PHYSICS

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2002

Physics

1. Length cannot be measured by

A. fermi

B. micron

C. debye

D. light year.

Answer: A

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2. The dimension of torque is:

A. $\left[MT^{-2}\right]$

B. $\left[ML^{-1}T^{-1}\right]$

C. $\left[ML^{3}T^{-2}\right]$

D. $\left[ML^{3}T^{-3}\right]$

Answer: A

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3. If vector $\overrightarrow{P} = a\hat{i} + a\hat{j} + 3\hat{k}$ and $\overrightarrow{Q} = a\hat{i} - 2\hat{j} - \hat{k}$ are perpendicular to each other , then the positive value of a is

A. 3

B. 1

C. 2

D. 0

Answer: A

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4. Three different objects of masses m_1, m_2 and m_2 are allowed to fall from rest and from the same point O along three different

frictionless paths. The speeds of three objects on reaching the ground will be:

A. $m_1 : m_2 : m_3$

B. $1 : 1 : 1$

C. $m_1 : 2m_2 : 3m_3$

D. $\frac{1}{m_1} : \frac{1}{m_2} : \frac{1}{m_3}$

Answer: B

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5. A particles starts from rest and has an acceleration of $2m/s^2$ for 10 sec. After that , it travels for 30 sec with constant speed and then undergoes a retardation of $4m/s^2$ and comes back to rest. The total distance covered by the particle is

A. 650 m

B. 750 m

C. 700 m

D. 800 m

Answer: B

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6. Hubble's law is related with

A. comet

B. speed of galaxy

C. black hole

D. planetary motion.

Answer: B

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7. A $0K$ temperature, a p-type semiconductor

A. does not have any charge carriers

B. has feq holes but no free electrons.

C. has few holes and few free electrons.

D. has equal number of holes and free electrons.

Answer: B

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8. The potential barrier, in the depletion layer, is due to

A. ions

B. electrons

C. holes

D. forbidden band.

Answer: A

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9. The speed of an electron having a wavelength of $10^{-10}m$ is

A. $7.25 \times 10^6 m/s$

B. $5.25 \times 10^6 m/s$

C. $6.26 \times 10^6 m/s$

D. $4.24 \times 10^4 m/s$.

Answer: A

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10. An electron having charge $'e'$ and mass $'m'$ is moving a uniform electric field E. Its acceleration will be

A. $\frac{e^2}{m}$

B. $\frac{eE}{m}$

C. $\frac{eE^2}{m}$

D. $\frac{mE}{e}$

Answer: B

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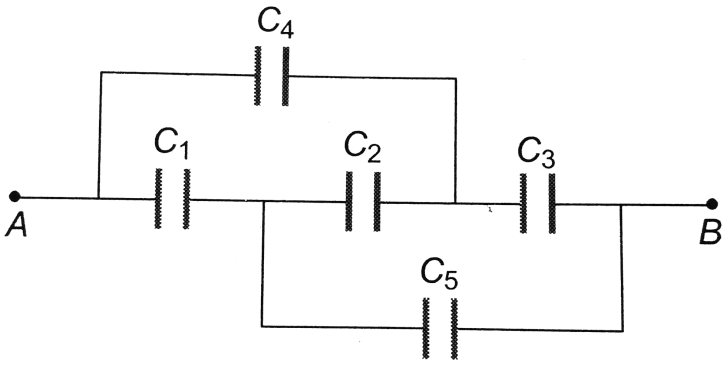
11. In the given figure the capacitors C_1, C_3, C_4, C_5 have a capaciance $4\mu F$ each if the capaitor C_2 has a capacitance $10\mu F$, then effective capacitance between A and B will be



A. $2\mu F$

B. $6\mu F$

C. $4\mu F$

D. $8\mu F$

Answer: C

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12. An electric bulb, marked $40W$ and $200V$, is used in a circuit of supply voltage $100V$. Now its power is

A. 100W

B. 20W

C. 40W

D. 10W

Answer: D

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13. The magnetic needle of a tangent galvanometer is deflected at an angle 30° due to a magnet. The hoeizontal component of earth's magnetic field $0.34 \times 10^{-4} T$ is along the plane of the coil. The magnetic intensity is

A. $1.96 \times 10^{-4}T$

B. $1.96 \times 10^{4}T$

C. $1.96 \times 10^{-5}T$

D. $1.96 \times 10^{5}T$

Answer: C

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14. The coefficient of mutual inductance when magnetic flux change by $2 \times 10^{-2}Wb$ and current changes by $0.01A$, will be

A. 2H

B. 4H

C. 3H

D. 8H

Answer: A

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15. Light propagates rectilinearly because of its

A. frequency

B. velocity

C. wavelength

D. wave nature.

Answer: D

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16. Brilliance of diamond is due to

