Hall Ticket Number :											R-15

Code: 5GC12

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

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)

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UNIT–I

1. a) What are the water treatments for domestic purpose? 6M

   b) Define alkalinity of water? How alkalinity of water estimated? 8M

OR

2. a) Describe the estimation of dissolved oxygen in water? 6M

   b) Determine the total hardness of a sample of water in ^{0}Fr and ^{0}Clarke which showed the following analysis:- Suspended matter = 100 mg; $Ca(NO_3)_2$ = 16.4 mg/litre; $MgSO_4$ = 24 mg/litre; $MgCl_2$ = 19 mg/litre; NaOH = 40 mg/litre; KOH = 56 mg/litre (At. Masses of Na = 23, Mg = 24, K = 39 and Ca = 40.) 8M

UNIT–II

3. a) Explain the passivity of the metal. 4M

   b) Explain why a pure metal rod half immersed vertically in water, starts corrosion at the bottom. 10M

OR

4. Describe the construction and working of Leclanche cell. Write the different electrode reactions occur at the electrodes. 14M

UNIT–III

5. Write the following in detail
   a) Functionality of polymers.
   b) Compounding of rubber. 14M

OR

6. a) What are plastics? How they are classified? 6M

   b) What is phenol-formaldehyde resine? Write the preparation, properties and applications of it. 8M

UNIT–IV

7. a) What is the main raw material for the metallurgical coke? Describe the manufacture and uses of metallurgical coke? 7M

   b) Discuss the principles involved in the determination of fuel gas analysis? 7M

OR

8. a) Discuss the relative merits of solid, liquid and gases fuels. 7M

   b) Compare the relative merits of the various reforming processes. 7M

UNIT–V

9. a) Explain the reactions in setting and hardening of cement and explain the role of gypsum in cement. 7M

   b) Write the characteristics of a good propellant. 7M

OR

10. What are Lubricants? Explain the properties of Lubricants? 14M

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Hall Ticket Number :											**R-15**

Code: 5G512

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Graphics-I

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. Two points A and B are 50 mm apart. Draw the curve traced out by a point P moving in such a way that the difference between its distances from A and B is always constant and equal to 20 mm. 14M

OR

2. Two fixed points A and B are 100 mm apart. Trace the complete path of a point P (moving in the same plane as that of A and B) in such a way that, the sum of its distances from A and B is always the same and equal to 125 mm. Name the curve. Draw another curve parallel to and 25 mm away from this curve. 14M

UNIT–II

3. Construct a hypocycloid, with rolling circle of 50 mm diameter and directing circle of 175 mm diameter. Draw a tangent to it at a point 50 mm from the centre of the directing circle. 14M

OR

4. Draw a circle with diameter AB equal to 65 mm. Draw a line AC 150 mm long and tangent to the circle. Trace the path of A when the line AC rolls on the circle without slipping. 14M

UNIT–III

5. An object O is placed 1.2 m above the ground and in the center of a room 4.2 m X 3.6 m X 3.6 m high. Determine graphically its distance from one of the corners between the roof and two adjacent walls. Scale, 10 mm = 0.5 m. 14M

OR

6. The end A of a line AB is in the H.P. and 25 mm behind the V.P. The end B is in the V.P. and 50 mm above the H.P. The distance between the end projectors is 75 mm. Draw the projections of AB and determine its true length, traces and inclination with the two planes. 14M

UNIT–IV

7. A thin rectangular plate of sides 60 mm X 30 mm has its shorter side in the V.P. and inclined at 30^o to the H.P. Project its top view if its front view is a square of 30 mm long sides. 14M

OR

8. A thin circular plate of 70 mm diameter is resting on its circumference such that its plane is inclined at 60^o to the H.P. and 30^o to the V.P. Draw the projection of the plate. 14M

UNIT–V

9. A hexagonal plate of side 40 mm, is resting on a corner in the V.P. with its surface making an angle of 30^o with the V.P. the front view of the diagonal passing through that corner is inclined at 45^o to the line xy. Draw the projections of the hexagonal plate using auxiliary plane method. 14M

