

Hall Ticket Number :

R-15

Code: 5GC12

I B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Engineering Chemistry

(Common to CE, ME, CSE and IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) What is meant by sterilization of water? Explain sterilization of water is carried out by using chlorine 7M
b) Describe the estimation of hardness by EDTA method 7M

OR

2. a) How water gets hardness. Distinguish between hard water and soft water? 7M
b) How is hardness of water expressed? Explain any one method for the determination of hardness of water. 7M

UNIT-II

3. Describe the factors affecting the rate of corrosion. 14M

OR

4. Explain electroless plating of nickel with relevant equations and mention it's advantages over electroplating. 14M

UNIT-III

5. What are elastomers? Write the processing of raw rubber? Explain the draw backs of raw rubbers. 14M

OR

6. What is Bakelite? Write the preparations, properties and applications of Bakelite in detail. 14M

UNIT-IV

7. a) Illustrate one method of carbonization of coal to yield coke? 7M
b) Compare the various methods of coke production? 7M

OR

8. a) Discuss the principles involved in the determination of fuel gas analysis? 7M
b) What is the significance of pre-heating furnace oil before burning? 7M

UNIT-V

9. What is pyrometric cone equivalent? How it is determined for refractories? 14M

OR

10. What is meant by rocket propellant? How is it useful? Distinguish between solid and Liquid rocket propellants. 14M

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Code: 5G512

I B.Tech. I Semester Supplementary Examinations Nov/Dec 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. A parallelogram has sides 100 and 80, at an included angle 70° . Inscribe an ellipse in the parallelogram. Find the major and minor axes of the curve.

OR

2. Construct a parabola in parallelogram of side 100 x 60 and with an included angle of 75° .

UNIT-II

3. Draw an epi-cycloid of a circle of 40 diameter, which rolls on another circle of 120 diameter for one revolution clock-wise.

OR

4. Draw the involute of a regular hexagon of side 20. Draw a tangent and a normal to the curve at a distance 100 from the center of the hexagon.

UNIT-III

5. A line AB of 100 length inclined at an angle of 30° to H.P and 45° to V.P. The point A is 15 above H, 20 in front of V.P and 120 from right profile plane (RPP). Draw (i) front view, (ii) top view and (iii) left side view of the line AB.

OR

6. A point at 25 above the reference line **xy** is the front view of two points A and B. The point A is 40 behind V.P and the point B is 50 in front of V.P. Draw the projections of the points and state their positions relative to the planes of projections and quadrants in which they lie.

UNIT-IV

7. An equilateral triangular plane ABC of side 40 has its plane parallel to V.P and 20 away from it. Draw the projection of the plane when one of its sides is perpendicular to H.P.

OR

8. A rectangle ABCD of size 40 x 25 has the corner A, 10 above H.P and 15 in front of V.P. All the sides of the rectangle are equally inclined to H.P and parallel to V.P. Draw its projections.

UNIT-V

9. A rectangular plane of size 100X60, is inclined to V.P. by an angle of 45° ; longer edge of which is making an angle of 30° with H.P. Draw the projections, by auxiliary plane method.

OR

10. A square ABCD of 40 side has a corner A on H.P and 25 in front of V.P. All the sides of the square are equally inclined to H.P and parallel to V.P. Draw the projection of the plane by adding Auxiliary front view of the points A and C on an A.V.P, making an angle of 30° with V.P.

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations Nov/Dec 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) $(1+y^2) + (x - e^{\tan^{-1}y}) \frac{dy}{dx} = 0$ 7M
- b) The temperature of a body drops from 100°C to 75°C in ten minutes when the temperature of the surrounding air is 20°C. When will be the temperature is 25°C. 7M

OR

2. a) Uranium disintegrates at a rate proportional to the amount present at any instant. If M_1 and M_2 are masses of uranium that are present at times T_1 and T_2 respectively, find half life of uranium. 7M
- b) Solve $\frac{dy}{dx} + y \tan x = y^2 \sec x$. 7M

UNIT-II

3. a) Solve $(D^3 + 2D^2 - D - 2)y = 1 - 4x^3$. 7M
- b) Solve $(D^3 - 4D^2 - D + 4)y = e^{3x} \cos 2x$. 7M

OR

4. a) Solve $(D^2 + 4D + 20)y = 23 \sin t - 15 \cos t$. 7M
- b) Solve $(D^2 - 1)y = x \sin x + x^2 e^x$. 7M

UNIT-III

5. a) Solve in series the equation $(1+x^2) \frac{d^2y}{dx^2} + x \frac{dy}{dx} - y = 0$. 7M
- b) Verify Rolle's theorem for the function $f(x) = (x-a)^m(x-b)^n$, where m and n are positive integers, in $[a, b]$. 7M

OR

6. a) Find the series solution of the equation $x(1-x) \frac{d^2y}{dx^2} - (1+3x) \frac{dy}{dx} - y = 0$. 7M
- b) Obtain the Maclaurin's series expansion of $f(x) = \tan x$. 7M

