Top 100+ Physics Questions for NDA Exam

1.The focal length of the objective lens of a telescope is 50cm. If the magnification of the telescope is 25, then the focal length of the eye-piece is

A. 12.5 cm
B. 5 cm
C. 2 cm
D. 10 cm

2.Light year is a unit of measurement of

A. very large distances
B. time interval in years
C. amount of light received on earth in a year
D. mass of atoms

3.Consider the following statements about a solenoid :

1) The magnetic field strength in a solenoid depends upon the number of turns per unit length in the solenoid

2) The magnetic field strength in a solenoid depends upon the current flowing in the wire of the solenoid

3) The magnetic field strength in a solenoid upon the diameter of the solenoid

Which of the statements given above are correct?

A. 1, 2 and 3
B. 1 and 3 only
C. 2 and 3 only
D. 1 and 2 only

4.Two metallic wires A and B are made using copper. The radius of wire A is r while its length is l. A de voltage V is applied across the wire A, causing power dissipation, P. the radius of wire B is 2r and its length is 2l and the same de voltage V is applied across it causing power dissipation P_1. Which one of the following is the correct relationship between P and P_1?

A.$P=2P_1$
B. $P = P_1/2$
C. $P=4P_1$
D. $P=P_1$

5.Who among the following has explained the phenomenon of photoelectric effect?

A. Max Planck
B. Albert Einstein
C. Neils Bohr
D. Ernest Rutherford

6.Basic scientific principle behind a nuclear reactor is

A. Nuclear fusion
B. Controlled nuclear fusion
C. Uncontrolled nuclear fission
D. Controlled nuclear fission

7.Let us consider a copper wire having radius r and length *l*. Let its resistance be R. If the radius of another copper wire is 2r and the length is *l*/2 then the resistance of this wire will be

A. R
B. 2R
C. R/4
D. R/8

8.Which one of the following could be the melting point of iron?

A. 25^oC
B. 37^oC
C. 500^oC
D. 1500^oC

9.At 20^oC, the speed of sound in water is approximately

A. 330 m/s
B. 800 m/s
C. 1500 m/s

D. 5000 m/s

10.Which one of the following can charge an insulator?

A. Current electricity
B. Static electricity
C. Magnetic field
D. Gravitational field

11.The correct sequence of energy transfer that occurs when an apple falls to the ground is

A. Gravitational potential energy → heat energy to air → kinetic energy → heat energy to ground and apple → sound energy B. Gravitational potential energy → sound energy → kinetic energy → heat energy to air → heat energy to ground and apple
C. Gravitational potential energy → kinetic energy → heat energy to air → heat energy to ground and apple → sound energy
D. Gravitational potential energy → kinetic energy → sound energy → heat energy to air → heat energy to ground and apple

12.The light energy escaping from the sun can be spread by

A. a shower of rain drops
B. a plane mirror
C. a convex lens
D. a combination of a convex lens and a concave lens

13.Which one of the following energy is stored in the links between the atoms?

A. Nuclear energy
B. Chemical energy
C. Potential energy
D. Thermal energy

14.Spring tides refer to

A. greatest difference in the sea level at high and low tides
B. lowest difference in the sea level at high and low tides
C. no difference in the sea level at high and low tides

D. counteraction of gravitational pull of the sun to that of moon

15.A fuse wire must be

A. conducting and of low melting point

B. conducting and of high melting point

C. insulator and of high melting point

D. insulator and of low melting point

16.When a beam of white light passes through a glass prism, the colour of light beam that deviates the least is _____.

A. Blue
B. Red
C. Green
D. Violet

17.The formula for conversion between Fahrenheit and Celsius is

$^{o}F = X + (1.8 \times {}^{o}C)$ What is factor X?

