Nayak's Tutorials

Way to Excellence

| Year: 2024-25 | Practice Paper - 1 | Marks - 80 |
| Std:- X ICSE | Physics | Duration :- 2 Hrs |

*Attempt **all** questions from **Section A** and **any four** questions from **Section B**.*
*The intended marks for question or parts of questions are given in brackets [ ].*

[Attempt all questions.]

Q.1. Choose the correct answers to the questions from the given options.

i) The point at which entire weight of the body can be supposed to be concentrated is

a) end point   b) centroid   c) centre of gravity   d) central point

ii) Solar cell converts

a) heat energy to mechanical energy   b) electrical energy to light energy

c) chemical energy to heat energy   d) solar energy to electrical energy

iii) A pendulum is oscillating on either side of its rest position. The correct statement is

a) It has only the kinetic energy at its each position.
b) It has maximum kinetic energy at its extreme position.
c) It has the maximum potential energy at its mean position.
d) The sum of its kinetic energy and potential energy remain constant throughout the motion.

iv) Which is used in cure of cancer and detecting brain tumour ?

a) Na-24   b) Fe-59   c) Co-60   d) None of these

v) When angle of incidence is more, then

a) lateral displacement is less
b) lateral displacement is more
c) lateral displacement is independent of incidence angle
d) Zero

vi) A ray of light suffers refraction through an equilateral prism. The deviation produced by the prism does not depend on the

a) angle of incidence   b) colour of light

c) material of prism   d) size of prism

vii) A ray of light incident at an angle of 48 on a prism of refracting angle 60, suffers minimum deviation. The angle of minimum deviation would be

a) 12   b) 24   c) 36   d) 48

viii) What is the magnification of the image when a lens of focal length 10 cm and object distance from the lens is 15 cm ?

a) 2   b) 1   c)   d) 4

ix) The sensation of sound persists in our brain for about

a) 0.001s   b) 0.2s   c) 0.1s   d) 10s

x) Sound energy passing per second through a unit area held perpendicular it is called

a) intensity   b) frequency   c) amplitude   d) quality

xi) A 9V battery has an internal resistance of 12 Ω. The potential difference across its terminals when it is supplying a current of 50 mA is

a) 8.94 V   b) 8.4 V   c) 9.06 V   d) 9.6 V

xii) Fuse wire used in power circuit is of

    a) 5A   b) 220 A   c) 15 A   d) 10 A

xiii) On reversing the direction of current in a wire, the magnetic field produced by it

    a) get reversed in direction
    b) increases in strength
    c) decreases in strength
    d) remains unchanged in strength and direction

xiv) At which temperature molecular motion ceases ?

    a) 273 K   b) −273 K   c) 0 K   d) 0 C

xv) Latent heat of fusion of ice is

    a) 436×10^5 Jkg^{-1} b) 236×10^5 Jkg^{-1}
    c) $L36 \times 10^5$ Jkg^{-1} d) 336×10^5 Jkg^{-1}

Q.2. i)   (a) A pulley cannot have 100% efficiency. Explain why ?   1

        (b) What is the nuclear energy ?   1

        (c) Write the two uses of radioactivity.   1

ii)   A girl weighing 40 kg skips 8 cm high 10 times, sufficient to stop a thief weighing 60 kg. Find the speed at which thief is running.   2

iii)   A uniform meter scale is in equilibrium as shown in the figure given below   2
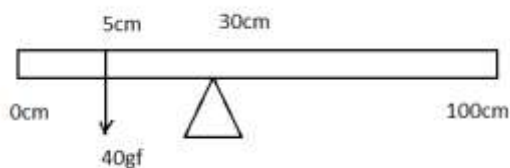
    Calculate the weight of the meter scale.

iv)   The distance between two bodies is decreased by a factor of 3. How is magnitude of gravitational force between them affected ?   2

v)   What will be the position of centre of gravity of   2
    a) parallelogram   b) hollow cone ?

vi)   a) Name the colour code of wire which is connected to the metallic body of an appliance according to new convection.

    b) Which part of the electrical appliance is earthed ?   2

vii)   a) Name the two major parts of a SONAR.
    b) Name the type of vibrations produced in the given case A freely suspended pendulum vibrating about its mean position.   2

Q.3. i)   A concave lens of focal length 20 cm forms an image at a distance of 10 cm from the lens. What is the distance of the object from the lens ?   2

ii)   Derive an expression for equivalent resistance in the following case   2
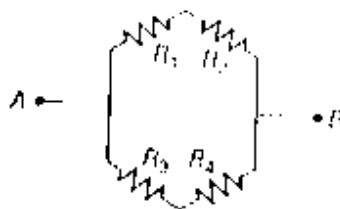
Decide, which resistances are in series and parallel. Solve for series and then for parallel. combine both the results to get the equivalent resistance.

