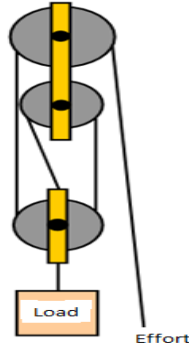


**INSTRUCTIONS: Attempt all questions**

1. (a) Define efficiency of a machine.

(1 mark)

- (b) In the diagram below an effort is used to lift a load.



- (i) Indicate the forces acting on the string.  
(ii) What is the velocity ratio of the system?

(2 mark)

(1 mark)

- (iii) How far will the load move if the effort moves by 2.4m.

(1 mark)

- (iv) If the M.A is 2.4, what effort will raise a load of 60N?

(3 mark)

- (v) Use the results above to calculate the efficiency of the pulley.

(3 mark)

2. (a) What is meant by uniform velocity?

(1 mark)

(b) A body of mass 60kg starts from rest and accelerates uniformly at a rate of  $4\text{ms}^{-2}$  for 5 seconds. It then maintains this constant speed attained for another 5 seconds after which it comes to rest in another 7 seconds.

(i) Draw a velocity-time graph for the body's journey. *(5 mark)*

(ii) Calculate the momentum of the body during the eighth second. *(3 mark)*

(iii) Find the total distance covered. *(5 mark)*

(c) Two men apply forces of 36N and 48N on a rope of mass 3kg as shown below.



(i) Calculate the resultant force on the rope. *(3 mark)*

(ii) Find the acceleration of the rope. *(2 mark)*

END.