Code: 5GC11

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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) Describe the first meeting of Mini and Abdul Rehman, Cabuliwallah   7M
   b) What road did the poet choose? Does he regret his choice?   7M

OR

2. Describe the life of Cabuliwallah.   14M

UNIT-II

3. What kind of life the dog leads from its childhood to adulthood in Mark
   Twain is "A dog's tale"?   14M

OR

4. a) What is the message presented in the poem 'If' by Rudyard Kipling?   7M
   b) What is the contribution of Sudha Murthy towards society?   7M

UNIT-III

5. What sacrifice do Della and Jim make for each other?   14M

OR

6. Why is Dr. Vijay Bhatkar referred to as the architect of India's Information
   technological revolution?   14M

UNIT-IV

7. Describe the astrologer's meeting with the stranger. What challenge they
   throw to each other?   14M

OR

8. Give a detailed account of J.C Bose's life at Presidency College.   14M

UNIT-V

9. What developments did Homi Jehangir Bhabha make towards nuclear
   programme?   14M

OR

10. What is the central theme of the play "The Proposal" by Anton Chekov?   14M

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Code: 5GC12

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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) What is the principle of EDTA Method? Describe the estimation of hardness of water by EDTA method   7M

    b) With the help of neat diagram, explain the use of zeolite process for softening of water and its limitations.   7M

OR

2.   Discuss the various boiler troubles, their causes and prevention.   14M

UNIT–II

3. a) What are fuel cells? Describe the working principle of methanol-oxygen fuel cell with reactions.   7M

    b) Describe the construction lead-acid battery with the reactions occurring during discharge.   7M

OR

4. a) What is electrochemical corrosion? Explain electrochemical theory of corrosion,   7M

    b) How is corrosion prevented by sacrificial anodic protection and cathodic protection? Explain.   7M

UNIT–III

5. a) How the following are produced?

        (i) Buna-S, (ii) Polyurethane. Mention their properties and uses.   7M

    b) Explain with examples the terms: addition polymerisation, copolymerisation and condensation polymeristaion.   7M

OR

6. a) Distinguish between thermoplastic and thermosetting polymers or resins.   7M

    b) Discuss briefly the process of vulcanization of rubber.   7M

UNIT–IV

7. a) A sample of coal containing 92 % C, 5 % H, 3 % ash. When this coal was tested in the laboratory for its calorific value in the bomb calorimeter, the following data were obtained

   Weight of coal burnt = 0.95 gms

   Weight of water taken = 700 gms

   Water equivalent weigh of bomb calorimeter = 200 gms

   Rise in temperature = 2.48^{0}C

   Cooling correction = 0.02^{0}C

   Fuse wire correction = 10.0 Cal

   Acid correction = 60.0 Cal

   Calculate the net and gross calorific values of the coal in Cal/g. (Assume the latent heat of condensation of steam as 580 cal/gm)   7M

   b) Explain the analysis of flue gases by Orsat's apparatus.   7M

OR

8. a) Explain the Fishcer – Tropsch's method of synthesis of petrol.   7M

   b) A sample of coal was found to contain the following constituents. C = 81%,   O = 8%, S = 1 & H = 5%, N = 1% and ash = 4%. Calculate the minimum amount of air required for the complete combustion of 1 Kg of coal. Also, calculate the percentage composition by weight of the dry products of combustion. Oxygen in air is 23% by weight.   7M

UNIT–V

9. a) What is setting and hardening of cement? Explain various reactions involved in setting and hardening of cement.   7M

   b) Explain the classifications and characteristics of rocket propellants.   7M

OR

10. a) What is the composition of Portland cement? Describe manufacture of Portland cement with dry method.   7M

    b) What are lubricants? Write any three properties and applications of lubricants.   7M

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Code: 5G512a

R-15

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
Engineering Graphics–I
(Civil Engineering)

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. The vertex of a hyperbola is 65 mm from its focus. Draw the curve if the eccentricity is $\frac{3}{2}$. Draw a normal and tangent at a point on the curve, 75 mm from the directrix.   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. 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

OR

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

UNIT–III

5. A line AB, inclined at 40° to the V.P., has its ends 50 mm and 20 mm above the H.P. The length of its front view is 65 mm and its V.T is 10 mm above the H.P. Determine the true length of AB, its inclination with the H.P. and its H.T.   14M

OR

6. A line PQ 100 mm log, is inclined at 30° to the H.P. and at 45° to the V.P. Its mid-point is in the V.P. and 20 mm above the H.P. Draw its projections, if its end P is in the third quadrant and Q in the first quadrant.   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° 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 60° to the H.P. and 30° to the V.P. Draw the projections of the plate.   14M

UNIT–V

9. A straight line AB of 30 length, is inclined at 30° to H.P and its top view makes an angle of 60° with XY. The end A of the line is 20 above H.P. and 15 in front of V.P. Draw the projections of the line, by auxiliary plane method.   14M

