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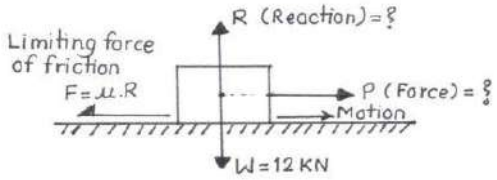
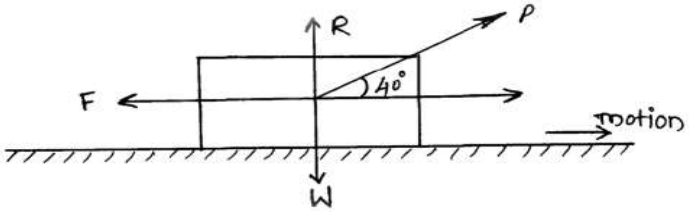
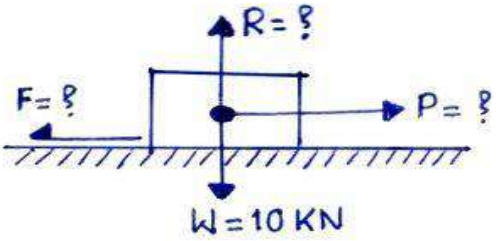
312312 - Engineering Mechanics (Sem II)

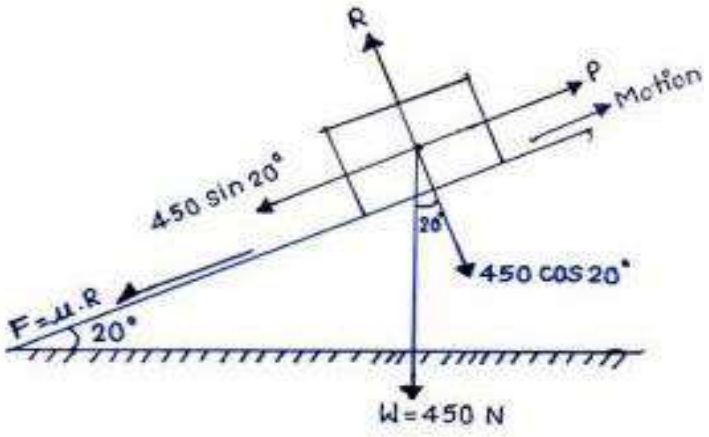
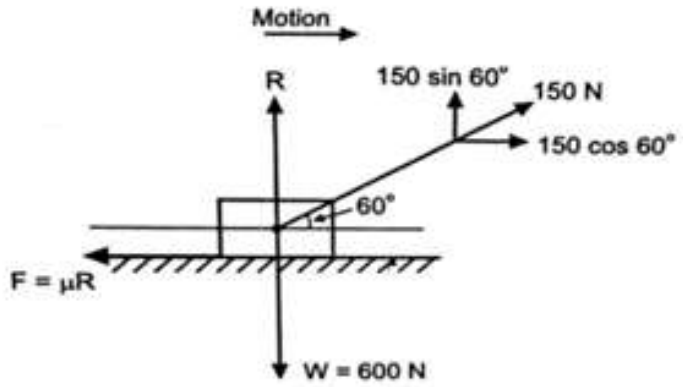
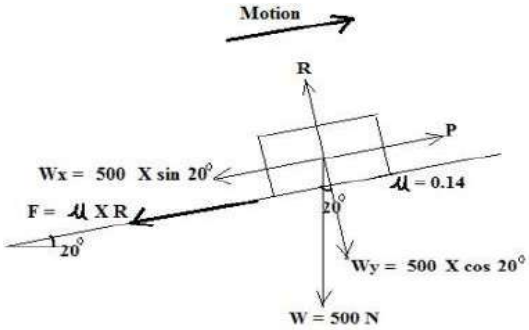
As per MSBTE's K Scheme

