ARCHDIOCESE OF MWANZA

ST. JOSEPH GIRLS SEMINARY

PHYSICS - FORM THREE TERMINAL EXAMINATION

Time: 3:00 hrs **May, 2024.**

INSTRUCTIONS:

- This paper consist of sections A, B and C with the total of eleven (11) questions.
- Answer all questions in section A and B and only two questions in section C.
- All unauthorized materials are not allowed in the examination room.
- The following constants may be used acceleration due to gravity, g = 10mls^2
  Specific heat capacity of water = 4200J/kg°c
  Specific heat capacity of copper = 390J/kg°c
  Density of water 1g/cm^3 or 1000kg/m^3
  Atmospheric pressure = 101.3kpa

SECTION A (16 marks)

Answer all questions in this section

1. For each of the items (i) – (x) choose the correct answer from the given alternatives and write its letter beside the corresponding item number in the answer sheet provided.

i. Which of the following scientific statement needs to be proved through scientific research?
A. Hypothesis B. principle C. proposal D. conclusion E. Measurement.

ii. The following statement about magnetic line of force are correct except.
A. Stronger where the lines are closer together B. start at north and end at south pole C. always form a closed loop D. pass through all materials both magnetic and non-magnetic E. Cross one another.

iii. Which of the following shows the correct comparison of the average kinetic energy of the particle in solid, liquid and gas for given substance.
A. solid = liquid = gas B. liquid $<$ *solid* $<$ *gas* C. solid $>$ *liquid* $>$ *gas*
D. solid $<$ *liquid* $<$ *gas* C. solid $<$ *liquid* $>$ *gas*

iv. An object weighs 3.5N in air and 2.8N in water. It's relative density is
A. 0.22 B. 0.25 C.0.2 D.0.8 E. 3.5

v. The displacement of an object for round trip between two locations.

A. Is always less than zero B. is zero C. is always greater than zero D. can have any value E. is infinity.

vi. Oil is used as a lubricant in a machine because it has;
A. High viscosity B. low viscosity C. low pressure D. high pressure E. low density

vii. Which of the following is the correct weight of a body of mass 48g when placed on the moon surface?
A. 0.480N B. 0.080N C. 0.048N D. 0.800N E. 80.00N

viii. Which of the following argument describe the mathematics relationship with physics?
A. force is pull or push B. Energy is the ability to do work C. Density is mass per unity volume. D. volume is the amount of space E. matter occupies space.

ix. One of the following is not safety role in the laboratory:
A. Handling apparatus B. to follow instructions C. to wear shoes with hard sole D. to sit on stool E. wearing goggles.

x. A car moving at steady speed has a frictional force that depends on;-
A. speed B. speed and surface area C. surface area D. wheel speed E. weight.

2. Match each item force from column A with its corresponding item in column B. Then write its letter of the correct response in the answer sheet given.

LIST A	LIST B
i. Atmospheric pressure	A. Minimum force
ii. Pascal's principle	B. Hydraulic press
iii. Pressure	C. N/M^2
iv. Razor blades, knife	D. Pascal
v. Application of atmospheric pressure	E. Maximum force
vi. Gas pressure	F. Manometer
	G. High pressure
	H. Low pressure
	I. Aneroid barometer
	J. Bicycle pump

SECTION B (54 marks)

3. (a) Explain any four factors affecting the rate at which heat is conducted in a conductor (04 marks)

(b) Its easy to open a tightly closed metal lid of a glass bottle when put into hot water for some time.

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How can you explain this by using the knowledge of physics that you have? (05 marks)

4. (a) Explain why the cardboard does not fall when it is firmly placed on top of a glass tumbler with water inside is inverted? (04 marks)

(b) A can hold water with a constant depth of 0.5m of the surface of water is exposed to the atmosphere. What is the pressure on the bottom of the can? (05 marks)

5. (a) An object is dropped and falls to the ground. Is there any work done while it is falling? If so what force is responsible? (04 marks)

(b) Calculate the power required to stop a 1500kg car travelling at 20mls^2 in 5 minutes (05 marks)

6. (a) Mechanics prefer to use long handle spanner than a short one while loosing a nut. Explain the reason for this (04 marks)

(b) A pulley system is made up of 8 pulleys. An effort of 200N is applied on the pulley system. If the pulley system has an efficiency of 80%, what is the maximum load that can be raised by the effort applied? (06 marks)

7. (a) Mwasi has to push a lighter box and Hoka has to push a similar heavier box. Who will have to apply large force and why? (04 marks)

(b) The brakes of a car moving at 20mls along a horizontal road are suddenly applied and it comes to rest after travelling some distance. If the coefficient of friction between the tyre and road is 0.90 and it is assumed that all four behave identically. Find the shortest distance the car would travel before moving to a stop (05 marks)

8. (a) State the direction of heat transfer by convection and radiation (04 marks)

(b) A copper pipe which is 0.5m long at 24^{0}c, increases in length by 0.25% when carrying steam at 100°c . find the coefficient of a linear expansion of copper (05 marks)

SECTION C (30 MARKS)

Answer only two (2) questions from this section.

9. (a) In hot region it is advised that the outer walls of houses should be painted white. Explain (03 marks)

(b) Suppose you are assigned to design a thermos flask. With aid of diagram explain how you will minimize heat loss by conduction and radiation (07 marks)

(c) The pressure of $3m^3$ of a gas at 27°c is 3 atmosphere. What will be the pressure of the gas if it is compressed into half the volume and heated to 102^0c? (05 marks)

10. (a) Describe three factors that determine the heat content of a substance. (05 marks)

(b) The pressure of a 6kg block of copper rises from 15°c to 30°c on being heated. Determine the amount of heat supplied to the block (05 marks)

(c) How can you distinguish between boiling and evaporation. Give three points (05 marks).

11. (a) An object 20cm high is placed 40cm in front of a concave mirror of focal length 15cm. determine the position, nature and size of the image formed using a ray diagram (06 marks)

(b) The speed of car B relative to car A is 8mls when the two cars are moving in the same direction and 28mls when the two cars are moving in opposite direction. Determine the speed of each car. (04 marks)

(c) In an experiment to determine the specific latent heat of vaporization of water, a certain amount of water was heated in a beaker. The water boiled in 20.3 minutes and vaporized in 80.8 minutes. Calculate the specific latent heat of vaporization of water (05 marks)

I wish you nice holiday.

"Determination is all about to act diligently"

Sr. Enock Nzumbi