OR

10. A regular pentagon of edge 30, is resting on H.P on one of its corners such that, the surface makes an angle of 60° to H.P. The edge opposite to this corner makes an angle of 45° with V.P. Draw its projections by auxiliary plane method.   14M

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I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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 100N force is applied to the end of lever which is attached to a shaft at O.
       Determine:

        (i) Moment about O
        (ii) Horizontal force at A which creates the same moment
        (iii) the smallest force at A which creates the same moment
        (iv) location of 240N vertical force to produce same moment
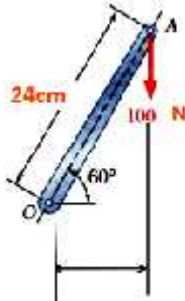
14M

OR

2.   A cube is acted on by a force P. Determine the moment of P

        (i) about A
        (ii) about the edge AB
        (iii) about the diagonal AG
        (iv) Determine the perpendicular distance between AG and FC
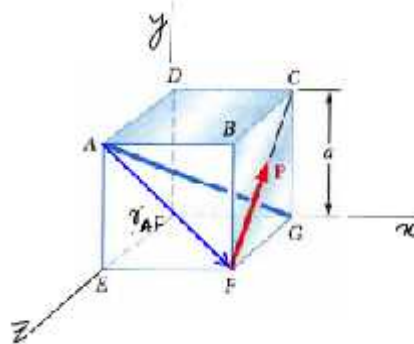
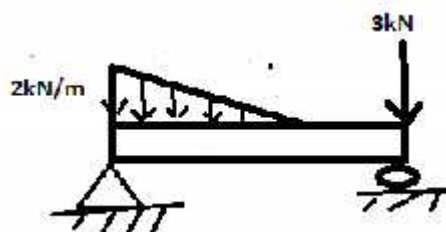14M

UNIT–II

3.   Determine the Resultant of the loads on the structure as shown in Figure and
       locate it relative to left hand support.
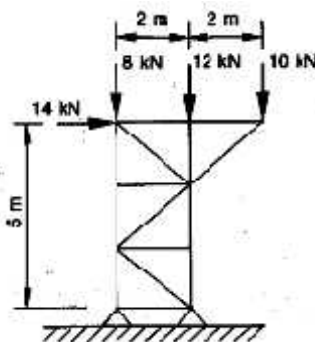
14M

OR

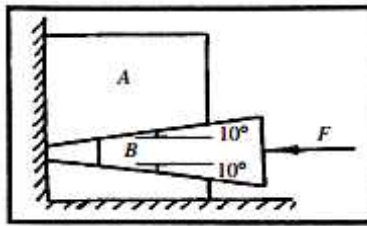4.   Find reaction forces on the beam given below:

14M

5. a) Discuss types and applications of friction   7M
   b) State laws of friction.   7M

OR

6. The box A has mass of 80kg and the wedge B has mass of 40kg.What force F is required to raise box A at constant rise.
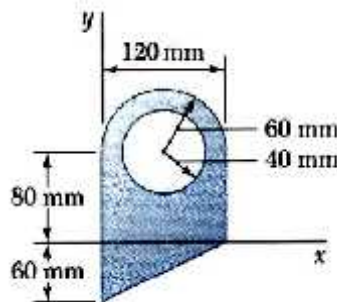

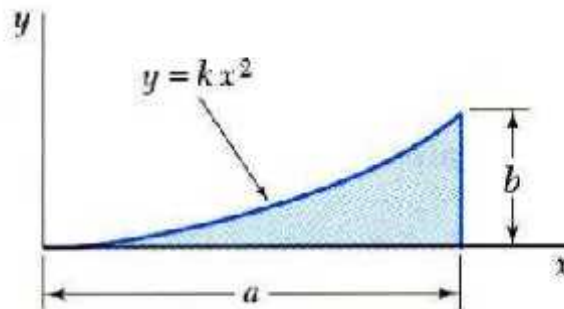$\mu_s = 0.15$ and $\mu_k = 0.12.$ 14M

UNIT–IV

7. Determine the coordinates of C.G. of the following lamina:
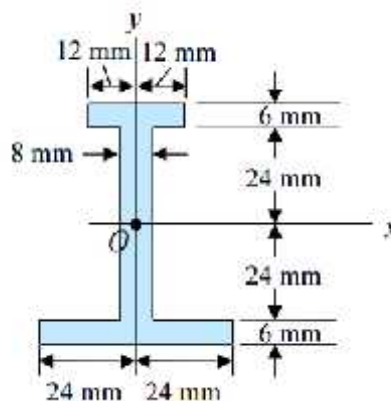

14M

OR

8. Determine coordinates of the centre of mass of lamina given below:
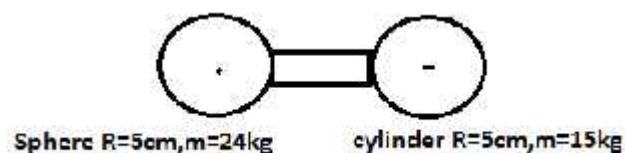

14M

UNIT–V

9. Determine the moments of inertia and the radius of gyration of the shaded area with respect to the x and y axes.

14M

OR

10. A sphere and cylinder are attached with a thin rod of length 1m and mass of 6kg.Determine the mass moment of inertia of the system.