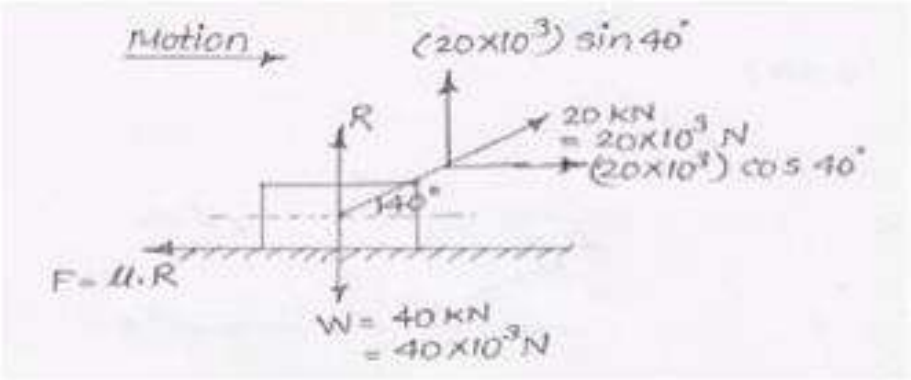
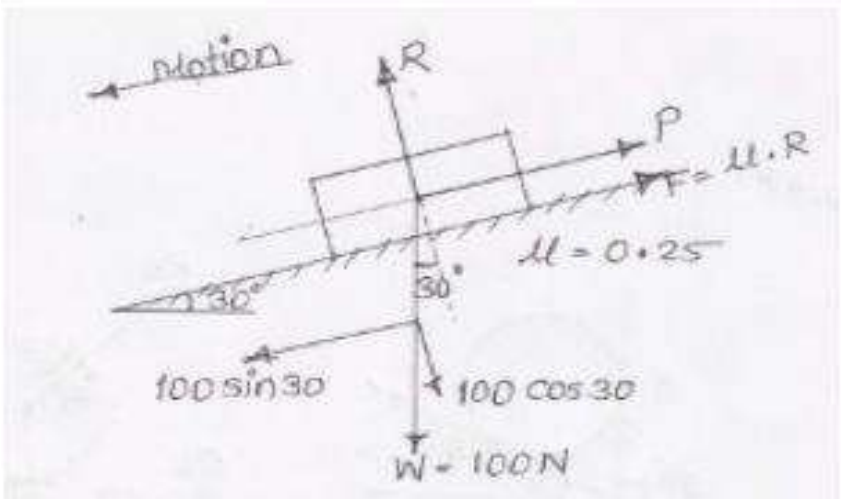
ME / AE / NK / PG

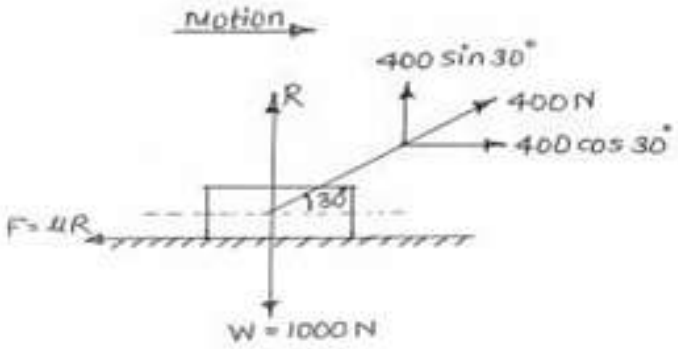
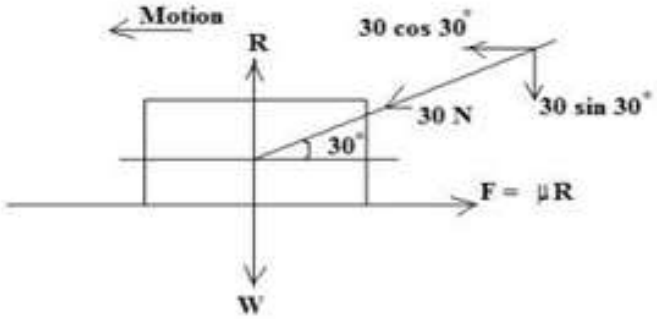
Unit IV	Friction of Forces	Marks - 12

