B.Tech. I Year Supplementary Examinations May 2017
Engineering Drawing
(Common to EEE, ECE, CSE and 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. Construct a hyperbola, with the distance between the focus and the directrix as 50mm and eccentricity as 3/2. Also, draw normal and tangent to the curve at a point 30 mm from the axis.

OR

2. Draw an epicycloid of rolling circle 40mm diameter, which rolls outside another circle of 150 mm diameter for one revolution.

UNIT–II

3. Draw the projections of the following points on a common reference line.
   i) P 35mm behind the VP and 20mm below the HP
   ii) Q 40mm in front the VP and 30mm above the HP
   iii) R 50mm behind the VP and 15mm above the HP
   iv) S 40mm below the HP and in the VP
   v) T 30 mm in front of the VP and 50mm below the HP

OR

4. A line PQ 70 mm long has its end P 10 mm above H.P and 15 mm in front of V.P. Its top view and front view measure 60 mm and 40 mm respectively. Draw the projections of the line and determine its inclinations with H.P and V.P

UNIT–III

5. A hexagonal plate of side 20 mm rests on the HP on one of its sides inclined at 45° to the VP. The surface of the plate makes an angle of 30o with the H.P. Draw the front and top views of the plate.

OR

6. A regular pentagonal lamina ABCDE of side 30 mm has one of its edges parallel to the VP and inclined at 30° to the HP. The pentagon is inclined at 45° to the VP. Draw the projections.

UNIT–IV

7. A Square pyramid of base side 30 mm and axis length 50 mm has one of its triangular faces in the VP and the axis parallel to and 25 mm above the HP. Draw its top and front views.

OR

8. Draw the projections of a hexagonal prism of base 25 mm side and axis 60 mm long resting on one of its corners of the base on HP. The axis of the solid is inclined at 45o to HP.

UNIT–V

9. A pentagonal prism, 30 mm edge of base and 65 mm height, stand on HP such that an edge of the base is parallel to VP and nearer to it. Draw the isometric view of the prism.

OR

10. Sketch the front view and top view of the object given in figure below.

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R-14
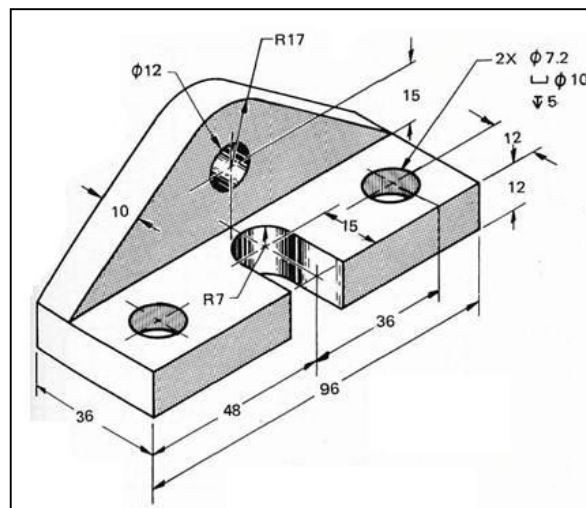
B.Tech. I Year Supplementary Examinations May 2017
Mathematics-I
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Solve $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)^2$.   7M

   b) Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = x + e^x \cos x$.   7M

OR

2. a) A body originally at $80_o c$ cools down to $60_o c$ in 20 minutes, the temperature of the air being $40_o c$. What will be the temperature of the body after 40 minutes from the original?   7M

   b) Using the method of variation of parameters Solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$.   7M

UNIT–II

3. a) Verify Lagrange's mean value theorem for the $f(x) = (x-1)(x-2)(x-3)$ in $(0,4)$, and find the appropriate value of 'c'.   7M

   b) If $u = 3x^2 - 2y^2 - 4z^2$, $v = x^2 yz$, $w = z^2 - xy$, then evaluate $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ at $(1,-1,0)$.   7M

OR

4. a) Discuss the maxima and minima of $f(x,y) = x^3 y^2 (1 - x - y)$.   7M

   b) Expand $e^{\sin x}$ by Maclaurin's series upto the term containing x^4.   7M

UNIT–III

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

   b) Change the order of integration in $I = \int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\, dx$ and hence evaluate.   7M

OR

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

   b) Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)} dx\, dy$ by changing to polar co-ordinates and hence show that $\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$.   7M

