GYAN GANGA INSTITUE OF SCIENCES AND TECHNOLOGY, JABALPUR

Subject- BT-204 [BASIC CIVIL AND ENGG.MECHANICS]

2021-22[FIRST SEMESTER]

Q1] A Body is under the action of four coplanar forces as shown in Fig.-1 Find the magnitude and direction of the resultant of the given force system.

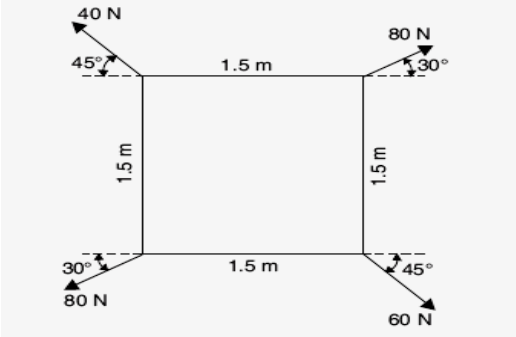

Fig.-1

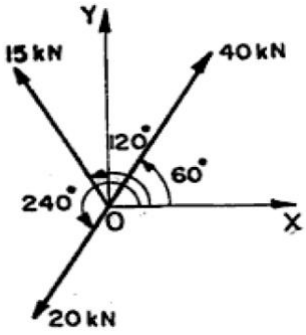

Fig.-2

Q2] Three forces of magnitude 40kN, 15KN, and 20KN are acting at a point O as shown in Fig. -2.The angles made by these forces with X-axis are 60,120 and 240 Degrees respectively. Determine the magnitude and direction of the resultant force.

Q3] Explain the system of forces.

Q4] a] Define resultant force and write about the methods to find it.

b] Explain triangle law of force and Polygon law of force.

Q5] a] Explain free body diagram with neat examples.

b] Explain Lami's theorm.

Q6] A string ABCD, attached to fixed points A and D has two equal weights of 1000 N attached to it at B and C. The weights rest with the portions AB and CD inclined at angles as shown in Fig.-1 Find the tensions in the portions AB, BC and CD of the string, if the inclination of the portion BC with the vertical is 120°.

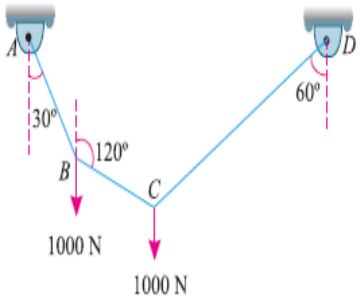

fig-1

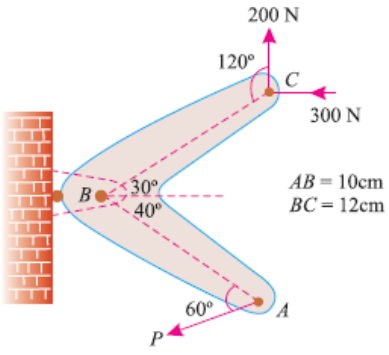

fig-2

Q7] The lever ABC of a component of a machine is hinged at B, and is subjected to a system of coplaner forces as shown in Fig.-2

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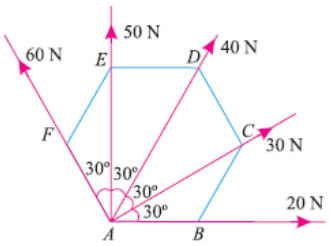
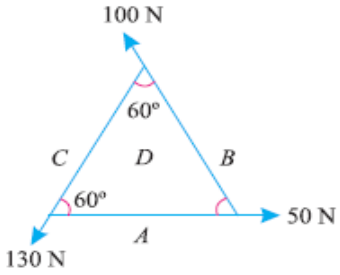
Q8] a] Explain the conditions of equilibrium.

b] Explain moment of a force & varignon's principle of moments.

Q9] The forces 20 N, 30 N, 40 N, 50 N and 60 N are acting at one of the angular points of a regular hexagon, towards the other five angular points, taken in order. Find the magnitude and direction of the resultant force.





Q10] A particle is acted upon by three forces equal to 50 N, 100 N and 130 N, along the three sides of an equilateral triangle, taken in order. Find graphically the magnitude and direction of the resultant force.