**MIDTERM EXAM TERM II 2021**

**PHYSICS FORM 3 MARKING SCHEME**

1. i) V.R = 2 = $\frac{Distance moved by load}{Distance moved by effort}$

2 = $\frac{x}{2}$✓1

2x = 2m

x = 1m✓1

ii) P.E = mgh

= 10 x 10 x 2

 = 200J✓1

iii) Work input = Effort x Effort distance

 = 80N x 1m

 = 80 Joules✓1

iv) $\frac{MA}{VR}$ x 100% = efficiency✓1

$\frac{\frac{100}{80}}{2}$ x 100% = $\frac{5000}{80}$

$Eff$ = 62.5%✓1

v) Friction between moving parts of the pulley system / friction1

- Weight of the movable part of pulley // work done in lifting the moving parts of pulley system1

 2. (a) The sum of kinetic energy and potential energy of a system is constant

 Or

Energy can neither be created nor destroyed but can be transformed from one form to another

 Any 1 mark

b). The sum of total linear momentum before and after collision is constant.

The momentum before collision = ∑Momentum after collision. √1

m1u1 + m2u2 = m1v1 + m2v2

0.4 x 0 + 0.090 = 0.4 x v1 + 0.09 x 600 √1

0 = 0.4v1 + 54√1

V1 = -135m/s

3.(i) - Nature of the surface√1

 - Weight (Reaction) √1

 (ii). - Lubrication

 - Rollers

 - Air cushioning

 4. (a).A collision in which objects combine / fuse, losing kinetic energy in the process (1mrk)

 (b) Final momentum = Initial momentum (3mks)

 (0.5 + 1.5 ) V = (0.5 x 1.2) + (1.5 x 0.2)

2.0V = 0.6 + 0.3

 2.0V = 0.9

 V = 0.45 m/s

c). i. Phenomena that occurs when angle of incidence exceeds the critical angle thus light gets reflected internally within the denser medium. ii. Critical angle is the angle of incidence in the denser medium for which the angle of refraction in the less dense medium is 90o.

d).- the incident rays, the refracted ray and the normal at the point of incidence all lie in the same plane.

- the ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant for a given pair of media.

5.(a) (i) Distance is a scalar quantity while displacement is a vector quantity.

1. Speed is the rate of change of distance with time while velocity is the rate of change in displacement with
2. Acceleration is the rate of change in velocity with time while deceleration is the rate at which velocity decreases with time.

b) (i)

Displacement(m)

 Velocity(m/s

(ii) S = ut + ½ at2

80 = ½ x 10t2

T2 = 16

T = 45

(iii) V2 = u2 + 2as

= 2 x 10x 80

= 1600

V = 40ms-1

6.(a) (i) Unlike charges attract like charges repel.

ii.) Charge — Voltage x Capacitance√

 Q=CV

= 12X50µF√1

= 600µC or 6 x 10-4C√1

