PHYSICS

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2000

Physics

1. The physical quantity which has the dimensional formula M^1T^{-3} is

A. Compressibility

B. Density

C. Solar constant

D. Surface tension

Answer: C

Watch Video Solution

2. A ball is dropped downwards . After 1 second another ball is dropped downwards from the

same point . What is the distance between them after 3 seconds .

A. 20 m

B. 9.8m

C. 25 m

D. 50 m

Answer: C

Watch Video Solution

3. If a particle of mass m is moving in a horizontal circle of radius r with a centripetal force $\left(-1/r^2\right)$, the total energy is

A. $-\frac{4}{r}$

B. $-\frac{2}{r}$

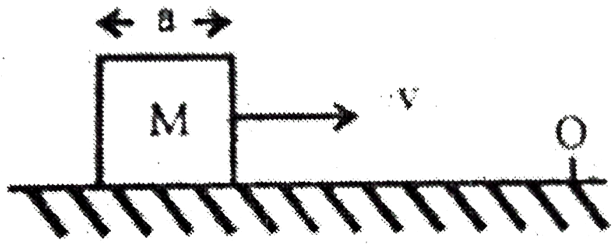
C. $-\frac{1}{r}$

D. $-\frac{1}{2r}$

Answer: D

Watch Video Solution

4. A cubical block of side a is moving with velocity v on a horizontal smooth palne as shown . It hits a ridge at point O. The angular sped of the block after it hits O is



A. 3v/2a

B. $\sqrt{3}v/\sqrt{2}a$

C. 3v/4a

D. Zero

Answer: C

Watch Video Solution

5. A second's pendulum is mounted in a rocket. Its period of oscillation decreases when the rocket

A. Moves up with uniform accelertion

B. Moves up with a uniform velocity

C. Comes down with uniform acceleration

D. Moves round the earth in a geosterationary orbit.

Answer: A

 Watch Video Solution

6. Consider a car moving along a straight horizontal road with a speed of 72 km/h. If the coefficient of static friction between the tyres and the road is 0.5, the shortest distance in

which the car can be stopped is $[g = 10ms^{-1}]$

A. 20m

B. 40m

C. 30m

D. 72m

Answer: B

Watch Video Solution

7. A force acts on a 3.0 gm particle in such a way that the position of the particle as a function of time is given by $x = 3t - 4t^2 + t^3$, where xx is in metres and t is in seconds. The work done during the first 4 seconds is

A. 530 mJ

B. 490 mJ

C. 450 mJ

D. 2.28J

Answer: D

Watch Video Solution

8. A body of mass 2kg collides with a wall with speed 100 m/s and rebounds with same speed. If the time of contact was 1/50 second, the force exerted on the wall is

A. $10^4 N$

B. 4N

C. $2 \times 10^4 N$

D. 8N

Answer: C

Watch Video Solution

9. If momentum is increased by 20% , then K.E. increase by

A. 0.55

B. 0.77

C. 0.66

D. 0.44

Answer: D

 Watch Video Solution

10. The decrease in the potential energy of a ball of mass 20kg which falls from a height of 50 cm is

A. 98 J

B. 968 J

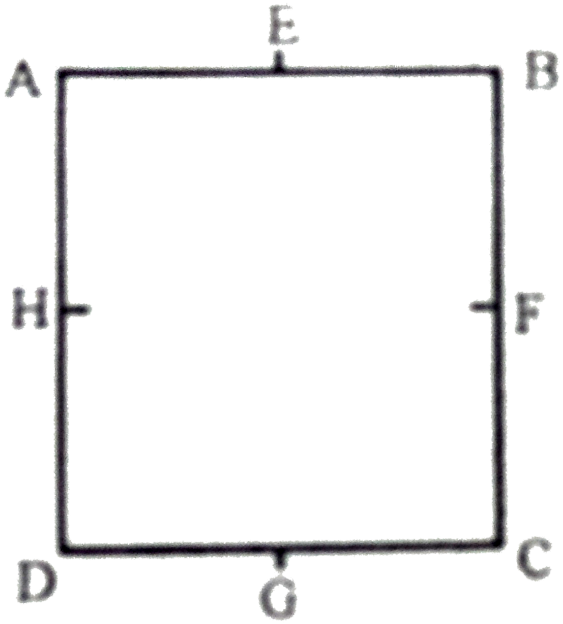
C. 1980 J

D. None of these .

Answer: A

Watch Video Solution

11. In a rectangle ABCD (BC=2AB). The moment of inertia along which axis will be minimum



A. EG

B. HF

C. BD

D. BC

Answer: A

View Text Solution

12. In a carbon monoxide molecule, the carbon and the oxygen atoms are separted by a

distance 1.12×10^{10} m. The distance of the centre of mass from the carbon atom is

A. $0.64 \times 10^{-10} m$

B. 0.56×10^{-6} m

C. $0.51 \times 10^{-10} m$

D. 0.48×10^{-10} m

Answer: A

Watch Video Solution

13. For a satellite escape velocity is 11 km/s . If the satellite is launched at an angle of 60° with the vertical , then escape velocity will be

