

Hall Ticket Number :

R-15

Code: 5GC12

I B.Tech. I Semester Supplementary Examinations June 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 = 70 Marks)

UNIT-I

1. a) Write short notes on
- i) Colloidal conditioning 7M
 - ii) Calgon conditioning 7M
- b) Explain the "Chlorinator" used in purification of drinking water. 7M

OR

2. a) Give a detailed account on Caustic embrittlement 7M
- b) Write short notes on Boiler corrosion. How it can be prevent? 7M

UNIT-II

3. Explain the following
- a) Galvanic corrosion. 7M
 - b) Concentration cell corrosion 7M

OR

4. a) Write briefly about primary cells and secondary cells. 7M
- b) Explain the construction and functioning of the Nickel-cadmium battery. 7M

UNIT-III

5. a) Write the following Thermoplastic & Thermosetting resine. 7M
- b) Distinguish between addition & condensation polymerization. 7M

OR

6. How polyaniline and polyacetylene acts as conducting polymers? Explain the mechanism of conduction of electrons through the polymers 14M

UNIT-IV

7. a) How are Octane number and Cetane number related to chemical composition and molecular structure of fuel? 7M
- b) How would you explain the chemistry of manufacture of water gas? 7M

OR

8. a) Examine the various constituents that are normally present in petroleum crude. 4M
- b) Illustrate the function of petroleum refineries in processing crude petroleum. 10M

UNIT-V

9. a) Define Lubricant? Give the functions of Lubricants. 7M
- b) Write short notes on extreme – Pressure Lubrication. 7M

OR

10. Give an account of flash and fire point of a Lubricant. Describe the determination of flash point by Penskey-Marten's method. 14M

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Code: 5G512

I B.Tech. I Semester Supplementary Examinations June 2017

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)

UNIT-I

1. Two points A and B are 100 mm apart. A point C is 75 mm from A and 60 mm from B. Draw an ellipse passing through A, B and C. 14M

OR

2. Draw a rectangle having its sides 125 mm and 75 mm long. Inscribe two parabolas in it with their axes bisecting each other. 14M

UNIT-II

3. Show by means of a drawing that when the diameter of the directing circle is twice that of generating circle, the hypocycloid is a straight line. Take the diameter of the generating circle equal to 50 mm. 14M

OR

4. An inelastic string 145 mm long has its one end attached to its 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

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. The front view of a line AB measures 65 mm and makes an angle of 45° with xy. A is in the H.P. and the V.T. of the line is 15 mm below the H.P. The line is inclined at 30° to the V.P. Draw the projections of AB and find its true length and inclination with the H.P. Also locate its H.T. 14M

UNIT-IV

7. A circular plate of negligible thickness and 50 mm diameter appears as an ellipse in the front view having its major axis 50 mm and minor axis 30 mm long. Draw its top view when the major axis of the ellipse is horizontal. 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. A thin regular pentagonal plate of 60 mm long edges has one of its edges in the H.P. and perpendicular to V.P. while its farthest corner is 60 mm above the H.P. Draw the projections of the plate. Project another front view on an A.V.P. making an angle of 45° with the V.P. 14M

OR

10. The top view of a 75 mm long line AB measures 65 mm, while the length of its front view is 50 mm. It's one end A is in the H.P. and 12 mm in front of the V.P. Draw the projections of AB and determine its inclinations with H.P. and V.P. using auxiliary plane method. 14M

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations June 2017

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)

UNIT-I

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

b) Find the orthogonal trajectories of the family of confocal conics $\frac{x^2}{a^2} + \frac{y^2}{b^2 + \lambda} = 1$ where λ is the parameter 7M

OR

2. a) Solve $\frac{dy}{dx} = \frac{y}{x + \sqrt{xy}}$ 7M

b) A body originally at $80^\circ C$ cools down to $60^\circ C$ in 20 minutes, the temperature of the air being $40^\circ C$. What will be the temperature of the body after 40 minutes from the original? 7M**UNIT-II**

3. a) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x}$ 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 turned to resonance so that $p^2 = \frac{1}{LC}$ find the current i 7M**OR**

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

b) Solve $(D^3 + 2D^2 + D)y = x^2 e^{2x} + \sin^2 x$ 7M

UNIT-III

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

b) Verify Rolle's theorem for $f(x) = (x-a)^m(x-b)^n$ where m, n are positive integers in $[a, b]$. 7M**OR**

