significance of Input resistance. 7M

**OR**

6. a) Draw the input and output characteristics of single stage CE amplifier. Explain how h-parameters can be evaluated from them. 7M
- b) Explain the role of  $C_E$ ,  $C_B$  and  $C_C$  capacitors in an amplifier. 7M

<b>UNIT-IV</b>
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7. a) Explain the FET small signal model with necessary equations and circuit diagram. 7M
- b) Derive expressions for Voltage gain, Input and Output admittances of Common Drain FET amplifier. 7M

**OR**

8. a) Why biasing is required, briefly explain how JFET can be biased. 7M
- b) Compare  $A_v$ ,  $Z_i$  and  $Z_o$  of Common Drain and Common Source FET amplifiers. 7M

<b>UNIT-V</b>
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9. a) Explain the principle of operation of SCR. 4M
- b) Write short notes on i) Shottky Diode ii) Photo Transistor. 10M

**OR**

10. a) Draw the circuit symbol of a Varactor diode and explain its operation. 6M
- b) Draw the symbol, construction and equivalent circuit of UJT and explain its operation. 8M

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**Code: 7GC22**

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

**Engineering Chemistry**

( Common to EEE &amp; ECE )

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )

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**UNIT-I**

1. a) Evaluate the hardness (permanent & temporary) of a water sample whose 25ml consumed 10 ml of 0.01M EDTA. 25 ml of boiled sample required 4 ml of same EDTA. 8M
- b) Explain caustic embrittlement type of boiler corrosion 6M

**OR**

2. a) A sample of water on analysis is found to contain 78 mg/L of  $Mg(HCO)_3$ , 146mg/L of  $Ca(HCO)_3$ , 58 mg/L of  $MgCl_2$  and 106 mg/L of  $CaSO_4$ . Calculate the permanent & temporary hardness of the water. 7M
- b) Describe the Zeolite process of water treatment. Mention the advantages and disadvantages of this method. 7M

**UNIT-II**

3. a) At what concentration of  $Ag^+(aq)$ , will the e.m.f. of the Cu-Ag cell be zero at  $25^\circ C$ , if concentration of  $Cu^{2+}(aq)$  is 0.1M? Given  $E^0_{(Cu^{2+}, Cu)} = 0.34V$ ,  $E^0_{(Ag^+, Ag)} = 0.79V$ . 7M
- b) What are fuel cells? Explain the working of Methanol-oxygen fuel cell. 7M

**OR**

4. a) Describe the process of electroplating of Nickel. 7M
- b) Discuss the factors affecting corrosion. 7M

**UNIT-III**

5. a) Write a note on synthesis of Nylon 6, 6 from 1,3-butadiene and uses of it. 7M
- b) Differentiate between addition polymerization & condensation polymerization. 7M

**OR**

6. a) Describe the synthesis, application & mechanism of conducting nature of polyacetylene. 7M
- b) Write a note on thermoplastics and thermosetting plastics. 7M

**UNIT-IV**

7. a) Write a note on octane and cetane rating of fuel. How can they be improved? 7M
- b) Calculate the gross and net calorific values of a coal sample containing 75% carbon, 8% nitrogen, 10% hydrogen, 5% sulphur and 2% oxygen. 7M

**OR**

8. Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labelled diagram. How do you recover the byproducts in this method? 14M

**UNIT-V**

9. a) What do you mean by setting and hardening of cement? Explain with the reactions involved. 7M
- b) What are refractories? Discuss about refractoriness & RUL and briefly describe their measurement process. 7M
- OR**
10. a) What is Portland cement? Describe the manufacture of Portland cement by dry method with a neat labelled diagram of rotary kiln. 8M
- b) Discuss the following properties of lubricants. 6M
- i) cloud and pour point, ii) flash and fire point, iii) Viscosity

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