GATITU DAY SEC SCHOOL TIME 1 ¾ HRS

TERM 2 2012 C.A.T 1

PHYSICS FORM III AND IV

*Section A*

1. The figure below shows part of a scale of a vernier calipers. What is the reading indicated by the scale (3mks)

↓ 7cm

6cm

0 10

2. Calculate the force required to produce an extension of 0.55 mm in a spiral spring constant 50 N/M (2MKS)

3. Jupiter’s gravitational field strength is 26 N/KG.What would be the weight of an object that weighs 30N on earth on Jupiter? (2mks)

4. State the two laws of refraction (2mks)

5. Calculate angle (i) below given that the refractive index N is 1.33 (2mks)

Air

Water 45

6. State Newton’s second law (2mks)

7. A van of mass 3 tones is travelling at velocity of 72 km hr.Calculate the momentum of the vehicle (3mks)

8. Define the terms renewable and non renewable sources of energy and give two examples in each case (6mks)

9. In a machine the load moves 2 cm when the effort moves 8 m, if an effort of 20N is used to raise the load of 60N. What is the efficiency of the machine? (3mks)

Section B

10 a. Define the power of a machine (1mk)

b. A mechanic uses a pulley system with velocity ratio of 6 to raise an engine of weight 2800 N through a vertical distance of 1.5m the mechanic pulls with an effort of 500m.

Calculate

i. The effort distance (2mks)

ii. The work done by the mechanic (2mks)

iii. The useful work done by the pulley system (2mks)

iv. The efficiency of the machine (2mks)

17. a. State Snell’s law (1mk)

b. i. Calculate the refractive index for light travelling from glass to air given that ang = 1.5 (2mks)

ii. Calculate the angle of refractive for a ray of light from air striking an air glass interface making an angle of 60 with the interface in ang=1.5 (2mks)

c. i. State two conditions which are necessary for internal reflection to occur (2mks)

ii. Calculate the critical angle of diamond if its refractive index is 2.42 (2mks)