A. 33 km/s

B. $\frac{11}{\sqrt{3}} km / s$

C. $\sqrt{3} km / s$

D. 11 km/s

Answer: D

Watch Video Solution

14. If the radius of the earth shrinks by 1.5% (mass remaining same) , then the value of acceleration due to gravity changes by

A. 0.01

B. 0.03

C. 0.04

D. 0.02

Answer: B

Watch Video Solution

15. In which case there is maximum tension in the wire, if same force is applied on each wire

A. L=400 cm, d=0.01 mm

B. L=300 cm, d=0.03 mm

C. L=200 cm, d=0.02 mm

D. L=500 cm, d=0.05 mm

Answer: A

 Watch Video Solution

16. If the surface tension of water is 0.06 Nm^{-1}, then then the capillary rise in a tube of diameter 1 mm is $(\theta = 0^{\circ})$

A. 3.86 cm

B. 3.12 cm

C. 2.44 cm

D. 1.22 cm

Answer: C

Watch Video Solution

17. 1 mole of gas occupies a volume of 100 ml at 50 mm pressure . What is the volume occupied by two moles of gas at 100 mm pressure and at same temperature

A. 500 ml

B. 200 ml

C. 100 ml

D. 50 ml

Answer: C

Watch Video Solution

18. What is the velocity of wave in monatomic gas having pressure 1 kilo pascal and density 2.6 kg/m^3

A. $8.9 \times 10^3 m/s$

B. $3.6 m/s$

C. Zero

D. None of these .

Answer: D

Watch Video Solution

19. A gas mixture consists of 2 moles of oxygen and 4 moles of argon at temperature T. Neglecting all vibrational modes , the total internal energy of the system is

A. 11 RT

B. 9RT

C. 15RT

D. 4RT

Answer: A

Watch Video Solution

20. A diatomic gas initally at $18^\circ C$ is compressed adiabtically to one- eighth of its original volume. The temperature after compression will be

A. $144^\circ C$

B. $395^\circ C$

C. $887^\circ C$

D. $18^{\circ} C$

Answer: B

Watch Video Solution

21. The radient energy from the sum incident normally at the surface of earth is 20 k cal/m^2 min. What would have been the radiant energy incident normally on the earth, if the sum had a temperature twice of the present one.

A. 80 kcal/m^2 min

B. 320 kcal/m^2min

C. 40 kcal/m^2 min

D. 160 kcal / m^2 min

Answer: B

Watch Video Solution

22. The ratio of energy of emitted radiation of black body at $27^\circ C$ and $927^\circ c$ is

A. $1:256$

B. $1:64$

C. $1:16$

D. $1:4$

Answer: A

 Watch Video Solution

23. Two waves of wavelength 50 cm and 51 cm produce 12 beat/s . The speed of sound is

A. 360 m/s

B. 340 m/s

C. 331 m/s

D. 306 m/s

Answer:

Watch Video Solution

24. When a β^- particle is emitted from a nucleus, the neutrons-proton ratio:

A. is increased

B. is decreased

C. remains the same

D. first decreases then increases

Answer:

Watch Video Solution

25. If the end A of a wire is irradiated with α-rays and the other end B is irradiated with β-rays. Then

A. a current will flow from B to A

B. a current will flow from A to B

C. there will be no current in the wire

D. a current will flow from each end to the mid point of the wire

Answer:

Watch Video Solution

26. If A, Z and N denote the mass number, the atomic number, and the neutron number for a given nucleus, we can say that.

A. isobar hae the same A but different Z and N

B. isotopes have the same Z but different N and A

C. isotones have the same N but different A and Z

D. N=Z+A

Answer:

Watch Video Solution

27. Moving with the same velocity . One of the following has the longest deBroglie wavelength

A. neutron

B. proton

C. β-particle

D. α-particle

Answer:

Watch Video Solution

28. A concave lens of focal length 20 cm placed in contact with a plane mirror acts as a

A. concave mirror of focal length 10 cm

B. concave mirror of focal length 60 cm

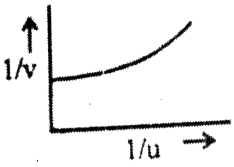
C. concave mirror of focal length 40 cm

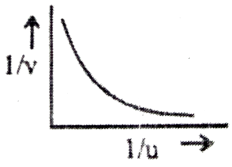
D. convex mirror of focal length 10 cm

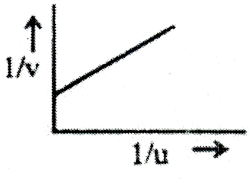
Answer:

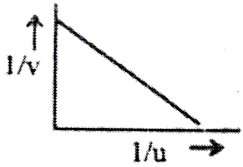
Watch Video Solution

29. If a graph is plotted between 1/v and 1/u , which one of the graph shown in figure is approximately correct ?

A. 

B. 

C. 

D. 