6. a) Solve in series the equation $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 4y = 0$ 7M

b) Expand $e^{a \sin^{-1} x}$ in ascending powers of x 7M

UNIT-IV

7. a) Find first and second partial derivatives of $f(x, y) = ax^2 + 2hxy + by^2$ and
 verify $\frac{\partial^2 f}{\partial x \partial y} = \frac{\partial^2 f}{\partial y \partial x}$ 7M
- b) Find the maximum and minimum values of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ 7M

OR

8. a) If $u = x^2 - 2y$, $v = x + y + z$, $w = x - 2y + 3z$, find $\frac{\partial(u, v, w)}{\partial(x, y, z)}$ 7M
- b) Find the dimensions of the rectangular box, open at the top, of maximum capacity whose surface is 432 sq.cm. 7M

UNIT-V

9. Trace the curve $y^2(a - x) = x^3$, $a > 0$ 14M
- OR
10. Trace the curve $r = a \sin 3\theta$, 14M

Code: 5G511

I B.Tech. I Semester Supplementary Examinations June 2017

Engineering Mechanics - Statics

(Common to CE & ME)

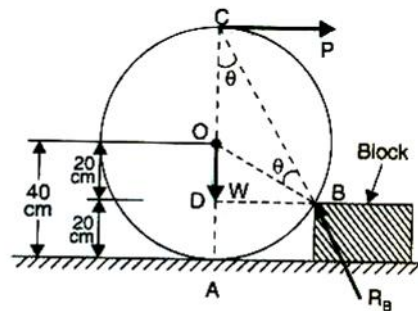
Max. Marks: 70

Time: 3 Hours

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

UNIT-I

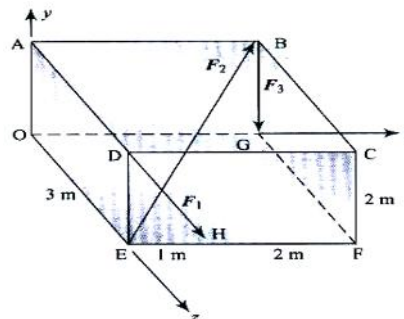
1. a) State the Varignon's principle. Also give the proof of Varignon's principle. 6M
- b) A roller of radius 40 cm, weighing 3000 N is to be pulled over a rectangular block of height 20 cm as shown in figure, by a horizontal force applied at the end of a string wound round the circumference of the roller. Find the magnitude of the horizontal force which will just turn the roller over the corner of the rectangular block. Also determine the magnitude and direction of reactions at A and B. All surfaces may be taken as smooth.



8M

OR

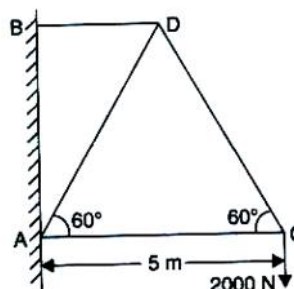
2. The forces F_1 , F_2 and F_3 act on the box as shown in figure. Determine the resultant of the forces. The magnitude of the given forces are 19 N, 23 N and 46 N respectively.



14M

UNIT-II

3. a) What is a frame? State the difference between a perfect frame and an imperfect frame. 4M
- b) Determine the forces in all the members of a cantilever truss shown in figure.



10M

OR

4. A simply supported beam AB is subjected to a distributed load increasing from 1500 N/m to 4500 N/m from end A to end B respectively. The span AB = 6 m. Determine the reactions at the supports. 14M

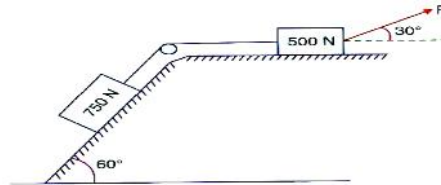
UNIT-III

5. A uniform ladder of length 10 m and weighing 20 N is placed against a smooth vertical wall with its lower end 8 m from the wall. In this position the ladder is just to slip. Determine (i) The co-efficient of friction between the ladder and the floor and (ii) Frictional force acting on the ladder at the point of contact between ladder and floor.

14M

OR

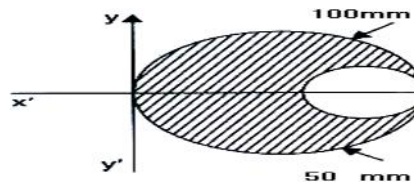
6. a) State the laws of static and dynamic friction. 4M
- b) What is the value of P in the system shown in figure to cause the motion of 500 N block to the right side? Assume the pulley is smooth and the coefficient of friction between other contact surfaces is 0.20.



