

PHYSICS  
(SCIENCE PAPER I)

Maximum Marks: 80

Time allowed: Two hours

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

You will not be allowed to write during first 15 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.

Section A is compulsory. Attempt any four questions from Section B.

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

SECTION A (40 Marks)

(Attempt all questions from this Section.)

Question 1

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

[15]

(Do not copy the questions, write the correct answers only.)

(i) When a bell fixed on a cycle rings, then the energy conversion that takes place is:

- (a) gravitational potential energy to sound energy
- (b) kinetic energy to sound energy
- (c) sound energy to electrical energy
- (d) sound energy to mechanical energy

(ii) A door lock is opened by turning the lever (handle) of length 0.2 m. If the moment of force produced is 1 Nm, then the minimum force required is:

- (a) 5 N
- (b) 10 N
- (c) 20 N
- (d) 0.2 N

(iii) A force 'F' moves a load from A to C as shown in the figure below. For the calculation of the work done, which of these lengths would you use as the displacement?

- (a) 3m
- (b) 4m
- (c) 5m
- (d) 7m



(iv) A radioactive nucleus containing 128 nucleons emits a  $\beta$ -particle. After  $\beta$ -emission the number of nucleons present in the nucleus will be:

- (a) 128
- (b) 129
- (c) 124
- (d) 127

(v) **Assertion (A):** Ultraviolet radiations are scattered more as compared to the microwave radiations.

**Reason (R):** Wavelength of ultraviolet radiation is more than the wavelength of microwave radiation.

- (a) Both A and R are true.
- (b) A is true but R is false.
- (c) A is false but R is true.
- (d) Both A and R are false.

(vi) When the stem of vibrating tuning fork is pressed on a table, the tabletop starts vibrating. These vibrations are definitely an example of:

- (a) resonance
- (b) natural vibrations
- (c) forced vibrations
- (d) damped vibrations

(vii) Which of the following is a class III lever?

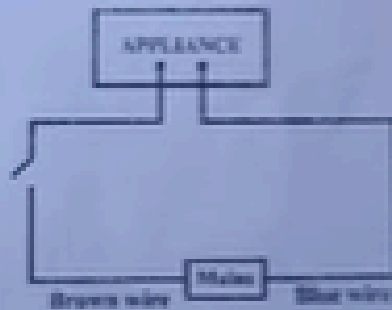
- (a) Pair of scissors
- (b) Wheelbarrow
- (c) Crowbar
- (d) Human forearm

(viii) The specific resistance of a conductor depends on its:

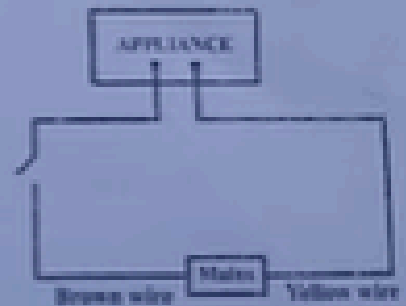
- (a) length
- (b) material
- (c) area of cross section
- (d) radius

(ix) Identify the option that displays the correct wiring with correct colour code:

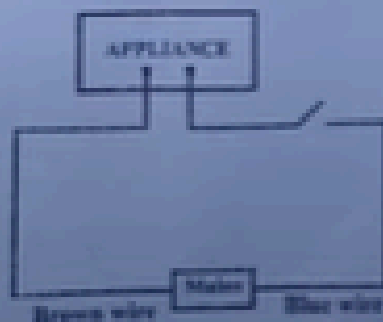
(a)



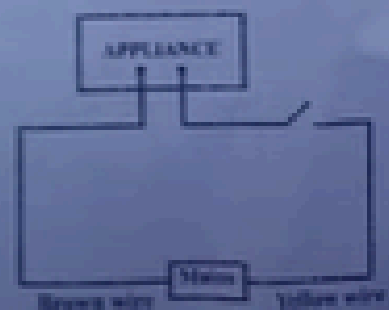
(b)



(c)



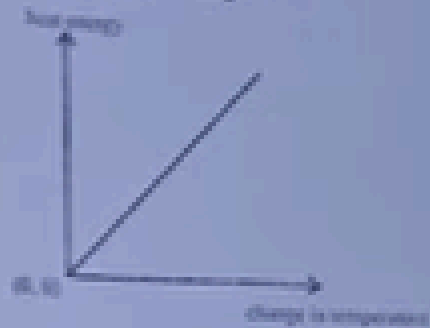
(d)



- (x) The potential difference between terminals of a cell in a closed electric circuit is:
- (a) terminal voltage
  - (b) electro motive force
  - (c) voltage drop
  - (d) none of these
- (xi) During melting of ice at  $0^{\circ}\text{C}$  the:
- (a) energy is released and temperature remains constant.
  - (b) energy is absorbed and temperature remains constant.
  - (c) energy is released and temperature decreases.
  - (d) energy is absorbed and temperature increases.
- (xii) Linear magnification( $m$ ) produced by a concave lens is:
- (a)  $m < 1$
  - (b)  $m > 1$
  - (c)  $m = 1$
  - (d)  $m = 2$
- (xiii) A radioactive element is placed in an evacuated chamber. Then the rate of radioactive decay will:
- (a) Decrease
  - (b) Increase
  - (c) Remain unchanged
  - (d) Depend on the surrounding temperature

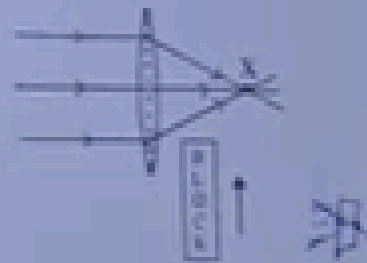
(xiv) The graph given below shows heat energy supplied against change in temperature when no energy is lost to the surrounding. The slope of this graph will give:

- (a) Specific heat capacity
- (b) Latent heat of fusion
- (c) Latent heat of vaporization
- (d) Heat capacity



(xv) A block of glass is pushed into the path of the light as shown below. Then the converging point X will:

- (a) Move away from the slab
- (b) Move towards the slab
- (c) Not shift
- (d) Move towards the left side of the lens



Question 2

(i) (a) In the following atoms, which one is a radioisotope? Give one use of this isotope. [1]



(b) Name the class of the lever shown in the picture below:



(ii) Fill in the blanks:

(a) When a stone tied to a string is rotated in a horizontal plane, the tension in the string provides \_\_\_\_\_ force necessary for circular motion.

\_\_\_\_\_ this force at any instant is \_\_\_\_\_