A. 32
B. 22
C. 98
D. 42

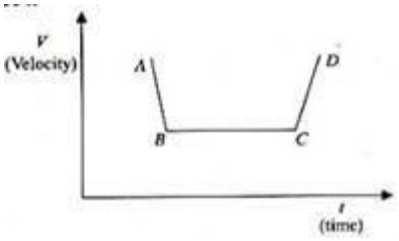
18.'Black hole' is a

A. huge black star which has zero acceleration due to gravity on its surface
B. star which has moderate acceleration due to gravity on its surface
C. star which has collapsed into itself and has large acceleration due to gravity on its surface.
D. star which has collapsed into itself and has zero acceleration due to gravity on its surface

19.Which one of the following statements regarding a thermos flask is NOT correct?

A. The walls of flask are separated by vacuum and made of glass which is a poor conductor of heat
B. The glass walls themselves have shiny surfaces
C. The surface of inner wall radiates good amount of heat and the surface of outer wall absorbs some of the heat that is radiated from the inner wall D. The cork supports are poor conductors of heat

20.



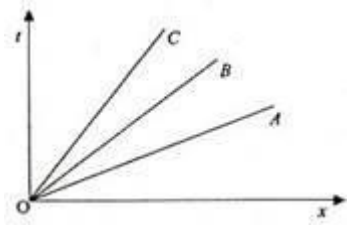
In the given velocity (V) versus time (t) graph, accelerated and decelerated motions are respectively represented by line segments

A. CD and BC
B. BC and AB
C. CD and AB
D. AB and CD

21.1 dyne (a unit of force in CGS system) equals to

A. 10^{3} g cm/s^{2}
B. 10^{-3} g cm/s^{2}
C. 10^{5} kg m/s^{2}
D. 10^{-5} kg m/s^{2}

22.



The figure shown above gives the time (t) versus position (x) graphs of three objects A, B and C. Which one of the following is the correct relation between their speeds V_A, V_B and V_C respectively at any instant (t > 0)?

A.$V_A < V_B < V_C$
B.$V_A > V_B > V_C$
C.$V_A = V_B = V_C \neq 0$
D.$V_A = V_B = V_C = 0$

23.The sun is seen before it rises and for a short while after it sets. This is because of

A. total internal reflection
B. atmosphere refraction
C. apparent shift in the direction of Sun
D. dispersion

24.Suppose there are two planets, 1 and 2, having the same density but their radii are R_1 and R_2 respectively, where $R_1 > R_2$. The accelerations due to gravity on the surface of these planets are related as

A. $g_1 > g_2$
B. $g_1 < g_2$
C. $g_1 = g_2$
D. Can't say anything

25.A thin disc and a thin ring, both have mass M and radius R. Both rotate about axes through their centre of mass and are perpendicular to their surfaces at the same angular velocity. Which of the following is correct?

A. The ring has higher kinetic energy
B. The disc has higher kinetic energy
C. The ring and the disc have the same kinetic energy
D. Kinetic energies of both the bodies are zero since they are not in linear motion

26.In which of the following phenomena do heatwaves travel along a straight line with the speed of light?

A. Thermal conduction
B. Thermal convection
C. Thermal radiation
D. Both thermal conduction and radiation

27.When does a ball bounce off the ground, which of the following changes suddenly?

(Assume no loss of energy to the floor)

A. Its speed
B. Its momentum
C. Its kinetic energy
D. Its potential energy

28.If an object moves at a non-zero constant acceleration for a certain interval of time, then the distance it covers in that time.

A. depends on its initial velocity.
B. is independent of its initial velocity.
C. increases linearly with time.
D. depends on its initial displacement.

29.A solid disc and a solid sphere have the same mass and same radius. Which one has a higher moment of inertia about its centre of mass?