A. shape

B. reflection

C. cutting

D. total internal reflection .

Answer: D

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17. Velocity of light is equal to

A. $\sqrt{\varepsilon_0 \mu_0}$

B. $\sqrt{\varepsilon_0 / \mu_0}$

C. ε_0 / μ_0

D. $\sqrt{\frac{1}{\varepsilon_0 \mu_0}}$

Answer: D

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18. The Cauchy's formula is

A. $n = A + B\lambda^{-2} + C\lambda^{-4}$

B. $n = A + B\lambda^{-2} + C\lambda^{4}$

C. $n = A + B\lambda^{2} + C\lambda^{-4}$

D. $n = A + B\lambda^2 + C\lambda^4$

Answer: A

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19. Golden view of sea shell is due to

A. diffreaction

B. polarisation

C. dispersion

D. reflection .

Answer: B

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20. At the appermost point of a projectile its velocity and acceleration are at an angle of:

A. 0°

B. 90°

C. 45°

D. 180°

Answer: B

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21. The kinetic energy of a body becomes four times its initial value.The new linear momentum will be:

A. same as the initial value

B. four times of the initial value

C. twice of the initial value

D. eight time of the initial value.

Answer: C

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22. The angular momentum of a moving body remains constant if

A. net external force is applied

B. net external torque is applied

C. net pressure is applied

D. net external torque is not applied .

Answer: D

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23. The force of gravitation is

A. repulsive

B. conservative

C. electrostatic

D. non-conservative .

Answer: B

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24. Kepler's second law is based on

A. Newton's first law

B. special theory of relativity

C. Newton's second law

D. conservation of angular momentum .

Answer: D

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25. A conducting sphere of radius $10cm$ is charged $10\mu C$. Another uncharged sphere of radius $20cm$ is allowed to touch it for some tome. After that if the sphere are separted, then surface density of chsrges, on the spheres will be in the ratio of

A. $1:4$

B. $1:2$

C. $1:3$

D. $1:1$

Answer: B

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26. What is the path difference of destructive interference

A. $n\lambda$

B. $\frac{(n+1)\lambda}{2}$

C. $n(\lambda+1)$

D. $\frac{(2n+1)\lambda}{2}$

Answer: D

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27. A siren emitting sound of frequency $800Hz$ is going away from a static listener with a speed of 30 m/s. Frequency of the sound to be heard by the listener is (Take velocity of sound as 300 m/s)

A. 733.3 Hz

B. 481.2 Hz

C. 644.8 Hz

D. 586. Hz

Answer: A

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28. A string in a musical instrument is 50 cm long and its fundamental frequency is 800 Hz. If a frequency of 1000 Hz is to be produced, then required length of string is

A. 62.5 cm

B. 40 cm

C. 50 cm

D. 37.5 cm

Answer: B

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29. The equation of a sound wave is $y = 0.0015 \sin(62.4x + 316t)$ the wavelength of this wave is

A. 0.2 unit

B. 0.3 unit

C. 0.1 unit

D. 2 unit

Answer: C

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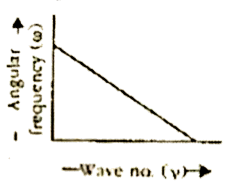
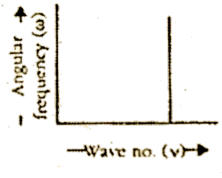
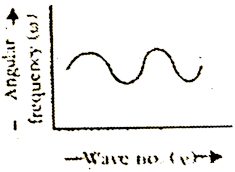
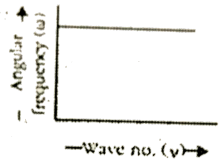
30. The graph between wave number $\left(\overrightarrow{v}\right)$ and angular frequency (ω) is

A. 

B. 

C. 

D. 

Answer: A

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31. If v_0 be the orbital velocity of a satellite in a circular orbit close to the earth's surface and v_e is the escape velocity from the earth , then relation between the two is

A. $v_0 = v_e$

B. $v_e = \sqrt{3}v_0$

C. $v_e = \sqrt{2}v_0$

D. $v_e = 2v_0$

Answer: C

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32. The breaking stress of a wire depends on

A. length of the wire

B. material of the wire

C. radius of the wire

D. shape of the cross-section

Answer: B

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33. The density of a substance at $0^\circ C$ is $10g/cc$ and at $100^\circ C$, its density is $9.7g/cc$. The coefficient of linear expansion of the substance is

A. 10^{-4}

B. 10^{-2}

C. 10^{-3}

D. 10^{2}

Answer: A

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34. Scent sprayer is based on

