DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in *FY Comp/Extc/IT/Electrical* **Sem: I**

Subject Name: *Engineering Mechanics* **Subject Code: BTES103**

Max Marks:20 **Date:-11/10/2018** **Duration:- 1 Hr.**

Instructions to the Students:

1. All questions are compulsory.
2. Use of non programmable scientific calculator is allowed.
3. Assume suitable data wherever necessary.
4. Solve all questions as per sequence.

Marks

Q. 1 Attempt following questions **06**

i. All forces do not meet at a point but lie in single plane is known as……

a) Coplanar concurrent forces b) Coplanar non concurrent forces

c) Collinear forces d) coplanar like parallel forces

ii. Two forces act at an angle of 120°. If the greater force is 50 N and their resultant is perpendicular to the smaller force, the smaller force is……..

a) 20 N b) 25 N c) 40 N d) 35 N

iii. A number of forces acting simultaneously on a particle of a body……

a) may not be replaced by a single force b) may be replaced by a single force

c) may be replaced by a couple d) none of these

iv. The necessary condition of equilibrium of a body is……

a) algebraic sum of horizontal components of all the forces must be zero

b) algebraic sum of vertical components of all the forces must be zero

c) algebraic sum of the moments of the forces about a point must be zero

d) all of the above

v. The resolved part of the resultant of two forces inclined at an angle θ in a given direction is……

a) algebraic sum of the resolved parts of the forces in the direction

b) arithmetical sum of the resolved parts of the forces in the direction

c) difference of the forces multiplied by cosine θ

d) sum of the forces multiplied by the sine θ

vi. The qualitative description of physical variable is known as dimension while quantitative description is known as ……

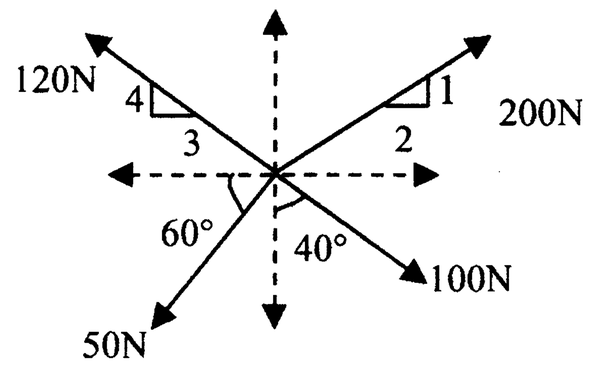
a) scalar b) vector c) unit d) tensor

3 X 2

Q.2 Solve any two of the following.

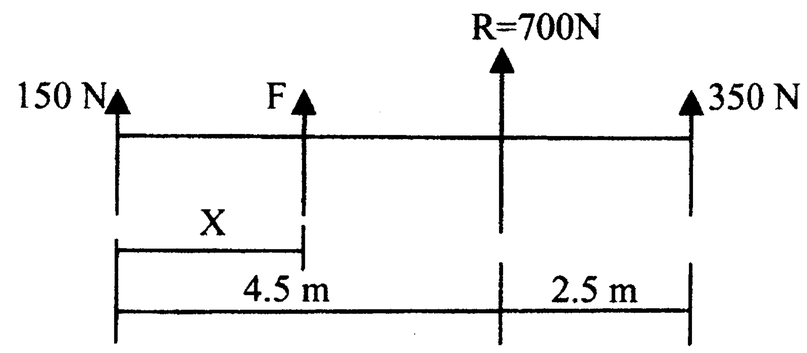
A system of four forces acting at a point on a body is as shown in fig. determine resultant.

(A)



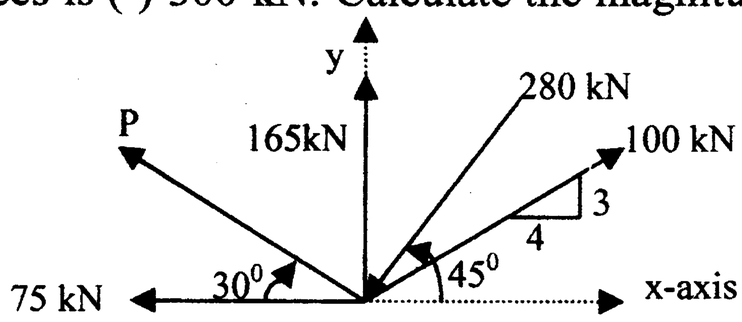
(B) What are the different types of support & different types of load with their practical examples?

(C) If resultant R= 700N of three forces 150N, 'F' and 350 N is acting as shown in fig. Find the magnitude of force 'F' and distance 'x' from point 'A'

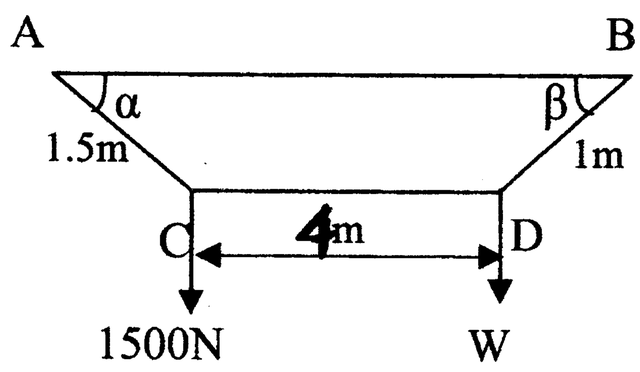


Q. 3 Solve any one of the following. **8**

(A) If five forces are acting on a particle as shown in fig. and the algebraic sum of horizontal components of all forces is (-) 300 kN. Calculate the magnitude of P and the resultant of all the forces.



(B) Rope AB shown in fig is 6.5m long and is connected at two points A and B at the same level 6m apart. a load of 1500N is suspended from a point C on the rope at 1.5m from A . What load connected at point D on the rope, 1m from B will be necessary to keep the position CD level?



AB = 6 m

AC = 1.5 m

CD = 4 m

BD = 1 m

***** End of paper*****