Mock Board Exam

STD: X | **SUBJECT: Physics** | **ASSESSMENT: Mock Test**
Maximum marks : 40 | **19/3/2022 11:00 - 19/3/2022 22:30** | **Time Limit : 90 Minutes**

Answers to this paper must be written on the paper provided separately.
Attempt all questions from Section A and any three questions from Section B.
A students has to answer a question either by typing it out, in the space provided, or writing down each answer on paper, and uploading a picture of it using the upload option.
A student is advised to write the answers in a clear, legible handwriting using a blue/black ball point pen before uploading it.

Section A

10 Marks

(Attempt all questions)

Do not copy the question, write the correct answer only. Select the correct answer for the MCQ questions.

10 Marks

Choose the correct answers to the questions from the given options. (Do not copy the

the question, Write the correct answer only.)

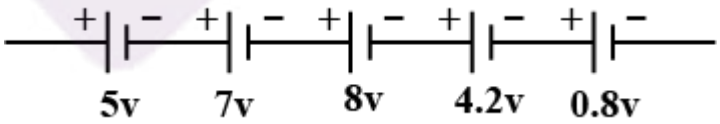
1 The middle finger in Fleming's right hand rule represents the direction of which quantity? **1 M**

(A) Motion of conductor (B) Induced current
(C) Magnetic field (D) Force on the conductor

2 The amplitude of a sound wave determines its: **1 M**

(A) Pitch (B) Quality (C) Timbre (D) Loudness

3 For the figure given below, find the effective potential difference when the batteries are connected in series. **1 M**



(A) 20 volts (B) 24 volts (C) 26 volts (D) 25 volts

4 The strength of an electromagnet CANNOT be increased by **1 M**

(A) Changing the number of turns of winding in the solenoid
(B) Increasing the current through the solenoid
(C) Increasing the voltage across the solenoid
(D) Changing the direction of flow of current in the solenoid

5 A metal ball requires $2000\ \mathrm{J}$ heat energy to increase its temperature by $20C$. Calculate the heat capacity of the metal ball. **1 M**

(A) $1000\ \mathrm{J/K}$ (B) $500\ \mathrm{J/K}$ (C) $100\ \mathrm{J/K}$ (D) $250\ \mathrm{J/K}$

6 Which of the following is NOT a property of gamma radiation? **1 M**

(A) Gamma radiations are electromagnetic waves like X -rays and light

(B) The speed of gamma radiation is always less than 3×10^8 m/s in air

(C) Gamma radiations are not deflected by electric and magnetic fields

(D) The ionizing power of gamma radiation is very low

7 What happens at the intermediate substation? **1 M**

(A) Voltage is stepped down to $33\ \mathrm{kV}$ from $132\ \mathrm{kV}$

(B) Voltage is stepped down to $11\ \mathrm{kV}$ from $33\ \mathrm{kV}$

(C) Voltage is stepped up to $132\ \mathrm{kV}$ from $11\ \mathrm{kV}$

(D) Voltage is stepped down to $220\ \mathrm{V}$ from $11\ \mathrm{kV}$

8 Which of the following is NOT an example of damped vibrations? **1 M**

(A) A tuning fork vibrating in the air

(B) A simple pendulum oscillating in air

(C) Oscillation of a simple pendulum in a vacuum

(D) The vibrations of spring with a mass at its end

9 A heating device melts $60\ \mathrm{g}$ of ice in 1 minute. The power supplied by the device is____. **1 M**

(Latent heat of ice is $80\ \mathrm{cal/g}$)

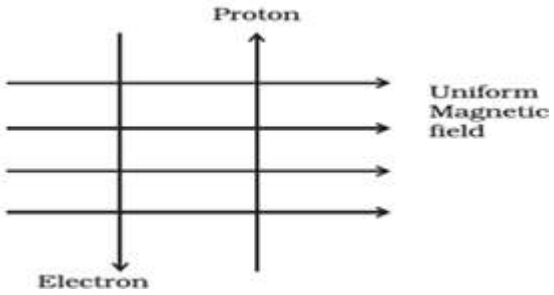
(A) $4856\ \mathrm{W}$

(B) $336\ \mathrm{W}$

(C) $60\ \mathrm{W}$

(D) $66\ \mathrm{W}$

10 A uniform magnetic field exists in the plane of a paper pointing from left to right as shown in Figure. The electron and the proton in the field experiences a force: **1 M**



(A) Pointing into the plane of the paper.

(B) Pointing out of the plane of the paper.

(C) Pointing into the plane of the paper and pointing out of the plane of paper for protons and electrons respectively.

