DBSSSV VIII, S2,025

PHYSICS (SCIENCE PAPER-1)

[15]

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

(Attempt *all* questions from this section)

Question 1

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

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

(i) The safe limit of loudness of audible sound is:

(a) 0 to 80 dB (b) above 80 dB (c) 0 to 120 dB (d) above 120 dB

(ii) A convex mirror is used :

(a) as a shaving mirror (b) as a head mirror by a dentist

(c) as a rear view mirror by a driver (d) as a reflector in torch.

(iii) Two coolies A and B do some work in time 5 minutes and 10 minutes respectively. The power spent is :

(a) same by both coolies (b) is more by coolie A than by B

(c) is less by coolie A than by B (d) nothing can be said.

- (iv) When a boy doubles his speed, his kinetic energy becomes :(a) half (b) double (c) four times (d) no change.
- (v) A boy lifts a luggage from height 2 m to 4 m. The potential energy will become :
 (a) half
 (b) double
 (c) one-third
 (d) one-fourth.

(vi) Assertion (A): If a drum is hit softly, a soft sound is produced.Reason (R): By hitting drum softly, vibrations of less amplitude is produced.

- (a) Both A and R are correct and R is the correct explanation of A
- (b) Both A and Reason R are correct but R is not the correct explanation of A

(c) **A** is true, but **R** is false (d) **A** is false but **R** is true.

(vii) Assertion (A): When the string of a bow is stretched the muscular energy is stored in the string and bow in the form of kinetic energy.

Reason (**R**): Potential energy makes the arrow shoot forward in string and bow.

- (a) Both A and Reason \mathbf{R} are correct and \mathbf{R} is the correct explanation of \mathbf{A} .
- (b) Both A and Reason \mathbf{R} are correct but \mathbf{R} is not the correct explanation of \mathbf{A} .

(c) **A** is true, but **R** is false (d) **A** is false but **R** is true.

- (viii) The factor responsible for charging a conductor is :
 - (a) transfer of protons (b) transfer of neutrons
 - (c) transfer of electrons (d) transfer of both protons and electrons.
 - (ix) The purpose of an electric meter in a house is :
 - (a) to give the cost of electricity directly (b) to put on or off the mains.
 - (c) to give the consumption of elecrical energy
 - (d) to safeguard the circuit from electrical short circuit
 - (x) When heat is transferred to any matter, it may have the following effects:(a) change in temperature(b) change in size/shape
 - (c) change in state (d) all of these
- (xi) The rate of evaporation of a liquid increases when:
 (a) temperature of liquid falls (b) humidity increases
 (c) liquid is poured in a vessel of less surface area
 (d) air is blown above the surface of liquid
- (xii) The coefficients of linear expansion, superficial expansion and cubical expansion are related to one another as:
 - (a) 1:2:4 (b) 1:2:3 (c) 3:2:4 (d) 3:2:1
- (xiii) When two rods P and Q of the same metal but of length 1 m and 3 m respectively are heated to the same temperature:
 - (a) both the rods expand to the same extent
 - (b) the rod \boldsymbol{P} expands more than the rod \boldsymbol{Q}
 - (c) the rod \boldsymbol{Q} expands more than the rod \boldsymbol{P}
 - (d) both the rods contract
- (xiv) The SI unit of energy is:
 - (a) joule (b) erg (c) kgf (d) newton
- (xv) Which of the following does not possess kinetic energy?
 - (a) a car moving on the road (b) a ball rolling on the ground
 - (c) flowing water (d) a compressed spring

Question 2

- (i) Complete the following by choosing the correct answer from the given bracket:
 - (a) The time period of a wave is 2 s. Its frequency is $(\frac{1}{2} \text{ Hz} / 2 \text{ Hz})$.
 - (b) In _____ (generator/motor) kinetic energy gets transformed into the electrical energy.
 - (c) Air is optically _____ (denser/rarer) than glass.