OR

10. The projectors of the ends of a line AB are 50 mm apart. The end A is 20 mm above the H.P. and 30 mm in front of the V.P. The end B is 10 mm below the H.P. and 40 mm behind V.P. Determine the true length of AB, and its inclinations with the two planes using auxiliary method. 14M

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Hall Ticket Number :										

R-15

Code: 5GC14

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Mathematics-I

(Common All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

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

   b) Find the Orthogonal trajectory of the family of confocal conics $\frac{x^2}{a^2+\text{a}}+\frac{y^2}{b^2+\text{a}}=1,$ a being the parameter. 7M

OR

2. a) Solve $\cos^2 x\frac{dy}{dx}+y=\tan x$ 7M

   b) Find orthogonal trajectories of the family of curves $r^2=a^2\cos 2\overline{\ }$ 7M

UNIT–II

3. a) Solve $\frac{d^2y}{dx^2}-6\frac{dy}{dx}+9y=6e^{3x}+7e^{-2x}-\log 2$ 7M

   b) Solve by the method of variation of parameters $\frac{d^2y}{dx^2}+y=Co\sec x$ 7M

OR

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

   b) Solve by the method of variation of parameters $y^{11}-6y^1+9y=\frac{e^{3x}}{x^2}$ 7M

UNIT–III

5. a) Solve in series the equation $\frac{d^2y}{dx^2}+y=0,\quad y(0)=0$ 7M

   b) Prove that if 0 < a < b < 1, $\frac{b-a}{1+b^2}\angle\tan^{-1}b-\tan^{-1}a\angle\frac{b-a}{1+a^2}$ hence show that $\frac{®}{4}+\frac{3}{25}\angle\tan^{-1}\frac{4}{3}\angle\frac{®}{4}+\frac{1}{6}$ 7M

OR

6. a) Solve in series the equation $\frac{d^2y}{dx^2}+xy=0$ 7M

   b) Using Taylor's series, express the polynomial $2x^3+7x^2+x-6$ in powers of $(x-1)$ 7M

UNIT–IV

7. a) If $U=\log\left(x^3+y^3+z^3-3xyz\right)$ prove that $\left(\frac{\partial}{\partial x}+\frac{\partial}{\partial y}+\frac{\partial}{\partial z}\right)^2U=\frac{-9}{(x+y+z)^2}$ 7M

   b) In a plane triangle, Find the maximum value of cosA cosB cosC. 7M

OR

8. a) If $u=x+y+z,\quad uv=y+z,\quad uvw=z,$ show that $\partial(x,y,z)/\partial(u,v,w)=u^2v$ 7M

   b) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. 7M

UNIT–V

9. Trace the curve $a^2y^3=x^2(a^2-x^2)$ 14M

OR

10. Trace the curve $r=a(1+\cos\overline{\ })$ 14M

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Hall Ticket Number :										

R-15

Code: 5G511

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Mechanics - Statics

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

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

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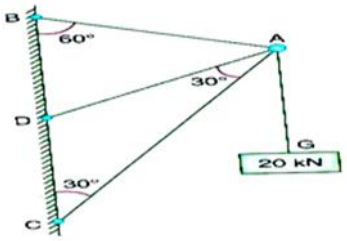
UNIT–I

1. a) Differentiate between:
   (i) Concurrent and non-concurrent forces,
   (ii) Coplanar and non-coplanar forces and
   (iii) Moment of a force and couple. 6M

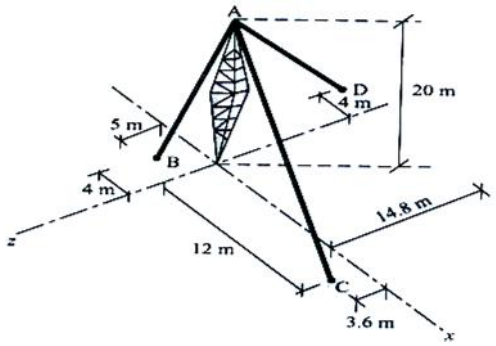
   b) The frictionless pulley A shown in figure is supported by two bars AB and AC which are hinged at B and C to a vertical wall. The flexible cable hinged at D, goes over the pulley and supports a load of 20 kN at G. The angle made by various members of the system are as shown in the figure. Determine the forces in the bars AB and AC. Neglect the size of the pulley.



