



KARNATAKA ICSE SCHOOLS ASSOCIATION

STD. X - Preparatory Examination 2022

Subject: Physics (Science Paper 1)

Time: 11.00 a.m. to 12.30 p.m.

Duration (1½ Hrs.)

Date: 05.04.2022

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 10 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Attempt all questions from Section A and any three questions from Section B.

The intended marks for questions or parts of questions are given in brackets []

SECTION I

(Attempt all the questions)

(A) The natural vibrations of a body actually can occur only in____.[1]

- (i) solid
- (ii) liquids
- (iii) gasses
- (iv) vacuum

(B) Resonance is a special case of_____vibrations. [1]

- (i) natural
- (ii) damped
- (iii) free
- (iv) forced

(C) Two resistors of 2 Ω each are connected in parallel. The equivalent resistance is____. [1]

- (i) less than 2 Ω but more than 1 Ω .
- (ii) 1 Ω
- (iii) 4 Ω
- (iv) between 4 Ω and 2 Ω

(D) Internal resistance of the cell is_____. [1]

(i) inversely proportional to the surface area of the electrode in contact with the electrolyte

(ii) directly proportional to the distance between the electrodes

(iii) dependent on the temperature of the electrolyte

(iv) All of the above

(E) A switch must be placed in _____. [1]

(i) neutral wire before the appliance

(ii) live wire after the appliance

(iii) live wire before the appliance

(iv) earth wire before the appliance

(F) A fuse has a/an_____. [1]

(i) low melting point

(ii) alloy of 50% lead and 50% tin

(iii) high resistance

(iv) all of these

(G) The direction of the induced current in a conductor can be obtained by____
[1]

(i) Fleming's right hand rule

(ii) Fleming's left-hand rule

(iii) Right hand thumb rule

(iv) Maxwell's cork screw rule

(H) The area around Himalayan mountains become bitterly cold when the ice starts melting because_____. [1]

(i) ice has the highest specific heat capacity of fusion of 336 J g^{-1}

(ii) every gram of ice which melts absorbs 336 J of heat energy from atmosphere

(iii) both (i) and (ii)

(iv) none of the above

(I) $1 \text{ cal g}^{-1} = \text{_____ J g}^{-1}$ [1]

(i) 4.2

(ii) 4200

(iii) 420

(iv) 0.42



In the above nuclear reaction equation, the value of P and Q are

(i) $P = 25, Q = 12$.

(ii) $P = 24, Q = 10$.

(iii) $P = 24, Q = 12$.

(iv) none of the above

SECTION II

(Attempt any three questions from this Section.)

Question 2

(a) A cell supplies a current of **2 A** when it is connected to a **5 Ω** resistance and supplies a current of **1.2 A**, if it is connected to a resistance of **9 Ω** . Find the emf and internal resistance of the cell. [3]

(b) (i) What do you understand by the statement: The specific heat capacity of copper is **385 J kg⁻¹ K⁻¹** ?

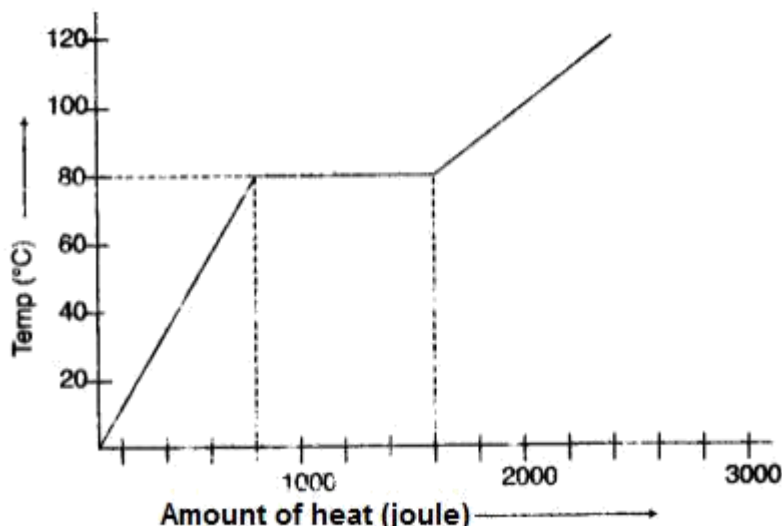
(ii) Define Electromagnetic Induction [3]

