

Roll No. 178250079 **UJTians**

Total No. of Questions : 10]

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**B.E. IInd Semester (CGPA)
Examination, 2017**

EF-318

**CIVIL ENGG.
(Engg. Mechanical)
Paper : CE-204**

Time : 3 Hours]

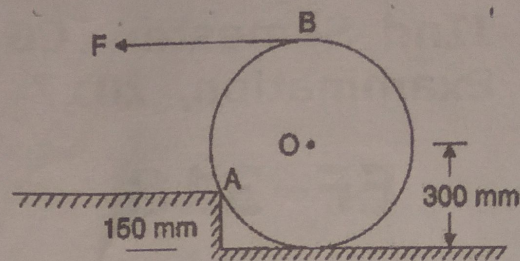
[Maximum Marks : 60

Note :- Attempt all questions. Assume missing data, if any, suitably.

Unit-I

1. (a) What are the various assumptions made in the analysis of truss ?
- (b) A roller of radius $r = 300$ mm and weighing 2000 N is to be pulled over a curb of height 150 mm, as shown in Fig. by applying a horizontal force F applied to the end of a

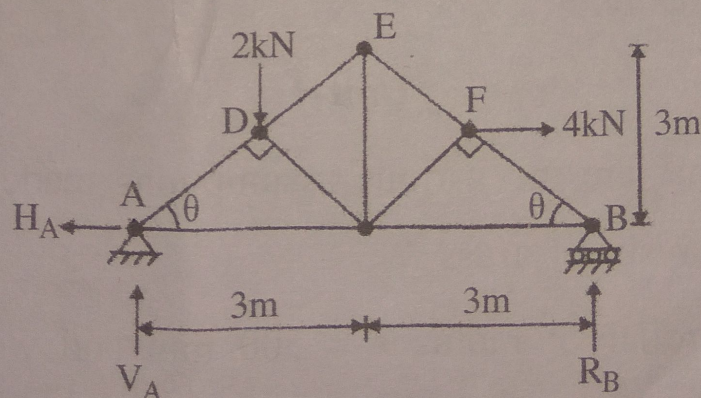
string wound around the circumference of the roller. Find the magnitude of force F required to start the roller move over the curb. What is the least pull F through the centre of the wheel to just turn the roller over the curb ?



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Or

2. (a) What is a truss ? Explain with its classification.
- (b) Determine force in each member of truss as shown in Fig. D and F are the respective middle points of AE and BE.

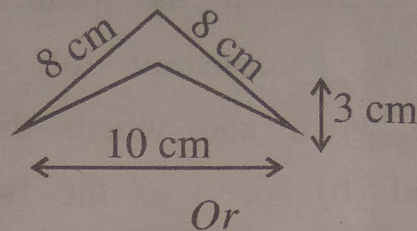


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Unit-II

3. (a) Derive the equation for finding centroid for a semi-circular section.

- (b) Determine the Moment of inertia of a triangular section as shown in fig. about its horizontal centroidal axes.



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4. (a) Define principal moment of inertia.
 (b) Find the moment of inertia of a equal leg angle section of size $150 \text{ mm} \times 150 \text{ mm} \times 10 \text{ mm}$ about its horizontal centroidal axes.

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Unit-III

5. (a) Define friction in brief.
 (b) A block of 50 kg mass rest on 35° incline. Find the horizontal force required to just push the block up the plane. The coefficient of friction between contact surfaces is 0.2.

12

Or

6. (a) If the ratio of the greatest to the least force which acting parallel to a rough inclined plane, can support a weight on it, is equal to that of the weight to the pressure on the plane then prove that the coefficient of friction is $\tan \alpha \cdot \tan^2(\alpha/2)$, where α is the inclination of the plane to the horizontal.

12

Unit-IV

7. In a car race, the car 'A' starts and accelerates at a constant rate of 3m/s^2 . Car 'B' starts 2 seconds later but accelerate at a constant rate of 4.6 m/s^2 . Determine: (a) when and where the car B will overtake A, and (b) speed of the two car at that instant. 12

Or

8. A lift can operate under a maximum of 8 persons. Mass of the lift is 800 kg. determine the limits of tension if the lift accelerates at a constant rate of 1 m/s^2 either upwards or downwards. Take average weight of a person equals to 750 N. 12

Unit-V

9. Draw SFD and BMD for a simple supported beam subjected to a uniformly distributed load over its entire span. 12

Or

10. A simply supported beam of length 6 m, carries point load of 3 kN and 6 kN at distance of 2 m and 4 m from the left end. Draw the SFD and BMD for the beam. 12