8M

OR

2. A transmission tower is held by three guy wires AB, AC and AD anchored by bolts at B, C and D respectively. If the tension in AB is 2100 N, determine the components of the force exerted by the wire on the bolt B.

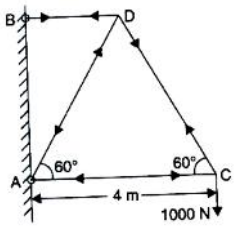


14M

UNIT–II

3. a) What are the different methods of analysing a perfect frame? Which one is used where and why? 4M

   b) Determine the forces in all the members of a cantilever truss shown in figure.



10M

OR

4. A simply supported beam of length 5 m carries a uniformly increasing load of 800 N/m at one end to 1600 N/m at the other end. Calculate the reactions at both ends. 14M

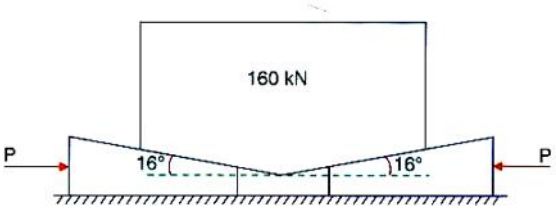
UNIT–III

5. A uniform ladder of length 13 m and weighing 25 N is placed against a smooth vertical wall with its lower end 5 m from the wall. The co-efficient of friction between the ladder and the floor is 0.3. Show that the ladder will remain in equilibrium in this position. What is the frictional force acting on the ladder at the point of contact between the ladder and floor? 14M

OR

6. a) Define the terms: Friction, limiting force of friction, co-efficient of friction and angle of friction. 4M

   b) The block C, weighing 160 kN is to be raised by means of driving wedges A and B as shown in figure. Find the value of force P for impending motion of the block upwards, if coefficient of friction is 0.25 for all contact surfaces. Self-weight of wedges may be neglected.

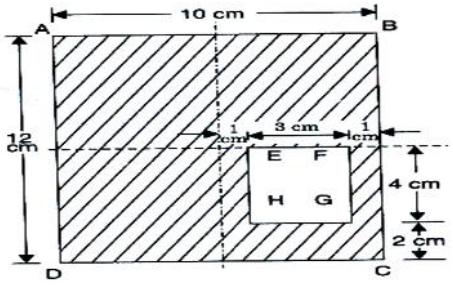


10M

UNIT–IV

7. a) Explain the terms centre of gravity and centroid. 4M

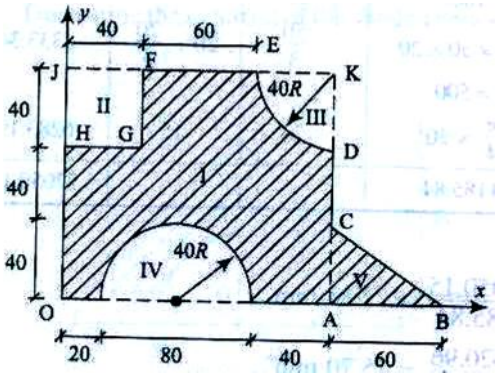
   b) From a rectangular lamina ABCD 10 cm x 12 cm a rectangular hole of 3 cm x 4 cm is cut as shown in figure. Find the centre of gravity of the remainder lamina.



