

7. A railway coach, having ordinary cross-seats, is travelling at 4m/s. A person runs at 5m/s on the platform. In what direction, he must run so that he may enter the railway coach parallel to the seats ? Also find the velocity with which he enters the coach. 20

SECTION – D

8. A car is travelling on a level track of a radius 50 m. Find the maximum speed at which he can travel on the curved track, if the coefficient of friction between the tyres and track is 0.45. 20
9. Draw S.F.D. and B.M.D. for a Cantilever Beam carrying a uniform distributed load of w N/m. Also find out point of contraflexure. 20

Roll No.

24048

**B. Tech 3rd Semester (MAE)
Examination – December, 2017**

ENGINEERING MECHANICS

Paper : ME-205-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions. Question No. 1 is *compulsory*. Attempt at least *one* question from each Section.

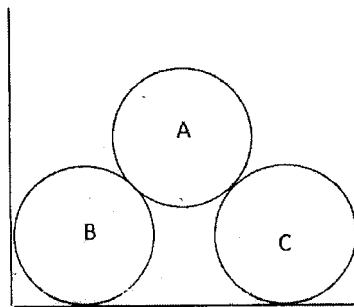
1. Explain following : 4 × 5 = 20
- (a) Varignon's Theorem
 - (b) Static Indeterminacy
 - (c) Difference. between Center of mass and Centre of gravity
 - (d) Work Energy Equation

SECTION – A

2. Forces of 20,30,40,50 and 60N act along the sides AB, CB, CD, DE and EA of a regular pentagon ABCDE whose each side measures 15cm. Find out the algebraic sum of moment of the forces about the centre of pentagon and one of the vertices. 20

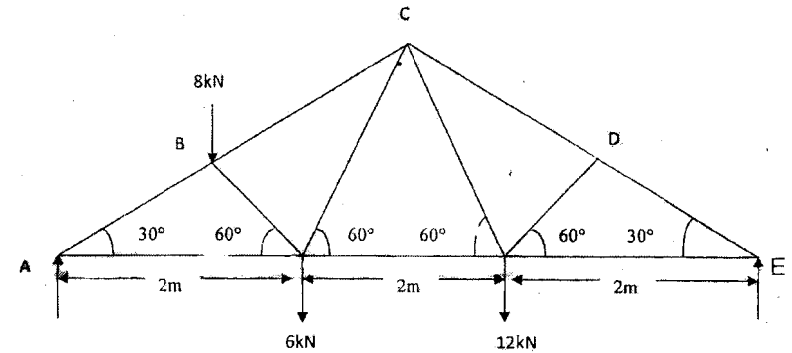
3. Three Cylinders weighing 100N each and of 80mm diameter are placed in a channel of 180mm width as shown in Fig. Determine the pressure exerted by : 20

- (i) the cylinder A on B at the point of contact
- (ii) the cylinder B on the base and
- (iii) the cylinder B on the wall.



SECTION – B

4. An inclined truss shown in Fig is loaded as shown. Determine the nature and magnitude of the forces in the members BC and DE of the truss. 20



5. Explain the method of Integration to find Centre of Gravity of regular figures by taking an example of any regular figure. 20

SECTION – C

6. Find moment of inertia of a hollow section shown in figure about an axis passing through its centre of gravity and parallel to X-X axis. 20

