

ICSE SEMESTER 2 EXAMINATION

**SAMPLE QUESTION PAPER  
PHYSICS**

**(SCIENCE PAPER 1)**

**Maximum Marks: 40**

**Time allowed: One and a half hours**

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 the brackets [ ].

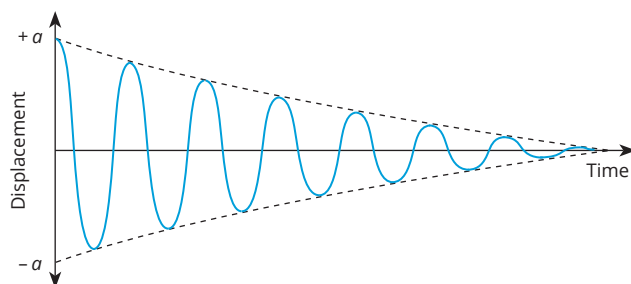
**Section A**

(Attempt **all** questions)

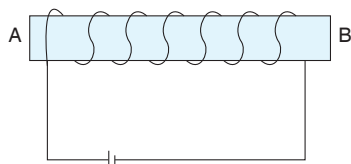
**Question 1**

Choose the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only.)

- i. The following distance–time graph illustrates which type of vibrations? [1]



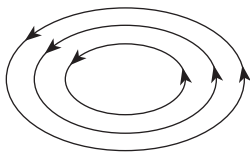
- a. Free vibrations  
b. Natural vibrations  
c. Damped vibrations  
d. Forced vibrations
- ii. If the resistors are connected in parallel circuit, then its equivalent resistance will [1]  
a. increase.  
b. decrease.  
c. Both a. and b.  
d. remain the same.
- iii. In an electric circuit, the fuse wire is connected in series in a/an [1]  
a. earth wire.  
b. neutral wire.  
c. live wire.  
d. any of these.
- iv. You have been provided with a solenoid AB. What is the polarity at end A? [1]



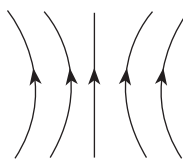
- a. South polarity at end A.  
b. North polarity at end A.  
c. Both a. and b.  
d. None of these

v. Which of the following figure represents the magnetic field due to a solenoid? [1]

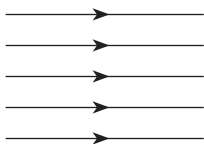
a.



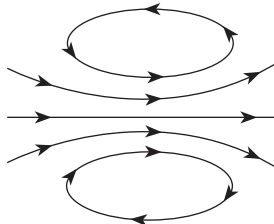
b.



c.



d.



vi. The specific heat of a body is [1]

- a. heat capacity  $\times$  mass.  
c. heat capacity  $\div$  mass.

- b. heat capacity  $\times$  weight.  
d. heat capacity  $\div$  weight.

vii. 2400 cal of heat is supplied to 200 g of water. What is the rise in temperature? (Specific heat of water =  $1 \text{ cal g}^{-1} \text{ }^\circ\text{C}^{-1}$ ). [1]

- a.  $10 \text{ }^\circ\text{C}$                       b.  $12 \text{ }^\circ\text{C}$                       c.  $15 \text{ }^\circ\text{C}$                       d.  $0 \text{ }^\circ\text{C}$

viii. In which radioactive decay, there is change in the mass number? [1]

- a.  $\alpha$ -decay                      b.  $\beta$ -decay                      c.  $\gamma$ -decay                      d. none of these

ix. Resonance is produced only when the external periodic force is of frequency [1]

- a.  $f, 2f, 3f, \dots$                       b.  $1\frac{1}{2}f, 2\frac{1}{2}f, 3\frac{1}{2}f, \dots$   
c.  $f, f_1, f_2, f_3, \dots$                       d. none of these

x. The nuclear radiation which gets deflected towards positively charged plate in an electric field is [1]

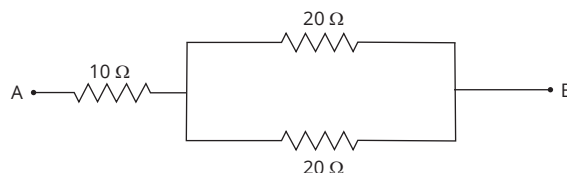
- a. Alpha                      b. Beta                      c. Gamma                      d. Ultraviolet

## Section B

(Attempt **any three** questions from this section)

### Question 2

i. a. Calculate the equivalent resistance of the following network: [3]

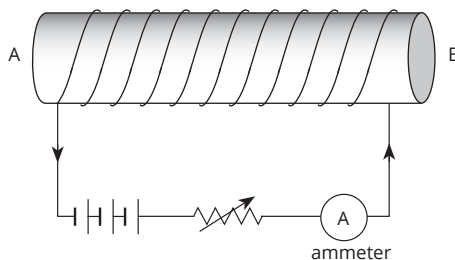


b. How much current will an electric bulb draw from a 220 V source, if the resistance of the filament of the bulb is 1100 W? [3]

ii. Specific heat capacity of substance A is  $3.8 \text{ J g}^{-1} \text{ K}^{-1}$  whereas the specific heat capacity of substance B is  $0.4 \text{ J g}^{-1} \text{ K}^{-1}$ . [3]

- a. Which of the two is a good conductor of heat?  
b. How is one led to the above conclusion?  
c. If substances A and B are liquids then which one would be more useful in car radiators?

