Code : 5GC12

R-15

I B.Tech. I Semester Supplementary Examinations May/June 2016
Engineering Chemistry
(Common to CE, ME, CSE & 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)　How is hard water estimated by EDTA method? From the following results calculate the total hardness of water sample and express the hardness of water in ppm. 50 ml of water required 14 ml of 0.05 M EDTA. (1000 ml of 1 M EDTA = 100 gms of $CaCO_3$)　　7M

　　b)　With the help of neat diagram, describe the reverse osmosis method for the desalination of brackish water.　　7M

OR

2.　a)　Describe the ion-exchange process of softening for water.　　7M

　　b)　Write a short note on
　　　　(i) Break point chlorination,
　　　　(ii) Calgon conditioning.　　7M

UNIT–II

3.　a)　Discuss the various factors affecting the rate of corrosion.　　7M

　　b)　What are potentiometric sensors? Describe the analysis of urea by using electrochemical sensors.　　7M

OR

4.　a)　Explain the composition, applications and advantages of the following cells. (i) Ni-Cd cell & (ii) Lithium ion cell.　　7M

　　b)　Define corrosion. Explain dry corrosion and its mechanism.　　7M

UNIT–III

5.　a)　Explain the synthesis of conducting polymers with examples.　　7M

　　b)　What are silicones? Draw the structure of siloxane polymer obtained by hydrolyzing dichlorodimethylsilane.　　7M

OR

6.　　Describe the methods of preparations, properties and applications of the following:
　　　　(i)　　Bakelite,
　　　　(ii)　　Buna-S,
　　　　(iii)　　Nylon-6,6 &
　　　　(iv)　　PVC　　14M

UNIT–IV

7. a) Describe the determination of calorific value of solid fuel using bomb calorimeter. 7M

   b) The percentage composition of a sample of coal by weight was found to be: C = 76%, H = 5.2%, O = 12.8%, N = 2.7%, S = 1.2%, the remaining being ash. Calculate the minimum (**i**) Weight and (**ii**) volume at NTP of air necessary for complete combustion of 1 kg of coal and percentage composition by weight of dry products, if 50% excess air supplied. 7M

OR

8. a) Describe the Otto Hoffmann's method of manufacture of metallurgical coke with a neat labeled diagram 7M

   b) Write a note on Production and uses of Producer gas and Biogas. 7M

UNIT–V

9. a) What are refractories? Discuss any three properties of refractories. 7M

   b) Explain theory of lubricants. Write any three applications of lubricants. 7M

OR

10. a) How can you classify the rocket propellants? What are the characteristics requires for good propellants. 7M

    b) What is Portland cement? Explain hardening and setting of cement with various reactions involved in that process. 7M

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Code: 5G512

I B.Tech. I Semester Supplementary Examinations May/June 2016
Engineering Graphics-I
(Common to CE and ME)

Max. Marks: 70   Time: 3 Hours

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UNIT–I

1. a) The major and minor axis of an ellipse is 120 mm & 80 mm. Draw an ellipse by arcs of circles method.   7M

   b) The asymptotes of a hyperbola are inclined at 70⁰ to each other. Construct the curve when a point p on it is at a distance of 20 mm and 30 mm from the two asymptotes   7M

OR

2. a) The foci of an ellipse are 90 mm apart and the minor axis is 65 mm long. Determine the length of the major axis and draw half the ellipse by concentric-circles method and other half by oblong method.   7M

   b) The vertex of a hyperbola is 60mm from its focus. Draw the curve, if the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve 75mm from the directrix.   7M

UNIT–II

3. a) A circle of 60 mm diameter rolls on a horizontal line for a half revolution and then on a vertical line for another half revolution. Draw the curve traced out by a point *p* on the circumference of the circle.   7M

   b) Draw the involute of a circle 40 mm diameter. Draw a tangent and normal to the curve at a point 95 mm from the center of the circle.   7M

OR

4. a) Draw a hypo-cycloid of a circle of 40 diameters, which rolls inside another circle of 160 mm diameters, for one revolution counter clockwise   7M

   b) Draw one turn of the involutes of a hexagon whose inscribed circle is 30 mm in diameters.   7M