A. The disc
B. The sphere
C. Both have the same moment of inertia
D. The information provided is not sufficient to answer the question

30.Two substances of densities P_1 and P_2 are mixed in equal volume, and their relative density is 4 . When they are mixed in equal masses, relative density is 3 . The values of P_1 and P_2 respectively are;

A.6,2
B.3,5
C. 12, 4
D.9,3

31."The sum of emf's and potential differences around a closed loop equals zero" is a consequence of :

A. Ohm's law.
B. Conservation of change.
C. Conservation of momentum.
D. Conservation of energy.

32.A student measures certain lengths using a meter scale having least count equal to 1mm. Which one of the following measurements is more precise?

A. 0.50 mm
B. 29.07 cm
C. 0.925 m
D. 910 mm

33.If the work done on the system or by the system is zero, which one of the following statements for a gas kept at a certain temperature is correct?

A. Change in internal energy of the system is equal to the flow of heat in or out of the system.
B. Change in internal energy of the system is less than heat transferred.
C. Change in internal energy of the system is more than the heat flow.
D. Cannot be determined.

34.10 g of ice at – 10^{o}C is mixed with 10 g of water at 0 ^{o}C . The amount of heat required to raise the temperature of the mixture to 10^{o}C is

A. 4000 cal
B. 550 cal
C. 1050 cal
D. 1200 cal

35.Water is heated with a coil of resistance R connected to domestic supply. The rise of temperature of the water will depend on

1) Supply voltage.

2) Current passing through the coil.

3) Time for which voltage is supplied.

Select the correct answer from among the following :

A. 1, 2 and 3
B. 1 and 2 only
C. 1 only
D. 2 and 3 only

36.The loudness of a sound depends upon the

A. velocity of sound waves in the medium.
B. amplitude of the sound waves.
C. frequency of the sound waves.
D. frequency and velocity of the sound waves.

37.Two bodies of mass M each are placed R distance apart. In another system, two bodies of mass 2M each are placed $\frac{R}{2}$ a distance apart. If F be the gravitational force between the bodies in the first system, then the gravitational force between the bodies in the second system will be

A.16F
B.1F
C.4F
D. None of the above

38.Which one of the following statements regarding cathode rays is not correct?

A. Cathode ray particles are electrons.
B. Cathode ray particles start from the anode and move towards the cathode.
C. In the absence of electrical and magnetic fields, cathode rays travel in straight lines.
D. Television picture tubes are cathode ray tubes.

39.Radiations coming from the Sun are mostly in the form

of A. light only.

B. light and long-wavelength infrared.
C. light and short-wavelength infrared.
D. both short and long-wavelength infrared.

40.Which of the following are the characteristics of electromagnetic waves?

1) They are elastic waves.

2) They can also move in a vacuum.

3) They have electric and magnetic components which are mutually perpendicular.

4) They move with speed equal to 3 lakh meters per second.

Select the correct answer using the code given below:

A. 1, 2, 3, and 4
B. 1, 2 and 4 only
C. 2 and 3 only
D. 3 and 4 only

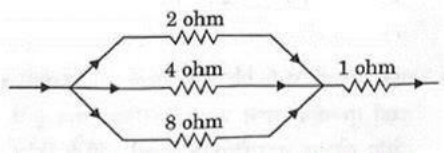
41.Which one of the following statements regarding Ohm's law is not correct?

A. Ohm's law is an assumption that current through a conductor is always directly proportional to the potential difference applied to it.
B. A conducting device obeys Ohm's law when the resistance of a device is independent of magnitude and polarity of applied potential difference.
C. A conducting material obeys Ohm's law when the resistance of a material is independent of the magnitude and direction of the applied electric field.
D. All homogeneous materials obey Ohm's law irrespective of whether the field is within range or strong.

42.A car starts from Bengaluru, goes 50 km in a straight line towards the south, immediately turns around and returns to Bengaluru. The time taken for this round trip is 2 hours the magnitude of the average velocity of the car for this round trip.

