

Hall Ticket Number :

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R-17

Code: 7G513

I B.Tech. I Semester Regular Examinations December 2017

Basic Engineering Drawing

(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)

UNIT-I

1. a) Divide a 70 mm straight line into 9 equal parts. 4M
b) A fixed point is at 50 mm from a fixed straight line .Draw and names the curve when the eccentricity is $\frac{3}{2}$ and also draws the tangent and normal to the curve through a point P, which is at 60 mm from the straight line. 10M

OR

2. a) Show the construction of dividing a circle in to 6 equal parts. take diameter of circle 50mm. 4M
b) The foci of an ellipse are 90 mm apart and minor axis is 60 mm. Determine the length of the major axes and draw the ellipse by Concentric circle method. Draw a tangent and normal to the curve at a point on it 20 mm above the major axis. 10M

UNIT-II

3. a) A point A is 20 mm above H.P and in the first quadrant. Its shortest distance from the reference line XY is 40 mm. draw the projections of the point and determine its Distance from V.P. 7M
b) Two points A and B are on H.P, the point A being 30 mm in front of V.P while B is 45 mm behind V.P. the line joining their top views makes an angle of 45° with xy. Find the horizontal distance between the two points. 7M

OR

4. a) A line CD 30 mm long is parallel to both the planes. The line is 40 mm above HP and 20 mm in front of V.P. Draw its projection. 4M
b) A 100 mm long line PQ has its end P 10mm above H.P. and 20mm in front of V.P. the line is inclined 60° to H.P and 30° to V.P. Draw its Projections 10M

UNIT-III

5. a) A thin rectangular plate 60x40 mm size has its shorter edge on H.P and inclined at 30° to V.P, Draw the projections of plate, when its top view is square of 40 mm side 7M
b) A hexagonal plane of side 25 mm has its surface parallel to 20 mm in front of V.P. Draw its projections, when a side is perpendicular to H.P and Center of the plane 40 mm above H.P. 7M

OR

6. A semi circular plate of 80 mm diameter has its straight edge in the VP & inclined at 45° to the HP. The surface of the plate makes an angle of 30° with the VP. Draw its projections. 14M

UNIT-IV

7. Draw the projections of a cone, base 45 mm diameter and axis 50 mm long, when it is resting on the ground on a point on its base circle with the axis making an angle of 30° with the H.P. and 45° with the V.P. 14M

OR

8. Draw the projections of a cube of 25 mm long edges resting on the H.P on one of its corners with a solid diagonal perpendicular to the V.P. 14M

UNIT-V

9. Draw the isometric view of a pentagonal prism of base side 35 mm and axis 60mm. The prism rest on its base on the H.P. with an edge of the base parallel to V.P. 14M

OR

10. Draw the elevation, top view and side view of the component shown in figure 1. (All dimensions are in mm.)

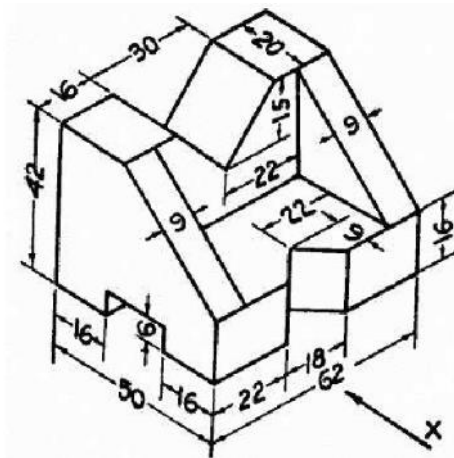


Fig 1: Isometric view of a component

14M

Code: 7GC12

I B.Tech. I Semester Regular Examinations December 2017

Engineering chemistry
(Common to CE, ME and CSE)

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. What is hardness of water? How do you classify and express hardness? Determine the total, temporary and permanent hardness of water by EDTA method. 14M

