

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)

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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R-15

Code: 5GC12

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)

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 polymerisation. 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°C

Cooling correction = 0.02°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 Fischer – Tropsh'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

Code: 5G512b

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

Engineering Graphics-I
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. 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 the other half by oblong method. Draw a curve parallel to the ellipse and 25 mm away from it. 14M

OR

2. 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

UNIT-II

3. A circle of 50 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. 14M

OR

4. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. Draw a tangent and a normal to the curve at a point 125 mm from the centre of the directing circle. 14M

UNIT-III

5. A line AB, 90 mm long, is inclined at 45° to the H.P. and its top view makes an angle of 60° with the V.P. The end A is in the H.P. and 12 mm in front of the V.P. Draw its front view and find its true inclination with the V.P. 14M

OR

6. A line AB, 65 mm long, has its end A 20 mm above the H.P. and 25 mm in front of the V.P. The end B is 40 mm above the H.P. and 65 mm in front of the V.P. Draw the projections of AB and show its inclinations with the H.P. and the V.P. 14M

UNIT-IV

7. Draw the projections of a circle of 50 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45° to the H.P. and the diameter AB making 30° angle with the V.P. 14M

OR

8. A thin 30°–60° set-square has its longest edge in the V.P. and inclined at 30° to the H.P. Its surface makes an angle of 45° with the V.P. Draw its projections. 14M

UNIT-V

9. The top view of a line AB of 100 long, measures 85, while the length of the front view is 65. It's one end A is on H.P and 15 behind V.P. Draw the projections of AB by auxiliary plane method and determine its inclinations with H.P and V.P. Find the distance of the mid-point of AB from XY. 14M

OR

10. A thin regular hexagonal plate of 30 side is resting on V.P on one of its edges, which makes an angle of 45° with H.P and the surface is inclined at 30° to V.P. Draw its projections by auxiliary plane method. 14M

Code: 5G511

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)

UNIT-I

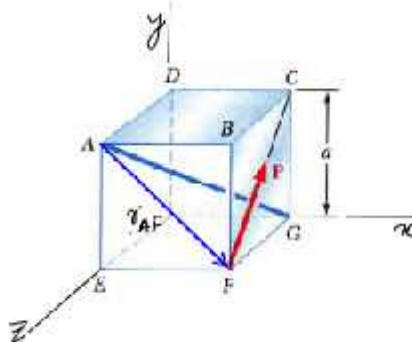
1. A 100N force is applied to the end of lever which is attached to a shaft at O. Determine:
- Moment about O
 - Horizontal force at A which creates the same moment
 - the smallest force at A which creates the same moment
 - location of 240N vertical force to produce same moment



14M

OR

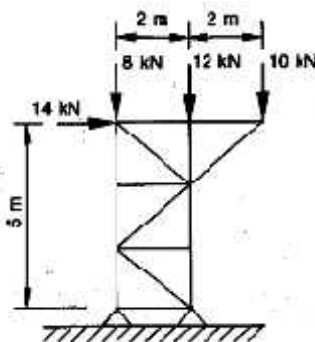
2. A cube is acted on by a force P. Determine the moment of P
- about A
 - about the edge AB
 - about the diagonal AG
 - Determine the perpendicular distance between AG and FC



14M

UNIT-II

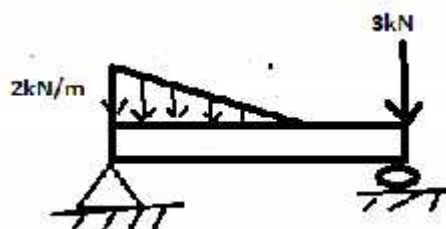
3. Determine the Resultant of the loads on the structure as shown in Figure and locate it relative to left hand support.



14M

OR

4. Find reaction forces on the beam given below:



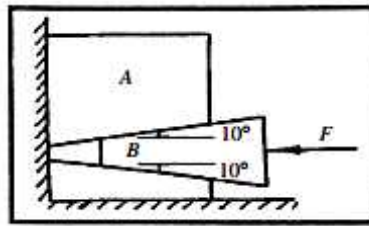
14M

UNIT-III

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.

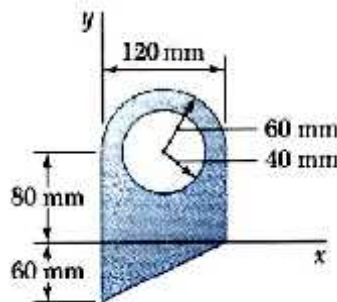


$$\mu_s = 0.15 \text{ and } \mu_k = 0.12.$$

14M

UNIT-IV

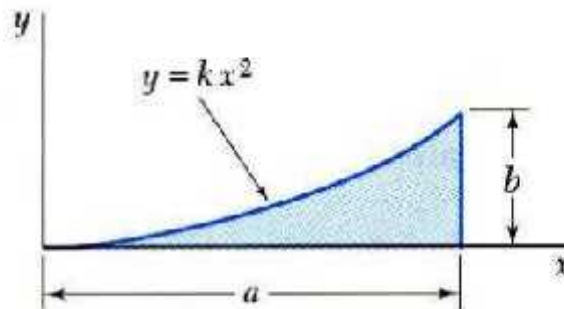
7. Determine the coordinates of C.G. of the following lamina:



14M

OR

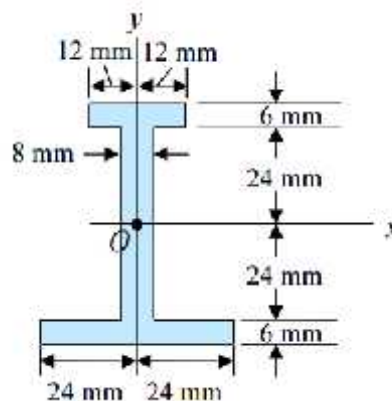
8. Determine coordinates of the centre of mass of lamina given below:



14M

UNIT-V

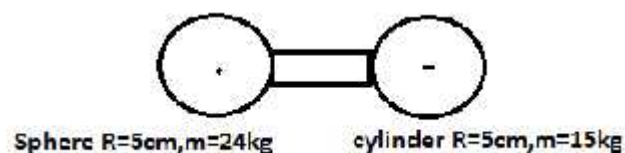
9. Determine the moments of inertia and the radius of gyration of the shaded area with respect to the x and y axes.



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.



14M

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 $\frac{x^2}{a^2 + \lambda} + \frac{y^2}{b^2 + \lambda} = 1$, λ is the parameter 7M

OR

2. a) Solve $x(x-y)dy + y^2dx = 0$ 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 $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 25y = e^{3x} + \sin x + x^2$ 7M
- b) Solve $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters 7M

OR

4. a) Solve $(D^3 - 5D^2 + 7D - 3)y = e^{2x} \text{Cosh } x$ 7M
- b) In an $L-C-R$ circuit, the charge q on a plate of a condenser is given by $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = E \sin pt$. 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 $9x(1-x)\frac{d^2y}{dx^2} - 12\frac{dy}{dx} + 4y = 0$ 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 $\frac{\partial^2 z}{\partial t^2} = c^2 \frac{\partial^2 z}{\partial x^2}$ 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 $r^2 = a^2 \cos 2\theta$ 14M

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)

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. 5M
 1 2 3 4 5
 1 2 3 4 5
 1 2 3 4 5
 b) Write a c program to print the following pattern using while, do-while and for loop. 9M
 1
 1 2
 1 2 3
 1 2 3 4

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
