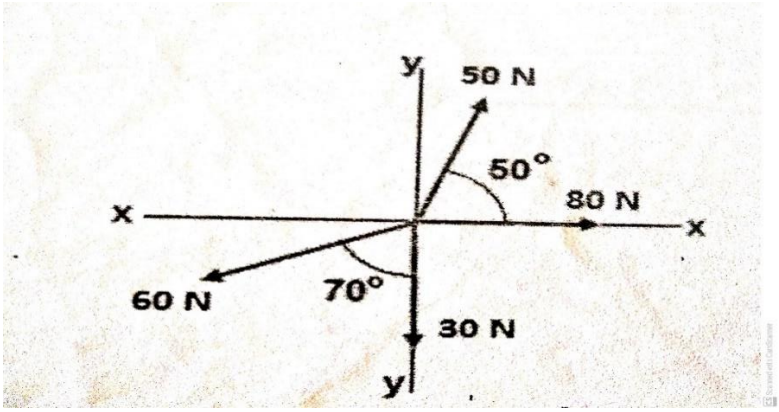
AGNEL INSTITUTE OF TECHNOLOGY & DESIGN
DEPT. OF MECHANICAL ENGINEERING

Internal Test I	Sub: Basics of Mechanical Engineering	Semester: I
Time: 1 hour	Max. Marks: 25	Date:15/12/2020

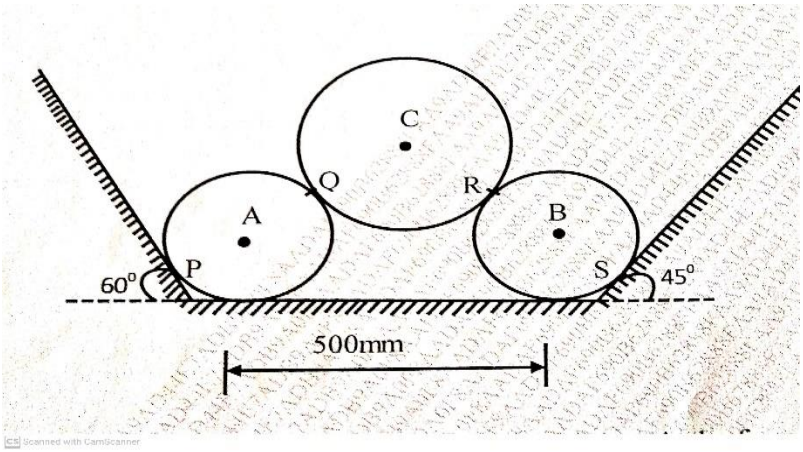
Instruction: i) All questions are compulsory
ii) Draw neat free body diagrams where applicable

1) Determine the magnitude and direction of the resultant force of the force system shown in figure below (6 marks) (CO 3)



2) Three spheres are piled in a trench as shown in figure below. Self-weight and radii of the spheres are as given below. Treating all the contact surfaces as smooth find the reactions developed at contact surfaces P, Q, R, S given that the centre to centre distance between sphere A & B is 500mm. (7 marks) (CO 1)

CYLINDER	WEIGHT	RADIUS
A	2kN	400mm
B	2kN	400mm
C	4kN	600mm



3) Describe the basic steps involved in sand casting with a neat sketch. (6 marks) (CO 2)

4) Define the thermodynamic system. With the help of neat sketches explain the different types of thermodynamics systems (6 marks) (CO 2)