

Code: 4G513*B.Tech. I Year Supplementary Examinations May/June 2016***Engineering Drawing**

(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)

UNIT-I

1. The distance between two fixed points is 100mm. a point moves in a plane through these two points, such that the sum of its distances from these two fixed points is always 140mm. Trace the path of the point. Draw a tangent and a normal to the curve at a point on it at a distance of 45mm from one of the fixed points.

OR

2. Draw an epicycloid when the directing and generating circles are each 50mm dia. Draw a tangent and a normal to the curve at a point on it 60mm. from the centre of the directing circle.

UNIT-II

3. The front view of a 125mm long line PQ measures 75mm and its top view measures 110mm. The end P is at distances of 20mm each from the reference planes. Draw its projections and determine its inclinations with the reference planes.

OR

4. A line AB is inclined at 40° to H.P. A is 25mm above H.P. and 30mm in front of V.P. The top view of the line is 70mm long and is inclined at 30° to XY. Draw the projections and determine true length and also its inclination with V.P.

UNIT-III

5. Draw the projections of a regular hexagon of 30mm side, having one of its sides in the H.P. but inclined at 60° to V.P., and its surface making an angle of 45° with H.P.

OR

6. The top view of a plate, the surface of which is perpendicular to V.P. and inclined at 60° to H.P., is a circle of 60mm dia. Determine its true shape.

UNIT-IV

7. Draw the projections of a pentagonal prism, 30mm base edges & 65mm long axis, when it has a corner of its base in the V.P., axis inclined at 30° to V.P. and the front view of the longer edge passing through the corner in the V.P. making an angle of 45° with XY

OR

8. Draw the projections of a cube of 40mm long edges, resting on one of its corners in the H.P. and a solid diagonal perpendicular to V.P.

UNIT-V

9. Draw the isometric view of the frustum of the hexagonal pyramid, base 50mm long edges, top 25mm long edges & height 50mm.

OR

10. Draw the front view, side view and top view of the solid shown in figure.

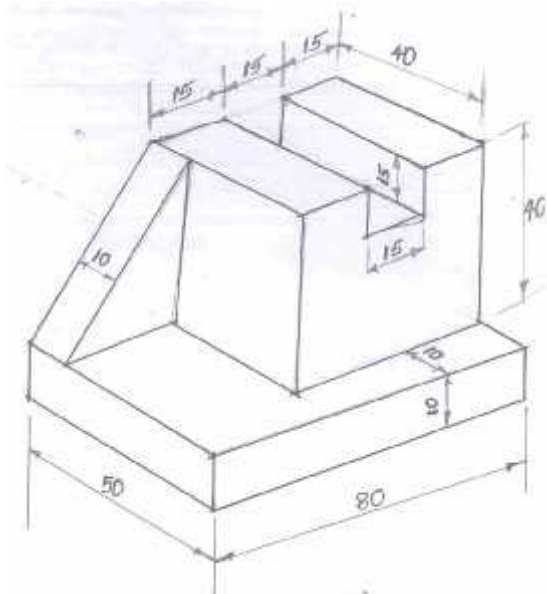


Figure (Not to scale)

Mathematics-I

(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) Find the orthogonal trajectories of the family of curves $r^n = a^n \cos n\theta$ 7M
- b) Solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$ by the method of variation of parameters 7M

OR

2. a) If the temperature of a cup of coffee is 92°C when freshly poured in a room having temperature 24°C. In one minute it was cooled to 80°C. How long a period must elapse before the temperature of the cup becomes 65°C? 6M
- b) Solve $(D^3 + 1)y = e^{-x} + \cos(2x - 1)$ 8M

UNIT-II

3. a) Verify Rolle' theorem for $f(x) = e^{-x} \sin x$ in $[0, f]$. 8M
- b) If $u = x + y + z, uv = y + z, uvw = z$, then prove that $\frac{\partial(x, y, z)}{\partial(u, v, w)} = u^2 v$ 6M

OR

4. a) Verify the Meclaurin's theorem for $f(x) = (1-x)^{\frac{5}{2}}$ with Lagrange's form of remainder up to 3 terms with $x=1$. 7M
- b) Discuss the maxima and minima of $f(x, y) = x^3 y^2 (1 - x - y)$. 7M

UNIT-III

5. a) Trace the curve $y^2(2a - x) = x^3$ 7M
- b) Evaluate $\iint r \sin \theta \, dr d\theta$ over the cardioids $r = a(1 - \cos \theta)$ above the initial line. 7M

OR

6. Change of order of integration and hence evaluate the double integral $\int_0^1 \int_{x^2}^{2-x} xy \, dx dy$ 14M

UNIT-IV

7. a) Evaluate $L\{te^{3t} \sin 2t\}$ 4M
- b) Find the Laplace transform of periodic function $f(t) = \begin{cases} 1, & 0 < t < a/2 \\ -1, & a/2 < t < a \end{cases}$ And $f(t+a) = f(t)$. 10M

OR

8. Solve $y'' + 2y' + 5y = e^{-t}$, $y(0) = 0$, $y'(0) = 1$ using Laplace transform technique. 14M

UNIT-V

9. a) Find the directional derivative of $2xy + z^2$ at $(1, -1, 3)$ in the direction of $\bar{i} + 2\bar{j} + 3\bar{k}$. 7M
- b) Prove that $\text{div} \left(\frac{\bar{r}}{r} \right) = \frac{2}{r}$, where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$ and $r = |\bar{r}|$ 7M

OR

10. Verify Gauss divergence theorem for $\bar{F} = (x^3 - yz)\bar{i} - 2x^2y\bar{j} + z\bar{k}$ taken over the surface of cube bounded by the planes $x=y=z=a$ & $x=y=z=0$. 14M

Code: 4G111

B.Tech. I Year Supplementary Examinations May/June 2016

Programming in C & Datastructures

(Common to CSE & IT)

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) Explain various kinds of Computer Systems. Explain the differences between them
b) What is an algorithm and flowchart and describe the various symbols in flowchart. Draw a flowchart for adding two numbers

OR

2. a) Explain the structure of a "C" programming language
b) Explain the "C" input and output library functions *printf* and *scanf* with examples.

