Hall Ticket Number :										

R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations March 2021

C Programming and 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) Write a C program to access elements of an array using pointer.
   b) Explain the concept of pointers to pointers.

OR

2. a) Define pointer and explain about pointer arithmetic.
   b) List the four dynamic memory allocation functions in C and give their syntax with examples.

UNIT–II

3. a) Explain with an example about nested structures.
   b) Explain any four four standard library functions for files in C.

OR

4. a) Give the tracing of selection sort algorithm for the data [5, 1, 7, 8, 2, 3, 4, 6] to be sorted in ascending order.
   b) Differentiate between structure and union.

UNIT–III

5. a) Write a C program to implement operations of a dynamic queue.(Use pointers)
   b) Write a program to implement stack operations using pointers.

OR

6. Convert the following infix expressions to postfix expressions.
   i) A / B * C - D ii) (A - B) * (C * D) iii) A + B + C * D

UNIT–IV

7. a) Explain the advantages and disadvantages of linked lists over arrays.
   b) Write the applications of circular linked list.

OR

8. a) Write a C program for insertion operation in a singly linked list.
   b) Write C functions for deletion operations in doubly linked list.

UNIT–V

9. a) Define the following terms of a graph.
   i) Undirected graph ii) In degree iii) Digraph
   b) Explain different types of traversals in a tree.

OR

10. Create a binary search tree by inserting following elements into an empty BST: [6, 4, 5, 3, 10, 8, 11].

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Hall Ticket Number :										

R-15

Code: 5G523

I B.Tech. II Semester Supplementary Examinations March 2021

Engineering Drawing-II

(Common to EEE , ECE, CSE & IT)

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. Draw the projections of a circle 60 mm diameter resting on V.P on a point on the circumference. The plane is inclined at 45^0 V.P and perpendicular to H.P. The center of the plane is 45 mm above H.P.

OR

2. A regular hexagonal plane of 35mm side has a corner at 20mm from V.P and 50mm from H.P. Its surface is inclined at 45^0 to V.P and perpendicular to H.P. Draw the projections of the plane.

UNIT–II

3. Draw the projections of a cone its base 50mm diameter and axis 80mm long. The cone is lying on the H.P by one of its generators with its axis parallel to the V.P.

OR

4. Draw the projections of a pentagonal prism of base 25mm side and axis 50mm long, when it is resting on one of its rectangular faces on H.P. The axis of the solid is inclined at 45^0 to V.P.

UNIT–III

5. An equilateral triangular prism of side of base 25mm and axis 50mm long is resting on an edge of its base on H.P. The face containing that edge is inclined at 30^0 to H.P. Draw the projections of the prism, when the edge on which the prism rests is inclined at 60^0 with V.P.

OR

6. A pentagonal prism is resting on one of the corners of its base on H.P. The longer edge containing that corner is inclined at 30^0 to H.P and the vertical plane containing that edge is inclined at 45^0 to V.P. Draw the projections of the prism of side of the base is 30mm and height is 80mm.

UNIT–IV

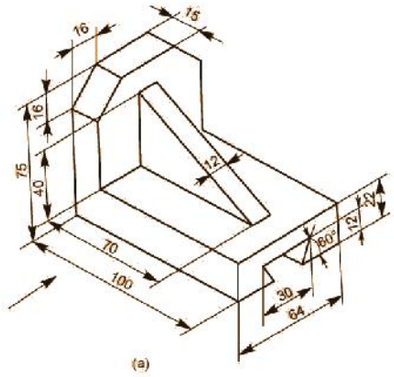
7. Draw the isometric projection of a hexagonal plane of side 25mm ,assuming the surface of the plane to be (i) parallel to V.P and (ii) parallel to H.P

OR

8. Draw the isometric view of a circle of 50mm diameter , when it is (i) parallel to V.P and (ii) parallel to H.P.

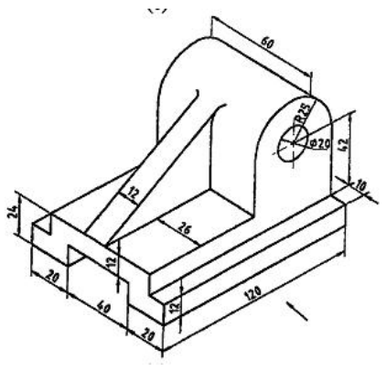
UNIT–V

9. The Figure shows a machine block. Draw its (i) Front view (ii) Top view (iii) Side view. Assume all the dimensions are in ‘mm ‘.