S. N.	MSBTE Board Asked Questions	Exam Year	Marks
1.	What do you mean by friction.	W-23	2M
2.	Define angle of repose with diagram.	W-23	4M
3.	A parcel weighing 200 N is just on the point of moving horizontally by a horizontal force of 50 N. What is the coefficient of friction.	W-23	4M
4.	A block of weight 500 N is placed on a inclined plane at an angle of 20° with horizontal. If coefficient of friction is 0.15.Find the force P applied parallel to the plane, just move the body up the plane.	W-23	6M
5.	Define coefficient of friction.	S-23	2M
6.	State four laws of static friction.	S-23	4M
7.	A body of weighing 12 kN is lying on a horizontal plane for which μ=0.70. Determine normal reaction limiting force of friction. Horizontal force required to move it and angle of friction. 	S-23	4M
8.	A block having weight of 400 N just start moving down the plane making an angle of 350 with the horizontal due to its own weight. Calculate the force applied parallel to the plane to keep the block in equilibrium μ = 0.25.	S-23	6M

9.	State two advantages of friction.	S-22	2M
10.	State four laws of friction.	S-22	4M
11.	A body weighing 12KN is lying on a horizontal plane for which μ = 0.70 as shown in Fig. No. 5. Determine normal reaction, limiting force of friction, horizontal force required to move it and angle of 	S-22	4M
12.	A body of weight 600N is resting on a rough inclined plane at an angle of 40°. If coefficient of friction is 0.58, What force is required to prevent the body from falling down the plane.	S-22	6M
13.	State relation between co-efficient of friction (μ) and angle of friction (ϕ).	W-22	2M
14.	Draw FBD for a ladder of length 'L', self-weight 'W', resting on rough horizontal floor and leaning against rough vertical wall. Angle between ladder and horizontal floor=θ Co-efficient of friction at floor = μf Co- efficient of friction at floor = μw	W-22	4M
15.	A body weighing 10 kN is placed in rough horizontal plane for which μ=0.60. Calculate normal reaction, limiting force of friction, horizontal force required just to move it and angle of friction. 	W-22	4M
16.	Define coefficient of friction.	S-19	2M
17.	Define coefficient of friction and angle of repose.	W-18	2M
18.	State four laws of static friction.	W-19	2M
19.	State four laws of static friction.	W-19	4M
20.	Write two advantages and two disadvantages of friction.	W-18	4M
21.	Define angle of repose.	S-18	2M
22.	Draw FBD of ladder in friction.	S-19	4M
23.	State four laws of static friction	S-18	4M

24.	**A block of weight 450 N is placed on rough inclined plane making inclination of 200 with horizontal. If μ=0.24, calculate the value of force to be applied parallel to the plane. Just to move the block up the plane.** 	**W-22**	**6M**
25.	**Calculate coefficient of friction if a block weighing 600 N resting on a rough horizontal plane can be moved by a force of 150 N applied at an angle of 60° with the horizontal.** 	**S-19**	**4M**
26.	**Calculate the force 'P' applied parallel to the plane, just to move the block up the plane, if the block weighing 500 N is placed on an inclined plane at an angle of 20° with the horizontal. Coefficient of friction is 0.14.** 	**S-19**	**6M**

27.	A body weighing 250N is resting on a rough horizontal plane and is just moved by a horizontal force of 100 N. Calculate coefficient of friction. Also calculate magnitude and direction of the resultant reaction.	W-19	4M
28.	A block is resting on a rough inclined plane whose inclination to the horizontal is 15°. A force of 11 N is applied parallel to the plane on which block is resting will just move it down. If the coefficient of friction between the block and the plane is 0.40, estimate the weight of the block.	W-19	6M
29.	A block weighing 40 kN resting on a rough horizontal plane can be moved by a force of 20 kN applied at an angle 40° with horizontal. Find the coefficient of friction. 	W-18	4M
30.	A block weighing 100 N on a 30° inclined rough plane. If coefficient of friction is 0.25. Calculate force required to be applied parallel to plane to make the block slide downward. 	W-18	6M

31.	**A block weighing 1000N, resting on a horizontal plane requires a pull of 400N to start its motion. When applied at an angle of 30° with the horizontal. Find the coefficient of friction, along with normal reaction, force of friction and resultant reaction.** 	**S-18**	**4M**
32.	**A push of 30 N applied at 30° to horizontal just to move the block of weight 'W' N. If angle of friction is 16°. Find coefficient of friction, total reaction and weight of block.** 	**S-18**	**6M**

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