UNIT–III

5. a) A 90 mm long line is parallel to and 25 mm in front of the V.P. Its one end is in the H.P. while other end is 50 mm above the H.P. Draw the projections of the line and determine its inclination with the H.P.   7M

   b) The length of the top view of a line parallel to the V.P. and inclined at 45⁰ to the H.P. is 5 cm.One end of the line is 1.2 cm above the H.P. and 2.5 cm in front of the V.P. Draw the projections of the line and determines its true length.   7M

OR

6. a)   **i.** Draw the projections of a point A lying on HP and 50 mm in front of VP.
        ii. Draw the projections of a point A lying on VP and 55 mm above HP.
        iii. A point D is 35 mm below HP and 35 mm behind VP. Draw the projections.
        iv. point S is 35mm above HP and 55mm behind VP. Draw the projections.   7M

   b)   A line PQ 40mm long is parallel to VP and perpendicular to HP. One end Q is 15 mm above HP. Another end P is 55 mm above HP and 25 mm in front of VP. Draw the projections.   7M

UNIT–IV

7. a) A pentagonal plate of 35 mm side is perpendicular to V.P and parallel to H.P One of its edges is perpendicular to V.P. Draw its projections   7M

   b) Draw the projections regular pentagon of 40 mm side, having its surface inclined 300 to HP and a side parallel to the HP. And inclined at angle of 600 to VP.   7M

OR

8. a) Square lamina of side 40 mm is perpendicular to VP and parallels to HP. Draw its projections.   7M

   b) Draw the projections regular pentagon of 40 mm side, having its surface inclined 30^0 to HP and a side parallel to the HP. And inclined at angle of 60^0 to VP.   7M

UNIT–V

9. A line AB 120 mm long is inclined at 45^0 to HP and 30^0 to the VP. It's mid -point C is in VP and 20 mm above HP. The end A is in third quadrant and B is in first quadrant. Draw the projections of the line using the auxiliary plane method   14M

OR

10. A rectangular plane of 60mmX40mm is resting on shorter edge on the ground and inclined at 45^0 to V.P. The plane surface is inclined at 30^0 to H.P. Draw its projections using auxiliary plane method   14M

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Code: 5G511

I B. Tech. I Semester Supplementary Examinations May/June 2016
Engineering Mechanics–Statics
(Common to CE & ME)

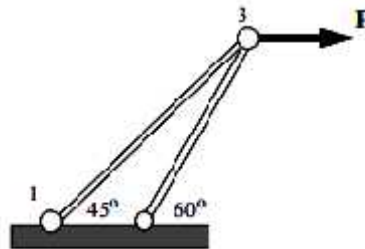Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)
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UNIT–I

1.   Find the forces in the members shown in the figure .Length of member 1-3 is 2m.

14M

OR

2. a) Define :-
            (i) Concurrent forces
            (ii) Coplanar forces
            (iii) Static equilibrium
            (iv) Dynamic Equilibrium   7M
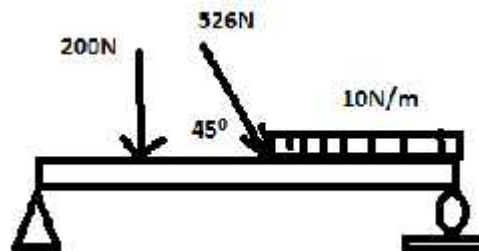
    b) Two forces $F_1=4i +7j -8k$ and $F_2= i+j+k$ acting on opposite corner points of a
        square of side 2units. Find the couple formed about a intersection point of
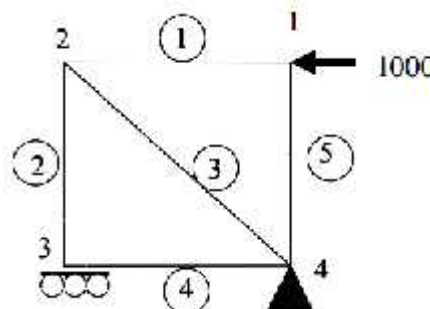   diagonal of the square.   7M

UNIT–II

3.   Find reaction forces and moments for the following beams:

14M

OR

4.   A five member's square truss structure is shown below: Using methods of
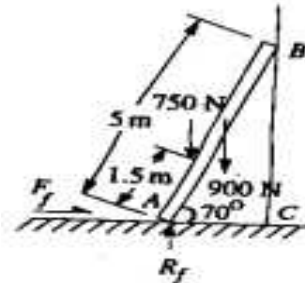   joints, determine all internal forces in members.

