

FE sem I (old)  
Engg. Mechanics

(OLD COURSE)  
(3 Hours)

11.12.2014

QP Code : 11902  
[Total Marks : 100]

N.B. (1) Question No. 1 is Compulsory.

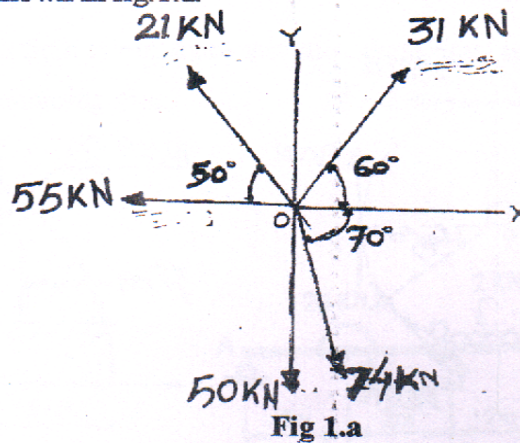
(2) Attempt any Four questions from the remaining.

(3) Figure to the right indicates full marks.

(4) Assume suitable additional data necessary and state the same clearly in your answer.

(5) Take  $g=9.81\text{m/s}^2$ .

Q1 a) Determine the magnitude and direction of the resultant of coplanar concurrent forces acting at O as shown in fig 1.a.



b) Explain the terms i) Perfect truss ii) Redundant truss iii) Deficient truss

c) A flat belt is passing over two fixed pulleys as shown in fig 1.c. Determine the minimum force P is required to just lift the 30 kN load. Take  $\mu = 0.3$  between belt and all pulleys.

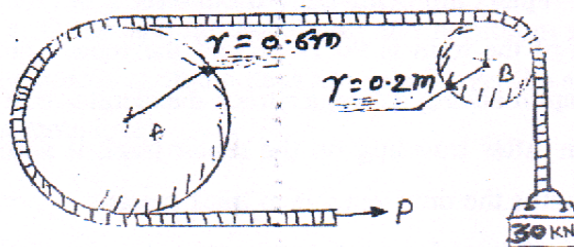


Fig 1.c

d) During a test, the car moves in a straight line such that its velocity is defined by

$$v = 0.3(9t^2 + 2t) \text{ m/s, where } t \text{ is in seconds. Determine the position and acceleration}$$

when  $t=3$  seconds. Given at  $t=0, s=0$ .

[TURN OVER]