UNIT-II

3. a) What are the bit-wise operators and give an example for each operator
b) Explain the basic operations on Strings. Write a program to read string from keyboard and display it using character array or pointers.

OR

4. a) Write the syntax for various control statements and give example for each control statement.
b) Write a program for two dimension Matrix reading from keyboard and displaying on the monitor using arrays

UNIT-III

5. a) What is parameter pass by value and pass by reference in functions? Write a program to exchange the values of two variables using functions in both methods
b) What is a pointer and write syntax for pointer declaration. Explain the dynamic memory allocation and give an example for it.

OR

6. a) Explain pointers to functions and command line arguments with examples
b) Write a program to find the substring of a given string using pointers

UNIT-IV

7. a) Explain nested and array of structures.
b) Explain character input and output functions with example programs

OR

8. a) Write and explain selection sort or quick sort program with example
b) Write and Explain binary search method with example

UNIT-V

9. a) Explain infix, prefix and postfix notations. Give an example converting from one form to other forms
b) Write a program for insertion, deletion and searching of an item in the tree data structure.

OR

10. a) Define and Explain Stack and Queue and their operations
b) Explain the difference between queue and circular queues.

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R-14

Code: 4GC15

B.Tech. I Year Supplementary Examinations May/June 2016

Mathematical Methods

(Common to CSE & IT)

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) Define the following and give one example
- i) Symmetric matrix. ii) Skew-symmetric matrix iii) Orthogonal matrix 6M
- b) Define the rank of the matrix. Find the rank of the matrix

$$A = \begin{bmatrix} 1 & 1 & 2 & 3 \\ 3 & 4 & 7 & 10 \\ 5 & 7 & 11 & 17 \\ 6 & 8 & 13 & 16 \end{bmatrix} \text{ by reducing it to Canonical form.}$$

8M

OR

2. a) Find the values of a and b for which the equations $x + y + z = 6$, $x + 2y + 3z$ and $x + 2y + }z = \sim$ will have i) no solution ii) a unique solution iii) an infinite number of solutions. 7M

- b) Find the matrix M that diagonalises the matrix $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ by means of a similarity transformation. Verify your answer. 7M

UNIT-II

3. a) Reduce the quadratic form $2x_1^2 + 6x_2^2 + 2x_3^2 + 8x_1x_3$ to the canonical form by orthogonal transformation. Also find the rank, index, signature and the nature of quadratic form. 7M

- b) Verify that the sum of the eigen values of A equals the trace of A and their product equals $|A|$, for the matrix $A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{bmatrix}$. 7M

OR

4. a) Define eigen values and eigen vectors of a matrix. 4M

- b) Find the eigen values and eigen vectors of the Matrix $A = \begin{bmatrix} 11 & -4 & -7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{bmatrix}$ 10M

UNIT-III

5. a) Find the real root of $x \log_{10} x - 1.2 = 0$ correct to five places of decimal using Regula-Falsi method. 7M
- b) Derive Newton's forward and backward difference interpolation formulae. 7M

OR

6. a) Evaluate $\sqrt{12}$ to four decimal places by Newton-Raphson Method. 7M
- b) Write down the general formula for pth root. Find cube root of 10. 7M

UNIT-IV

7. a) Evaluate $\int_0^2 \frac{1}{1+x^2} dx$ using Trapezoidal rule, Taking $h = 0.25$. 7M
- b) Find the curve $Y = aX + (b/X)$ to the following data.

X	1	2	3	4
Y	-1.51	0.99	3.88	7.66

7M

OR

8. a) Given $\frac{dy}{dx} = \frac{y-x}{y+x}$ with $y=1$ for $x=0$. Find y approximately for $x=0.1$ by Euler's method. 7M
- b) Find a solution of the set of simultaneous equations
 $\frac{dx}{dt} = xy + t, \frac{dy}{dt} = ty + x$ Subjected to initial conditions $x=1, y=-1, t=0$
 using Taylor's series method. 7M

UNIT-V

9. a) Expand $f(x) = (x-1)^2$ as a Fourier cosine series in $0 < x < 1$ 7M
- b) Find the half range sine series for $f(x) = \left. \begin{array}{l} x, \quad 0 \leq x \leq 1 \\ 2-x, \quad 1 \leq x \leq 2 \end{array} \right\}$ 7M

OR

10. a) Eliminate the arbitrary constants and arbitrary function respectively
 i) $z = (x+a)(y+b)$ ii) $f(x^2 + y^2 + z^2, z^2 - 2xy) = 0$ 7M
- b) Find the complete integral of the first order the differential equation
 i) $(p+q)(z-xp-yq) = 1$
 ii) $pqz = p^2(xq+p^2) + q^2(yq+q^2)$ 7M