14M

UNIT–III

5. a) State the laws of kinetic and dynamic frictions. 7M

   b) Explain the concept of cone of friction. 7M

OR

6. Free body diagram of ladder with man weight 750N is shown below: If the ladder is at point of sliding, determine coefficient of friction between floor and ladder.
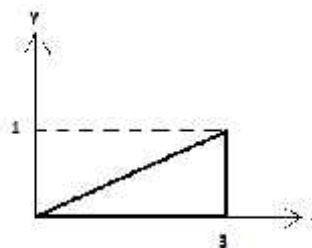

14M

UNIT–IV

7. a) State the Pappus–Guldin Theorems. 7M

   b) A region is bounded by semicircle y = $\sqrt{1 - x^2}$. Find the centroid of the region within the interval[-1 , 1]. 7M

OR

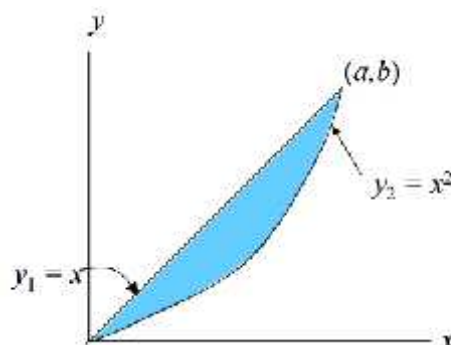8. Determine the coordinates of centre of mass for the triangle area shown below with integration:

14M

UNIT–V

9. Determine the moment of inertia of the shaded area shown with respect to each of the coordinate axes.

14M

OR

10. A square hole of dimension a is made in a circular plate of Radius R and thickness t. Find the mass moment of Inertia if q is density of plate material. 14M

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Code : 5GC14

I B.Tech. I Semester Supplementary Examinations May/June 2016
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 = 70Marks)
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UNIT–I

1. a) Solve $ydx - xdy = \sqrt{x^2 + y^2}\,dx$ 7M

    b) Find the orthogonal trajectory of the family of $r^n = a\sin n_n$ 7M

OR

2. a) Solve $\dfrac{dy}{dx} + x\sin 2y = x^3\cos^2 y$ 7M

    b) A tank contains 1000 gallons of brine in which 50 lt. of salt are dissolved. Fresh water runs into the tank at the rate of 10 gallons per minute and the mixture kept uniform by stirring, runs out at the same rate. How long will it be before only 50 lt. of salt is left in the tank?   7M

UNIT–II

3. a) Solve $\dfrac{d^2 y}{dx^2} - 2\dfrac{dy}{dx} + y = xe^x \sin x$ 7M

    b) Solve $y'' + 4y = x\sin x$ by the method of variation of parameters   7M

OR

4. a) Solve $\dfrac{d^2 y}{dx^2} - 3\dfrac{dy}{dx} + 2y = xe^{3x} + \sin 2x$ 7M

    b) In an $L - C - R$ circuit, the charge q on a plate of a condenser is given by

    $L\dfrac{d^2 q}{dt^2} + R\dfrac{dq}{dt} + \dfrac{q}{C} = E\sin pt$ The circuit is tuned to resonance so that $p^2 = 1/LC$
    . Find the current i 7M

UNIT–III

5. a) Solve in series of the equation $\dfrac{d^2 y}{dx^2} + x^2 y = 0$ 7M

    b) Verify Rolles mean value theorem on $[0, 2]$ for the function $f(x) = 1 - (x-1)^{2/3}$ 7M