Sphere R=5cm,m=24kg   cylinder R=5cm,m=15kg

14M

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Code: 5GC14

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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)
****

UNIT–I

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

   b) Find the orthogonal trajectories of the family of $\dfrac{x^2}{a^2+\}} + \dfrac{y^2}{b^2+\}} = 1$, $\}$ is the parameter   7M

OR

2. a) Solve $x(x-y)dy + y^2 dx = 0$ 7M

   b) A tank initially contains 50 gallons of fresh water. Brine containing 2 pounds per gallon of salt, flows into the tank at the rate of 2 gallons per minute and the mixture kept uniform by stirring, runs out at the same rate. How long will it take for the quantity of salt in the tank to increase from 40 to 80 pounds?   7M

UNIT–II

3. a) Solve $\dfrac{d^2y}{dx^2} - 6\dfrac{dy}{dx} + 25y = e^{3x} + \sin x + x^2$ 7M

   b) Solve $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters   7M

OR

4. a) Solve $(D^3 - 5D^2 + 7D - 3)y = e^{2x}\operatorname{Cosh}x$ 7M

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

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

UNIT–III

5. a) Solve $(1-x^2)y'' + 2y = 0$ by series method with $y(0) = 4$, $y'(0) = 5$ 7M

   b) Verify Rolles mean value theorem on $[a,b]$ for the function $f(x) = (x-a)^m (x-b)^n$, m,n are positive integers.   7M

OR

6. a) Solve in series of $9x(1-x)\dfrac{d^2y}{dx^2} - 12\dfrac{dy}{dx} + 4y = 0$ 7M

   b) Verify Taylors theorem for $f(x) = \log(1+x)$ with Lagranges form of remainder upto 2 terms in the interval $[0,1]$ 7M

UNIT–IV

7. a) If $z = f(x+ct) + w(x-ct)$ then prove that $\dfrac{\partial^2 z}{\partial t^2} = c^2\dfrac{\partial^2 z}{\partial x^2}$ 7M

   b) Find the maxima and minima of $f(x,y) = x^3 y^2 (1-x-y)$ 7M

OR

8. a) Let $r^2 = x^2 + y^2 + z^2$ and $V = r^m$ then prove that $V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$ 7M

   b) Find the maximum and minimum distances of the point $(3,4,12)$ from the sphere $x^2 + y^2 + z^2 = 4$ 7M

UNIT–V

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

OR

10.   Trace the curve $r^2 = a^2\cos 2_{\,\prime\prime}$ 14M

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Code: 5G111

I B. Tech. I Semester Regular Examinations Dec/Jan 2015/2016
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)	Explain software development method with suitable example.	10M
	b)	Draw flowchart for factorial of a number.	4M

OR

2.	a)	What is an algorithm? Explain the properties of an algorithm and write an algorithm to find whether a number is even or odd.	7M
	b)	What is flowchart? Describe various symbols used in flowcharts and draw flowchart for reversing the digits of a given number.	7M

UNIT–II

3.	a)	Define a variable. What are the rules used in naming a variable? Give examples.	5M
	b)	What is data type? Explain basic data types and their sizes used in a C Language.	9M

OR

4	a)	What is type conversion? Explain about implicit and explicit type conversion with suitable examples.	8M
	b)	Define constant. Explain different types of constants used in c language with examples.	6M

UNIT–III

5	a)	Define nested loop. Write a c program to print the following pattern.	

```
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
```
5M

	b)	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
```
9M

OR

6.	a)	Explain if, if-else, nested-if and else-if-ladder with suitable examples.	10M
	b)	Explain goto statement with suitable example program.	4M

UNIT–IV

7	a)	Write a c program to read one matrix and find the sum of its diagonal elements.	8M
	b)	What is string? Describe at least six string handling functions with suitable examples.	6M

OR

8	a)	Define an array. Write a c program to perform matrix multiplication on two 3x3 matrices.	7M
	b)	Define string. Write a c program to find whether the given string is palindrome or not.	7M

UNIT–V

9	a)	Write a c program to swap two numbers using call by value and call by reference.	9M
	b)	What is library function? Explain about any five-library functions.	5M

OR

10	a)	Write a short note on macros.	6M
	b)	What is user defined function? Describe different categories of user defined functions with suitable examples.	8M

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