B.E./ B.Tech. (Chemical Engineering) / B.Text. Second Semester (Old Course)

Engineering Mechanics – II : 2 S 5

P. Pages : 2 **AW - 3542**

Time : Two Hours * 0 2 8 9 * Max. Marks : 40

Notes : 1. All question carry equal marks.
2. Answer **three** question.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answer necessary with the help of neat sketches.
6. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) A stone is projected vertically upward with velocity of 30m/s, after 2 seconds another stone is projected vertically upward with a velocity of 22m/s. At what position above the ground both the stone will meet? **6**

b) A wheel rotating about a fixed axis at 20 r.p.m is uniformly accelerated for 70 seconds during which time it makes 50 revolutions. Find the angular velocity at the end of this interval. **7**

2. a) Explain motion curves. **4**

b) The rectilinear motion of a particle is defined by $S = \frac{1}{3}t^3 - 36t$. Determine the acceleration when particle reverses its direction. **9**

3. a) What is Dynamic Equilibrium. **3**

b) What is the equations of kinetics in translation & rotation. **6**

c) Determine the force P that will give the block shown in Fig. (1) an acceleration of $0.2g\,m/s^2$. consider co-efficient of kinetic friction as 0.20. **5**

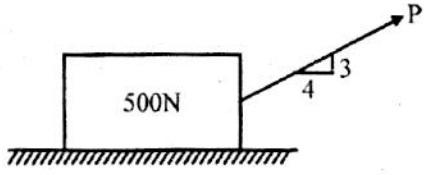

Fig. (1)

4. The Weights of three blocks shown in Fig. (2) are 100N for block A, 200N for block B and 200N for block C. The co-efficient of friction between the surface & block A is 0.20 and between the surface and block B is 0.25. Assume pully as frictionless. Calculate the acceleration of each block. **14**

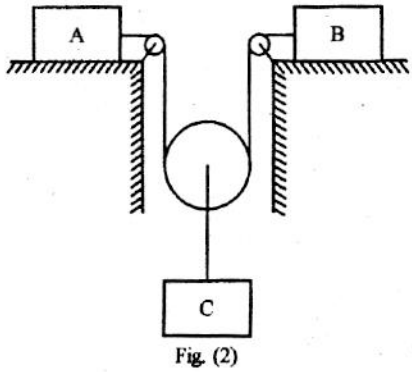

Fig. (2)

5. a) Derive Work-Energy equation in translation. 4

b) The pulley shown in fig. (3) is frictionless and of negligible weight. Find the velocity of block B after it has moved 3m from rest. Use this result to determine the acceleration for block A. Use Work-Energy method only. 9

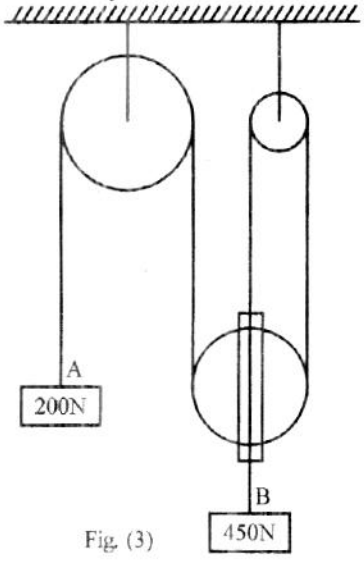

Fig. (3)

6. a) Derive Impulse-Momentum equation. 4

b) A system shown in fig. (4) is moving rightward with a velocity of 15 m/s when a constant horizontal force P is applied as shown in fig. (4). Determine the value of P that will give the system a leftward velocity of 30 m/s in a time interval of 10 seconds. 9

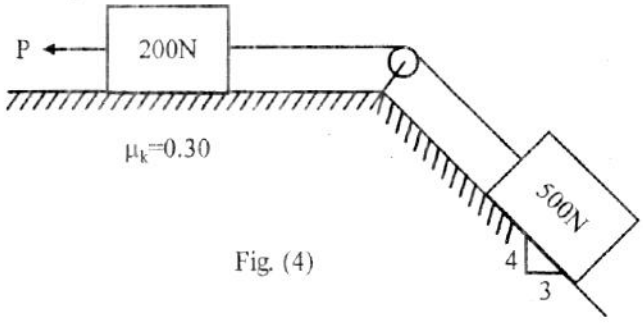

Fig. (4)

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