Code: 7G121

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020

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? Explain in detail about pointer arithmetic.	7M
	b)	Write a program to read and display array elements using pointers	7M

OR

2.	a)	What is the use of command line arguments	4M
	b)	Explain in detail about dynamic memory allocation functions in C.	10M

UNIT–II

3.	a)	Define Structures. Explain with an example how structure members are initialized and accessed	8M
	b)	Explain different modes to open a file	6M

OR

4.	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

UNIT–III

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

OR

6.	Write a C Program to perform the following operations on a queue	
	i) Insert ii) Delete	14M

UNIT–IV

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

OR

8.	Write C functions to perform the following operations:	
	i. Create a circular singly linked list	
	ii. Display Circular singly linked list	14M

UNIT–V

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

OR

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

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Code: 7GC24

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020

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. a) Trace the curve $r = a(1 - \cos_n)$. 7M

   b) Evaluate the integral by changing the order of integration $\int_0^1 \int_{x^2}^{2-x} xy \, dx \, dy$. 7M

OR

2. a) Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dx \, dy$ by changing to polar coordinates. 7M

   b) Evaluate $\int_0^1 \int_0^{1-z} \int_0^{1-x-y} x + y + z \, dx \, dy \, dz$ 7M

UNIT–II

3. a) Find the Laplace Transform of sin2t sin3t 7M

   b) Find the Laplace Transform of $\dfrac{\cos at - \cos bt}{t}$ 7M

OR

4. a) Evaluate $\int_0^\infty e^{-2t} \sin^3 t \, dt$ 7M

   b) Find the Laplace Transform of the periodic function defined by the triangular wave

   $f(t) = \begin{cases} t & ; 0 \le t \le 1 \\ 2 - t & ; 1 \le t \le 2 \end{cases}$ and $f(t+2) = f(t)$ 7M

UNIT–III

5. a) Find the inverse transform of $\dfrac{s+2}{s^2 - 4s + 13}$. 7M

   b) Find the inverse transform of $\dfrac{s^2 - 3s + 4}{s^3}$. 7M

OR

6.   Solve the differential equation $y'' + y = t,\ y(0) = 1,\ y'(0) = 2$ 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) Evaluate $curl \ of \ \bar{V} = e^{xyz}(\bar{i} + \bar{j} + \bar{k})$ at the point $(1, 2, 3)$. 7M

OR

8.   Find $div \ \bar{F}$ and $curl \ \bar{F}$ where $\bar{F} = grad(x^3 + y^3 + z^3 - 3xyz)$ 14M

UNIT–V

9.   Evaluate by Green's theorem $\int_c [(x^2 - \cos hy) dx + (y + \sin x) dy]$, where 'c' is the rectangle

   with vertices $(0,0), (f,0), (f,1), (0,1)$. 14M

OR

10. Verify stoke's theorem for a vector field $\bar{F} = y^3 \bar{i} - x^3 \bar{j}$ in the region $x^2 + y^2 \le 1,\ z = 0$. 14M

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I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020
Engineering Physics
(Common to CE, ME & CSE)

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) Define constructive and destructive interferences   4M
   b) Describe Newton's rings experiment for diameter of ring   10M

OR

2. a) What is LASER and write characteristics of laser   6M
   b) Recite the ruby laser for production of laser   8M

UNIT–II

3. a) What is Unit cell & describe the Seven Crystal Systems.   10M
   b) Show Bragg's law as 2d Sin   = n   4M

OR

4. a) What is space lattice and draw Bravias lattices   10M
   b) Write steps to find Miller indices   4M

UNIT–III

5. a) State de-Broglie hypothesis of dual nature and derive its wavelength   8M
   b) Define and explain Heisenberg uncertainty principle   6M

OR

6. a) Explain postulates of free electron model   6M
   b) How the solids are classified on the basis of energy band theory   8M

UNIT–IV

7. a) Define and explain drift and diffusion currents in semiconductors   10M
   b) what is LED brief it   4M

OR

8.   Explain Meissner's effect and how superconductors are classified as Type-I & Type-2   14M

UNIT–V

9. a) Define magnetic materials write any two examples   4M
   b) Write the properties of dia, para and ferro magnetic materials   10M

OR

10. a) What is CNT and explain it   8M
    b) Write the applications of nano materials   6M

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Code: 7G221

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2020

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

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)	Define the Ohm's Law and its applications.	7M
	b)	State and explain Kirchoff's laws using neat diagrams.	7M

OR

2.	a)	Define the terms i) Electric Current ii) Potential Difference iii) Electric Power iv) Energy	8M
	b)	Three capacitors of 6 mF, 8 mF and 10 mF are connected in series. Find the equivalent capacitance.	6M

UNIT–II

3.	a)	Explain the operation & principle of dc motors and explains the significance of back emf in dc motors.	7M
	b)	A 6 pole, lap wound armature has 840 conductors and flux per pole of 0.018wb. Calculate the emf generated when the machine is running at 1500rpm.	7M

OR

4.	a)	Explain the operation of principle of DC generator.	7M
	b)	Derive the expression for Torque in a DC Motor.	7M

UNIT–III

5.	a)	Explain Torque-Slip Characteristics of a Three phase induction motor.	7M
	b)	Explain the working principle of three phase alternator.	7M

OR

6.	a)	Describe the tests that can be performed on a single phase transformer in detail.	7M
	b)	Explain the various losses that occur in single phase transformer.	7M

UNIT–IV

7.	Explain the operation of Half wave rectifier with relevant diagrams.	14M

OR

8.	a)	Explain the working of N-P-N transistor and mention its input-output characteristics.	7M
	b)	Explain the input and output characteristics of transistor in CE configuration.	7M

UNIT–V

9.	Enumerate the applications of dielectric heating and induction heating.	14M

OR

10.	a)	Describe how phase and frequency are measured by using CRO.	7M
	b)	List the applications of CRO.	7M

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