(c) Give any two uses of radioactivity and any two safety precautions we must take while using nuclear energy. [4]

Question - 3

(a) **40g** of ice at **0°C** is used to bring down the temperature of a certain mass of water from **60°C to 10°C**. Find the mass of water used. [Specific heat capacity of water = **4200 J kg⁻¹ °C⁻¹**.] [Specific latent heat of fusion of ice = **336 x 10³ J kg⁻¹**.] [3]

(b) A substance is in the form of a solid at **0°C**. The amount of heat added to this substance and the temperature of the substance are plotted on the following graph, If the specific heat capacity of the solid substance is **500 J/kg°C**, find the mass of the substance from the graph



[3]

- (c) (i) When **1 g** of ice at **0 °C** melts to form **1g** of water at **0 °C** then, is the latent heat absorbed by the ice or given out by it ?
- (ii) Give one example where the high specific heat capacity of water is used as a heat reservoir.
- (iii) Give one example where the high specific heat capacity of water is used for cooling purposes.
- (iv) Which material is the calorimeter commonly made of ? Give one reason for using this material.

[4]

Question 4

- (a) (i) The ratio of amplitudes of two waves A and B is **5:11** respectively. Calculate the ratio of their intensities.
- (ii) Give any one point of difference between forced vibrations and resonant vibrations.
- (b) State any three factors affecting the resistance of the conductor.
- (c) (i) Define 1 kilo calorie.
- (ii) A bucket contains **8 kg** of water at **25°C**. **2 kg** of water at **80° C** is poured into it. Neglecting the heat absorbed by the bucket, calculate the final temperature of the water.

[3]

[3]

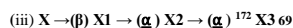
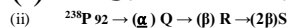
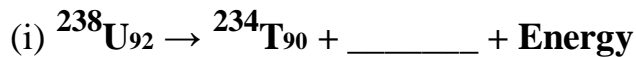
[4]

Question 5

(a) (i) Which pin of the three pin plug socket is made longer in length?

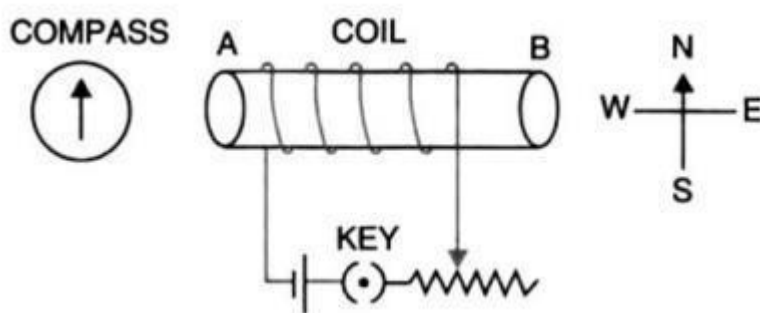
(ii) Can copper wire be used for fuse wire? Explain with a scientific reason for your answer. [3]

(b) Complete the following nuclear changes.



[3]

(c) (i) The diagram below shows a spiral coil wound on a hollow cardboard AB. A magnetic compass is placed close to it. Current is switched on by closing the key.



(1) What will be the polarity at the ends A and B?

(2) How will the compass needle be affected? Give reason for your answer.

(ii) State any two ways by which the magnetic field of the current carrying solenoid can be made stronger. [4]

Question 6

(a) Three resistors of $6\ \Omega$, $3\ \Omega$ and $2\ \Omega$ are connected together so as to make the equivalent resistance greater than $6\ \Omega$ but less than $8\ \Omega$. Draw a neat circuit diagram to show the arrangement and calculate its total resistance. [3]

(b) Give any three points of difference between heat capacity and specific heat capacity. [3]

(c) An isotope of uranium has mass number **235** and atomic number **92**. [4]

(i) What is the number of electrons in the neutral atom of this isotope?

(ii) What are the number of protons and number of neutrons in its nucleus?

(iii) Do all the isotopes have the same number of neutrons?

(iv) What is the number of protons and neutrons in $^{238}_{92}\text{U}$?