UNIT–IV

7. a) If a periodic function of period '2a' is defined by
   $f(x) = \begin{cases} t, & 0 \le t \le a \\ 2a - t, & a \le t \le 2a \end{cases}$, then show that $L\{f(t)\} = \frac{1}{s^2} \tanh\left(\frac{as}{2}\right)$.   7M

   b) Find $L\left\{\frac{\cos at - \cos bt}{t} + t \sin t\right\}$.   7M

OR

8. a) Apply convolution theorem to evaluate $L^{-1}\left\{\frac{s}{(s^2+a^2)^2}\right\}$.   7M

   b) Use Laplace transform method to solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^t$, given $y(0) = 2$, $y'(0) = -1$.   7M

UNIT–V

9. a) Find $div\, \vec{F}$ and $rl\, \vec{F}$, where $\vec{F} = grad\,(x^3 + y^3 + z^3 - 3xyz)$.   7M

   b) Verify Green's therom for $\int_c (xy + y^2)dx + x^2 dy$, where c is the curve bounded by $y = x$ and $y = x^2$.   7M

OR

10. a) Verify Divergence therom for $\vec{F} = (x^2 - yz)\hat{i} + (y^2 - zx)\hat{j} + (z^2 - xy)\hat{k}$ taken over the rectangular parallelepiped $0 \le x \le a$, $0 \le y \le b$, $0 \le z \le c$.   7M

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

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B.Tech. I Year Supplementary Examinations May 2017
Mathematical Methods
(Common to CSE and 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) Solve the system of homogeneous equation

   $X+3y+2z=0$

   $2x-y+3z=0$

   $3x-5y+4z=0$

   $X+17y+4z=0$ 7M

   b) Find the eigen values and eigenvectors of the matrix $\begin{bmatrix} 3 & -2 & -5 \\ 4 & -1 & -5 \\ -2 & -1 & -3 \end{bmatrix}$

   7M

OR

2. a) Diagonalize the matrix $A=\begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ and hence find A^8. Find the model matri

   14M

UNIT–II

3. a) Show that $A=\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$ is Skew-Hermitian and also Unitary. Find the eigen

   values and eigen vectors.   7M

   b) By Lagrange's reduction transform the quadratic form $x^2+2y^2-7z^2-4xy+8xz$ to
   sum of the squares form   7M

OR

4. a) Transform the equation form $x^2+3y^2+3z^2-2yz$ into canonical form by orthogonal
   reduction. Determine the index, signature and nature of the quadratic form.   14M

UNIT–III

5. a) Find a positive root of the equation $xe^x=1$ which lies between 0 and 1 by
   bisection method   7M

   b) Applying Lagrange's formula find a cubic polynomial for the following data

X	0	2	3	4	7
Y	-1	3	6	9	12

   7M

OR

6. a) Find a real root of the equation $x^3-2x-5=0$ using Newton's raphson method   7M

   b) Form the following table the values of x and f(x) determine (i) f(0.23) and (ii)
   f(0.29)

X	0.20	0.22	0.24	0.26	0.28	0.30
f(x)	1.6596	1.6698	1.6804	1.6912	1.7024	1.7139

   7M

<div align="center">UNIT–IV</div>

7. a) Evaluate $\int_{0}^{1} \dfrac{1}{1+x}\, dx$ by (i)Trapezoidal rule   (ii) Simpson's $\dfrac{1}{3}$ rd rule

7M

   b) Given $\dfrac{dy}{dx} = y - x$ when y(0) =2 , find y(0.1) and y(0.2) correct to four decimal

   places by Runge-kutta method

7M

<div align="center">**OR**</div>

8. a) Fit a polynomial for the following data

X	0	1	2	3	4	5
Y	2	5	7	9	12	18

4M

   b) Use the predictor- corrector formula for tabulation a solution of $10\dfrac{dy}{dx} = x^2 + y^2$,

   y(0)=1 for the range 0.5   x   1.

10M

<div align="center">UNIT–V</div>

9. a) Find the Fourier series expansion of the function f(x) = x² in (- ,)

7M

   b) Solve (y+zx)p-(x+yz)q = x²-y²

7M

<div align="center">**OR**</div>

10. a) Obtain the half-range Fourier sine and cosine series for f(x) =x in

   $0 < x < \dfrac{f}{2}$ and f(x)=   − x in $\dfrac{f}{2} < x <$.

7M

   b) Solve $3u_x + 2u_y = 0$ with $u(x,0) = 4e^{-x}$ by method of separation of variables.

7M

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R-14

B.Tech. I Year Supplementary Examinations May 2017
Programming in C and 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)
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UNIT–I

1. a) Explain about generation of programming languages.

    b) What are the difference between keywords and identifiers?

