

SV-623

Seat No.	
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Total No. of Pages : 3

F.Y. B.Tech. (All Branches) (Semester - I & II) (CBCS) Examination, May - 2019

**APPLIED MECHANICS**

**Sub. Code : 71819**

Day and Date : Monday, 13-05-2019

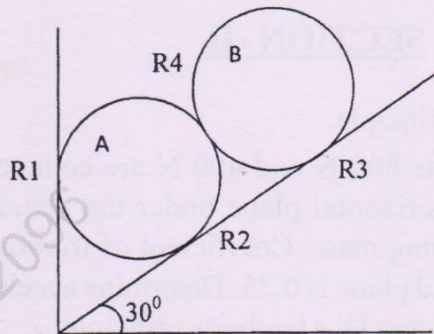
Total Marks : 70

Time : 10.00 a.m. to 12.30 p.m.

- Instructions :
- 1) Solve any three questions from each section.
  - 2) Assume any data necessary & highlight it in answer sheet.
  - 3) Figures to right indicates full marks.
  - 4) Use of non programmable calculator is allowed.
  - 5) Neat sketches should be drawn wherever necessary.

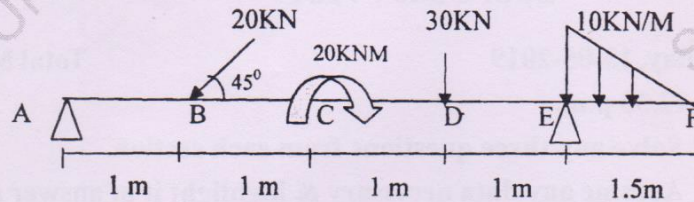
**SECTION - I**

- Q1) a) Define Moment of force & couple. [3]  
b) The resultant of two forces when they act at right angles is 10N. And when they act at an angle of 60 degree, resultant is 12.16. Find magnitude of two forces. [8]
- Q2) a) With suitable example explain Free Body Diagram. [3]  
b) Two identical spheres A and B, each of weight 50 N are supported by an inclined plane and vertical wall as shown in figure. Find reactions at the point of support. Assume all supports are smooth. [9]

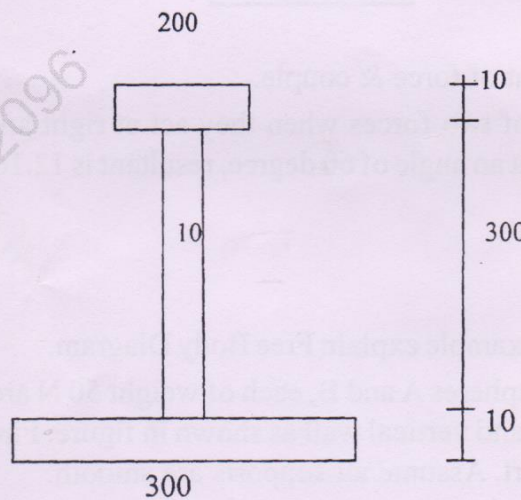


P.T.O.

- Q3) a) Explain the principle of Virtual Work. [3]  
 b) A beam ABCDEF is hinged at A and supported on roller at E. It carries load as shown in figure. Determine support reactions. [8]



- Q4) a) Define Polar Moment of Inertia and Radius of gyration. [3]  
 b) Determine Moment of Inertia of unequal section shown in figure about its centroidal axis. [9]



### SECTION - II

- Q5) a) Define D'Alembert's Principle. [3]  
 b) Two blocks of weights 800 N and 400 N are connected by cable and pulled along rough horizontal plane under the action of force 500 N applied to 800 N leading mass. Coefficient of friction between sliding surfaces of weights and plane is 0.25. Determine acceleration of weights and tension in string using D'Alembert's principle. [8]

- Q6)** a) Explain in brief Kinetics and Kinematics. [3]  
b) A block weighing 2500 N rests on a horizontal plane for which coefficient of friction is 0.20. This block is pulled by a force of 1000 N making an angle of 30 degree to horizontal. Find velocity of the block after it moves 30 m starting from rest. Use work energy principle. [9]
- Q7)** a) Define centripetal and centrifugal force. [3]  
b) Determine angle of banking for a highway curve of radius 180 m designed to accommodate cars travelling at 80 Kmph. Given coefficient of friction between tyres and road is 0.6. [9]
- Q8)** a) State Law of conservation of momentum. [3]  
b) A sphere of weight 12 N moving at 4 m/s strikes another sphere of weight 60 N moving in the same direction at 0.8 m/s. Find velocities of both bodies after impact and show that direction of motion of first sphere is reversed, if coefficient of restitution is 0.75. [8]