[6]

- (d) A switch is connected to the _____ (neutral/live) wire.
- (e) _____ (linear/volume) expansion occurs only in solids.
- (f) Change of state from liquid to gas at any temperature is called __________(evaporation/vaporization).
- (ii) It takes 40 s for a man P to climb up the stairs while the man Q takes 30 s for the same job. Compare: (i) the work done and (ii) the power spent by them.
- (iii) What happens to the given metallic strip on heating? Explain it with the help of a diagram. [2]



Question 3

- (i) With the help of a diagram, explain the conversion of energy in a swinging [2] pendulum.
 (ii) Represent the following graphically. Draw two separate diagrams in each case. [2]
 (a) Two sound waves having the same amplitude but different frequencies.
 (b) Two sound waves having the same frequency but different amplitudes.
- (iii) The frequencies of notes given by flute, guitar, trumpet and mouth organ are respectively 400 Hz, 200 Hz, 500 Hz and 440 Hz. Arrange these musical instruments in the increasing order of their pitch.
- (iv) The figure given below shows two jars A and B containing water up to different [2] heights. Which will produce a sound of higher pitch when air is blown in them? Give a reason for your answer.

A	В
- E	

- (v) Draw the ray diagram for the image formed by a concave mirror when the object is [2] kept at 'C'
- (vi) Mishika was looking into the outer and inner faces of a new steel spoon. She found [2] she could see her clear image on both the sides of the spoon. But one side, the image was erect and on the other side, the image was inverted. She discussed this with her Physics teacher who explained the reasons clearly.
 - (a) Which side of the spoon forms erect image and why?
 - (b) Which side of the spoon forms inverted image and why?
- (vii) Look at the figure given below and answer the following questions:



(a) Label the two boxes in the figure as 'object' and 'image'.

(b) Identify the phenomenon due to which the image is appearing at a different position? Define the phenomenon.

SECTION B

(Attempt any four questions from this section)

Question 4

(i) Complete the following table in case of a concave mirror.

No.	Position of the object	position of the image	nature of the image	size of the image
1	Beyond C			
2	Between F and C			
3	Between P and F			

(ii) Complete the following diagram given below by drawing the reflected rays for the incident rays A and B if F is the focus and C is the centre of curvature. Identify the spherical mirror also.



(iii) Name the kind of mirror used to obtain:

(a) a real and enlarged image (b) a virtual and enlarged image,

(c) a real and diminished image (d) a virtual and diminished image.

Question 5

(i) Complete the following diagrams by drawing the refracted rays in each case.



[3]

[4]

[3]

(ii)	Give reasons for the following.	[3]
	(a) Swimming pools appear shallower from the outside.	
	(b) Pencil in a glass of water appears to be bent.	
	(c) The sun is seen before the sunrise and after the sunset.	
(iii)	(a) What is dispersion of light? Mention it's cause.	[4]
	(b) With the help of a diagram, show the dispersion of white light.	
Questio	on 6	
(i)	A metal plate is heated. Explain the three factors on which the increase in its area will depend.	[3]
(ii)	Explain any three factors on which linear thermal expansion depends.	[3]
(iii)	(a) What is a bimetallic strip? Give one application of it.	[4]
	(b) Give reason for the following:	
	(1) Small gaps are left between the railway tracks.	
	(2) A glass stopper stuck in the neck of a bottle can be removed by pouring hot water on the neck of the bottle.	

Question 7

(i) Identify the device shown below and label it. [Do not copy the diagram] [3]



- (ii) Differentiate between the live, neutral and earth wires used in household electrical [3] circuits.
- (iii) Identify the devices shown below. Write the use and working principle of these [4] devices in an electric circuit.
 - (1)





Question 8

- (i) What is meant by monotonic and polytonic sounds? Represent them graphically. [3]
- (ii) Differentiate between music and noise.
- (iii) The figures given below show the waves that are produced in 5 seconds. Observe the [4]

figures and answer the following:



- (a) Which sound is louder? Why?
- (b) Which one has a higher pitch? Why?
- (c) Determine the frequency of the sound waves in both figures.

Question 9

- (i) Briefly explain the characteristics of sound?
- (ii) Identify the type of musical instrument shawn in the figure below. Give another example of the same type from your day to day life. Which are the two parts of it and write their functions. Write any two factors on which its pitch depend.



(iii) (a) Classify the below instruments into different types.



(b) Write the factors on which the pitch of the sound produced by these instruments depends? Explain.

(c) What are reed instruments? Give two examples.

[4]

[3]