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R-17

Code: 7G511

I B.Tech. I Semester Supplementary Examinations December 2020

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 = 70 Marks)

UNIT-I

- 1. a) Divide a straight line AB of length 50 mm, into 9 equal parts
b) Bisect a straight line AB of length 65 mm
- OR**
- 2. Bisect an angle AOB given Angle AOB = 45° and Angle AOB = 125°

UNIT-II

- 3. Draw an involute of a hexagon of side length 30mm. Also draw a normal and tangent to the curve at a distance of 90mm from the center of the hexagon
- OR**
- 4. Draw an involute of a circle of diameter 50mm. Also draw a normal and tangent to the curve at a distance of 75mm from the center of the circle

UNIT-III

- 5. A line PQ, 50mm long is perpendicular to H.P. and 15mm in front of V.P. The end P, nearer to H.P is 20mm above it. Draw the projections of a line
- OR**
- 6. A line PQ, 50mm long is perpendicular to V.P. and 15mm above H.P. The end P, nearer to V.P. is 20mm in front of it. Draw the projections of a line

UNIT-IV

- 7. A hexagonal plane of side length 30mm is parallel to V.P. and perpendicular to H.P. with a side parallel to H.P. The plane is 25mm in front of V.P. Draw its projections
- OR**
- 8. A pentagon plane of side length 30mm is parallel to H.P. with a side perpendicular to V.P. The plane is 30mm from H.P. Draw its projections

UNIT-V

- 9. A straight line AB of 50 length is inclined at 45° to V.P. The end A of the line is 20 above H.P. and 15 in front of V.P. Draw the projections by auxiliary plane method
- OR**
- 10. A straight line PQ of 90 length is inclined at 35° to H.P. The end P of the line is 45 above H.P. and 30 in front of V.P. Draw the projections by auxiliary plane method

Code: 7G512

I B.Tech. I Semester Supplementary Examinations December 2020

Engineering Mechanics - Statics
(Common to CE & ME)

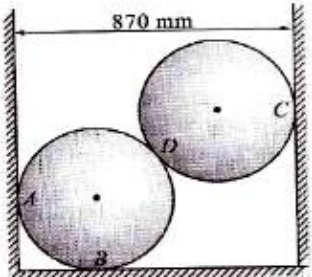
Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Two smooth spheres of weight 100N and radius 250 mm each are in equilibrium each are in equilibrium in a horizontal channel of width 870 mm as shown in the Figure. Find the reactions at the surfaces of contact A, B, C, D assuming all surfaces to be smooth.

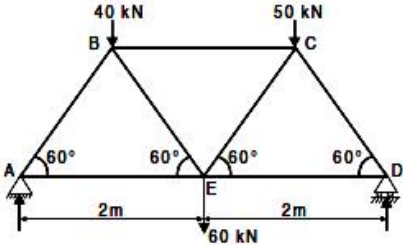


OR

2. a) State and prove Varignon's theorem.
b) How do you define the system of forces? Sketch at least three systems of forces.

UNIT-II

3. Determine the forces in all the members of the truss shown in Fig. and indicate the magnitude and nature of forces on the diagram of the truss. All inclined members are at 60° to horizontal and length of each member is 2 m.

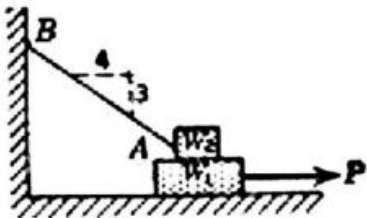


OR

4. a) What are the advantages of method of sections over method of joints?
b) Explain the reactions at i) fixed support and ii) roller support.

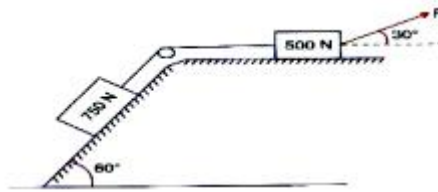
UNIT-III

5. A block of weight $W_1 = 200\text{ N}$ rests on a horizontal surface and supports on top of it another block of weight $W_2 = 50\text{ N}$. The block W_2 is attached to a vertical wall by the inclined string AB. Find the magnitude of the horizontal force P , applied to the lower block as shown, that will be necessary to cause slipping to impend. The coefficient of static friction for all contact surfaces is $\mu = 0.3$ as shown in figure.



OR

6. 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.