A. is 0.
B. is 50 km/hr.
C. is 25 km/hr.
D. cannot be calculated without knowing acceleration.

43.Consider the following part of an electric circuit :



The total electrical resistance in the given part of the electric circuit is

A. $\frac{15}{8}$ ohm

B. $\frac{15}{7}$ ohm

C. 15 ohm

D. $\frac{17}{3}$ ohm

44.A pendulum clock is lifted to a height where the gravitational acceleration has a certain value g. Another pendulum clock of the same length but of double the mass of the bob is lifted to another height where the gravitational acceleration is g/2. The time period of the second pendulum would be :

(in terms of period T of the first pendulum)

A. $\sqrt{2}T$

B. $\frac{1}{\sqrt{2}}T$

C. $2\sqrt{2}T$

D. T

45.Light rays move in straight lines. But through an optical fibre, they can move in any type of zigzag path because

A. the holes through the fibre are extremely fine.
B. light rays are absorbed in the entry end and relieved at the exit end of the fibre.
C. scattering of light occurs inside the fibre.
D. successive total internal reflections occur as a ray moves through the fibre.

46.A rigid of mass 2 kg is dropped from a stationary balloon kept at the height of 50 m from the ground. The speed of the body when it just touches the ground and the body when it just touches the ground and the total energy when it is dropped from the balloon are respectively

(acceleration due to gravity = 9.8 m/s^2)

A. 980 $m.s^{-1}$ and 980 J

B. $\sqrt{980}$ $m.s^{-1}$ and $\sqrt{980}$ J

C. 980 $m.s^{-1}$ and $\sqrt{980}$ J

D. $\sqrt{980}$ $m.s^{-1}$ and 980 J

47.Let there be an object having some chemicals in it. It starts moving with a uniform velocity v, and a chemical reaction starts happening. In this case, which of the following statement/s is/are correct?

1) Chemical reactions happening in the system cannot change the velocity v of the centre of mass of the object.

2) Chemical reactions happening in the system cannot change the kinetic energy of the particles inside with respect to the centre of mass an object weighs 36g in air and has a volume of 8.0 cmof an object.

Select the correct answer using the code given below:

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

48.The temperature of a place on one sunny day is 113 on the Fahrenheit scale. The Kelvin scale reading of this temperature will be

A. 318 K
B.45K
C. 62.8 K
D. 335.8 K

49.Compared to audible sound waves, ultrasound waves have

A. higher speed.
B. higher frequency.
C. longer wavelength.
D. both higher speed and frequency.

50.A ball thrown by one player reaches the other in 2 seconds. The maximum height attained by the ball above the point of the projection will be

A. 4 m
B. 5 m
C. 2.5 m

D. 6 m

51.A particle is moving eastwards with a velocity of 5 m/s. In 10 sec the velocity changes to 5 m/sec northwards. The average acceleration in this time is

A. Zero
B. $\frac{1}{\sqrt{2}}$ m/sec^2 towards north-east
C. $\frac{1}{\sqrt{2}}$ m/sec^2 towards north-west
D. $\frac{1}{2}$ m/sec^2 towards north.

52.The bomb of mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 m/s . The kinetic energy of the other mass is

A. 256 J
B. 486 J
C. 524 J
D. 324 J

53.A particle performs uniform circular motion with an angular momentum L. if the frequency of the particle's motion is doubled and its kinetic energy is halved, the angular momentum becomes

A. 2L
B. 4L
C. $\frac{L}{2}$
D. $\frac{L}{4}$

54.If the radius of the earth were to shrink by 1%, its mass remaining the same, the acceleration due to gravity on the earth's surface would

A. Decrease by 2%
B. Remain unchanged
C. Increase by 2%
D. Increase by 1%

55.A projectile can have the same range R for two angles of projection. If T_1 and T_2 be the time of flights, then the products T_1T_2 is directly proportional to

A. $\frac{1}{R^2}$
B. $\frac{1}{R}$
C. R
D. R^2

56.A cricket ball of mass 250 g collides with a bat with velocity 10 m/s and returns with the same speed within 0.01 s. the force acted on the bat is.