OR

2. a) Write a short notes on
i) Break point chlorination 8M
ii) Caustic embrittlement
- b) Explain the process of a phosphate ,carbonate and sodium aluminate conditioning of boiler feed water 6M

UNIT-II

3. a) Explain the construction and functioning of Galvanic Cell 7M
b) i) Describe the sacrificial anodic protection in corrosion control. 4M
ii) Define molar and equivalent conductance 3M

OR

4. a) Write short notes on concentration corrosion and galvanic corrosion 8M
b) What are fuel cells? How does fuel cell differ from battery? List the merits and demerits of fuel cell. 6M

UNIT-III

5. a) Explain the differences between thermoplastics and thermosetting plastics with examples. 7M
b) Why silicones are called inorganic polymers? Discuss the synthesis of linear chain silicones. 7M

OR

6. a) What is meant by condensation polymerization? Describe the preparation, properties and uses of Nylon-6,6 8M
b) What is vulcanization of rubber? Explain the natural rubber needs vulcanization. How is it carried out? 6M

UNIT-IV

7. a) Write short note on octane number and cetane number. 6M
b) Describe the following i) Natural gas ii) Bio gas 8M

OR

8. a) How do you determine the calorific value of solid fuel experimentally? 7M
b) Evaluate GCV and NCV of coal sample from the following data: Weight of coal sample 0.73gms, weight of water in calorimeter 1500gms, water equivalent of calorimeter 470gms, T_1 and T_2 are 25°C and 28°C respectively. % of H in coal 2.5, latent heat of steam 587 cal/gm 7M

UNIT-V

9. a) Explain the setting and hardening of cement with suitable chemical reactions 7M
b) Write the characteristics of good refractory material. 7M

OR

10. a) Describe any two of the following
i) Porosity ii) Thermal spalling iii) Refractoriness 8M
b) Write the functions of lubricant. Describe any one mechanism of lubrication 6M

Code: 7G511

I B.Tech. I Semester Regular Examinations December 2017

Engineering Graphics-I

(Common to CE and ME)

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. Draw a rectangle having its sides 125 mm and 75 mm long. Inscribe two parabolas in it with their axes bisecting each other. 14M

OR

2. Two straight lines OA and OB make an angle of 90° between them. P is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola through P, with OA and OB as asymptotes, marking at least ten points. 14M

UNIT-II

3. Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside another circle of 160 mm diameter, for one revolution counter clockwise. Draw a tangent and normal to it at a point 65 mm from the center of the directing circle. 14M

OR

4. An inelastic string 145 mm long, has its one end attached to the circumference of a circular disc of 40 mm diameter. Draw the curve traced out by the other end of the string, when it is completely wound around the disc, keeping the string always tight. 14M

UNIT-III

5. a) A point P is 15 mm above the H.P. and 20 mm in front of the V.P. Another point Q is 25 mm behind the V.P. and 40 mm below the H.P. Draw projections of P and Q keeping the distance between their projectors equal to 90 mm. Draw straight lines joining (i) their top views and (ii) their front views. 7M

- b) A point P is 50 mm from both the reference planes. Draw its projections in all possible positions. 7M

OR

6. The front view of a line AB measures 65 mm and makes an angle of 45° with xy. A is in the H.P. and the V.T. of the line is 15 mm below the H.P. The line is inclined at 30° to the V.P. Draw the projections of AB and find its true length and inclination with the H.P. Also locate its H.T. 14M

UNIT-IV

7. Draw a rhombus of diagonals 100 mm and 60 mm long, with the longer diagonal horizontal. The figure is the top view of a square of 100 mm long diagonals, with a corner on the ground. Draw its front view and determine the angle which its surface makes with the ground. 14M

OR

8. A composite plate of negligible thickness is made-up of a rectangle 60 mm \times 40 mm, and a semi-circle on its longer side. Draw its projections when the longer side is parallel to the H.P. and inclined at 45° to the V.P., the surface of the plate making 30° angle with the H.P. 14M

