232/1
PHYSICS
PAPER 1
End term 2
2 HOURS
**FORM 3**

INSTRUCTIONS TO THE CANDIDATES
- **Write your name, Adm number and dates on the spaces provided above clearly**
- **The papers consist of section and b as follows. Section a = 25mks, section b 75mks**
- **All questions must be answered on the spaces left/provided after each.**
- **All working must be clearly shown and numerical answers given in correct SI units.**
- **Mathematical tables and silent electronic calculators may be used.**

SECTION A (25 MARKS)

1. State any two forces that acts between two objects not in contact. (2mks)

2. State two physical characteristics that change when a metal cube is heated. (2mks)

3. The diagram below shows jets from two holes at the side of a tank filled with water. Explain why Jet A is longer than B (2mks)
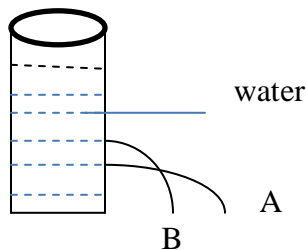
4. State the law of conservation of linear momentum (1mk)

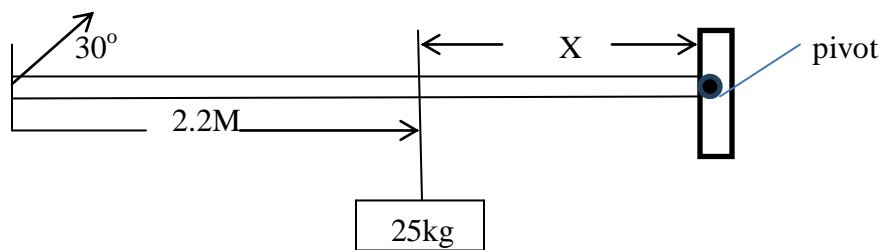5. State physical quantities whose SI units are shown below. (2mks)

   NM
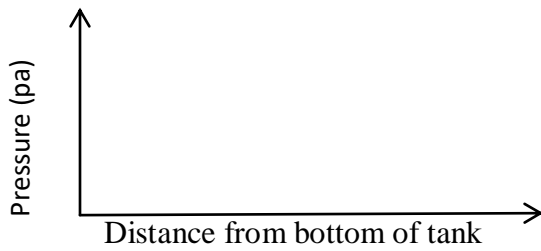
   Kgm/s

   M^3/s

   J/kg K

6. The system below was used to balance a mass of 25kg fixed at a distance of Xm from the pivot. Find the value of X to 2.d.p. (3mks)

7. State two circumstances under which an object floats on a liquid. (2mks)

8. In the graph below sketch the graph of pressure experienced by a ball moving from the bottom of a tank of water towards the surface. (3mks)

9. Two springs A and B. have the same length and same diameter. When the same object was suspended from the bottom of each spring separately, there was a difference in their extensions. State two factors that may have caused the difference extensions (2mks)

10. A road surface offers friction of 32,000N, to a vehicle of mass 2500kg running on it. Find the coefficient of kinetic friction of the road. Explain if the value obtained will change when it rain. (3mks)

11. In a laboratory experiment, it was realized that two different gases of equal volume diffused across a chamber at different rates. What may have caused the difference? (2mks)

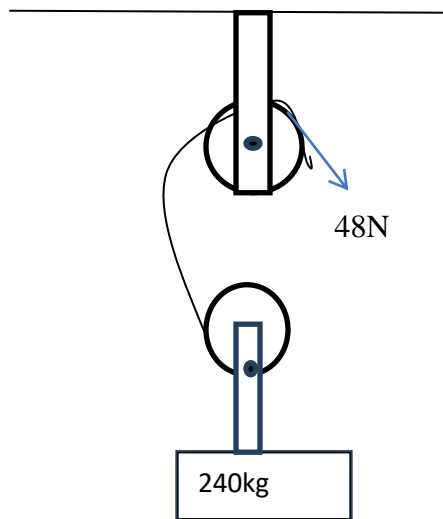12. State one physical change that affects the speed of sound in air.   1mks

SECTION B. (55MKS)

13. (a) Outline the order of energy transformations when lighting a match box   (3mks)

(b) The system below was used to lift a load of mass 240kg in a warehouse using a force of 48N.

48N

240kg

Find
(i)   V..R   (2mks)

(ii)   Efficiency   (3mks)

14. (a) Explain how unusual expansion of water favours aquatic life. (4mks)

(b) The number of particles per mm^3 of substances A, B and C are given in the table below.

substance	No of particles per mm^3
A	3.0×10^7
B	4.5×10^{28}
C	$6.8.\times 10^{12}$

(i)   Identify the states of matter of the substances (3mks)

(ii)   Explain how the number of particles of B will change when heated. (3mks)

(c) State the factors that determine pressure exerted by a wooden block resting on a table surface. (3mks)

15. (a) A bullet of mass 20g travelling at a velocity of 600m/s hits a suspended wooden block of mass 400g. The bullet gets stuck inside the wooden block and the two bodies move together in one direction. If the string holding the wooden block is not cut; Find

(i)   The common velocity of the bullet and wooden block.   (3mks)

(ii)   Maximum height the two bodies reach   (3mks)

(iii)   The time taken by the two bodies to reach maximum height   (3mks)

16. (a) (i) State two characteristics of turbulent flow.   (3mks)

(iii)   Give three examples of Bernoulli's effect in air.   (3mks)

(b)(i) A liquid flows in a pipe of cross sectional area 60cm^2 has a constriction of cross sectional area of 18cm^2 of one point. The velocity of the liquid at the construction is 5m/s^{-1}. Find
(i) The velocity of liquid in the wider section   (3mks)

(ii) The volume of liquid in litres that passes through the construction in one hour.   (2mks)

17. A stone is projected vertically upwards from the top of a building at a velocity of 20m/s. If the stone took 5.5 seconds to reach the bottom of the building. Find;
    (i)   After how long did the stone start the down ward journey   (3mks)

(ii)   Height of the building.   (3mks)

(iii)   Velocity with which the stone hits at the bottom of the building   (3mks)

18. a) An oil drop of volume 0.4mm³ was placed on a clean water surface. It spread to form a monoatomic circular patch of area 2000mm². Use this data to calculate the diameter of a molecule of oil. (3mks)

b) Name **two** applications of Pascal's Principle.   (2mks)