**SECTION A (15 MKS)**

**Answer all questions**

1. (a)Complete the table 1 below. (2mks)

**Table 1**

 (b) List down factors that reduce the surface tension of a liquid. (2mks)

(i)……………………………………………………………………………………………….

(ii)………………………………………………………………………………………………

1. An alloy contains 30% by mass of lead (density 11.4 gcm-3) and 70% by volume of tin (density 7.3gcm-3). Find the density of the alloy. (3mks)

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1. Define time and state its S.I Unit. (2mks)

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1. Derive the fluid pressure formular. (3mks)

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1. Explain the following observations.
2. Camels have wide soles. (1mk)

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1. Our mothers add unga to water when they cook ugali before water boils. (1mk)

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1. Name the liquid that can be suitable for use in a thermometer to be used in measuring a temperature of – 900c. (1mk)

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**SECTION B (45 MARKS)**

**ANSWER ALL QUESTIONS**

1. (a) Define a laboratory. (1mk)

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1. State the three basic facilities that an average laboratory should have. (3mks)
2. ……………………………………………………………………………………..
3. ……………………………………………………………………………………..
4. ……………………………………………………………………………………..

(b)State two likely causes of burns in a laboratory and the remedy in case of a burn. (3mks)

(i) ………………………………………………………………………………………….

(ii)…………………………………………………………………………………………...

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1. State one laboratory precaution to be observed. (1mk)

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1. Study figure 1 and use it to answer the questions that follow.

**F=160N**

**0.002 m2**

**3m2**

Oil

**A**

**B**

**Figure 1**

1. State the principle on which the lift works upon. (1mk)

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1. Calculate the pressure realized by a force applied on piston A. (2mks)

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1. Calculate the pressure realized on piston B. (2mks)

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1. Calculate the force achieved on piston B. (2mks)

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1. State the reason why a gas cannot be used instead of oil in the lift. (1mk)

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1. Needles used in hospitals are very sharp. Explain. (2mks)

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1. (a) Mechanics is one of the branches of physic. What does it deal with? (1mk)

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(b) Study figure 2 that shows the arrangement of molecules in the three states of matter. Use it to answer the questions that follow.

**STATE 1**

**STATE 3**

**Figure 2**

**STATE 2**

1. Name the process represented by the arrow. (1mk)

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1. State the reason for arrangement of molecules in state 3. (2mks)

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(c)State a reason why a burette used to measure volume graduates from up downwards. (1mk)

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1. Highlight three precautions to be observed when using a density bottle. (3mks)
2. …………………………………………………………………………………
3. …………………………………………………………………………………
4. …………………………………………………………………………………
5. (a) A man has a mass of 70kg. Calculate his weight on the moon. (Take g = 1.7Nkg-1 on the moon) (3mks)

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(b) Distinguish between vector and scalar quantities. (2mks)

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(c) Complete the diagram in figure 3 to show the water levels in all the tubes. (2mks)

1. Three identical strings A,B and C are arranged as shown in fig 4.

If C stretches by 3cm and bar XY is assumed to be weightless, determine the extension in A. (3mks)

1. (a) Which is heavier? 1kg of iron or 1kg of feathers? (1mk)

………………………………………………………………………………………………

(b) Explain the observation in figure 4.

**Figure 4**

**Water**

**Mercury**

**Capillary tubes**

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(c) (i) Define fractional force. (1mk)

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(ii) Highlight two advantages friction. (2mks)

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(d) The following readings were taken from an experiment;

Height of rod = 180 cm

Length of the rod’s shadow – 116 cm

Length of the flag post’s shadow = 84 cm

Using estimation of length method calculate the height of the flag post. (3mks)

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