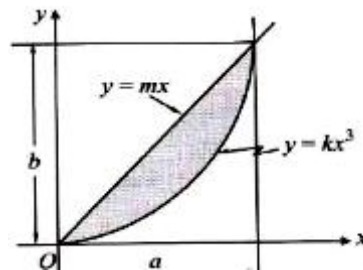


UNIT-IV

7. Determine the centre of gravity of a composite body formed by placing a brass cone with a base diameter of 8 cm and 12cm height over a steel cylinder of same diameter and a height of 10 cm. Density of steel is 7850 kg/m^3 and that of brass is 8650 kg/m^3 .

OR

8. Find the center of gravity of the shaded area as shown in the Figure.

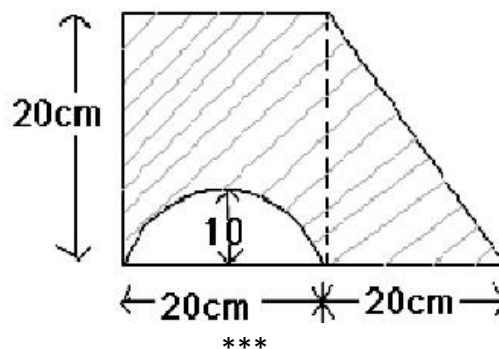


UNIT-V

9. a) State and prove parallel axis theorem.
b) Derive the expression for moment of inertia of a triangle about centroidal axis.

OR

10. Find the moment of inertia for the in the figure Find the moment of inertia for the hatched area parallel to centroidal x – axis.



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R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations December 2020

Problem Solving Techniques and 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 = 70 Marks)

UNIT-I

1. a) Give the block diagram of a computer. Explain functionality of each component.
b) Write an algorithm to calculate the roots of a quadratic equation.

OR

2. Explain in detail about the software development method with suitable example.

UNIT-II

3. a) What is the need of explicit type conversion in C? How to cast the data?
b) What is an integer constant, floating constant and character constant? Give valid examples.

OR

4. a) Describe the structure of a C program with example
b) What are bitwise logical operators? Explain about bitwise logical operators with suitable programming example.

UNIT-III

5. a) How does a switch statement works? List the difference between switch and if else ladder statement.
b) Write a program to demonstrate 'goto' statement.

OR

6. a) Write 'C' program to print the Fibonacci sequence.
b) Explain the significance of 'break' and 'continue' statement with a sample program.

UNIT-IV

7. Write a C program to perform the operation of addition of two matrices.

OR

8. What are the different types of arrays in C? Explain with a suitable example, array declaration, initialization and accessing of the elements for these different types.

UNIT-V

9. What is the scope of variables of type extern, auto, register and static? Explain with example.

OR

10. What is a function? What are its advantages? Explain various parameter passing techniques.

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R-17

Code: 7GC12

I B.Tech. I Semester Supplementary Examinations December 2020

Engineering Chemistry
(Common to CE, ME & CSE)

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) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water 7M
b) Give detailed procedure for the determination of dissolved oxygen in water. 7M

OR

2. a) Write short notes on
i) Scale and sludge 7M
ii) Caustic embrittlement 7M
b) Discuss in brief the boiler corrosion. How is it controlled? 7M

UNIT-II

3. a) What is the principle underlying conductometric titration? Discuss the titration curve obtained for a titration between HCl and NaOH. 7M
b) Explain the construction and working of H₂-O₂ fuel cell with neat sketch and chemical reactions 7M

OR

4. a) On what factors does the conductance of a solution depend? How would you proceed to determine the conductivity of a solution? 7M
b) Explain passivity of metals. How it affects rate of corrosion 7M

UNIT-III

5. a) What is vulcanization of rubber? Explain why natural rubber needs vulcanization. How is it carried out? 7M
b) Write a note on the classification of polymers with examples 7M

OR

6. Write a note on processing of raw rubber? Explain the draw backs of raw rubbers. 14M

UNIT-IV

7. a) Explain various steps involved in refining of petroleum 7M
b) Describe how synthetic petrol is synthesized from Bergius process 7M

OR

8. a) Describe the Production and uses of water gas and Biogas. 7M
b) What is knocking? Describe how we can minimize knocking? 7M

UNIT-V

9. a) What is cement? How do you classify the cement? 7M
b) How are lubricants classified? Give examples 7M

OR

10. Explain the measurement and significance of the following properties of lubricant
(i) Viscosity (ii) Aniline point (iii) Neutralization Number 14M
