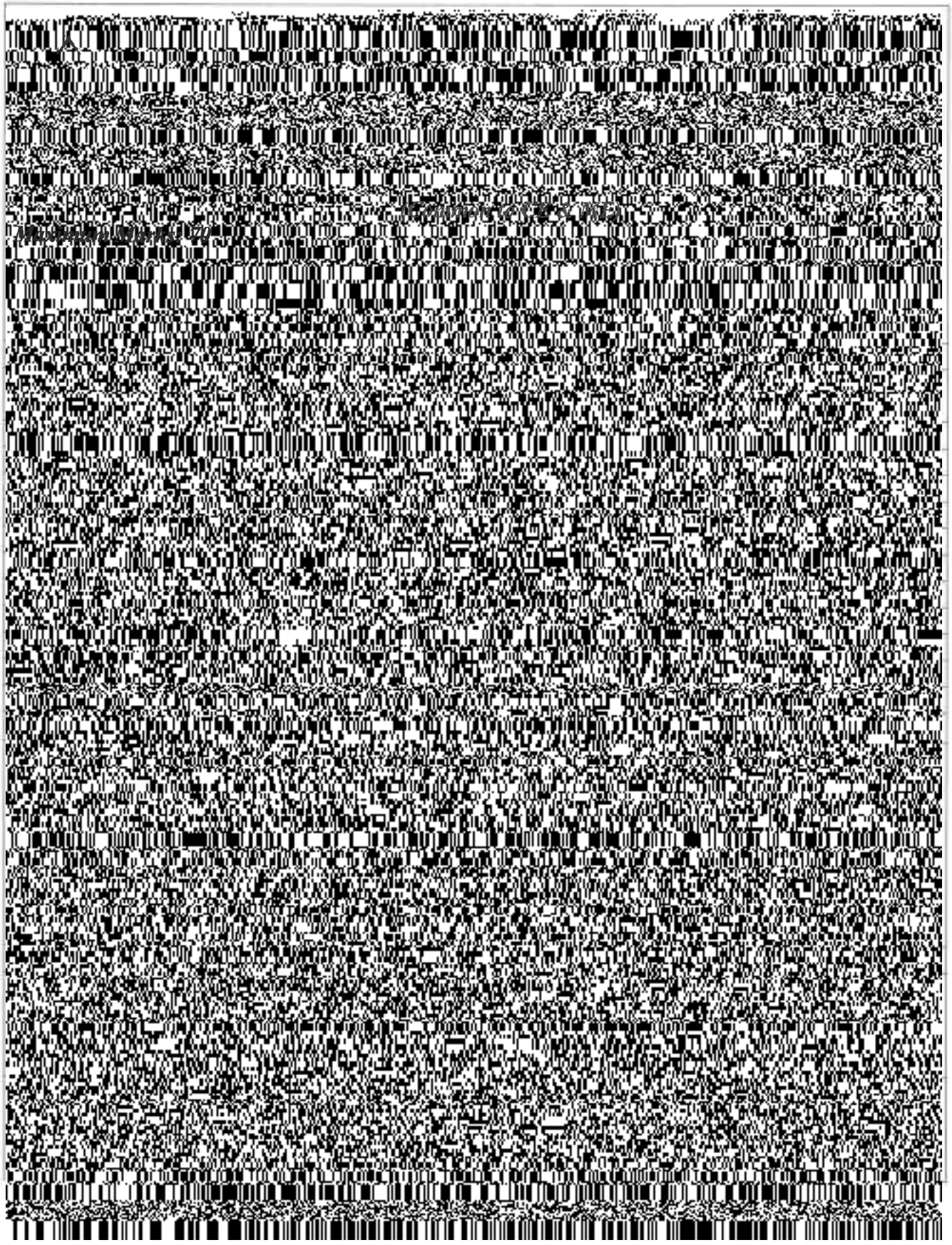
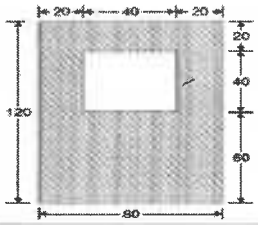
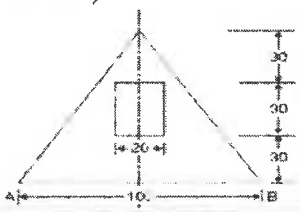


	(b) A ladder 6 m long and weighs 300 N is resting against a wall at an angle of 60^0 to the ground. A man weighing 750 N climbs the ladder. At what position along the ladder from the bottom does he induce slipping? The coefficient of friction for both the wall and the ground with the ladder is 0.2. [5M]		
	OR		
14	A block weighing 100N is resting on a rough plane inclined 20^0 to the horizontal. It is acted upon by a force of 50N directed upward at angle of 14^0 above the plane. Determine the friction. If the block is about to move up the plane, determine the co-efficient of friction. [10M]	2	L2
15	For the shaded area as shown in the following figure, determine the Moment of Inertia of an area of plane figure about their centroidal axes. All units are in centimeters. [10M] 	3	L2
	OR		
16	Determine the moment of inertia an area of a triangle with a rectangular cut as shown in the following figure, about the base *A-B* and the centroidal axis parallel to *AB*. (All dimensions are in Centimeters). [10M] 	3	L2
17	(a)Derive work energy equation for translation. [5M] (b) State the law of conservation of momentum. [5M]	4	L2
	OR		
18	A 20 Kg block starting from rest slides up a 300 inclined plane under the action of a 175 N force directed along the inclined plane. The coefficient of kinetic friction between the block and the plane is 0.2. Determine the (i) speed of the block after it slides 4.5 m and (ii) the distance travelled by the block when its speed becomes 4.5 m/s. [10M]	4	L2
19	Differentiate Simple and Compound Pendulums. [10M]	5	L2
	OR		
20	(a)A body moving with simple harmonic motion has amplitude of 1 m and a period of oscillation of 2 seconds. What will be its velocity and acceleration 0.4 seconds after passing an extreme position? [5M] (b) Mention the forces which are generally omitted while applying the principle of virtual work. [5M]	5	L2