UNIT-IV

7. a) If $x = r \sin \theta \cos \phi, y = r \sin \theta \sin \phi, z = r \cos \theta$, then show that $\frac{\partial(x,y,z)}{\partial(r,\theta,\phi)} = r^2 \sin \theta$. 7M
- b) Find the maximum and minimum values of $f(x,y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$. 7M

OR

8. a) Find a point on the plane $3x+2y+z-12=0$, which is nearest to the origin. 7M
- b) If $u = \log(x^3 + y^3 - x^2y - xy^2)$, then show that $\frac{\partial^2 u}{\partial x^2} + 2 \frac{\partial^2 u}{\partial x \partial y} + \frac{\partial^2 u}{\partial y^2} = -\frac{4}{(x+y)^2}$ 7M

UNIT-V

9. Trace the curve $y^2(a^2 + x^2) = x^2(a^2 - x^2)$ 14M
- OR**
10. Trace the curve $r^2 = a^2 \cos 2\theta$ 14M

Code: 5G511

I B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Engineering Mechanics - Statics

(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. Three cylinders are piled in a rectangular ditch as shown in Fig.1. Neglecting friction, determine the reaction between cylinder A and the vertical wall.

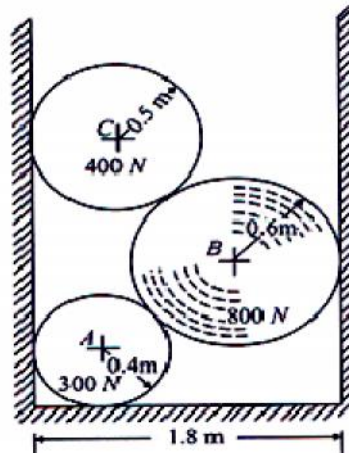


Fig.1

OR

2. A 12 m bar of negligible weight rests in a horizontal position on the smooth inclines in Fig.2. Compute the distance x at which load $T = 100\text{N}$ should be placed from point B to keep the bar horizontal.

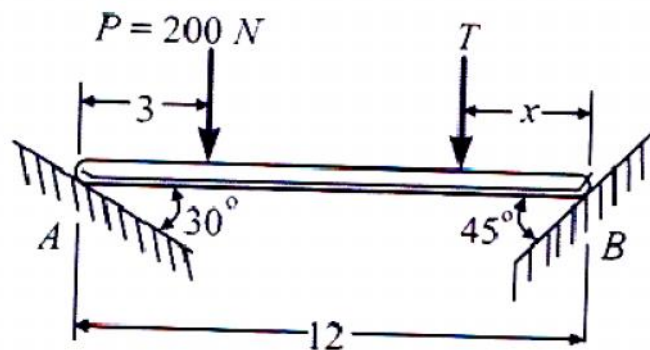


Fig.2

UNIT-II

3. Determine the forces in all the members of the frame shown in Fig.3. Indicate the nature of force also

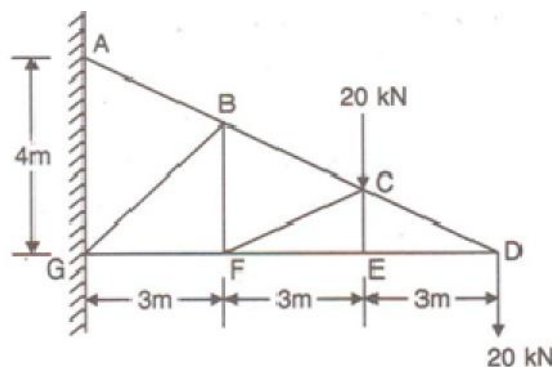


Fig.3

OR

4. The frame shown in Fig.4 is supported by a hinge at E and a roller at D. Determine the horizontal and vertical components of the hinge force at C as it acts upon member BD.

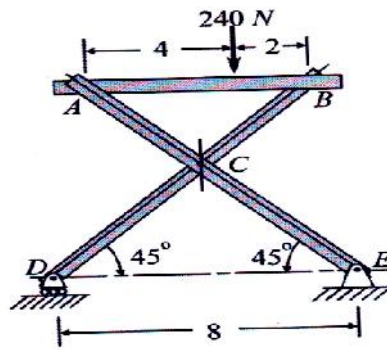


Fig.4

UNIT-III

5. Determine the force P required to start the wedge shown in Fig.5. The angle of friction for all surfaces in contact is 15° .

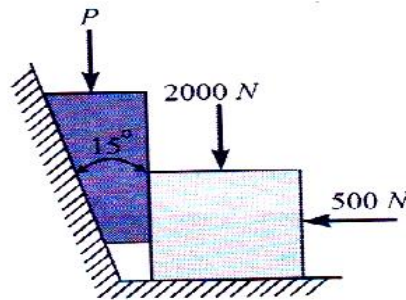


Fig.5

OR

6. What is the value of P in the system shown in Fig.6 to cause the motion of 500 N block to the right side? Assume the pulley is smooth and the coefficient of friction between other contact surfaces is 0.20.