Answer:

Watch Video Solution

30. A particle of mass m and charge q is placed at rest in a uniform electric field E and then

released, the kinetic energy attained by the particle after moving a distance y will be

A. q^2 Ex

B. q Ex

C. q E^2x

D. q Ex^2

Answer:

Watch Video Solution

31. The wavelength of the first line of Balmer series is 6563Å. The Rydbergs constant fro hydrogen is about

A. 1.09×10^5 per m

B. 1.09×10^9 per m

C. 1.09×10^8 per m

D. 1.09×10^7 per m

Answer:

Watch Video Solution

32. Radius of $._{2}^{4}He$ nucleus is 3 Fermi. The radius of $._{82}^{206}Pb$ nucleus will be.

A. 8 fermi

B. 11. 16 fermi

C. 6 fermi

D. 5 fermi

Answer:

Watch Video Solution

33. An atom of mass number 15 and atomic number 7 captures an $\alpha -$ particle and then emits a proton. The mass number and atomic number of the resulting product will respectively be.

A. 18 and 8

B. 16 and 4

C. 15 and 3

D. 14 and 2

Answer:

Watch Video Solution

34. 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 the assertion and reason are true statement and reason is correct explanation of the assertion .

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer:

 Watch Video Solution

35. Radioactivity of 108 undecayed radioactive nuclei of half life of 50 days is equal to that of 1.2×108 number of undecayed nuclei of some material with half life of 60 days

Radioactivity is proportional to half-life.

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

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer:

 Watch Video Solution

36. Assertion: Isotopes of an element can be separated by using a mass spectrometer.

Reason: Separation of isotopes is possible because of difference in electron numbers of isotope.

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

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer:

 Watch Video Solution

37. Assertion: Two systems, which are in thermal equilibrium with a third system, are in thermal equilibrium with each other.

Reason: The heat flows spontaneously from a system at a higher temp. to a system at a lower temp.

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

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

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

D. If both assertion and reason are false statements.

Answer: A

 Watch Video Solution

38. Assertion : Heating enegineers use u-values , rather than k-values when calculating heat losses through walls, windows and roots .

Reason : The u-values of a single brick wall is $1.7Wm^{-2}K^{-1}$

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

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer: C

View Text Solution

39. Assertion : Two satellites of mass $m_1 \& m_2 (m_1 > m_2)$ are going around the earth in orbit of raddi s r_1 and $r_2 (r_1 > r_2)$.

Reason : They will have same velocity .

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

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

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

D. If both assertion and reason are false statements.

Answer: C

Watch Video Solution

40. Assertion : If a convex lens of glass is immersed in water its power decreases.

Reason : In water it behaves as a convex lens.

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

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

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

D. If both assertion and reason are false statements.

Answer: C

View Text Solution

41. Assertion : When light passes from one medium to another of different density the only quantity which is unchanged is its wavelength .

Reason : The wavelength of light is not related to the refractive index of the medium .

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

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

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

D. If both assertion and reason are false statements.

Answer: D

View Text Solution

42. Assertion : The relative velocity of two photons travelling in opposite directions is C.

Reason : The rest mass of a photon is zero .

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

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

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

D. If both assertion and reason are false statements.

Answer: B

View Text Solution

43. Assertion : A thin aluminium disc spinning freely about a central pivot is quickly brought to rest when placed between the poles of a strong U-shaped magnet .

Reason : A current induced in a disc rotating in a magnetic field produces a force which tends to oppose the disc's motion .

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

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

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

D. If both assertion and reason are false statements.

Answer: A

View Text Solution

44. Assertion : If the law of gravitation becomes inverse cube law even then a line joining the sun the planet sweeps equal areas in equal time intervals .

Reason : A planet moves in an alliptical path .

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

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer: B

View Text Solution

45. Assertion : A balloon stops rising after attaining a certain maxium height .

Reason : Upthrust due to air decreases with height till it just balances the weight of the balloon.

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

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

explanation of the assertion .

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

D. If both assertion and reason are false statements.

Answer: A

View Text Solution

46. Assertion:A table cloth can be pulled from a table without dislodging the dishes.

Reason: To every action there is an equal and opposite reaction.

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

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

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

D. If both assertion and reason are false statements.

Answer: B

 Watch Video Solution

47. Assertion : Alpha particles produce more intense ionisation than beta particles.

Reason : Alpha particles are positively charged

.

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

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

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

D. If both assertion and reason are false statements.

Answer: A

Watch Video Solution

48. Consider the following statements:

Assertion (A) The velocity of sound in air increases due to the presence of moisture in it.

Reason (R): The presence of moisture in air

lowers the density of air.

Of these statements-

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

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

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

D. If both assertion and reason are false statements.

Answer: A

 Watch Video Solution

49. Assertion : The positive ray particles are more massive than electrons .

Reason : Positive rays are reflected by a magnetic field to a greater extent than cathode rays .

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

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

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

D. If both assertion and reason are false statements.

Answer: C

View Text Solution