A.25N
B.50N
C. 250 N
D. 500N

57.Two bodies of mass 3 kg and 4kg are suspended at the ends of mass less string passing over a frictionless pulley. The acceleration of the system is (take g= 9.8 m/s^2)

A. 4.9 m/s^2
B. 2.45 m/s^2
C. 1.4 m/s^2
D. 9.5 m/s^2

58.A drum of radius R and mass M, rolls down without slipping along an inclined plane of angle θ. The frictional force

A. dissipates energy as heat
B. decreases the rotational motion
C. decreases the rotational and translational motion
D. converts translational energy to rotational energy

59.The block of mass M moving on the frictionless horizontal surface collides with the spring of spring constant k and compresses it by length l . the maximum momentum of the block after the collision is

A. 0
B. $\frac{Ml^2}{k}$
C. $\sqrt{kM}\,l$
D. None of these

60.A small ball is dropped from height 20 m. If the coefficient of restitution is 0.9 , then the height after the first collision

A. 1.26 m
B. 16.2 m
C. 20 m
D. 17.5 m

61.A solid cylinder of mass M and radius R rolls without slipping down an inclined plane of length L and height h. What is the speed of its centre of mass when the cylinder reaches its bottom?

A. $\sqrt{\frac{3}{4}gh}$
B. $\sqrt{\frac{4}{3}gh}$
C. $\sqrt{4gh}$
D. None of these

62.which of the following astronomer first proposed that the sun is static and the earth revolves round the sun?

A. Galileo
B. Kepler
C. Copernicus
D. Tyen Brahe

63.if the distance between the earth and the sun were half its present value, the number of days in a year would have been

A. 64.5
B. 129
C. 182.5
D. 730

64.In steel, the Young's Modulus and the strain at the breaking point are 2×10^{11} N/m^2 and 0.15 respectively. The stress at the breaking point for steel is

A. 1.33×10^{-7} N/m^2
B. 1.33 $\times10^{12}$ N/m^2
C. 7.5×10^{-13} N/m^2
D. 3×10^{10} N/m^2

65.Two drops of equal radius coalesce to form a bigger drop. What is the ratio of surface energy of bigger drop to smaller one?

A. $2^{1/2}:1$
B. 1:1
C. $2^{2/3}:1$
D. None of these

66.A liquid does not wet the sides of a solid, if the angle of contact is

A. 0
B. Obtuse
C. Acute
D. Right angle

67.A 10 cm long wire is placed horizontally on the surface of water and is gently pulled up with a force of 2×10^{-2} N. to keep the wire in equilibrium, the surface tension of water in N/m is

A. 0.1
B. 0.2
C. 0.001
D. 0.002

68.A gas, for which $\gamma=1.5$, is suddenly compressed to 1/4th of the initial volume. Then the ratio of the final to the initial pressure is

A. 1:16
B. 1:8
C. 1:4

D. 8:1

69.The work of 146 KJ is performed on order to compress one kilo mole of a gas adiabatically and in this process the temperature of the gas is increases by 7° C.

A. Diatomic
B. Triatomic
C. A mixture of monoatomic and diatomic
D. Monoatomic

70.Three objects coloured black, gray and white can withstand hostile conditions up to 2800∘C. These objects are thrown into a furnace where each of them attains a temperature of 2000∘C. Which object will glow brightest?

A. The white object
B. The black object
C. All glow with equal brightness
D. Gray object

71.If v_m is the speed of sound in moist air and v_d is the speed of sound in dry air under identical conditions of pressure and temperature, then

A. $V_m > v_d$
B. $V_m < v_d$
C. $V_m = v_d$
D. $V_m.v_d = 1$

72.When heat is given to a gas in an isobaric process

A. Work is done by gas
B. Internal energy of the gas increases
C. Both (a) and (b) is correct.
D. Neither (a) and (b) is correct.

