PHYSICS

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2007

Physics

1. The camera lens has an aperture of f and the exposure time is (1/60)s. What will be the new

exposure time if the aperture become 1.4f ?

A. $\frac{1}{42}$

B. $\frac{1}{56}$

C. $\frac{1}{72}$

D. $\frac{1}{31}$

Answer: D

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2. A point source is kept at a distance of 1000 m has an illumination I. To change the illumination to 16I the new distance should become

A. 250 m

B. 500 m

C. 750 m

D. 800 m

Answer: A

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3. If collector current is 120 mA and base current is 2 mA and resistance gain is 3, what is power gain ?

A. 180

B. 10800

C. 1.8

D. 18

Answer: B

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4. With the decrease of current in the primary coil from 2 amperes to zero value in 0.01 s the emf generated in the secondary coil is 1000 volts. The mutual inductance of the two coils is

A. 1.25 H

B. 2.50 H

C. 5.00 H

D. 10.00 H

Answer: C

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5. In case of infinite long wire electric field is proportional to

A. $\frac{1}{r}$

B. $\frac{1}{r^2}$

C. $\frac{1}{r^3}$

D. r^0

Answer: A

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6. What is the magnetic field at a distance R from a coil of radius r carrying current I ?

A. $\frac{\mu_0 l R^2}{2(R^2+r^2)^{\frac{3}{2}}}$

B. $\frac{\mu_0 l r^2}{2(R^2+r^2)^{\frac{3}{2}}}$

C. $\frac{\mu_0 l}{2r}$

D. $\frac{\mu_0 l}{2R}$

Answer: B

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7. In the following diagram, which particle has highest e/m value ?

A. A

B. B

C. C

D. D

Answer: D

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8. What is the energy of He electron in first orbit ?

A. $40.8eV$

B. $-27.2eV$

C. $-54.4eV$

D. $-13.6eV$

Answer: C

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9. What is the dinensions of impedance ?

A. $ML^2T^{-3}I^{-2}$

B. $M^{-1}L^{-2}T^3I^2$

C. $ML^3T^{-3}I^{-2}$

D. $M^{-1}L^{-3}T^3I^2$

Answer: A

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10. If the highest modulating frequency of the wave is 5 kHz, the number of stations that can be accomodated in a 150 kHz bandwidth ?

A. 15

B. 10

C. 5

D. None of these

Answer: A

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11. Zener diode acts as a/an

A. oscillator

B. regulator

C. rectifier

D. filter

Answer: B

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12. In communication with help of antenna if height is doubled then the range covered which gas initially r would become

A. $\sqrt{2}r$

B. 3r

C. 4r

D. 5r

Answer: A

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13. Which wavelength of sun is used finally as electric energy ?

A. Radio waves

B. Infra red waves

C. Visible light

D. Micro waves

Answer: B

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14. CO_2 laser uses

A. microwaves

B. infra red

C. ultra violet

D. visible light

Answer: C

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15. Shear modulus is zero for

A. solids

B. liquids

C. gases

D. liquids and gases

Answer: C

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16. Height of geostationary satellite is

A. 16000 km

B. 22000 km

C. 28000 km

D. 36000 km

Answer: D

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17. If a solid sphere of mass 1 kg and radius 0.1 m rolls without slipping at a uniform velocity of 1 m/s along a straight line on a horizontal floor, the kinetic energy is

A. $\frac{7}{5}J$

B. $\frac{2}{5}J$

C. $\frac{7}{10}J$

D. 1 J

Answer: C

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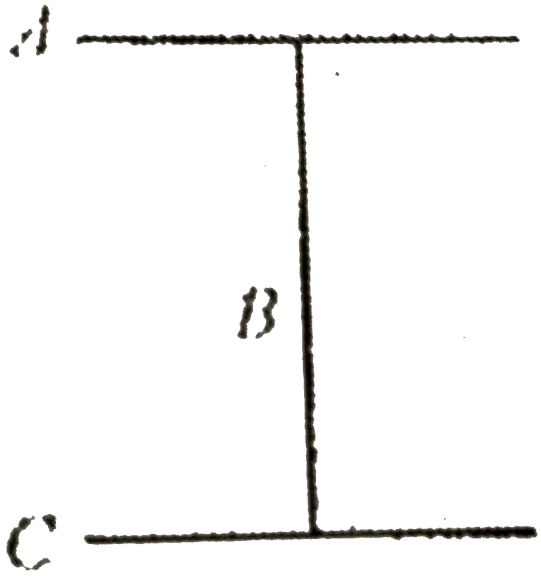
18. In the diagram shown below all three rods are of equal length L and equal mass M. The system is rotated such that rod B is the axis.

