Hall Ticket Number :										

R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations June 2024

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) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dy\, dx$. 7M

   b) changing the order of integration $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\, dx$ 7M

OR

2. a) Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\, dz\, dy\, dx$ 7M

   b) Find the area of the plate in the form of a quadrant (1st quadrant)of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ 7M

UNIT–II

3. a) Find $L^{-1}\left\{\frac{1}{(s-1)(s+3)}\right\}$ 7M

   b) Find the Laplace Transform of $\left(\sqrt{t}-\frac{1}{\sqrt{t}}\right)^3$ 7M

OR

4. a) Using Convolution Theorem, Evaluate $L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$ 6M

   b) Find the Laplace Transform of $\int_0^t \frac{e^{-t}\sin t}{t}\, dt$ 8M

UNIT–III

5. Solve the differential equation $\frac{d^2x}{dt^2}+9x=\sin t$ given that $x(0)=1, x\left(\frac{®}{2}\right)=1$ using Laplace Transform 14M

OR

6. Solve $y''+2y'-3y=\sin t,\ y(0)=0,\ y'(0)=0$ Using Laplace Transform 14M

UNIT–IV

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

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

OR

8. a) Show that $div(grad\ r^n)=n(n+1)r^{n-2}$ 7M

   b) Evaluate $divergence\ of\ (2x^2z\,\bar{i}-xy^2z\,\bar{j}+3yz^2\,\bar{k})$ at the point $(1,1,1)$. 7M

UNIT–V

9. Verify Divergence thermo for $\bar{F}=(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ taken over the rectangular parallelepiped $0\le x\le a$, $0\le y\le b$, $0\le z\le c$ 14M

OR

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

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Hall Ticket Number :										

R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations June 2024

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) What is a pointer? What are the features of pointers? Write a C program to print address of a variable 8M

   b) Write a C program to swap two numbers using pointers. 6M

OR

2. Compare array and pointers in terms of memory efficiency and execution time efficiency. 14M

UNIT–II

3. a) Define union. List out the differences between unions and structures 7M

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

OR

4. a) Define Structures. Explain with an example how structure members are initialized and accessed 8M

   b) Write a C program to find the given element using linear searching. 6M

UNIT–III

5. Write a program to implement a linear queue using arrays. Take into account the exceptions like Queue Full and Queue Empty. 14M

OR

6. a) What is Data Structure? Explain in detail about different type of data structures. 7M

   b) Write applications of stack 7M

UNIT–IV

7. Write advantages of doubly linked list over singly linked list. Write C function that will insert a given integer value into an ordered doubly linked list. 14M

OR

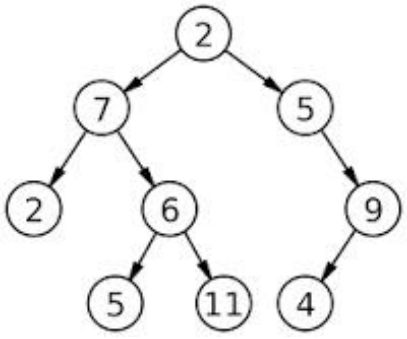
8. What is a Singly Linked List.? Explain different operations of a singly linked list with suitable examples. 14M

UNIT–V

9. Define binary search tree. Explain with example deletion of an element from a binary search tree. 14M

OR

10. Write the recursive algorithms for different binary tree traversal techniques. Find all the tree traversals for the following binary tree:



14M

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