COURSE CODE: **10B11CE211**   MAX. MARKS: 25
COURSE NAME: Engineering Mechanics
COURSE CREDITS: 04   MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Every question carries 5 marks. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1. Determine the support reactions and forces in all the members of the truss shown in Fig. 1.
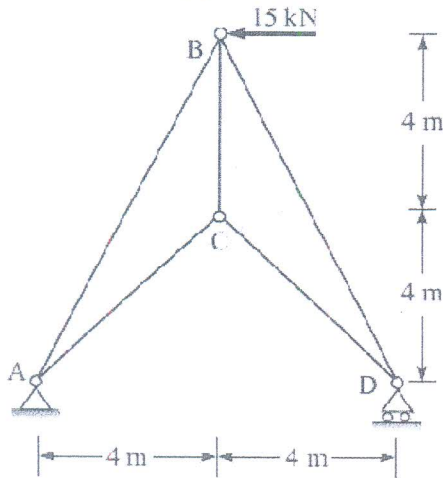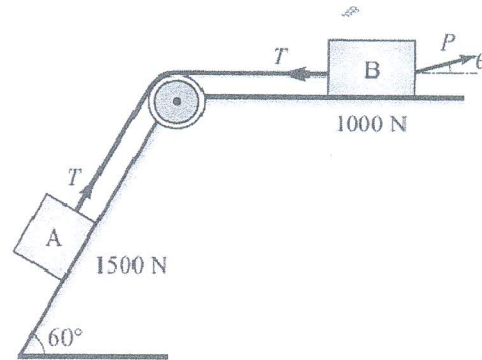

Fig. 1.

Fig. 2.

Q.2. In Fig. 2, determine the least value of the force P to cause rightward impending motion of block B. Assume the coefficient of friction under the blocks to be 0.2 and the pulley to be frictionless.

Q.3. A mass m is suspended by a rope passing over a fixed shaft. The force required at the other end of the rope to raise the mass m is 6 kN and that required to lower m at a uniform speed is 2.4 kN. Find the value of mass m, if the angle of wrap and coefficient of friction remain unchanged.

Q.4. A wire of uniform cross-section is bent into a closed loop A-B-C-D-E-A as shown in Fig. 3, in which the portion AB is a quarter circular arc. Determine the centroidal coordinates of the wire.

Q.5. A section of a concrete gravity dam is shown in Fig. 4. Locate the centroid of the section.
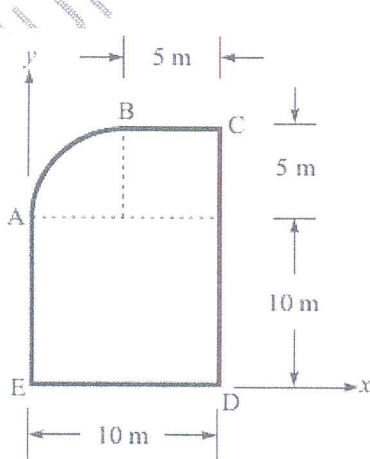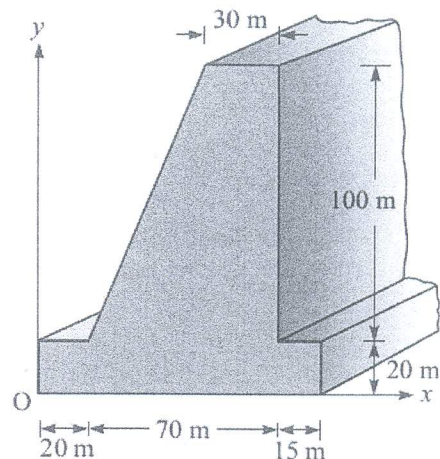

Fig. 4.

Fig. 5.

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