What is the moment of inertia of the system ?



A. $\frac{ML^2}{6}$

B. $\frac{4}{3}ML^2$

C. $\frac{ML^2}{3}$

D. $\frac{2}{3}ML^2$

Answer: A

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19. In the half wave rectifier circuit operating from 50 Hz mains frequency, the fundamental frequency in the ripple would be

A. 25 Hz

B. 50 Hz

C. 70.7 Hz

D. 100 Hz

Answer: B

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20. In an AC circuit the potential differences across an inductance and resistance joined in series are respectively 16 V and 20 V. The total potential difference of the cource is

A. 20.0 V

B. 25.6 V

C. 31.9 V

D. 53.5 V

Answer: B

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21. The focal length of the objective and eye lenses of a microscope are 1.6 cm and 2.5 cm respectively. The distance between the two lenses is 21.7 cm. If the final image is formed at infinity. What is the linear magnification ?

A. 11

B. 110

C. 1.1

D. 44

Answer: B

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22. If the temperature of a black body incresese from $7^\circ C$ to $287^\circ C$ then the rate of energy radiation increases by

A. $\left(\frac{287}{7}\right)^4$

B. 16

C. 4

D. 2

Answer: B

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23. Faraday law of electrolysis indirectly shows

A. quantisation of charge

B. quantisation of angular momentum

C. quantisation of current

D. quantisation of viscosity

Answer: A

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24. What is the amount of energy released by deuterium and tritum fusion ?

A. 60.6 eV

B. 12.6 eV

C. 17.6 eV

D. 28.3 eV

Answer: C

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25. What is the energy of photon whose wavelength is $6840Å$?

A. `1.81 eV

B. 3.6 eV

C. `-13.6 eV

D. 12.1 eV

Answer: A

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26. What is the power output of a ${}_{92}U^{235}$ reactor if it is takes 30 days to use up $2kg$ of fuel, and if each fission gives $185MeV$ of usable energy ?.

A. 56.3 MW

B. 60.3 MW

C. 58.3 MW

D. 54.3 MW

Answer: C

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27. A transistor is a/an

A. chip

B. insulator

C. semiconductor

D. metal

Answer: C

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28. The number 0 (zero) is required for

A. transistor

B. abacus

C. computer

D. calculator

Answer: C

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29. The magnetic susptibility of an ideal diamagnetic substance is

A. -1

B. 0

C. $+1$

D. ∞

Answer: A

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30. The direction of the angular velocity vector is along

A. the tangent to the circular path

B. the inward radius

C. the outward radius

D. the axis of rotation

Answer: D

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31. A man of mass 60 kg records his wt. on a weighing machine placed inside a lift. The ratio of wts. Of man recorded when lift is ascending up with a uniform speed of 2 m/s to

when it is descending down with a uniform speed of 4 m/s will be

A. 0.5

B. 1

C. 2

D. none of these

Answer: B

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32. The force of gravitation is

A. repulsive

B. conservative

C. electrostatic

D. non-conservative

Answer: B

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33. In old age arteries carrying blood in the human body become narrow resulting in an increase in the blood pressure, this follows from

A. Pascal's law

B. Stoke's law

C. Bernoulli's principle

D. Archimede's principle

Answer: C

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34. In an adiabatic change, the pressure and temperature of a monoatomic gas are related with relation as $P \propto T^C$, Where C is equal to:

A. $\frac{2}{5}$

B. $\frac{5}{2}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

Answer: B

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35. A large horizontal surface moves up and down in SHM with an amplitude of 1 cm . If a mass of 10 kg (which is placed on the surface) is to remain continually in contact with it, the maximum frequency of S.H.M. will be

A. 5 Hz

B. 0.5 Hz

C. 1.5 Hz

D. 10 Hz

Answer: A

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36. 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. 727.3 Hz

B. 481.2 Hz

C. 644.8 Hz

D. 286.5 Hz

Answer: A

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37. Which of the following physical quantities do not have same dimensions ?