UNIT-V

9. An isosceles triangle PQR having the base PQ 50 mm long and altitude 75 mm has its corners P, Q and R 25 mm, 50 mm and 75 mm respectively above the ground. Draw its projections by auxiliary plane method. 14M

OR

10. An equilateral triangle ABC of sides 75 mm long has its side AB in the V.P. and inclined at 60° to the H.P. its plane makes an angle of 45° with the V.P. Draw its projections by auxiliary plane method. 14M

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R-17

Code: 7GC14

I B.Tech. I Semester Regular Examinations December 2017

Engineering 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) Define rank of a matrix. Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$

b) Investigate for what values of } and ~ the simultaneous equations $2x+3y+5z=9; 7x+3y-2z=8; 2x+3y+ }z= \sim,$ have (i) no solution (ii) a unique solution (iii) infinite number of solutions.

OR

2. a) Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$

b) Use Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and express

$A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I$ as a quadratic polynomial in A .

UNIT-II

3. a) If $A = \begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ then find the matrix P which transforms the matrix A to a diagonal matrix.

b) If $A = \begin{bmatrix} 0 & 1+2i \\ -1+2i & 0 \end{bmatrix}$ then show that $(I - A)(I + A)^{-1}$ is a unitary matrix.

OR

4. Reduce the quadratic form $6x^2 + 3y^2 + 3z^2 - 2yz + 4zx - 4xy$ in to a sum of squares. Also find the rank, index, signature and nature of the quadratic form.

UNIT-III

5. a) Solve: $(x+2y^3)\frac{dy}{dx} = y$.
- b) Find the orthogonal trajectory of the family of curves $r^n = a \sin n\theta$.

OR

6. a) Solve: $(y \log y) dx + (x - \log y) dy = 0$.
- b) Uranium disintegrates at a rate proportional to the amount then present at any instant. If M_1 and M_2 grams of uranium are present at times T_1 and T_2 respectively, find the half-life of uranium.

UNIT-IV

7. a) Solve: $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = 8x^2 e^{2x} \sin 2x$.
- b) Using the method of variation of parameters, solve: $\frac{d^2y}{dx^2} - y = \frac{2}{1+e^x}$.

OR

8. a) Solve: $\frac{d^2y}{dx^2} + a^2y = \sec ax$.
- b) A condenser of capacity C is discharged through the inductance L and a resistance R in series and the charge q at any time satisfies equation $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = 0$. Given that $L=0.25$ henry, $R=250$ ohms, $C = 2 \times 10^{-6}$ farad and that when $t = 0$, the charge q is 0.002 coulomb, and the current $\frac{dq}{dt} = 0$. Obtain the value of q in terms of t .

UNIT-V

9. a) If $u = x^2 + y^2 + z^2$, $v = xy + yz + zx$, $w = x + y + z$, find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$.
- b) If $u = u\left(\frac{y-x}{xy}, \frac{z-x}{xz}\right)$, show that $x^2 \frac{\partial u}{\partial x} + y^2 \frac{\partial u}{\partial y} + z^2 \frac{\partial u}{\partial z} = 0$.
- OR
10. a) Find the extreme values of $2(x^2 - y^2) - x^4 + y^4$.
- b) Show that the rectangular solid of maximum volume that can be inscribed in a sphere is a cube.

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R-17

Code: 7G111

I B.Tech. I Semester Regular Examinations December 2017

Problem Solving Techniques and C Programming

(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) Define and explain the various steps involved in program development with example. 7M
- b) Describe the difference between Pseudo code and algorithm. Write Pseudo Code for finding factorial of a given number 7M

OR

- 2. a) Draw the Flow Chart for finding a number is prime or not. 7M
- b) Explain the Types and Categories of Programming Languages with example 7M

UNIT-II

- 3. a) State and explain Compiling and Execution process of a program 8M
- b) Differentiate between Keywords and Identifiers. 6M

OR

- 4. Illustrate the difference between Primary and Derived data types used in C with example. What is the importance of symbolic constant explain with example. 14M