(D) Pointing opposite and along the direction of uniform magnetic field for protons and electrons respectively.

Section B

30 Marks

Attempt any three groups from this Section B.

Group 1 **10 Marks**

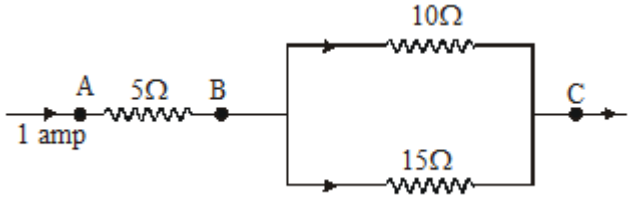
11 Explain the following parts of an electric motor: **3 M**
(a) Armature
(b) Commutator
(c) Brushes

12 a). What is the difference between Fleming's left and right-hand rule? **4 M**
b). Explain different ways to induce a current in a coil
c). Which instrument can be used to show that a magnetic field exists around a wire carrying current? Why does a compass needle get deflected when brought near a bar magnet

13 a. Write one advantage of connecting electrical appliances in parallel combination. **3 M**
b. What characteristics should a fuse wire have?
c. Which wire in a power circuit is connected to the metallic body of the appliance?

Group 2 **10 Marks**

14 Three resistances are connected as shown in the diagram, through the resistance $5\ \Omega$ a current of $1\ \mathrm{A}$ is flowing : **3 M**



a. What is the current through the other two resistors?
b. What is the potential difference (p.d.) across AB and across AC?
c. What is the total resistance?

15 a. It is observed that during march - past we hear a base drum distinctly from a distance compared to the side drums. Name the characteristic of sound associated with this observation and explain why it is so. **3 M**
b. What distinguishes between the sounds of same pitch and loudness produced from a tuning fork and a piano?

16 a. Distinguish between natural and forced vibrations. **4 M**
b. What is resonance and its condition for occurrence?
c. List down at least three examples for resonance.

Group 3 **10 Marks**

17 In the experimental verification of Ohm's law, the following observations are obtained. **3 M**

Potential difference (in volt)	0.6	1.2	1.8	2.4	3
Current (in Ampere)	0.2	0.4	0.6	0.8	1.0

Draw a
$\mathrm{V}\ -\mathrm{I}$
graph and use this graph to find:
(a) The potential difference V when the current is $0.9\ \mathrm{A}$.
(b) The current I when the potential difference V is $2.1\ \mathrm{V}$.
(c) The resistance in the circuit.

18 a. A transformer is designed to give a supply of $10\ \mathrm{V}$ to ring a house bell from $240\ \mathrm{V}$ AC mains. The primary coil has 4800 turns. How many turns will be in the secondary coil? **3 M**
b. Define Faraday's laws of electromagnetic induction.

19 a. Distinguish between heat and temperature. **4 M**
b. Calculate the heat capacity of a copper vessel of mass 200 g if the specific heat capacity of copper is 410 J/kg K.
c. How much heat energy is required to increase the temperature of the vessel in part (b) from 25 °C to 35 °C?

Group 4 **10 Marks**

20 a. List down at least three natural consequences of high specific latent heat of fusion of ice. **3 M**
b. Heat energy is supplied at a constant rate to 600 g of ice at 0 °C. The ice is converted into water at 0 °C in 8 minutes. How much time will be required to raise the temperature of water from 0 °C to 100 °C? (Specific latent heat of ice = 336 J/g, specific heat capacity of water = 4.2 J/g K.)

21 a. Distinguish among at least four properties of α , β and γ radiations. **3 M**
b. List down sources of harmful radiation and types of harmful biological effects of Radiation.

22 Distinguish between nuclear fission and nuclear fusion. **2 M**

23 A certain nucleus P has a mass number 18 and atomic number 9 . **2 M**
1. Find the number of neutrons.
2. Write the symbol for the nucleus P
3. The nucleus P loses (i) one proton, (ii) one β particle, (iii) one α particle. Write the symbol of the new nucleus in each case and express each change by a reaction.

Group 5 **10 Marks**

24 a. Compare loudness and intensity of sound. Are they the same or different? **7 M**
b. Explain the difference between low-pitched and high-pitched sound using diagrams.
c. What should be the minimum distance between the source and reflector in water so that the echo is heard distinctly? (The speed of sound in water = 1400 m/s)

25 a. State whether the current is a scalar or vector? What does the direction of current convey? **3 M**
b. In a conductor, 6.25×10^{16} electrons flow from its end A to B in $2\ s$. Find the current flowing through the conductor ($e = 1.6 \times 10^{-19}\ C$).