A. Pressure and stress

B. tension and surface tension

C. strain and angle

D. energy and work.

Answer: B

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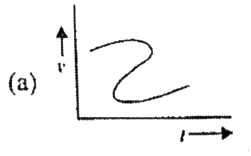
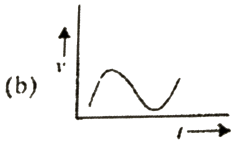
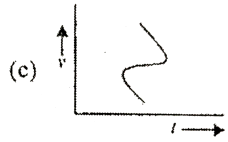
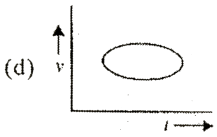
38. Which of the following velocity-time graphs shows a realistic situation for a body in motion ?

A.



B. 

C. 

D. 

Answer: B

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39. The workdone in increasing the size of a soap film from $10cm \times 6cm$ to $10cm \times 11cm$

is $3 \times 10^{-4} J$. The surface tension of the film is

A. $5 \times 10^{-2} N/m$

B. $3 \times 10^{-2} N/m$

C. $1.5 \times 10^{-2} N/m$

D. $1.2 \times 10^{-2} N/m$

Answer: B

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40. If the water falls from a dam into a turbine wheel 19.6 m below, then the velocity of water at the turbine is $\left(g = 9.8m / s^2\right)$

A. 9.8 m/s

B. 19.6 m/s

C. 39.2 m/s

D. 98.0 m/s

Answer: B

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41. Assertion : Goggles have zero power.

Reason : Radius of curvature of both sides of lens is same

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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42. Assertion : A white source of light during interference forms only white and black fringes.

Reason : Width of fringe is inversely proportional to the wavelength of the light used.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: D

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43. Assertion : A current continues to follow in superconducting coil even after switch is off.

Reason : Superconducting coils show Meissner effect.

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

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

assertion

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: B

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44. Assertion : Heavy water is a better moderator than normal water.

Reason : Heavy water absorbs neutrons more efficiently than normal water.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: C

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45. Assertion : Dipole oscillations produce electromagnetic waves.

Reason : Accelerated charge produces electromagnetic waves.

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

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

assertion

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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46. Assertion : NAND is a universal gate.

Reason : It can be used to describe all other logic gates.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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47. Assertion : Ferro magnetic substances become paramagnetic above Curie temp.

Reason : Domains are destroyed at high temp.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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48. Assertion : In a cavity within a conductor, the electric field is zero.

Reason : Charges in a conductor reside only at its surface.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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49. Assertion : Voltmeter is connected in parallel with the circuit

Reason : Resistance of a voltmeter is very large.

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

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

assertion

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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50. Assertion : Ohm's law is applicable for all conducting elements.

Reason : Ohm's law is a fundamental law.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: D

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51. Assertion : No power loss associated with pure capacitor in ac circuit.

Reason : No current is flowing in this circuit.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: C

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52. Assertion : In a metal all the free electrons have same energy.

Reason : Electrons do not obey Pauil's exclusion principle.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: C

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53. Assertion : Optical fibers are used for telecommunication.

Reason : Optical fibres are based on the phenomenon of total internal reflection.

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

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

assertion

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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54. Assertion : A hollow metallic closed container maintained at a uniform temperature cab act as a source of black body

radiation.

Reason : All metals act as a black body.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: B

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55. Statement-1: Machine parts are jammed in winter.

Statement-2: The viscosity of lubricant used in machine part decrease at low temperature.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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56. Assertion : An astronaut experience weightlessness in a space satellite.

Reason : When a body falls freely it does not experience gravity.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: B

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57. Assertion : A brass tumbler feels much colder than a wooden tray on a chilly day.

Reason : The thermal conductivity of brass is less than that of wood.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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58. Assertion : In free expansion of an ideal gas, the entropy increases.

Reason : Entropy increases in all natural processes.

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

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

assertion

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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59. $._{}^{90}Sr$ from the radioactive fall out from nuclear bomb ends up in the bones of human being through the milk consumed by them. It causes impairment of the production of res

blood cells.

The energetics $\beta -$ particles emitted in the decay of $.^{90}Sr$ damage the bone marrow.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: A

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60. Assertion : Sound waves cannot propagate through vacuum but light waves can.

Reason : Sound waves cannot be polarised but light waves can.

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

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

C. If assertion is true but reasonb is false

D. If both assertion and reason are false.

Answer: B

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