UNIT-III

- 5.
 - i. Explain the conditional control statements with example.
 - ii. Explain the code and what is the output of the following piece of code?

```
main( )  
{  
int i=3;  
switch(i)  
{  
default : printf("0");  
case 1 : printf("1");  
break;  
case 2 : printf("2");  
break;  
case 3 : printf("3");  
break;  
}  
}
```

14M

OR

6. a) i. Differentiate between break and continue with an example.
 ii. Write the output of the following code with explanation

```
while(1)
{
  if (printf ("%d", printf ("%d")))
  break;
  else
  continue;
}
```

10M

- b) Write a Program to find the topper of your class using "for" and "if ".

4M

UNIT-IV

7. a) Write a C Program to find Transpose of a Matrix. 10M
 b) Write the functions to find Length of a String and Concatenate Two Strings 4M

OR

8. a) Write a C Program to Remove all Characters in a String Except Alphabets 10M
 b) Explain the applications of array. 4M

UNIT-V

9. a) Write a C Program to Find G.C.D Using Recursion 8M
 b) Explain the following key words with example.
 i) Auto, ii) Register, iii) Static, iv) Extern. 6M

OR

10. a) Write a program to swap two numbers using call by reference and call by value. 7M
 b) Why function is required to write a program, justify your answer with a suitable example. 7M

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R-17

Code: 7GC11

I B.Tech. I Semester Regular Examinations December 2017

Technical English & Professional Communication

(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) Explain the concept of 'Technology with a Human Face' and state why modern technology does not enrich man but empties him.
- b) Fill in the blanks in the following sentences using the hints given in brackets.
 - i. The only way to ___ women is to give them education.(a word with the prefix em-)
 - ii. Once the process of contamination of water begins, it is ___. (a word with the prefix ir-)
 - iii. My friend speaks English _____ and correctly. (freely, fluently)
 - iv. You have to _____ to many challenges in your life. (Phrasal verb with face)
 - v. The man is moving _____ the building. (at/ towards)

OR

2. What makes technical communication different from general communication?

UNIT-II

3. a) Explain with examples the two kinds of factors that cause the climate to change over long periods of time.
- b) Write a letter of application in response to an advertisement for the post of Assistant Civil Engineer in R & D Department.

OR

4. Describe in brief the five levels of communication.

UNIT-III

5. a) Discuss the two kinds of technologies currently used to generate solar power on a large scale.
- b) Complete the following sentences with appropriate words chosen from those in brackets:
 - i. To prove his points, he _____ an example. (cited /sited)
 - ii. The workers raised a voice of ___ against the management. (dissent / descent)
 - iii. He is very _____ at dodging awkward questions. (adept / adopt)
 - iv. Fruits makes a healthy ___ after lunch or dinner. (desert / dessert)
 - v. The ___ at my work were fired. (personnel / personal)

OR

6. Explain the various functions of Non- verbal Communication.

UNIT-IV

7. a) Discuss some of the measures that are used to prevent soil erosion.
- b) Discuss in detail the Discriminative and Comprehensive listening.

OR

8. The management of your company proposes to establish a school near the factory site for the benefit of its staff. As Public Relations Officer you have been asked to study its feasibility and submit a report to the Personnel Manager, specially referring to the following: finance, teaching staff, library, games and sports, construction cost, etc.

UNIT-V

9. According to Swami Viveananda, what is the spirit in which the nature of work be done.

OR

10. List out the four communication styles and explain them briefly.

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R-17

Code: 7G513b

I B.Tech. I Semester Regular Examinations December 2017

Basic Engineering Drawing

(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)

UNIT-I

1. a) Draw an angle of 75° and bisect it with the help of compass. 4M
b) Inscribe the largest Possible ellipse in a rectangle of side 120 mm and 80mm. 10M

OR

2. a) Construct regular hexagon side of 30mm. 4M
b) The ratio of the fixed point to fixed straight line is 1, Draw and names the curve with the distance of the focus from the directrix as 50 mm. Also draw normal and tangent to the curve at a point 70mm from the focus. 10M

