STD.10   TIME: 1.5 HR.

DATE: 29/9/2022   MARKS: 60

NOTE:

1] Answer to this paper must be written on the paper provided separately.

2] You will not be allowed to write during the first 10 minutes. This time is to be spent in reading the paper.

3] The time given at the head of this paper is the time allowed for writing the answers.

4] Section A is compulsory. Attempt any 3 questions from Section B.

5] The intended marks for a question or parts of questions are given in the brackets [ ].

SECTION A [30 MARKS]
ALL QUESTIONSS IN THIS SECTION ARE COMPULSORY.

QUESTION 1

A] Choose the correct answers to the questions from the given options: [8]

i) The Infrared radiations are used for photography in fog because ____
a) these radiations strongly affect the photographic plate.
b) they are scattered less by the atmosphere.
c) they can easily penetrate through metallic sheet.
d) they are usually scattered by dust.

ii) If 'X' does 400 J of work in 1/6 hr and 'Y' does 600 J of work in 1/3 hr, what will be the ratio of powers developed by Y and X?
a) 2:3   b) 3:4   c) 4:3   d) 1:2

iii) The figure shows a convex lens of focal length 10 cm placed in water, which one will be the most probable value of changed focal length?

a) 8 cm   b) 10 cm   c) 10.8 cm   d) 9.2 cm

iv) When mass and velocity of a body are doubled then kinetic energy will
a) increase by 8 times   b) decrease by 8 times   c) increase by 4 times
d) remain constant

v) To calculate Mechanical advantage, divide the resistance force by the
a) friction   b) work   c) ideal mechanical advantage   d) effort force

vi) In refraction of light through a prism, the light ray
a) suffers refraction at one face of the prism.
b) emerges out from prism in a direction parallel to the incident ray.
c) bends at both surfaces of the prism towards its base.
d) bends at both surfaces of the prism opposite to its base.

vii) Which of the following options correctly describes the relation between wavelength and frequency of light?
a) Greater the frequency of light, greater is its wavelength
b) Greater the frequency of light, smaller is its wavelength
c)The frequency of light remains constant irrespective of the change in wavelength of light
d) There is no relation between the wavelength and frequency of light.

viii) Observe the figure and choose the wrong one:
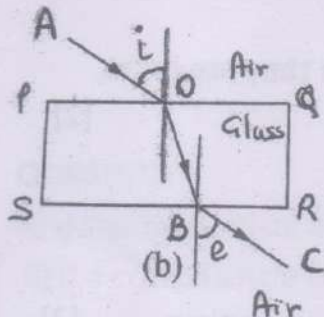
a) Ray AO || Ray BC   b) Speed of AO = Speed of BC

c) Speed of AO > Speed of OB   d) Speed of OB > Speed of AO

B] Where does the position of centre of gravity lie for a   [2]

i) triangular lamina   ii) solid cone

QUESTION 2

A] Name the constituent radiation of an electromagnetic spectrum which   [2]

i) is obtained by using a rock salt prism

ii) has the longest wavelength

B] Write the principle of machine. Do all machines obey this principle?   [2]

C] Can a concave lens form an image of size two times that of the object?

Justify your answer.   [2]

D]The real depth of a liquid whose refractive index is 1.36 is 20 cm. Find the

apparent depth.   [2]

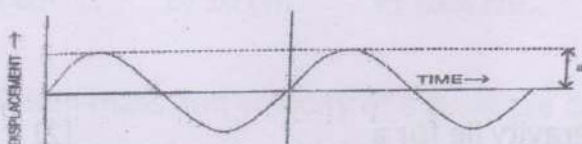E] Name the physical quantity whose unit is kWh. State its value in SI unit.   [2]
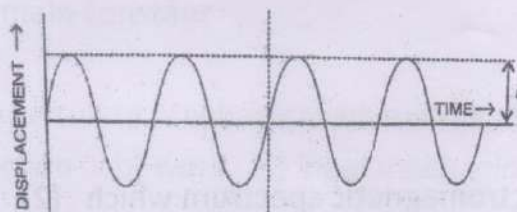
QUESTION 3

A] State the energy conversion in each of the following when they are in working state: **[2]**

i) Loudspeaker   ii) Kerosene lamp

B] The figures given below show sound waves formed in the same time interval. Which figure shows i) a high pitch note ii) a low frequency note **[2]**

← figure i

← figure ii

C] How the heat transfer to the surrounding is prevented in a calorimeter? **[2]**

i) by radiation   ii) by convection

D] Name the factor that determines: i) quality of sound **[2]**

ii) Loudness of sound

E] What do you understand by the following statements: **[2]**

i) The specific heat capacity of lead is 130 J kg⁻¹K⁻¹

ii) The absolute refractive index of kerosene is 1.44.

SECTION B [30 MARKS]

ATTEMPT ANY THREE COMPLETE QUESTIONS FROM THIS SECTION.

QUESTION 4

A] i) Define: Critical angle. [3]

ii) If a critical angle of glass for yellow colour is 45^0, then critical angle for blue colour can be $45^030'$. State with a reason whether the above statement is true or false.

B] [3]

i) How can a temperature in ^0C be converted into SI unit of temperature?

ii) A liquid 'X' has the maximum specific heat capacity and is used as coolant in car radiators. Name the liquid 'X'. Explain its working as a coolant in car radiators.

C]i) Name the phenomenon involved in tuning a radio set to a particular [4] station.

ii) Defined the phenomenon named by you in part i above.

iii) Which type of vibrations are responsible for the vibrations mentioned by you in i.

iv) Name the forces responsible for the vibrations mentioned by you in iii.

QUESTION 5

A] Draw a neat labelled diagram of a block and tackle system of pulleys having V.R.= 4. Indicate point of application and direction of load, effort. Also mark tension. [3]

B] In the figure given below there are two isosceles right angled prisms A and B. There are two rays incident on prism A. Copy the figure in your answer booklet and complete it to show the rays emerging out from the prism B. Name the phenomenon observed in it. [3]
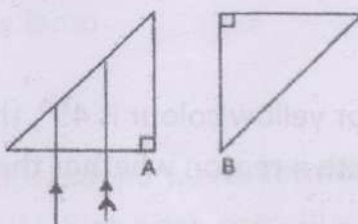
C] a) Kartik is surprised to see water boiling at 115°C in a container. Give any two reasons as to why water boils at the said temperature? b) State any two ways by which the frequency of vibrations in a string instrument can be decreased. [4]

QUESTION 6

A] Calculate the power of an electric heater required to melt 2 kg of ice at 0°C in 60 sec, if the efficiency of heater is 50%. Specific latent heat of ice = 336 Jg^{-1} [3]

B] Define:

i) Dynamic equilibrium   ii) Principal axis of a lens   iii) Dispersion of light [3]

C] Draw a neat labelled ray diagram using a lens which is used in making spectacles for myopic eye. [4]

QUESTION 7

A] A submarine produces an ultrasonic wave of velocity 1500 ms^{-1}. A man sends a signal from transmitter and detects an object 1600m below the submarine. What will be the time taken for a receiver to receive signal sent from a transmitter? Also calculate the frequency of waves. [3]

B] A convex lens forms an image 20cm long of an object 4cm long [3] kept at a distance 5cm from the lens. The object and image are on the same side of the lens.
i)What is the nature of the image?
ii) Find the position of the image.

C] Give scientific reasons: [4]
i) In cold countries water in lakes and ponds does not freeze at once. (Give 2 points)
ii) Echo is not heard in a small room.
iii) Gamma radiations are used in radio-therapy.

BEST OF LUCK