10M

UNIT-IV

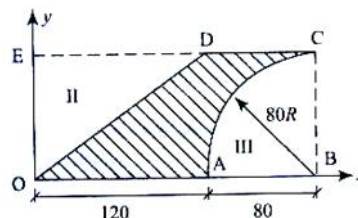
7. a) State and explain Pappus and Guldinus theorems. 6M
- b) From a circular plate of diameter 100 mm a circular part of diameter 50 mm is cut as shown in figure. Find the centroid of the remainder.



8M

OR

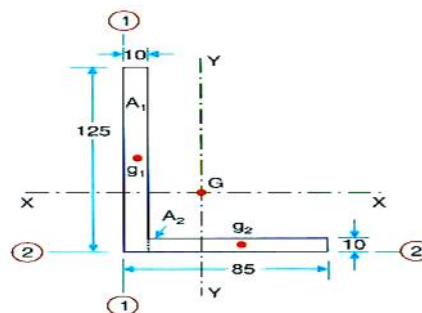
8. Determine the location of centroid of the composite figure as shown in figure. All dimensions are in mm.



14M

UNIT-V

9. a) State the theorem of perpendicular axis. How will you prove this theorem? 6M
- b) Determine the moment of inertia of the L-section shown in the figure about its centroidal axes parallel to the legs. All dimensions are in mm.



8M

OR

10. A brass cone with base diameter of 400 mm and height of 225 mm is placed on a vertical aluminium cylinder of height 300 mm and diameter 400 mm. Density of brass = 85 kN/m^3 and density of aluminium = 25.6 kN/m^3 . Determine the mass moment of inertia of the composite body about the vertical geometrical axis.

14M

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Code: 5GC11

I B.Tech. I Semester Supplementary Examinations June 2017

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)

UNIT-I

1. Estimate G.B. Naidu's contribution to the field of science. 14M

OR

2. a) How does the poet describe nature in "The Road not Taken"? 7M
b) Assess the character of Cabuliwala. 7M

UNIT-II

3. a) Give the summary of Rudyard Kipling's poem "If". 7M
b) In what way Sudha Murthy's life remain exemplary? 7M

OR

4. Critically analyse the story "A Dog's Tale" 14M

UNIT-III

5. Justify the title of the story " Gift of Magi" 14M

OR

6. a) Appreciate the poem "Leisure" 7M
b) Write a note on Vijay Bhatkar 7M

UNIT-IV

7. a) Compare the attitude of father with that of peasants in "Night of the Scorpion"? 7M
b) Estimate the contribution of Bose to the field of science 7M

OR

8. Examine the role of fate in "An Astrologer's Day" 14M

UNIT-V

9. Critically appreciate Chekhov's play "The Proposal" 14M

OR

10. Who is Homi Jehanghir Baba? Briefly discuss the various positions he held, institutions he established and awards he received and contributions he made to the development of India. 14M

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R-15

Code: 5G111

I B.Tech. I Semester Supplementary Examinations June 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 = 70Marks)

UNIT-I

1. a) What is the role of Debugging programs in implementation of algorithms? 6M
b) Define Flow Chart? Draw a flow chart to read 50 numbers and print their sum. 8M

OR

2. a) What is the need of Computer Language? Describe different computer languages in detail. 7M
b) Does the use of Procedures will emphasize modularity of the program? Justify. 7M

UNIT-II

3. a) List and explain various Bitwise Operators with suitable examples. 6M
b) What are the rules to be followed in naming a variable? 8M

OR

4. a) What is a data type? Write in brief about the data types in C. 6M
b) Illustrate about various input and output statements in C. 8M

UNIT-III

5. a) Differentiate break and continue with a suitable example. 5M
b) Write code segments for displaying numbers from 1 to 10 using While, do ..while, and for statements. 9M

OR

6. a) Illustrate multi way selection statement with sample c code. 7M
b) Write a C program to find the given number is palindrome or not. 7M

UNIT-IV

7. a) Write a C program to find the maximum element in an array. 7M
b) Write a C program to find the occurrence of a substring in a given string. 7M

OR

8. What is an Array? How to declare two dimension array? Write a C program to perform multiplication of two matrices. 14M

UNIT-V

9. a) Compare library functions and user-defined functions. 7M
b) Write a C program which uses a recursive function to evaluate,
 $F(x) = x - x^3/3! + x^5/5! - x^7/7! + \dots$ 7M

OR

10. What are the storage classes in C? Explain their usage with suitable examples. 14M