OR

6. a) Solve in series of $x^2\dfrac{d^2 y}{dx^2} + x\dfrac{dy}{dx} + (x^2 - 4)y = 0$ 7M

    b) Verify Taylors theorem for $f(x) = (1-x)^{7/2}$ with Lagranges form of remainder upto 2 terms in the interval $[0,1]$ 7M

UNIT–IV

7. a) Find the first and second partial derivatives of $z = x^3 + y^3 - 3axy$ 7M

    b) Find the maxima and minima of $f(x, y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$ 7M

OR

8. a) If $\dfrac{x^2}{a^2 + u} + \dfrac{y^2}{b^2 + \}} + \dfrac{z^2}{c^2 + u} = 1$ then prove that $u_x^2 + u_y^2 + u_z^2 = 2(xu_x + yu_y + zu_z)$ 7M

    b) Find the stationary values of $u = x^2 + y^2 + z^2$ subject to $ax^2 + by^2 + cz^2 = 1$ and $lx + my + nz = 0$ 7M

UNIT–V

9. Trace the curve $x^{2/3} + y^{2/3} = a^{2/3}$ 14M

OR

10. Trace the curve $x = a(_{,,} - \sin _{,,}), y = a(1 - \cos _{,,})$ where $(0 < _{,,} < 2f)$ 14M

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Code : 5GC11

R-15

I B.Tech. I Semester Supplementary Examinations May/June 2016
English through Literature
(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 kind of a lady was Mini's mother? Why was she suspicious of Cabuliwallah?   7M

    b) What do you think about the ending of the story "Cabuliwallah"?   7M

OR

2. Give an account of the life of G.D Naidu   14M

UNIT-II

3. a) The poem 'If' by Rudyard Kipling is a celebration of values. Explain.   7M

    b) How does the mother dog react to its puppy dog's death in 'A Dog's tale' by Mark Twain?   7M

OR

4. Why is Sudha Murthy considered a role model for young Indian women?   14M

UNIT-III

5. Do you think Jim and Della were wise? Give your reason.   14M

OR

6. a) Why does William Davies refer to the lives of modern world as poor lives? 7M

    b) What are the achievements of Dr.Vijay Bhatkar in the field of Information Technology?   7M

UNIT-IV

7. a) What kind of working analysis does the astrologer follow while making predictions?   7M

    b) What is the challenge thrown by the stranger to the astrologer? Who wins the challenge finally?   7M

OR

8. Describe the greatness of Sir.J.C.Bose   14M

UNIT-V

9. Give a detailed account of Homi Jehangir Bhabha's life in UK.   14M

OR

10. The play "The Proposal" is considered a satirical comedy. Explain your view. 14M

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Code: 5G111

I B. Tech. I Semester Supplementary Examinations May/June 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 is Programming Language? Explain about Computer Programming Languages with example.   7M
   b) Apply Software Development method to find roots of quadratic equation.   7M

OR

2. a) Define flowchart. Draw flowchart to find given number is Armstrong or not   7M
    b) Give short notes on computer environments.   7M

UNIT–II

3. a) Enlist the features of c language.   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 c program, which takes two integer operands and one Operator from the user, performs the specified operation and then prints the result (consider the operators +,-,*,/,% and use switch statement).   5M
    b) Explain break, continue and goto statements with suitable example.   9M

OR

6. a) Write a c program to find sum of series 1!+2!+3!+4!+.......+n!   5M
    b) Explain while, do-while and for loop with suitable example Programs.   9M

UNIT–IV

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

OR

8. a) What is an array? How one-dimensional and two-dimensional arrays are declared and initialized. Give suitable example.   7M
    b) Explain strcpy, strcat, strcmp, strlen functions with suitable example programs.   7M

UNIT–V

9. a) What is function? Describe different categories of functions with suitable example programs.   10M
    b) Write a c program to find factorial of a number using recursion.   4M

OR

10. a) Explain the scope, visibility and lifetime of variables with suitable examples. 10M
    b) Describe preprocessor commands with suitable examples.   4M

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