

#100
HOD

2

GOVERNMENT BILINGUAL HIGH SCHOOL, YAOUNDE

2020/2021 Academic year

| Evaluation N ^o | Subject | Class | Duration |
|---------------------------|---------|-------|--------------|
| 5 | PHYSICS | LSS | 1 hr 30 mins |

Instructions : Answer ALL questions in your answer sheets.

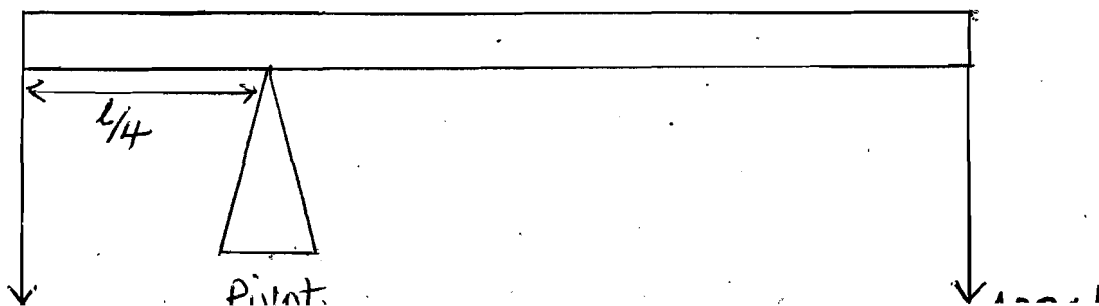
- Consider the acceleration of free fall on the moon's surface to be 1.6 ms^{-2} . Determine the length of a simple pendulum which will have a period of 1.0 s on the moon's surface.
 - A particle executing SHM has 5 times the energy of another particle but their masses and frequencies are equal. Calculate the ratio of the amplitudes for the two motions. (5 Marks)
- The power obtainable from a wind turbine may be given by $P = KL^2 \rho v^3$, where L = length of the blades, ρ = Air density and v = wind speed. The equation is homogeneous.

 - What is a homogeneous equation?
 - Determine the base units of the constant K .
 - State two shortcomings of using homogeneity to check the correctness of a physical equation. (6 marks)
- State Newton's law of universal gravitation . Give the meaning of any symbol used.
 - Define gravitational field strength, giving two alternative units in which it can be measured.
 - A satellite orbits about the earth in a circular orbit of radius r with a period, T , of one day. Show that

$$r^3 = \frac{r_E^2 T^2 g_0}{4\pi^2}$$

where g_0 is the acceleration of free fall at the Earth's surface and $r_E = 6.4 \times 10^6 \text{ m}$ is the radius of the Earth. Hence calculate how high the satellite is above the Earth's surface .(8 marks)

- State the conditions necessary for a body to in equilibrium in a plane.
 - The figure below shows a uniform bar of length l , in equilibrium. Determine the weight of the bar. (5 marks)



5. A motorist moving at a uniform velocity of 45 m/s on approaching a traffic light notices that the lights turned from green to red when he is a distance 90 m away from the lights and immediately applies the brakes . Given that the driver has a reaction time of 0.5 s, find the minimum retardation that would bring the motorist to rest at the traffic lights. (5 marks)

END

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