PHYSICS

BOOKS - D MUKHERJEE PHYSICS (HINGLISH)

MISCELLANEOUS QUESTION 2

Missellaneous Qns 2 Assertion

1. STATEMENT-1: A geostationary satellite must be located in the equatorial plane, i.e, at some

point vertically above the equator.

STATEMENT-1: The only external force acting on an earth satellite is direted towards the centre of the earth.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

View Text Solution

2. Statement-1 : In an elastic collision in one dimension between two bodies, total momentum remains the same before, during and after the collision.

Statement-2 : In an elastic collision in one

dimension between two bodies, total kinetic energy remains the same before, during and after the collision.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: C

 Watch Video Solution

3. STATEMENT-1: The gravitational potential energy of a solid sphere is negative.

STATEMENT-2: Two masses attract each other.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

4. STATEMENT-1: The electrostatic potential energy of a sphere with uniformly distributed negative charge is positive.

STATEMENT-1: Two similar charges repel each other.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

5. STATEMENT-1: When an uncharged parallel-plate capacitor is charged by conneting it to a cell, the heat produced in the circuit is equal to the energy stored in the capacitor.

STATEMENT-1: The charge on a parallel-plate capacitor means the equal and opposite charges, on its inner surfaces.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: B

View Text Solution

6. STATEMENT-1: When a charged particle eneters a magnetic field from outside, its cannot complete one rotation inside the field.

STATEMENT-2: The entry and exit of a charged particle into and out of a uniform magnetic filed are symmetrical.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

7. STATEMENT-1: It is possible for a charged particle to move in a circular path around a uniformly charged long conductor.

STATEMENT-2: The electrostatic force on the moving particle is directed towards the conductor.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

8. STATEMENT-1: It is not possible for a charged particle to move in a circular path around a long straight conductor carrying current.

STATEMENT-2: The electromagntic force on a moving particle is normal to its plane of rotation.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: C

View Text Solution

9. STATEMENT-1: When two sounds of slightly different frequecies are heard together, periodic variations in intensity (called beats) are observed. Similar phenomenon is not observed when two lights of slightly different wavelengths reach a point together.

STATEMENT-2: Sound waves are longitudinal in nature, while light waves are transverse in nature.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for

Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: B

 Watch Video Solution

10. STATEMENT-1: When a sphere falls under gravity or moves up due to buoyancy forces in a fluid, its velocity becomes constant after some time.

STATEMENT-2: The force of visocosity is proportional to velocity.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

11. STATEMENT-1: When two sounds of equal frequencies and slightly different intensities are heard together, beats are heard.

STATEMENT-2: Beats are caused by alternate constructive and destructive interferences between two sounds.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: D

Watch Video Solution

12. STATEMENT-1: It is necessary to define two molar heat capacitor for a gas.

STATEMENT-2: Work is done by a gas when its volume changes.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

View Text Solution

13. STATEMENT-1: The thermal conductivity of a rectangular slab of a material can be defined only under steady-state conditions, i.e, when the temperatures of the end faces do not

changes with time.

STATEMENT-2: The rate of conduction of heat through a reactangular slab is proportional to the difference in temperature between its end faces.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: D

Watch Video Solution

14. STATEMENT-1: In high-quality optical devices, such as camera, binocular, periscope, et.c prisms are used in place of plane mirrors to reflect light.

STATEMENT-2: In plane mirrors, reflections occur both in the front and rear (silvered) surfaces.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

15. STATEMENT-1: Real images cannot be formed by reflection of light in a convex mirror.

STATEMENT-2: Parallel rays incident on a convex mirror must diverge after reflection.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: D

Watch Video Solution

16. STATEMENT-1: When an electrical heater is switched on, the colour of the filament gradually changes from red to yellow to almost white.

STATEMENT-2: Wien's displacement law states that $\lambda_m T = b$ (constant).

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

17. STATEMENT-1: The specific heat capacity of a gas at constant pressure is always greter than its specific heat capacity at constant volume.

STATEMENT-2: Work is done by a gas when it expands.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation

for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

18. STATEMENT-1: When two identical strings stretcheed to slightly different tensions vibrate together, the loudness of the sound

heard changes periodically.

STATEMENT-2: Interference can occur in all wave motions under suitable conditions.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

 Watch Video Solution

19. STATEMENT-1: A single lens will have two different focal lengths if the media on its two sides have different refractive indices.

STATEMENT-2: The focal length of a lens can be defined in two different ways.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

20. STATEMENT-1: When a closed organ pipe vibrates, the pressure of the gas at the closed end remians constant.

STATEMENT-2: In a stationary-wave system, displacement nodes are pressure antinodes, and displacement antinodes are pressure nodes.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for

Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: D

 Watch Video Solution

21. STATEMENT-1: When a coil is connected to a cell, no current flows through it initially.

STATEMENT-2: When a coil is connected to a cell, the initial emf induced in it is equal to the emf of the cell.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation

for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

22. STATEMENT-1: In a moving train, a small potential different arises across the axles of the wheels due to the earth's magnetic field.

This potential difference vanishes at the equator.

STATEMENT-2: At the equator, the earth's magnetic filed is horizontal.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: A

Watch Video Solution

23. STATEMENT-1: In an X-ray tube, the wavelengths of the characteristic X-rays depends on the metal used as target.

STATEMENT-2: Metals atomic numbers are best suited for the production of X-rays

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: B

Watch Video Solution

24. STATEMENT-1: When α- and β-particles pass through external electric fields, β-particles are deflected must more than α- particles.

STATEMENT-2: β-particles have must larger velocitiest than α-particles.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: B

 Watch Video Solution

25. STATEMENT-1: The activity of a radioactive sample decreases linearly with time.

STATEMENT-2: The number of active nuclei present in a radioactive sample decreases exponentialy with time.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation, for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation

for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is a False, Statement-2 is True.

Answer: D

 Watch Video Solution