PHYSICS

BOOKS - CHETANA PHYSICS (MARATHI ENGLISH)

Annual Exam

Exercise

1. Light year is a unit of

A. Time

B. Mass

C. Distance

D. Luminous intensity

Answer:

2. Two plane mirrors are inclined at an angle of

$40°$ 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

Answer:

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3. The value of acceleration due to gravity is

zero at

A. the equator of the earth

B. the centre of the earth

C. the pole of the earth

D. slightly above the surface of the earth

Answer:

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4. Change in dimensions is known as

A. deformation

B. formation

C. contraction

D. strain

Answer:

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5. When sound waves travel from air to glass, which of these remain constant?

A. velocity

B. frequency

C. wavelength

D. all of above

Answer:

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6. Choose the correct options.

Earth's atmosphere is rechest in

A. Intra red

B. Ultra violet

C. X-ray

D. Microwaves

Answer:

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7. Which of the following is an Ohmic conductor?

A. Transistor

B. Diode

C. Electrolyte

D. copper wwire

Answer:

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8. Range of temperature in a clinical thermometer, which measures the temperature of human body, is

A. $70°C$ to $100°C$

B. $34°C$ to $42°C$

C. $0°F$ to $100°F$

D. $34°F$ to $80°F$

Answer:

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9. An object of mass 100 gm moves uniformly

along a circular orbit with an angular speed of

$25 rad/\text{sec}$. If the linearspeed of particle is $25m/s$ then the radius of circle is

A. 1m

B. 2m

C. 4m

D. 5m

Answer:

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10. A mass 2m moving with some speed is directly approaching another mass m moving with double speed. After some time, they collide with coefficient of restitution 0.5 Ratio of their respective speeds after collision is

    A. $1/2$

    B. $2/3$

    C. $3/2$

    D. 2

Answer:

11. The speed of light is $3 \times 10^8 m/\sec$. Calculate the frequency of red light of wavelength of 6.5×10^{-7} m.

12. Find the magnitude of a vector $\vec{a} = \dfrac{\hat{i} - \hat{j}}{\sqrt{2}}$

13. State Newton's law of gravitation.

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14. Define uniform circular motion.

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15. Write the formula for coefficient of linear expansion of a solid.

16. What is position vector?

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17. Define Dimensional formula for any physical quantity.

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18. Define one Coulomb.

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19. Show that the path of a projectile is a parabola

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20. Derive dimensions for power.

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21. As I was standing on a weighing machine inside a lift it recorded 50 kg-wt. Suddenly for few seconds it is recorded 42 kg-wt. What must have happened during that time? Explain with complete numerical analysis.

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22. State any four characteristics of vector product of vectors.

23. A metal cube of side lm is subjected to a force. The force acts normally on the whole surface of cube and its volume changes by $1.5 \times 10^{-5} m^3$. The bulk modulus of metal is $8 \times 10^{10} N/m^2$. Calculate the change in pressure.

24. At what temperature will the speed of sound in air be 2 times its speed at NTP?

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25. Derive an expression for couple acting on an electric dipole kept in a uniform electric field.

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26. Define temperature coefficient of resistivity. State its S.I unit.

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27. Explain term : Convection.

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28. Two satellites A and B are revolving round a planet. Their periods of revolution are 1 hour

and 27 hour respectively. The radius of orbit of satellite A is $8 \times 104km$., find radius of orbit of satellite B.

29. A convex lens held some distance above a 10cm long pencil produces its image of some size. On shifting the lens by a distance equal to its focal length, it again produces the image of the same size as earlier. Determine the image size.

30. Expalin n-type semiconductor with an example.

31. Obtain an expression for binding energy of a satellite revolving in a circular orbit around earth.

32. If $\vec{A} = 2\hat{i} + 2\hat{j} - \hat{k}$ and $\vec{B} = \hat{i} + 4\hat{j} - 3\hat{k}$ then find (a) $\vec{A} \cdot \vec{B}$ (b) $\vec{A} \times \vec{B}$

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33. Explain forward biasing in P-N junction diode with diagram.

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34. Name three basic units of communication system. Draw the labelled block diagram of the basic elements of a communication system

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35. Derive an expression for strain energy of the material of wire.

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36. A metal sphere cools at the rate of $1.6°C/\min$ when itstemperature is $60°C$. At what rate will it cool when its temperature is $50°C$? The temperature of surroundings is $30°C$.

37. Explain fundamental forces in nature.

38. Derive an expression for refraction at single spherical surface.

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39. Derive formula for kinetic energy of a body having mass M and velocity V using dimensional analysis.

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40. Derive expression for Magnetic induction due to a bar Magnet at a point along the axis.

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41. State any six properties of magnetic lines of force.

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42. Draw the diagram showing two cells connected in series. State advantages and disadvantages of cell connected in series

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43. State the expression for apparent frequency when source of sound and listener are moving towards each other

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44. State the expression for apparent frequency :

i. when source of sound and listener are moving away from each other.

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45. State the expression for apparent frequency when source of sound and listener are moving towards each other

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46. State the expression for apparent frequency when source of sound and listener are moving towards each other

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47. Define elastic collision

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48. Define in elastic collision. Derive an expression for velocities for head-on elastic collision.

49. State the formula and unit of electric dipole moment.

A charge of 50 μC is kept at the centre of a sphere of radius 0.1m. What is the flux through the sphere?

50. From given data set, determine angular dispersion by the prism for extreme colours.

$n_R = 1.622, n_V = 1.656$ and $\delta_R = 2.1°$

State two conditions for total internal reflection.

51. Distinguish between average velocity and instantaneous velocity. (Any two points) A man

throws a ball to maximum horizontal distance of 160m. Calculate the maximum height reached.