Hall Ticket Number :

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations August 2021
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)
****

UNIT–I

1. a) What is the use of command line arguments
   b) Write a program using pointers to compute the sum of all elements stored in an array.

OR

2. a) How pointers permit inter function communication.
   b) How do you simulate arrays using pointers? Illustrate.

UNIT–II

3. a) How to copy and compare structure variables? Illustrate with example.
   b) Write and Explain syntax of the following functions: (i) fopen() (ii) fclose() (iii) fread() (iv) fwrite() (v) rewind() (vi)fprintf() (vii) fscanf() (viii) feof().

OR

4. a) Explain the following:
      i. Nested structures ii. Array of structures
   b) Define union. List out the differences between unions and structures

UNIT–III

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

OR

6. Show the stack after each operation of the following sequence that starts with the empty stack: push(a), push(b), pop, push(c), push(d), pop.

UNIT–IV

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

OR

8. Write a C function to insert and delete a node from the front end in case of doubly linked list.

UNIT–V

9. Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree.

OR

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

***

Code: 7G521

I B.Tech. II Semester Supplementary Examinations August 2021

Engineering Graphics-II

(Common to CE & ME)

Max. Marks: 70   Time: 3 Hours

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

****

UNIT–I

1. a) A hexagonal pyramid, base 25mm side and axis 50mm long, has an edge of its base on the ground. Its axis is inclined at 30^0 to the ground and parallel to the VP. Draw its projections.   7M

   b) Draw the projections of a cone, base 75mm diameter and axis 100mm lying on the HP on one of its generators with the axis parallel to the VP.   7M

OR

2. A pentagonal pyramid, base 25mm side and axis 50 mm long has one of its triangular faces in the V.P and the edge of the base contained by that face makes an angle of 30^0 with the H.P. Draw its projections   14M

UNIT–II

3. A pentagonal prism, side of base 50 mm and length 100 mm has a rectangular face on the H.P. and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T. of which makes an angle of 30^0 with xy and bisects the axis. Draw the sectional front view, top view and true shape of the section.   14M

OR

4. A cone, diameter of base 45 mm and axis 60 mm is resting on its base on the HP. It is cut by a section plane perpendicular to the VP and inclined at 800 to the HP. The section plane passes through the apex. Draw the sectional top view and also obtain the true shape of the cut section.   14M

UNIT–III

5. A square prism of base 50 mm side and height 125 mm stands on the ground with its side of base inclined at an angle of 30^0 to VP. It is penetrated by a cylinder of diameter 50 mm and axis 125 mm long. The axis of the cylinder is parallel to both HP and VP and bisects the axis of the prism. Draw the projection showing fully the curves of intersection.   14M

OR

6. A cube of 50 mm long edges is resting on the H.P. with a vertical face inclined at 30^0 to the V.P. It is cut by a section plane, perpendicular to the V.P. inclined at 30^0 to the H.P. and passing through a point on the axis, 38 mm above the H.P. Draw the sectional top view, true shape of the section and development of the surface of the remaining portion of the cube.   14M

UNIT–IV

7. A hexagonal prism with a 30 mm base and 45 mm axis has an axial hole with a 30 mm diameter. Draw its isometric projection.   14M

OR

8. A hexagonal prism of base edge 30 mm and height 70mm long is resting on its rectangular face on the ground with its axis parallel to the VP. A square prism of 20 mm base edge and height 40 mm rests on its base on the top rectangular face of the hexagonal prism. The axis of the square prism intersects and bisects the axis of the hexagonal prism when produced. One of the base edges of the square prism is parallel to the VP. Draw an isometric projection of the set up.   14M
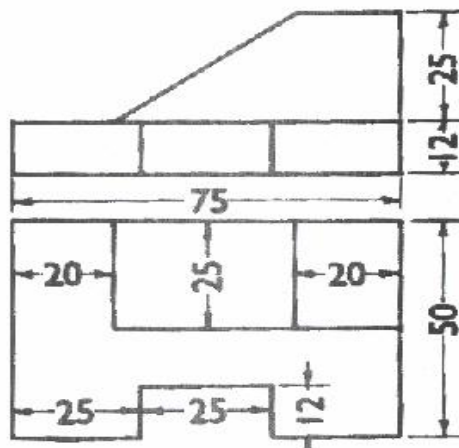
UNIT–V

