Reg. No. : | | | | | | | | | | |

Question Paper Code: 53705

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Mechanical Engineering

15UME305 - ENGINEERING MECHANICS

(Regulation 2015)

Duration: 1:15hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. A force is completely defined when we specify CO1- R

   (a) Magnitude (b) Direction (c) Point of application (d) All of the above

2. Forces are called coplanar when all of them acting on body lie in CO1- R

   (a) One point (b) One plane (c) Perpendicular planes (d) Different planes

3. If a rigid body is in equilibrium under the action of three forces, then CO2- R

   (a) the lines of action of these forces meet in a point (b) these forces are equal

   (c) the lines of action of these forces are parallel d) Above (b) and (c)

4. Fixed Support has _____. CO2- R

   (a) One Horizontal Reaction (b) One Vertical Reaction

   (c) One Rotational Reaction (d) All of the Above

5. The center of gravity of a uniform lamina lies at_____ CO3- R

   (a) The center of heavy portion (b) The bottom surface

   (c) The midpoint of its axis (d) All of the above

6. The calculation of the moment of the body due to the loadings involve a quantity called _____ CO3- R

   (a) Moment (b) Inertia (c) Rotation (d) Moment of Inertia

7. A car is moving with a velocity of 20m/s. The car is come to rest after 6seconds. Find acceleration CO4- R

(a) 0 m/s^2 (b) 3.33 m/s^2 (c) -3.33 m/s^2 (d) 20 m/s^2

8. The unit of angular acceleration is CO4- R

(a) N-m (b) m/s (c) m/s^2 (d) rad/s^2

9. The friction experienced by a body, when in motion, is known as CO5- R

(a) Rolling friction (b) Dynamic friction (c) Limiting friction (d) Static friction

10. The co-efficient of friction depends upon CO5- R

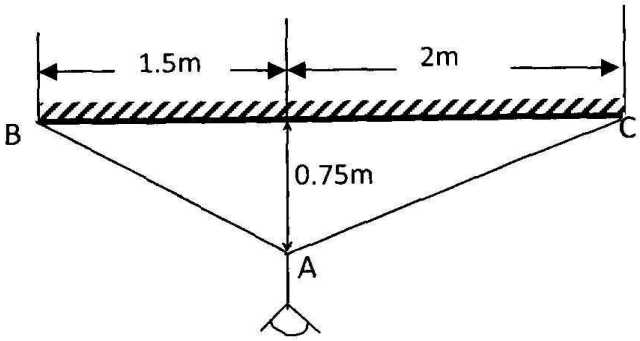
(a) Nature of surfaces (b) Area of contact

(c) Shape of the surfaces (d) All of the above

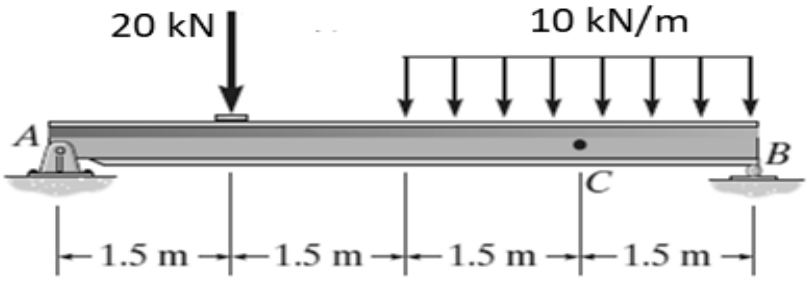
PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

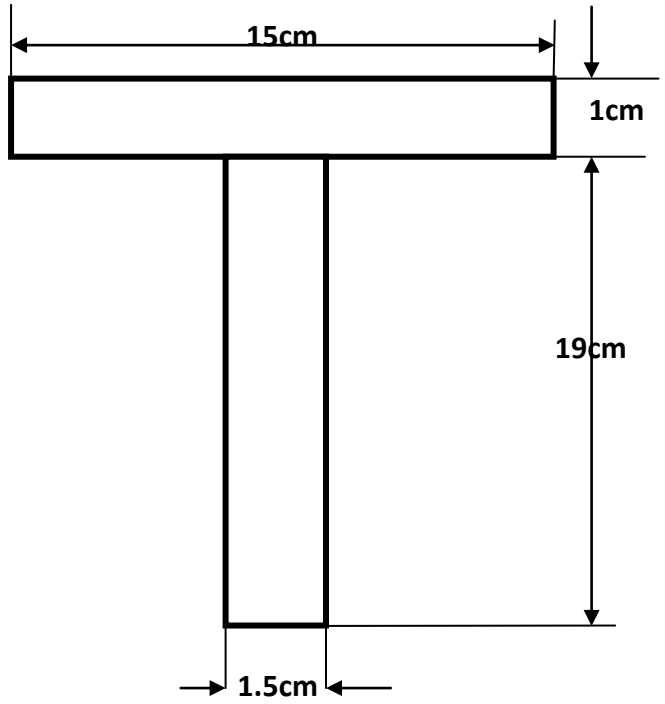
11. Figure shows a 10 kg lamp supported by two cables AB and AC. Find the tension in each cable. CO1- App (8)



12. Determine the reactions at the supports A and B for the simply supported beam shown. CO2- App (8)



13. Find out the moment of inertia and radius of gyration of the T-section about its centroidal axis. CO3- App (8)



14. Two trains A and B leave the same station on parallel lines. The train A starts with a uniform acceleration of 0.15 m/s² and attains a speed of 40 km/hr when the steam is reduced to keep the speed constant. The train B leaves 1 min after, with a uniform acceleration of 0.3 m/s² to attain a maximum speed of 70 km/hr. When will the train B overtake train A? CO4- App (8)

15. A weight of 40kN is on the point of motion down a rough inclined plane when supported by a force of 15kN acting parallel to the plane and is on the point of motion up the inclined plane under the influence of the force 20kN applied parallel to the inclined plane. Determine the coefficient of friction and angle of the plane. CO5- App (8)

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