73.The maximum velocity of a particle, executing simple harmonic motion with an amplitude 7 mm, is 4.4 m/s. the period of oscillation is

A. 0.01 s
B. 10 s
C. 0.1 s

D. 100 s

74.A satellite moves in an elliptical orbit about a planet. Its maximum and minimum velocities of the satellite are 30,000 m/s and 1000 m/s respectively. What is the minimum distance of the satellite from the planet if the maximum distance is 4×10^4 km?

A. 4×10^4 km
B. 3×10^4 km
C. $\frac{4}{3}\times10^3$ km
D. None of these

75.A planet has a mass M_1 and radius R_1. The value of acceleration due to gravity on its surface is g_1. There is another planet 2, whose mass and radius both are two times that of the first planet. Which one of the following is the acceleration due to gravity on the surface of planet 2?

A. g_1
B. $2g_1$
C. $g_1/2$
D. $g_1/4$

76.Consider the following statements about a microscope and a telescope:

1) Both the eyepiece and the objective of a microscope are convex lenses.

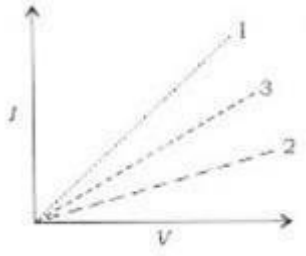
2) The focal length of the objective of a telescope is larger than the focal length of its eyepiece

3) The magnification of a telescope increases with the increase in focal length of its objective.

Which of the statements given above are correct?

A. 1 and 3 only
B. 1 and 4
C. 2, 3 and 4
D. 1, 2 and 3

77.The graphs between current (I) and voltage (V) for three linear resistors 1,2 and 3 are given below :



If R_1, R_2 and R_3 are the resistances of these resistors, then which one of the following is correct?

A. $R_1 > R_2 > R_3$
B. $R_1 < R_3 < R_2$
C. $R_3 > R_1 > R_2$
D. $R_3 < R_2 < R_1$

78.The connecting cable of electrical appliances like electric iron, water heater or contains three insulated copper wires of three different colours-red, green and black. Which one of the following is the correct colour code?

A. Red-live wire, Green –neutral wire, Black –ground wire
B. Red-neutral wire, Green-ground wire, Black-live wire
C. Red-live wire, Green-ground wire, Black-neutral wire
D. Red-ground wire, Green-live wire, Black-neutral wire

79.The time period of oscillation of a simple pendulum having length L and mass of the bob m is given as T. If the length of the pendulum is increased to 4L and the mass of the bob is increased to 2m, then which one of the following is the new time period of oscillation?

A. T
B. 2T
C. 4T
D. T/2

80.Consider the following statements about visible light, UV light and x-rays :

1) The wavelength of visible light is more than that of X-rays

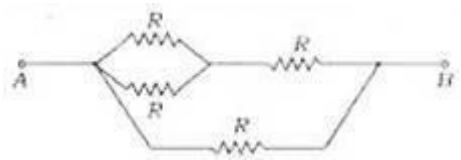
2) The energy of X-rays photons is higher than that of UV light photons.

3) The energy of UV light photons is less than that of visible light

photons. Which of the statements given above is/are correct?

A. 1, 2 and 3
B. 1 and 2 only
C. 2 and 3 only
D. 1 only

81.Consider the following circuit:



Which one of the following is the value of the resistance between points A and B in the circuit given above?

A. $\frac{2}{5}R$
B. $\frac{3}{5}R$
C. $\frac{3}{2}R$
D. 4 R

82.Which one of the following depicts the correct circuit of a reflex are?

A. Effector-sensory neuron-spinal cord- motor neuron –receptor
B. Receptor-sensory neuron-spinal cord-motor neuron – effector
C. Receptor-sensory neuron-brain-motor neuron-effector
D. Sensory neuron-receptor-brain-effector-motor neuron

83.If a free electron moves through a potential difference of 1kV, then the energy gained by the electron is given by

A. 1.6×10^{-19} J
B. 1.6×10^{-16} J
C. 1×10^{-19} J
D. 1×10^{-16} J

84.The full form of LED is_____.