A. Charle's law

B. Archimedes principle

C. Boyle's law

D. Bernoulli's theorem .

Answer: D

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35. WIEN'S DISPLACEMENT LAW

A. λT=constant

B. $lamdba\,/\,T$=constant

C. $\lambda \propto (1/T)$

D. both (b) and (c)

Answer: D

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36. A black body is at a temperature $300K$. It emits energy at a rate, which is proportional to

A. 300

B. $(300)^3$

C. $(300)^2$

D. $(300)^4$

Answer: D

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37. The latent heat of vaporisation of water is 2240 J/gm. If the work done in the process of expansion of 1 g of water is 168 J, then increase in internal energy is

A. 2408 J

B. 2072 J

C. 2240 J

D. 1904 J

Answer: B

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38. The velocities of sound at same temperature in two monoatomic gases densities ρ_1 and ρ_2 are v_1 and v_2 repectively , if $\frac{\rho_1}{\rho_2} = 4$, then the value of $\frac{v_1}{v_2}$ will be

A. $1/4$

B. 2

C. $1/2$

D. 4

Answer: C

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39. The property utilized in the manufacture of lead shots is

A. specific weight of liquid lead

B. compressibility of liquid lead

C. specific gravity of liquid lead

D. suface tension of liquid lead.

Answer: D

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40. When a wire is stretched and its radius becomes $r/2$ then its resistance will be

A. 16R

B. 2R

C. 4R

D. 0

Answer: A

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41. Assertion : Planet is a heavenly body revolving round the sun

Reason : Star is luminous body made of gasesous .

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

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42. Assertion: Coloured spectrum is seen when we look through a muslim cloth.

Reason: It is due to the diffraction of white light on passing through fine slits.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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43. Assertion (A) : When tiny circular obstacle is placed in the path of light from some distance, a bright spot is seen at the center of the shadow of the obstacle.

Reason (R) : Destructive interference occurs at the centre of the shadow.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: C

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44. Assertion: The quantity L/R possesses dimensions of time.

Reason: To reduce the rate of increases of current through a solenoide should increase the time constant (L/R).

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: C

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45. Assertion : In a simple battery circuit the point of lowest potential is positive terminal of the battery.

Reason : The current flows towards the point of the higher potential as it flows in such a circuit from the negative the positive terminal.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: D

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46. Assertion : We use a thick wire in the secondary of a step down transformer to reduce the production heat .

Reason : When the plane of the armature is parallel to the lines of force of magnetic field , the magnitude of induced e.m.f. is maximum .

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

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47. Assertion: We cannot think of magnetic field configuration with three poles.

Reason: A bar magnet does exert a torque on itself due to its own field.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: D

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48. Assertion (A) : Thin films such as soap bubble or a thin layer of oil on water show beautiful colours when illuminated by white light.

Reason (R): The colours are obtained by dispersion of light

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: C

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49. Assertion : Quasar emits radiowaves more than radio galaxy .

Reason : Quasar has very small size.

A. If both the assertion and reason are true and reason is correct explanation of the

assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

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50. Assertion : S.I. units are logical and coherent .

Reason : S.I. system of units is a rationalised system.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

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51. Assertion : It is difficult to move a cylce along the roda with its brakes on .

Reason : Sliding friction is greater than rolling friction.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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52. Assertion: Faraday's laws are consequences of conservation of energy.

Reason: In a purely resistive AC circuit, the current lags behind the e.m.f. in phase

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: C

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53. Assertion: The flash of lightening is sees before the sound of thunder is heard.

Reason: Speed of sound is greater than speed of light.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: C

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54. Assertion : Blue star is at high temperature than red star.

Reason : Wein's displacement law states that $T \propto (1/\lambda_m)$.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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55. Assertion : The time-period of pendulu, on a satellite orbiting the earth is infinity .

Reason : Time-period of a pendulum is inversely proportional to $\sqrt{g}$.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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56. Assertion : Sterss is the internal force per unit area of a body.

Reason : Rubber is less elastic than steel.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

57. Assertion : In an elastic collision of two billiard balls, the total knetic energy is conserved during the short time of oscillation of the balls (i.e. when they are in contact) .

Reason : Energy spent against friction does not follow the law of conservation of energy .

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: D

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58. Assertion : The earth without its atmosphere would be inhospitably cold.

All heat would escape in the absence of atmosphere .

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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59. Statement-1 : In S.H.M., the motion is 'to and fro' and

periodic.

Statement-2 : Velocity of the particle

(v) $= \omega\sqrt{k^2 - x^2}$(where x is the displacement and k is amplitude)

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: B

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60. Assertion : Woollen clothes keep the body warm in winter

Reason : Air is a bad conductor of heat.

A. If both the assertion and reason are true and reason is correct explanation of the assertion .

B. If both the assertion and reason are true but reason is not a correct explanation of the assertion .

C. If the assertion is true but the reason is false.

D. If both assertion and reason are false.

Answer: A

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