OR

10. The Figure shows an object. Draw its (i) Front view (ii) Top view (iii) Side view. Assume all the dimensions are in ‘mm ‘.



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Hall Ticket Number :										

R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations March 2021

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 of order of integration and evaluate $\int_0^{\infty}\int_x^{\infty}\frac{e^{-y}}{y}\,dx\,dy$

OR

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

UNIT–II

3. Find the Laplace Transform of $\frac{\text{Cos}\,2t-\text{Cos}\,3t}{t}$

OR

4. State and Prove the convolution Theorem of Laplace Transform

UNIT–III

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

OR

6. Solve the differential equation $y''+3y'+2y=e^{-t}$ given that $y(0)=0, y'(0)=1$ using Laplace Transform

UNIT–IV

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

OR

8. Prove that $\nabla r^n = n r^{n-2}\bar{r}$ where $\bar{r}=x\bar{i}+y\bar{j}+z\bar{k}$ and $r=|\bar{r}|$

UNIT–V

9. Verify Green's Theorem in the plane for $\int_c\left[\left(3x^2-8y^2\right)dx+\left(4y-6xy\right)dy\right]$ where 'c' encloses the region bounded by $y=\sqrt{x}$ and $y=x^2$

OR

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

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Hall Ticket Number :										

R-15

Code: 5GC23

I B.Tech. II Semester Supplementary Examinations March 2021

Engineering Physics

(Common to CE, ME, CSE & IT)

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) Describe construction of optical fiber
   b) Write the application of optical fiber in communication system

OR

2. a) Explain conditions of interference by the reflected light due to thin parallel film
   b) Describe the Fraunhofer diffraction grating spectrum

UNIT–II

3. a) Define ultrasonics and write its properties
   b) Describe the production of ultrasonics by Inverse Peizo electric effect

OR

4. a) Deduce Bragg's law equation
   b) Illustrate the powder method to describe the structure of crystal

UNIT–III

5. a) Describe Fermi-Dirac distribution function
   b) Write the sources of electrical resistance

OR

6. Derive Eigen energies of a particle in one dimensional potential box

UNIT–IV

7. a) Explain Hall effect and write its applications
   b) What is photo diode explain it

OR

8. a) Explain direct and indirect band gap semiconductors
   b) Brief Joshepson's effect with types

UNIT–V

9. a) Define ferromagnet and explain the B-H loop
   b) Explain the production of nano materials by ball milling method

OR

10. a) Brief the basic principles of nano materials
    b) Explain the synthesis of nano materials by sol-gel method

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Hall Ticket Number :										

R-15

Code: 5GC25

I B.Tech. II Semester Supplementary Examinations March 2021

Mathematical Methods-II

(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. Find the parabola of the form $a + bx + cx^2$ which fits most closely with the observations

x	-3	-2	-1	0	1	2	3
y	4.63	2.11	0.67	0.09	0.63	2.15	4.58

OR

2. Estimate *y* at *x* = 2.25 by fitting an indifference curve of the form $ay = ax + b$ to the following data

x	1	2	3	4
y	3	1.5	6	7.5

UNIT–II

3. Using Taylor's series method solve the initial value problem

$\frac{dy}{dx} = x - y$, $y(0) = 1$ at $x = 0.2, 0.2, 0.3$ and compare the value with the exact solution.

OR

4. Using Euler's method solve for *y* at *x = 2* from $\frac{dy}{dx} = 3x^2 + 1, y(1) = 2$, taking step size (i) $h = 0.5$ and (ii) h 0.25.

UNIT–III

5. Expand f(x) = cos x, $0 < x < \pi$ in half range sine series.

OR

6. Define periodic function and find the Fourier expansion of $f(x)=x-x^2$, $-1<x<1$.

UNIT–IV

7. Find the Fourier cosine transform of $f(x) = 1/(1 + x^2)$. Hence derive the Fourier sine transform of $\phi(x) = \frac{x}{1+x^2}$.

OR

8. Find the Fourier sine and cosine transform of e^{-ax} ($a > 0$) and deduce the inverse formula.

UNIT–V

9. Solve $(\sec x)p + (\sin x - y \sec x \tan x)q = (a^2 - z^2)$.

OR

10. Solve $\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial y} + 2u$ subject to conditions, $u = 0$, $\frac{\partial u}{\partial x} = 1 + e^{-3y}$ when $x = 0$.

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