Sahaj Adhyayan (सहज अध्ययन)

जर हे Practice Question Papers तुम्हाला खरंच फायदेशीर वाटत असतील तर तुमच्या सर्व मित्र मैत्रिणींना पाठवा.

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TERM – END EXAMINATION 2021-22

Class :- XI Science **Subject :- Physics** **Time :- 2 ½ Hrs** **Marks :- 50**

General Instructions :- The question paper divided into four sections
1) Section A :- Q. No. 1 contains seven multiple choice type questions carrying one mark each. Q. No. 2 contains seven very short answer type questions carrying one mark each.
2) Section B :- Q. No. 3 to 13 contains ten short answer type of questions carrying Two marks each
3) Section C :- Q. No. 14 to 19 contain six short answer type questions carrying Three marks each
4) Section D:- Q. No 20 to 23 contain Four long answer type question carrying Four marks each
5) Use of Logarithmic Table is allowed. Use of calculator is not allowed
6) Figure to the right indicate full marks

Section A

Q. 1. Select and write the correct answer (7)

i) $[L^1M^1T^{-2}]$ is the dimentional formula for

a) velocity b) acceleration c) force d) work

ii) The magnitude of vector product of two unit vectors making an angle of 60^0 with each other is

a) 1 b) 2 c) 3/2 d) $\sqrt{3}/2$

iii) For two vectors to be equal, they should have the

a) same magnitude b) same direction c) same magnitude and direction
d) same magnitude but opposite direction

iv) Speed of sound is maximum in

a) air b) water c) vacuum d) solid

v) When sound wave travel from air to water, which of these remains constant?

a) velocity b) frequency c) wavelength d) all of these

vi) Which of the following aberrations will NOT occure for spherical mirror?

a) chromatic aberration b) coma c) direction d) spherical aberration

vii) Two plane mirrors are inclined at angle 40^0 between them. Number of images seen of a tiny object kept between them is

a) only 8 b) only 9 c) 8 or 9 d) 9 or 10

Q. 2. Answer the following (7)

i) What do you mean by error?
ii) Define order of magnitude
iii) Find a unit vector in the direction of the vector $3\vec{i} + 4\vec{j}$
iv) State triangle law of vector addition
v) Sound wave A has period 0.015 sec , sound wave B has period 0.025 sec Which sound has greater frequency?
vi) What do you mean by an echo?
vii) Define Refraction of light.

Section B

Attempt any EIGHT (16)

Q. 3. Define Dimensions of physical quantity and state the dimensions of work.

Q. 4. What do you mean by a) systematic error and b) Random error

Q. 5. The masses of two bodies are measured to be (15.7 ± 0.2) kg and (27.3 ± 0.3) kg. What is the total mass of two and the error in it?

Q. 6. Find a vector which is parallel to $\vec{v} = \hat{i} - 2\hat{j}$ and has a magnitude 10.

Q. 7. State any four characteristics of scalar product.

Q. 8. What is the effect of humidity of air on the velocity of sound?

Q. 9. What are the common properties between Doppler effect of sound and light

Q. 10. Draw ray diagram for chromatic aberration in case of convex lens.

Q. 11. Define thin prism and obtain an expressions for the angle of deviation for it.

Q. 12. The angle of minimum deviation of a ray of light passing through an equilateral prism is 38^0. Determine the refractive index of the material of the prism.

Q. 13. A police car travels towards a stationary observer at a speed of 15 m/s. The siren on the car emits a sound of frequency 250 Hz. Calculate the recorded (apparent) frequency. The speed of sound in air is 340 m/s.

Section C

Attempt any FOUR (12)

Q. 14. Using dimensional analysis establish the relationship between period (T), length (l), acceleration due to gravity (g) and constant K $\left[T = 2\pi\sqrt{l/g}\right]$

Q. 15. What is meant by resolution of a vector into components? Explain how a vector is expressed in terms of its Cartesian components in (i) two dimensions (ii) three dimensions.

Q. 16. Given $\vec{v_1} = 2\hat{i} - 3\hat{j}$ and $\vec{v_2} = -6\hat{i} + 5\hat{j}$ determine the magnitude and direction of $\vec{v_1} + \vec{v_2}$

Q. 17. Explain Laplace's correction to Newton's formula for the speed of sound in air

Q. 18. For a prism, prove the relation $i + e = A + \delta$ where the symbols have their usual meaning

Q. 19. Refractive index of a flint glass varies from 1.60 to 1.66 for the visible range. The radii of curvature of a thin convex lens are 10 cm and 15 cm, calculate the chromatic aberration between the extreme colours.

Section D

Attempt any TWO (8)

Q. 20. Define a) Absolute error b) Mean absolute error. In ohm's law experiment, the values of the unknown resistances were found to be 6.12Ω, 6.09Ω, 6.22Ω, 6.15Ω. Calculate the absolute error and mean absolute error.

Q. 21. State and prove the parallelogram law of vector addition. Show how the law enables us to determine analytically the magnitude and direction of the resultant of two vectors.

Q. 22. Derive an expression for the apparent frequency of sound heard when the source of sound is moving away from the stationary listener

Q. 23. With a neat labeled ray diagram, explain the phenomenon of total internal reflection.

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