10M

OR

8. Determine the centroid of the composite area as shown in figure. All dimensions are in mm.

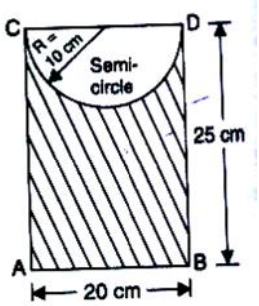


14M

UNIT–V

9. a) State and prove the theorem of parallel axis. 6M

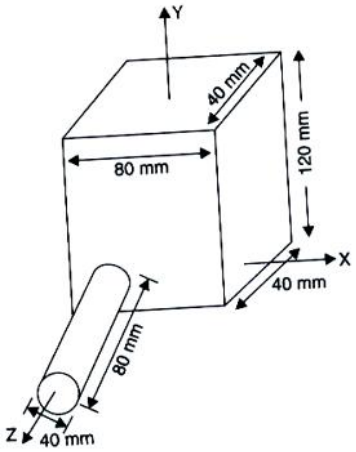
   b) Find the moment of inertia of the area shown shaded in figure about edge AB.



8M

OR

10. Determine the mass moment of inertia of the composite body about Z-axis shown in figure. The mass density of the cylinder is 6000 kg/m^3 and the rectangular prism is 7000kg/m^3.



14M

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Hall Ticket Number :										

R-15

Code: 5GC11

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

English through Literature

(Common All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) The poem "The Road not Taken" is about making choices. Discuss 7M
   b) Why did Mini's father help Cabuliwallah? 7M

OR

2. Briefly discuss the various facets of G.D. Naidu's personality 14M

UNIT–II

3. a) Examine the values reflected by Rudyard Kipling in his poem "If" 7M
   b) What kind of message Mark Twain tries to give through his story "A Dog's Tale"? 7M

OR

4. Estimate Sudha Murthy's contribution to society 14M

UNIT–III

5. a) Appreciate the story "The Gift of Magi" 7M
   b) Interpret the poem "Leisure 7M

OR

6. Discuss Vijaya Bhatkar as the architect of Indian IT industry. 14M

UNIT–IV

7. a) What kind of superstitious beliefs do you find in the poem "Night of the Scorpion"? 7M
   b) Describe the astrologer in "An Astrologer's Day". 7M

OR

8. a) Write a few points about the childhood and early life of Bose. 7M
   b) List out some of the achievements of Bose. 7M

UNIT–V

9. Analyse the character of Natalya in Chekhov's *The Proposal*. 14M

OR

10. Estimate the achievements of Homi Jehangir Baba in the field of science 14M

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Hall Ticket Number :										

R-15

Code: 5G111

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

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 = 70Marks)

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UNIT–I

1. a) What are the General Problem solving strategies? Discuss. 7M
   b) Define Algorithm? Write an algorithm to read three integers and find the biggest number. 7M

OR

2. Illustrate different phases of Software Development Life Cycle (SDLC) with a neat diagram. 14M

UNIT–II

3. a) Describe the various steps involved in executing a C program. 7M
   b) What is Type Conversion? Illustrate type conversion with suitable example. 7M

OR

4. a) Write and explain the structure of C Program. 6M
   b) What are precedence and associativity of operators? Explain them with an example. 8M

UNIT–III

5. a) Compare While and do.. While statements with suitable example code. 8M
   b) Write a program to display the numbers, 1 to 100 except 29, 77 and 86. 6M

OR

6. a) Discuss in detail about the for Loop statements in C. 7M
   b) Write about the functioning of the jump statements, ***break*** and ***continue*** with suitable examples. 7M

UNIT–IV

7. a) What is an Array? Explain how to declare one dimensional array with example. 8M
   b) Write a C program to find the sum of all elements in the array. 6M

OR

8. What are the different String Library functions available in C? Explain them with example. 14M

UNIT–V

9. a) What is a function? What are the advantages of using functions in a program? 8M
   b) Explain in detail about Preprocessor Commands. 6M

OR

10. a) Describe the two parameter passing methods with suitable examples. 7M
    b) What is a recursive function? Write a C program to find the factorial of a given number using recursion. 7M

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