R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations December 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. Evaluate $\int_0^\infty \int_0^\infty e^{-\left(x^2+y^2\right)} dx\,dy$ by changing to polar coordinates. And hence show that $\int_0^\infty e^{-x^2} dx = \dfrac{\sqrt{f}}{2}$ 14M

OR

2. a) Evaluate $\int_0^{\frac{f}{2}} \int_0^{a\sin_{"}} \int_0^{\frac{\left(a^2-r^2\right)}{a}} r\,dz\,dr\,d_{"}$ 7M

   b) Evaluate $\int_0^5 \int_0^{x^2} x\left(x^2+y^2\right) dy\,dx$ 7M

UNIT–II

3. a) Find the Laplace Transform of $t\,e^{-t}\,\mathrm{Sin}\,t$ 7M

   b) Find $L^{-1}\left\{\dfrac{s}{\left(s^2+1\right)\left(s^2+9\right)\left(s^2+25\right)}\right\}$ 7M

OR

4. a) Find the Laplace Transform of $\int_0^t \dfrac{e^{-t}\,\mathrm{Sin}\,t}{t}\,dt$ 7M

   b) Write the Laplace Transforms of some standard functions   7M

UNIT–III

5. Solve the differential equation by Laplace Transform
$\left(D^2+2D+5\right)y=e^{-t}\sin t,\ y(0)=0;\ y'(0)=-1$ 14M

OR

6. Solve the differential equation $y''+y=t,\ y(0)=1,\ y'(0)=2$ Using Laplace Transform   14M

UNIT–IV

7. Using the line integral, calculate the work done by the force,
$\bar{F}=\left(3x^2-6yz\right)\bar{i}+\left(2y+3xz\right)\bar{j}+\left(1-4xyz^2\right)\bar{k}$ in moving a particle from the point $(0,0,0)$ to the point $(1,1,1)$ along the curve $C: x=t,\ y=t^2,\ z=t^3$.   14M

OR

8. a) Show the vector $\left(x^2 - yz\right)\bar{i} + \left(y^2 - zx\right)\bar{j} + \left(z^2 - xy\right)\bar{k}$ is irrotational and find its scalar potential. **7M**

    b) Find the directional derivative of $2xy + z^2$ at the point $(1, -1, 3)$ in the direction of $\bar{i} + 2\bar{j} + 3\bar{k}$ **7M**

UNIT–V

9. Verify the Stoke's theorem for a vector field $\bar{F} = \left(2x - y\right)\bar{i} - yz^2\,\bar{j} - y^2 z\bar{k}$ over the upper half surface of $x^2 + y^2 + z^2 = 1$ bounded by projection on xy-plane **14M**

OR

10. Verify by Green's Theorem for $\int_c \left[\left(xy + y^2\right)dx + x^2 dy\right]$ where 'c' is bounded by $y = x$ and $y = x^2$ **14M**

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R-15

Code: 5GC22

I B.Tech. II Semester Supplementary Examinations December 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) Describe the estimation of hardness of water by EDTA method.　　8M

　b) What are boiler troubles? Describe scale and sludge.　　6M

OR

2. Describe the process of water treatment by ion exchange method.　　14M

UNIT–II

3. a) Differentiate the Primary and secondary batteries　　7M

　b) Describe the chemistry of Dry Cell.　　7M

OR

4. a) Write short notes on i) electrode ii) electrolyte iii) salt bridge.　　6M

　b) What are conductometric titrations? Describe strong acid Vs Strong base titration.　　8M

UNIT–III

5. a) Illustrate the conducting mechanism of poly-acetylene　　7M

　b) Discuss the differences between Thermoplastics and Thermo settings　　7M

OR

6. Describe the processing of Natural rubber. What are its disadvantages?　　14M

UNIT–IV

7. a) Explain the process of Flue gas analysis by Orsat's apparatus.　　7M

　b) Write a note on a) Octane Number b) Cetane Number.　　7M

OR

8. Describe the manufacture of Coke by Otto Hoffmann by product Oven. Also explain the recovery of by products.　　14M

UNIT–V

9. Describe the manufacture of Portland cement.　　14M

OR

10. a) What are lubricants Describe any two properties of lubricants.　　7 M

　b) Define refractories. Describe their classification with examples.　　7 M

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Code: 5G121

I B.Tech. II Semester Supplementary Examinations December 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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UNIT–I

1. a) Write a program to perform addition of array elements using pointer to array.   7M

    b) Explain the declaration of pointers and pointer to pointer with examples.   7M

OR

2. a) Explain dynamic memory allocation functions in C in detail.   7M

    b) What is the use of command line arguments   7M

UNIT–II

3. a) Write a program for sorting given numbers using selection sort technique   7M

    b) Write an algorithm for Binary search? Validate it with suitable data set?   7M

OR

4. Write a C program that defines a structure **employee** containing the details such as **empno, empname, department name and salary**. The structure has to store 20 employees in an organization. Use the appropriate method to define the above details and define a function that will display the contents?   14M

UNIT–III

5. Write an algorithm to convert a given infix expression into prefix expression.   14M

OR

6. Write a C Program to perform the following operations on a queue

    a) Insert   b) Delete   14M

UNIT–IV

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

OR

8. What are different types of linked list? Write a C function to count number of elements present in single linked list.   14M

UNIT–V

9. State binary search tree property. And construct the binary search tree for the following keys: G , K, L ,R, A, C, T, F, J, T, Y, E.   14M

OR

10. Define Graph and describe various representations of a graph with suitable examples.   14M

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