9.   Draw the front view, top view and side view of the object whose isometric view is shown
      in the Figure below (All dimensions are in mm).
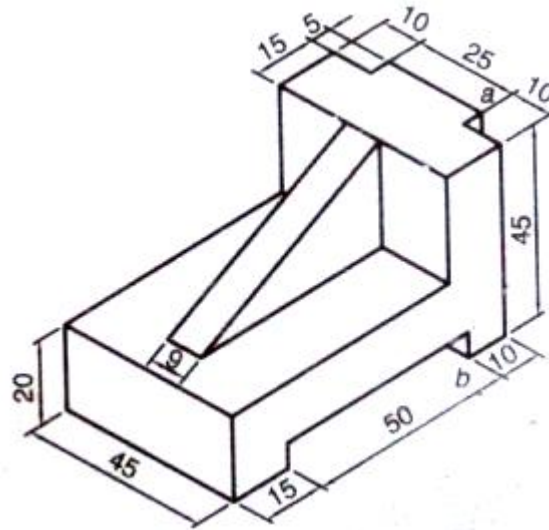
14M

OR

10.   Draw isometric view for the following orthographic projection.

14M

***

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations August 2021

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)

****

UNIT–I

1. a) Trace the curve $y^2(2a-x)=x^2$.   7M

   b) Evaluate the double integral $\iint_R x\,y\,dx\,dy$ where 'R' is the region bounded by the lines $x-axis$, the line $y=2x$ and $y=\dfrac{x}{4a}$ 7M

OR

2. a) Trace the curve $r^2=a^2\cos 2\theta$ 7M

   b) Evaluate $\iint r^3 dr\,d\theta$, over area bound between the circles $r=2\cos\theta$ and $r=4\cos\theta$ 7M

UNIT–II

3. a) Find the Laplace Transform of $t^2 e^{-3t}$.   7M

   b) Find the Laplace Transform of $\dfrac{\operatorname{Sin}3t\,\operatorname{Cos}t}{t}$ 7M

OR

4. a) Find the Laplace Transform of $\int_0^t\int_0^t\int_0^t \operatorname{Cos}a\,u\,du\,du\,du$ 7M

   b) Find the Laplace Transform of $\dfrac{\operatorname{Cos}2t-\operatorname{Cos}3t}{t}$ 7M

UNIT–III

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

   b) Find the inverse transform of $\dfrac{1}{s(s^2+a^2)}$.   7M

OR

6. Using Convolution Theorem, Evaluate $L^{-1}\left\{\dfrac{1}{s\left(s^2+2s+2\right)}\right\}$ 14M

UNIT–IV

7. a) Find the unit vector normal to the surface $x^3+y^3+3x\,y\,z=3$ at the point $(1,\,2,-1)$ 7M

   b) Prove that $div\,curl\,\overline{F}=0$ 7M

OR

8. Evaluate the line integral of $\int_c\left(xy+y^2\right)dx+x^2dy$ where 'c' is the square formed by the lines $y=\pm1$ and $x=\pm1$ 14M

UNIT–V

9. Verify Gauss Divergence theorem for $\overline{F}=x^3\overline{i}+y^3\,\overline{j}+z^3\,\overline{k}$ taken over the cube bounded by $x=0,x=a;y=0,\ y=a;z=0,z=a$ 14M

OR

10. Verify Green's Theorem for $\int_c\left[\left(3x-8y^2\right)dx+\left(4y-6xy\right)dy\right]$ where 'c' is bounded by region bounded by $x=0$, $y=0$ and $x+y=1$ 14M

***

Code: 7G522

I B.Tech. II Semester Supplementary Examinations August 2021
Engineering Mechanics-Dynamics
(Common to CE & ME)

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

UNIT–I

1. a) Define normal and tangential components of accelerations. Write the equations.

   b) Derive the equations of rectilinear motion of a particle moving with constant acceleration.