UNIT-II

3. a) A point A is 15mm above H.P and 20 mm in front of V.P. Another point B is 25 mm behind V.P and 40 mm below H.P. Draw the projection of A and B, keeping the distance between the projectors equal to 90mm. Draw straight lines, joining (i) the top views and (ii) the front views. 7M
b) Draw the orthographic projections of the following points.
(i) Point P is 30 mm. above H.P and 40 mm. in front of V.P.
(ii) Point Q is 25 mm. above H.P and 35 mm. behind V.P.
(iii) Point R is 32 mm. below H.P and 45 mm behind V.P.
(iv) Point S is 35 mm. below H.P and 42 mm in front of V.P.
(v) Point T is in H.P and 30 mm. is behind V.P.
(vi) Point W is in H.P and 48 mm. in front of V.P. 7M

OR

4. a) A 60mm long line PQ has its end P 20 mm above H.P. The line perpendicular to H.P and 40 mm in front of V.P. Draw its projections. 7M
b) A line AB of 100mm length is inclined at 30° to H.P and 45° to V.P. The point A is 15 mm above H.P and 20 mm in front of V.P. Draw the projections of the line 7M

UNIT-III

5. a) A square plane of side 40 mm has its surface Parallel to 20 mm above H.P Draw its projections when one side is inclined 30° to V.P. 7M
b) Draw the projections of a circle of 60 mm diameter, resting on V.P. on a point on the circumference. The plane is inclined at 45° to V.P. and perpendicular to H.P. The centre of the plane is 40 mm above H.P. 7M

OR

6. A circle of 40 mm diameter, its resting on H.P. on a point, with its surface inclined at 30° to H.P. Draw the projection of the circle. when (i) the top view of the diameter through the resting point, makes an angle 45° with xy and the diameter passing through the resting point makes an angle 45° with H.P. 14M

UNIT-IV

7. Square pyramid with side of base 30 mm and axis 50 mm long is resting with its base on H.P. Draw the projections of the pyramid when one of its base edges is parallel to V.P. The axis of the pyramid is 30mm in front of V.P. 14M

OR

8. A cylinder having base diameter 50 mm and axis 60 mm rest on a point of its base circle on the H.P. Draw its projections when the axis is inclined at 30° to H.P. and 40° to V.P. 14M

UNIT-V

9. Draw the isometric view of the following figure 2.

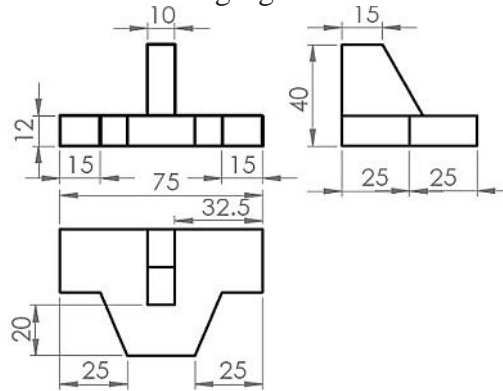


Figure 2.

14M

OR

10. Draw the elevation, top view and side view of the objects shown in figure 1. (All dimensions are in mm.)

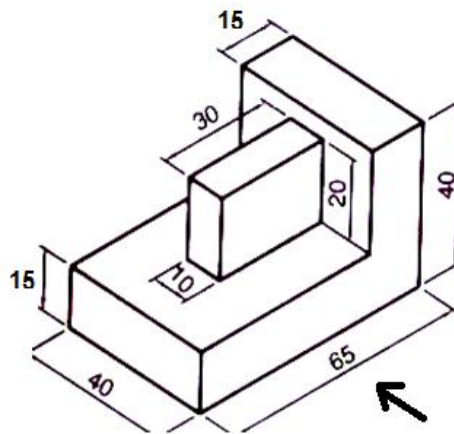


Fig 1: Isometric view of object

14M