    iii)   10125 J of heat energy boils off 4.5 g of water at 100 C to steam at 100 C. Find the specific latent heat of steam.

    iv)   A wire is dropped freely towards earth. Will any emf be induced across the ends of wire, if wire is initially in

        a) North–South direction ?   1

        b) East–West direction ?   1

    v)   Complete the following nuclear changes.

        a) $_{11}Na^{24} \rightarrow ....X + _{-1}\beta^{0}$ 1

        b) $_{92}U^{238} \rightarrow _{90}Th^{234} + ... +$ Energy.   1

Section – B
[Attempt any four questions.]

Q.4. i)   a) What is dispersion ?   1

        b) Explain a natural phenomenon involving dispersion.   2

    ii)   a) Write a note on total reflecting prism.   1

        b) State three actions that it can produce.   1

        c) With the help of a diagram, show one action of total reflecting prism.   1

    iii)   a) A coin placed at the bottom of a beaker appears to be raised by 4.0 cm. If the refractive index of water is 4/3, then find the depth of the water in the beaker.   2

        b) Write the factors on which lateral displacement depends.   1

        c) How does the value of angle of deviation produced by a prism change with the increase in the value of angle of incidence ?   1

Q.5. i)   A virtual, diminished image is formed when an object is placed between the optical centre and the principal focus of a lens.   3

        a) Name the type of lens which forms the above image.

        b) Draw a ray diagram to show the formation of the image with the above stated characteristics.

    ii)   a) Define EM spectrum.   1

        b) Write two uses of ultraviolet rays.   1

        c) Calculate the speed of EM wave in a glass slab in which its frequency is 4×10^{14} and wavelength is 500 nm.   1

    iii)   a) One–half of a convex lens of focal length 10 cm is covered with a black paper. can such a lens produce an image of a complete object placed at a distance of 30 from the lens? Draw a ray diagram to justify your answer.   2

        b) Write two uses of concave lens.   2

Q.6. i)   a) Explain, when can an object be in stable equilibrium.   1

        b) A pulley system has four pulleys in all and is 95% efficient. Calculate   2

I. MA   II. Effort required to lift a load of 1000 N.

ii)   A uniform meter scale of mass 60 g, carries masses of 20 g, 30 g and 80 g from points 10 cm, 20 cm and 90 cm marks. Where must be the scale hanged with string to balance the scale ?   3

iii)   If a man raises a box of 50 kg mass to a height of 2m in 2min, while the other man raises the same box to a same height in 5 min. Compare   4
a) the work done.   b) the power developed by them.

Q.7.   i)   a) Explain, why echoes cannot be heard in a small room.   1
b) An iron rod was gently touched by the hammer and then was hit harder.   2
I. When will be the sound created louder ?
II. Which characteristic of sound here is responsible for change in sound ?

ii)   A nucleus $_{11}Na^{24}$ emits a β particle to change into magnesium (Mg).
a) Write the symbolic equation for the process.   1
b) What are numbers 24 and 11 called ?   1
c) what is the general name of with respect to ?   1

iii)   Explain, how can you produce deviation with dispersion ?   4

Q.8.   i)   An electric iron consumes energy at a rate of 640 W when heating is at the maximum rate and 260 W when the heating is at the minimum rate. The applied voltage is 220 V. What is the value of current and the resistance in each case ?   3

ii)   A certain nucleus P has a mass number 16 and atomic number 8.
a) Find the number of neutrons.   1
b) The nucleus P losses I. one proton and II. one β – particle.   1
Write the symbol of the new nucleus in each case and express each change by reaction.   2

iii)   a) Draw a schematic diagram of main circuit.   1
b) Define conductivity.   1
c) Of the three connecting wires in a household circuit, which two of the three wires are at the same potential ?   1

Q.9.   i)   a) The melting point of naphthalene, a crystalline solid is 80C and the room temperature is 20C. Liquid naphthalene at 90C is cooled in room temperature. Draw the temperature–time graph to represent this cooling.   2
b) It takes a much longer time to boil off (change to steam) a certain quantity of water rather than bring it to its boiling point from room temperature, say 25C. Explain the reason for this.   2

ii)   a) What is a reason of spraying of water on the roads in the evening in the hot summer ?   2
b) Explain the benefits of high specific heat capacity of water.   2

iii)   a) A coil of insulated copper wire is connected to a galvanometer. What will happen, if a bar magnet is   2
I. pushed into the coil,
II. withdrawn from inside the coil and
III. held stationary inside the coil ?
IV. Name the phenomenon involved.

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