

Roll No.

Total No. of Questions : 10] [Total No. of Printed Pages : 5

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**B.E. IInd Semester (CGPA) Elect. & Commun. Engg.
Examination, 2019
Engg. Mechanics
Paper - EL - 204**

Time : 3 Hours] [Maximum Marks : 60

Note :- Attempt all questions. All questions carry equal marks.

1. (a) Define the term resultant of a force system.
- (b) The magnitude of two forces is such that when acting at right angles produce a resultant force of $\sqrt{20}$ and when acting at 60 degree produce a resultant equal to $\sqrt{28}$. calculate the magnitude of the forces.

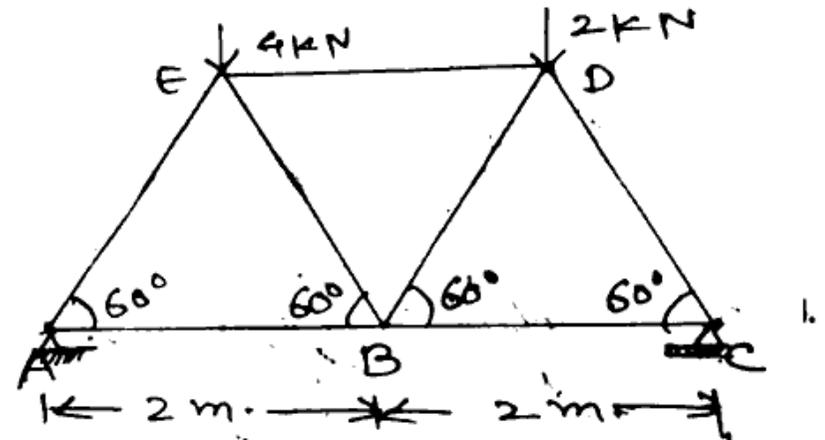
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(1)

P.T.O.

OR

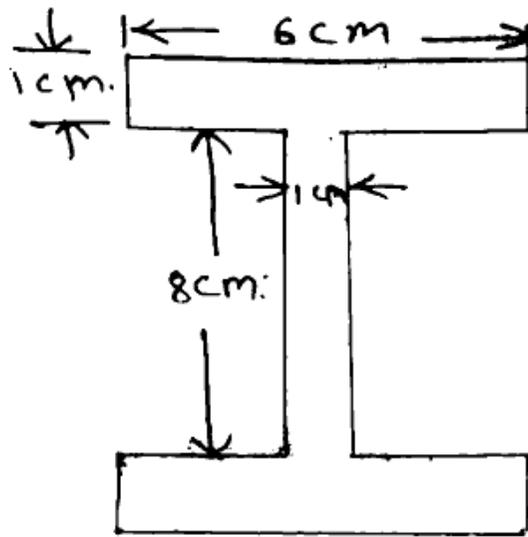
2. (a) What is a framed structure. write the assumption made while making an analysis of framed structure.
- (b) Determine the reactions and the forces in members AB, AE and CD of a simple triangular truss supporting two loads as known in the given figure.



3. (a) Define radius of gyration. How is it related to moment of inertia.
- (b) Find the moment of inertia of a rolled steel joist girder of symmetrical I section. shown in figure.

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(2)



OR

4. (a) Define the centroid and centre of gravity.
- (b) A rectangular column of section 30 cm × 50 cm and height 4 cm is centrally cast over a concrete bed which measure 3 m × 5 m and thickness 40 cm. If the mass density of concrete is 2500 kg/m³ calculate the mass moment of inertia of the column and bed combination about a pole.
5. (a) Define the term friction. Differentiate between the sliding and rolling friction.

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(3)

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- (b) A body of weight 100 N rests on a rough horizontal surface ($\mu = 0.3$) and is acted upon by a force applied at an angle of 30 degree to the horizontal. What force is required to just cause the body to slide over the surface.

OR

6. (a) Give a brief description of the various types of belts used for power transmission.
- (b) Define the epicyclic gear and compound gear train with neat sketches.
7. (a) Write the impulse - momentum equation and mention its applications. <http://www.onlinebu.com>
- (b) A ball of mass 2 kg moving with a velocity of 3 m/s. impinges directly on a ball of mass 4 kg at rest. After impact, the 2 kg mass ball come to the rest. Determine the velocity of 4 kg ball after striking and the coefficient of restitution between the two balls.

OR

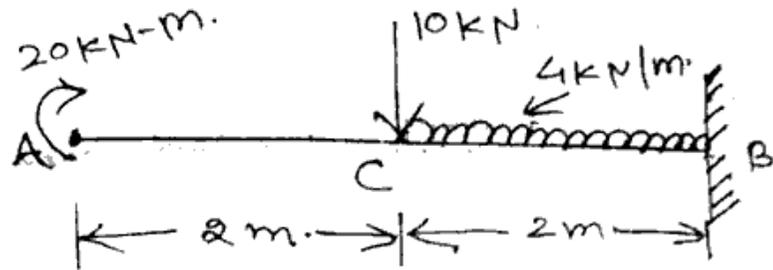
8. (a) State the different stages in the phenomenon of collision.

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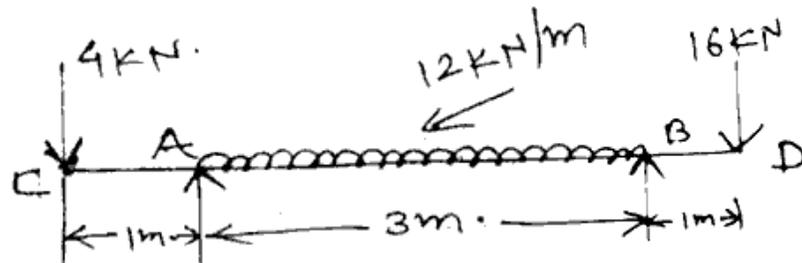
(4)

(b) State D'Alembert's principle. How it is applied in solving the problems related to the dynamics.

9. Draw the SF and BM diagrams for given cantilever beam and locate the position of the point of contraflexure.



10. Draw the SF and BM diagrams for the given simply supported overhanging beam. -



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