OR

2. a) Why #include is used in a c program?

    b) Write a c program to print ASCII value of a character.

    c) C Program to Find the Size of int, float, double and char

UNIT–II

3. a) What is operator? Explain about different types of operators in detail.

    b) C Program to Make a Simple Calculator Using switch...case

OR

4. a) Write a C program find largest and smallest in n elements using arrays.

    b) Explain any four string handling functions.

UNIT–III

5. a) What is an argument? Differentiate between formal arguments and actual arguments?

    b) What is the purpose of main( ) function?

OR

6. a) Define pointer. How are pointer variables initialized?

    b) C Program to Access Elements of an Array Using Pointer.

UNIT–IV

7. a) Elaborate different ways of passing structure as arguments in functions.

    b) Write a C program to print maximum marks in each subject along with the name of the student by using structures. Take 3 subjects and 3 students records.

OR

8. a) Describe the following file functions.

    i.   fopen().
    ii.   fclose().
    iii. getc().
    iv.   putc().

    b) Write and explain linear search procedure with a suitable example.

UNIT–V

9. a) What is meant by linked list? What are the advantages and disadvantages in using linked lists?

    b) Write a program to illustrate queue operations.

OR

10. a) What are the advantages and disadvantages of stack? Write a program to illustrate stack operations.

    b) Describe the infix, postfix and prefix expressions with examples.

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B.Tech. I Year Supplementary Examinations May 2017
Engineering Chemistry
(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 meant by hardness of water? Give its units   7M

    b) What is meant by carbonate and non-carbonate hardness of water? Explain with examples.   7M

OR

2   a) Write brief account on Priming and foaming.   7M

    b) 0.5 g of $CaCO_3$ was dissolved in dil.HCl and diluted to 1000 mL. 50 mL of this solution required 48 mL of EDTA solution for titration. 50 mL of hard water sample required 15 mL of EDTA solution for titration. 50 mL of same water sample on boiling, filtering etc, required 10 mL of EDTA solution. Calculate the di erent kinds of hardness in ppm.   7M

UNIT–II

3. Define galvanic cell. Why the anode of galvanic cell is –ve and cathode is +ve. Write the different electrode reactions occur at the electrodes.   14M

OR

4. a) Discuss the how the nature of the metal influences the rate of corrosion.   7M

    b) Explain the rusting of iron with the help of electrochemical theory of corrosion.   7M

UNIT–III

5. Write notes on
    (a) Tacticity
    (b) Vulcanization of rubber.   14M

OR

6. What are the polymers? Explain the applications of polymers in different fields.   14M

UNIT–IV

7. a) Explain the difference between gross calorific value and net calorific value.   7M

    b) What is the difference between proximate analysis and ultimate analysis of coal?   7M

OR

8. a) What are the major constituent of LPG and Natural gas?   7M

    b) Why excess air is required for complete combustion?   7M

UNIT–V

9. Define refractories? What are the characteristics of good refractory? Give the classification of refractories with examples.   14M

OR

10. Define Viscosity? How is it determined by Redwood Viscometer?   14M

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B.Tech. I Year Supplementary Examinations May 2017
Engineering Physics
(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 few applications of lasers   4M

    b) Describe the newton's rings formation experiment.   10M

OR

2   a) Explain the characteristics of lasers.   4M

    b) Explain the construction and working of optical fibre   10M

UNIT–II

3. a) What are Miller indices? Explain the procedure for finding Miller indices. Give one example   10M

    b) Draw the planes (211), (100) and and (220)   4M

OR

4. a) What are properties of ultrasonics?   4M

    b) Describe any one method for the detection of ultrasonics.   10M

UNIT–III

5. a) State and explain Heisenberg uncertainty principle   6M

    b) Define de-Broglie dual nature of energy and derive its wavelength   8M

OR

6. a) Give the salient features of Kronig-Penny model.   10M

    b) Discuss the origin of formation of energy bands   4M

UNIT–IV

7. a) With symbol explain the construction and working of Photo diode. Discuss its characteristics.   10M

    b) Explain the role of LED & Photo diode in optical fibre communication systems.   4M

OR

8. a) Describe different types of magnetic materials in terms of their spin dipole alignment and its temperature dependence.   10M

    b) Define magnetic dipole moment. List out various sources of magnetic dipole moment in magnetic materials.   4M

UNIT–V

9. a) What is Meissner effect?   4M

    b) Explain about the flux exclusion principle exhibited by the superconductors   10M

OR

10. a) What are nanomaterials? Why do they exhibit different properties?   8M

    b) Explain the types of nanomaterials based on dimensionalities   6M

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