R-15

Code: 5G321

I B.Tech. II Semester Supplementary Examinations February 2022

Electronic Device and Circuits-II

(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Write a short notes on
        i. Thermal resistance   7M
        ii. Heat sinks

    b) Illustrate the importance of dc and ac load line circuit in transistor amplifiers.   7M

OR

2. a) Determine the stability factor for collector to base bias circuit.   7M

    b) Explain why operating point is fixed in the center of the active region of transistor
        characteristics in a good voltage amplifier? Explain the factors which may alter   7M
        operating point and its effects on performance of an amplifier.

UNIT–II

3. a) Explain different FET Biasing methods. Also explain their merits and demerits.   7M

    b) Establish a relation between the three JFET parameters, μ, r_d and g_m.   7M

OR

4. a) Explain the principle and working of N-channel MOSFET with labeled diagram
        showing constructional features.   7M

    b) Write the necessary steps for gate bias circuit design and voltage divider bias   7M
        circuit design.

UNIT–III

5. a) With the help a graphical demonstration illustrate how a transistor can be used
        as an amplifier.   7M

    b) Write about classification of amplifiers?   7M

OR

6. a) Write short notes on the following
        i. dc and ac load lines   7M
        ii. Phase reversal

    b) Why ac load line is steeper than dc load line?   7M

UNIT–IV

7. a) Draw a two stage RC coupled Amplifier circuit and explain its operation.   7M

    b) List the various applications of RC coupled Amplifier   7M

OR

8. a) Explain the analysis of frequency response of RC coupled amplifiers   7M

    b) List the advantages and disadvantages of RC coupled amplifiers.   7M

UNIT–V

9. a) Explain the working of Photo Transistor with neat diagram   7M

    b) Discuss the principle of operation of UJT   7M

OR

10. a) Write short notes on Schottky Barrier Diode   7M

    b) With a neat sketch explain the characteristics of SCR.   7M

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Code: 5GC22

I B.Tech. II Semester Supplementary Examinations February 2022

Engineering Chemistry

(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water   7M
   b) Give detailed procedure for the determination of dissolved oxygen in water.   7M

OR

2. a) Write short notes on
      i) Scale and sludge
      ii) Caustic embrittlement   7M
   b) Discuss in brief the boiler corrosion. How is it controlled?   7M

UNIT–II

3. a) Write a note on the mechanism of hydrogen evolution type of wet corrosion.   7M
   b) Explain rusting of iron with the help of electrochemical theory of corrosion   7M

OR

4.   Give reasons for the following
      (i) Corrosion of water-filled tank occurs below the waterline
      (ii) A Copper equipment should not possess a small Steel bolt   14M

UNIT–III

5. a) Write the characteristics of co-polymerization   7M
   b) Write a note on polydispersive index   7M

OR

6. a) Explain Chain polymerization and Step growth polymerization with examples.   7M
   b) Discuss the functions of various ingredients used in the compounding of rubber   7M

UNIT–IV

7. a) Write short note on octane number and cetane number.   7M
   b) Compare the liquid fuels with gaseous fuels.   7M

OR

8. a) Describe the Production and uses of water gas and Biogas.   7M
   b) What is knocking? Describe how we can minimize knocking?   7M

UNIT–V

9. a) What is the significance of flash & fire point, cloud & pour point of a good lubricant?   7M
   b) Write functions of lubricants   7M

OR

10.   What is meant by Lubrication Process? Describe thick-film Lubrication and thin-film Lubrication.   14M

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I B.Tech. II Semester Supplementary Examinations February 2022
Engineering Mathematics-II
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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UNIT–I

1. a) Find the area of a plate in the form of a quadrant of the ellipse $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$.

    b) Evaluate $\displaystyle\int_{0}^{\frac{f}{2}}\int_{0}^{a\sin_\pi}\int_{0}^{\frac{a^2-r^2}{a}} r\,dz\,dr\,d_\pi$

OR

2. Change the order of integration in $\displaystyle\int_{0}^{1}\int_{x}^{\sqrt{2-x^2}}\dfrac{x}{\sqrt{x^2+y^2}}\,dy\,dx$ and hence evaluate it.

UNIT–II

3. a) Find the Laplace Transform of $\left(\sqrt{t}-\dfrac{1}{\sqrt{t}}\right)^{3}$

    b) Evaluate $\displaystyle\int_{0}^{\infty}e^{-t}\left(\dfrac{\cos at-\cos bt}{t}\right)dt$

OR

4. a) Find $L^{-1}\left\{\dfrac{s}{\left(s^2+a^2\right)^2}\right\}$ by convolution theorem.

    b) Find $L^{-1}\left\{\log\left(\dfrac{s+1}{s-1}\right)\right\}$.

UNIT–III

5. Solve $\left(D^2+9\right)x=\sin t$ using Laplace transform given that $x(0)=1, x\left(\dfrac{f}{2}\right)=1$.

OR

6. Solve $y''-3y'+2y=4t+e^{3t}, y(0)=1, y'(0)=1$.

UNIT–IV

7. a) Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point $(2,-1,2)$

    b) Find the directional derivative of $f(x,y,z)=xy^3+yz^3$ at the point(2,-1,1) in the direction of the vector I+2J+2K.

OR

8. Evaluate the line integral $\displaystyle\int_{c}(x^2+xy)dx+(x^2+y^2)dy$, where c is the square formed by the lines $y=\pm1$ and $x=\pm1$.

UNIT–V

9. Verify Green's theorem for $\displaystyle\int_{c}(3x^2-8y^2)dx+(4y-6xy)dy$, where c is the boundary of the region bounded by x=0,y=0 and x+y=1.

OR

10. Verify Stoke's theorem for $\overline{f}=(2x-y)\overline{i}-yz^2\overline{j}-y^2z\overline{k}$ over the upper half surface of the sphere $x^2+y^2+z^2=1$ bounded by the projection of the xy-plane.

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I B.Tech. II Semester Supplementary Examinations February 2022
C Programming and Data Structures
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Using pointers write a C program which finds the maximum among the list of elements.   10M
   b) Write a C program to swap two numbers using pointers.   4M

OR

2. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable   7M
   b) Explain dynamic memory allocation functions in C in detail.   7M

UNIT–II

3. a) Write a C Program to sort the given array in descending order using Bubble Sort.   7M
   b) Write a C program to find the given element using linear searching.   7M

OR

4. a) Define Structures. Explain with an example how structure members are initialized and accessed   7M
   b) Write a C program to copy the contents from one file to another file.   7M

UNIT–III

5. What is a stack? How it can be represented in "C" using arrays?   14M

OR

6. a) What is Data Structure? Explain in detail about different type of data structures.   7M
   b) Write the steps for evaluating postfix expression   7M

UNIT–IV

7. What is a Doubly Linked List.? Explain different operations of a Doubly linked list with suitable examples.   14M

OR

8. Write a C program to implement the following operations on a singly Linked List
   i) Insert at beginning   ii) deletion at end   iii)Traversing a List   14M

UNIT–V

9. a) Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree.   7M
   b) Draw a complete undirected graph having five nodes.   7M

OR

10. Construct Binary search tree for the following elements: 67, 12, 45, 98, 80, 73, 7, 120, 85, 30, 42 then Delete 73, 67, 12, 98.   14M

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