- iii. The given diagram shows a circuit containing a coil wound on a long and thin hollow cardboard tube. Answer the questions that follow: [4]



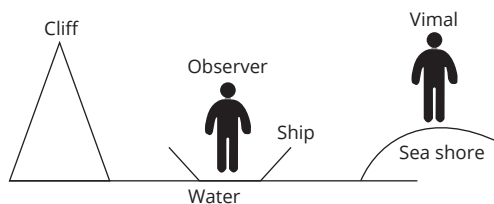
- Name the coil wound arrangement shown in the diagram. Also define it.
- Draw the pattern of magnetic field lines of a solenoid through which a steady current flows.
- What does the pattern of field lines inside the solenoid indicate?

### Question 3

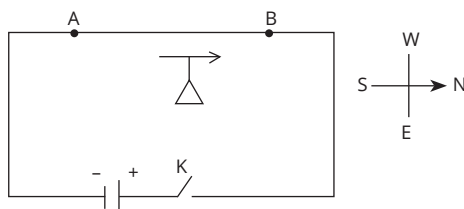
- How is the transference of heat energy by radiation prevented in a calorimeter? [3]
  - You have a choice of three metals A, B and C, of specific heat capacities  $900 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$ ,  $380 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$  and  $460 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$  respectively, to make a calorimeter. Which material will you select?
- An electrical gadget can give an electric shock to its user under certain circumstances. Mention any two of these circumstances. [3]
  - What preventive measure provided in a gadget can protect a person from an electric shock?
- During the phase change, does the average kinetic energy of the molecules of the substance increase? [4]
  - What is the energy absorbed during the phase change called?
  - The temperature of 170 g of water at  $50 \text{ }^\circ\text{C}$  is lowered to  $5 \text{ }^\circ\text{C}$  by adding certain amount of ice to it. Find the mass of ice added.  
Given: Specific heat capacity of water =  $4200 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$  and Specific latent heat of ice =  $336000 \text{ J kg}^{-1}$

### Question 4

- Vimal is standing at the sea shore. An observer on the ship which is anchored in between a vertical cliff and the person on the shore fires a gun. The person on the shore heard two sounds, 2 seconds and 3 seconds after seeing the smoke of the fired gun. If the speed of sound in the air is  $320 \text{ m s}^{-1}$  then calculate: [3]
  - the distance between the observer on the ship and Vimal on the shore.
  - the distance between the cliff and the observer on the ship.

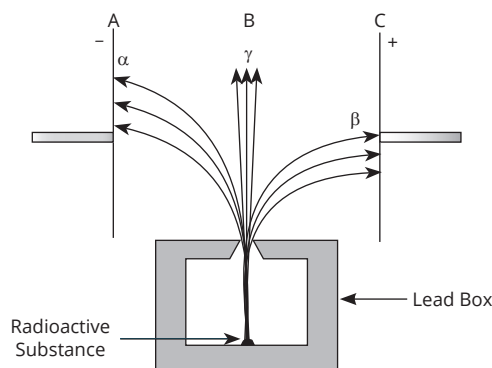


- The diagram below shows a magnetic needle kept just below the conductor AB which is kept in North South direction. [3]



- In which direction will the needle deflect when the key is closed?
- Why is the deflection produced?
- What will be the change in the deflection if the magnetic needle is taken just above the conductor AB?

- iii. Radiations given out from a source when subjected to an electric field in a direction perpendicular to their path are shown below in the diagram. The arrows show the path of the radiation A, B and C. Answer the following questions in terms of A, B and C. [4]



- Name the radiation B which is unaffected by the electrostatic field.
- Why does the radiation C deflect more than A?
- Which among the three causes the least biological damage externally?
- Name the radiation which is used in carbon dating.

### Question 5

- Which particles are responsible for current in conductors? [3]
  - To which wire of a cable in a power circuit should the metal case of a geyser be connected?
  - To which wire should the fuse be connected?
- Name the waves used for echo depth sounding. [3]
  - Give one reason for their use for the above purpose.
  - Why are the waves mentioned by you not audible to us?
- Why are hot water bottles very efficient for fomentation? [4]
  - Write any two medicinal usage of radioactive isotopes.

### Question 6

- An atomic nucleus A is composed of 84 protons and 128 neutrons. [3]
  - The nucleus A emits an alpha particle and is transformed into nucleus B. What is the composition of nucleus B?
  - The nucleus B emits a beta particle and is transformed into a nucleus C. What is the composition of nucleus C?
  - Does the composition of nucleus C change if it emits gamma radiations?
- Name the factor that determines: [3]
  - Loudness of the sound heard.
  - Quality of the note.
  - Pitch of the note.
- For a heater rated 5.5 kW and 220 V, calculate [4]
  - the current
  - the resistance of the heater
  - the energy consumed in 5 hours
  - the cost if 1 kWh is priced at ₹ 3 per unit.