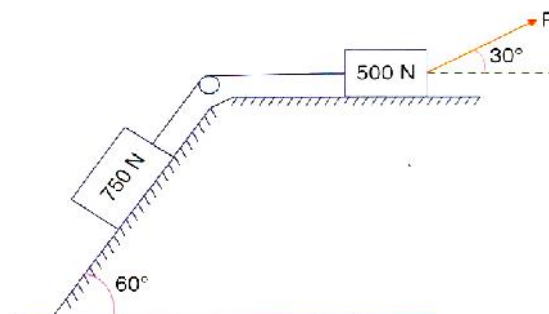


Fig.6

UNIT-IV

7. a) Define the terms: Centre of gravity and Centroid
b) Locate the centroid of the shaded area enclosed by the curve $y^2 = ax$ and the straight line shown in Fig.7

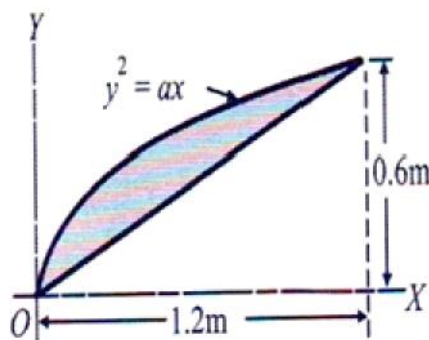


Fig 7

OR

8. A circular plate of uniform thickness and of diameter 500 mm as shown in Fig.8 has two circular holes of 40 mm diameter each. Where should a 80 mm diameter hole be drilled so that the centre of gravity of the plate will be at the geometric centre?

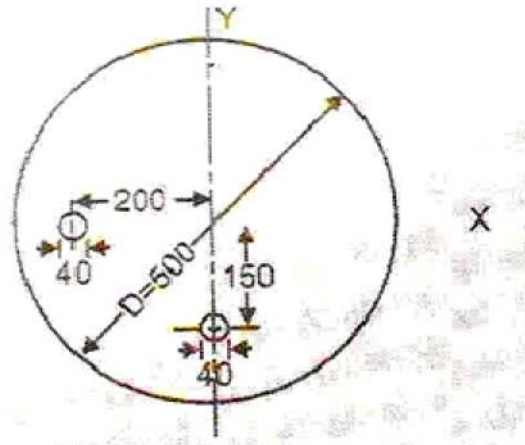
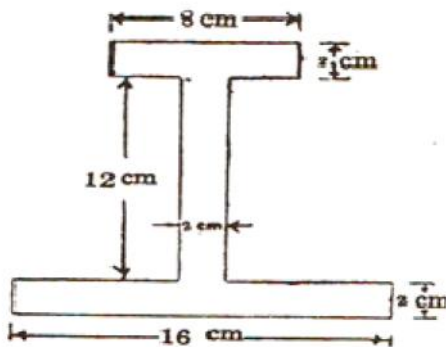


Fig.8

UNIT-V

9. a) State the theorem of perpendicular axis. How will you prove this theorem?
 b) For the I-section shown in Figure find the moment of inertia about the centroidal axis X-X perpendicular to the web.



OR

10. Find the mass moment of inertia of the solid cone of height h and base radius R about an axis through vertex normal to the axis of rotation.

Hall Ticket Number :

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R-15

Code: 5G111

I B.Tech. I Semester Supplementary Examinations Nov/Dec 2017

Problem Solving Techniques and Introduction to 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) What is Programming Language? Explain about Computer Programming Languages with example. 7M
b) Explain different phases in Software Development method. 7M

OR

2. a) Define flowchart. Draw flowchart to find biggest of three numbers 7M
b) Define algorithm. Write an algorithm to find roots of a quadratic equation. 7M

UNIT-II

3. a) Describe the various steps involved in executing a C program 6M
b) Define operator. Describe different types of operators used in c language with example. 8M

OR

4. a) Describe the structure of c program with suitable example. 8M
b) Explain typedef AND enumerated type with suitable example. 6M

UNIT-III

5. a) Write a program to display the even numbers between 1 and 100 6M
b) Explain break, continue and goto statements with suitable example. 8M

OR

6. Write a c program to print the following pattern using while, do-while and for loop.

```
1
1 2
1 2 3
1 2 3 4
```

14M

UNIT-IV

7. a) Write a c program for sorting the elements of an array in ascending order. 8M
b) Define string. Explain declaration and initialization of string variables. 6M

OR

8. a) What is an array? How one-dimensional arrays are declared and initialized. Give suitable example. 6M
b) Explain String handling functions with suitable example programs. 8M

UNIT-V

9. a) What is function? Describe different categories of functions with suitable example programs. 9M
b) Explain in detail about Preprocessor Commands. 5M

OR

10. a) Explain the scope, visibility and lifetime of variables with suitable examples. 8M
b) Describe the two parameter passing methods with suitable examples 6M