OR

2. A stone is dropped into a well and falls vertically with constant acceleration $g=9.81$ m / s². The sound of impact of the stone is on the bottom of the well is heard 6.5 sec after it is dropped. If the velocity of sound is 336.33 m / s, how deep is the well?

UNIT–II

3. A ladder of 3mtrs leaning against a wall with an inclination of 30⁰ and resting on a floor, slides down. If the velocity of the bottom end is 2 m/s towards the right, for the position shown, determine

   (i) the angular velocity of the ladder and

   (ii) the velocity of the end attached to wall

OR

4. a) Derive the equations describing the motion of a rigid body rotating about a fixed axis with constant angular acceleration.

   b) Explain about kinematics of rotation of a rigid body.

UNIT–III

5. a) Explain Virtual work principle and D'Alembert's principle with an example.

   b) A locomotive of weight W = 600 KN goes around a curve of radius r=300m at a uniform speed of 70kmph. Determine the total lateral (outward) thrust on the rails.

OR

6. Determine the tensions in the strings and accelerations of blocks A and B weighing 150N and 50N connected by a string and a frictionless and weightless pulley as shown in figure.
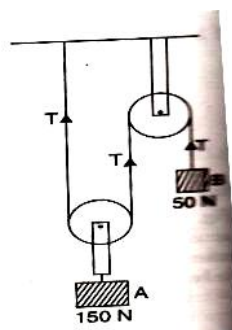
UNIT–IV

7. a) Derive impulse – momentum equation.

   b) A jet of water 6 mm moves at 15 m/s issued from a nozzle strikes normally a smooth fixed plate. The water after striking the plate leaves parallel to the plate. Determine the force exerted by the jet of water on the plate.

OR

8. a) State and prove Work-Energy principle of rectilinear translation.

   b) Define kinetic energy and potential energy of a system. Hence state law of conservation of energy of a system of particles.

UNIT–V

9. A solid circular cylinder and a sphere are started from rest at the top of an inclined plane at the same time, and both roll without sliding down the plane. If, when the sphere reaches the bottom of the incline, the cylinder is 3.6 m behind it, what is the total length s of the incline? Assume both the cylinder and sphere have the same radius r.

OR

10. The composite pulley shown in figure weighs 800N and has a radius of gyration of 0.6m. The 2000N and 4000N blocks are attached to the pulley by inextensible strings as shown in figure. Neglecting weight of the strings, determine the tension in the strings and angular acceleration of the pulley.

***
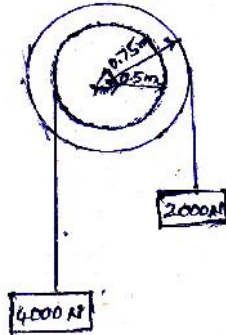
Code: 7GC23

I B.Tech. II Semester Supplementary Examinations August 2021

Engineering Physiscs

(Common to CE , ME & CSE)

Max. Marks: 70   Time: 3 Hours

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

****

UNIT–I

1. a) Discuss the working of He-Ne laser   8M

    b) Summarize the applications of LASER   6M

OR

2. a) Differentiate Step-Index and Graded-Index optical fibers   8M

    b) Brief the working principle of optical fiber   6M

UNIT–II

3. a) Differentiate SC with BCC   8M

    b) Discuss the rules to find Miller Indices and find Miller Indices of a plane (2a,3b,2c)   6M

OR

4. a) Explain production and detection of ultrasonics in detail   7M

    b) Formulate applications of Ultrasonics   7M

UNIT–III

5. a) Derive Schrodinger's time independent wave equation   10M

    b) Brief the physical importance of Schrodinger's equation   4M

OR

6. Analyze motion of electron in periodic potential of metal   14M

UNIT–IV

7. a) Differentiate intrinsic and extrinsic semiconductors   8M

    b) Explain direct and indirect band gap semiconductors   6M

OR

8. a) State and explain Hall effect   8M

    b) Brief Joshepson's effect with types   6M

UNIT–V

9. a) Differentiate any three of dia , para , ferro, antiferro and ferrite   6M

    b) classify soft and hard magnetic materials   8M

OR

10. a) Justify magnetic moment by the origin of materials   8M

    b) classify the ferromagnetics by hysteresis property   6M

***