A. Light Emitting Diode
B. Light Emitting Devise
C. Light Enhancing Devise
D. Light Enhancing Diode

85.Which one of the following is the correct relation between A and nm?

A. 1 nm = 10^{-1} A
B. 1 nm = 10 A
C. 1 nm = 1 A
D. 1 nm = 10^{-2} A

86.The magnetic field strength of a current carrying wire at a particular distance from the axis of the wire

A. Depends upon the current in the wire
B. Depends upon the radius of the wire
C. Depends upon the temperature of the surroundings
D. None of the above

87.The frequency of ultrasound waves is

A. less than 20 Hz
B. between 20 Hz and 2 kHz
C. between 2 kHz and 20 kHz
D. greater than 20 kHz

###COMMON###88###88###**Directions:** The following six (6) items consist of two statements. Statement I and statement II. Examine these two statements carefully and select the correct answer using the code given below. ###DONE###

88. **Statement I :**

Sound wave cannot propagate in vacuum.

Statement II :

Sound waves are elastic waves and require a medium to propagate

A. Both the statements are individually true and statement II is the correct explanation of statement I
B. Both the statements are individually true but Statement II is not the

correct explanation of Statement I
C. Statement I is true Statement II is false
D. Statement I is false but statement II is true

89.

Statement I :

The pitch of the sound wave depends upon its frequency

Statement II :

The loudness of the sound wave depends upon its amplitude

A. Both the statements are individually true and statement II is the correct explanation of statement I
B. Both the statements are individually true but Statement II is not the correct explanation of Statement I
C. Statement I is true Statement II is false
D. Statement I is false but statement II is true

90.A circular coil of radius R having N number of turns carries a steady current I. The magnetic induction at the centre of the coil is 0.1 tesla. If the number of turns is doubled and the radius is halved, which one of the following will be the correct value for the magnetic induction at the centre of the coil?

A. 0.05 tesla
B. 0.2 tesla
C. 0.4 tesla
D. 0.8 tesla

91.An object is placed in front of a convex mirror. Which one of the following statements is correct?

A. It will never form an inverted image
B. The image moved towards the focus when the object moves towards the mirror.
C. Depending on the position of the object with respect to the mirror, the image can be inverted and real
D. The size of the image becomes larger than that of the object when the object is placed at a distance equal to half the focal length

92.Which one of the following statements is correct for a plane mirror?

A. Its focal length is zero

B. The size of the image of an object placed in front of the mirror is slightly less than that of the object.
C. The image is virtual, erect and laterally inverted D. Its focal length is 200 cm

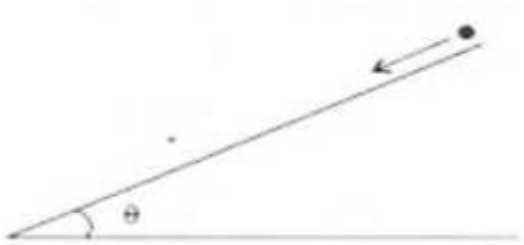
93.The refractive indices of two media are denoted by n_1 and n_2, and the velocities of light in these two media are respectively v_1 and v_2. If n_2/n_1 is 1.5, which one of the following statements is correct?

A. v_1 is 1.5 times v_2
B. v_2 is 1.5 times v_1
C. v_1 is equal to v_2
D. v_1 is 3 times v_2

94.The coefficient of areal expansion of a material is $1.6 \times 10^{-5}\ K^{-1}$. which one of the following gives the value of coefficient of volume expansion of this material?

A. $0.8 \times 10^{-5}\ K^{-1}$
B. $2.4 \times 10^{-5}\ K^{-1}$
C. $3.2 \times 10^{-5}\ K^{-1}$
D. $4.8 \times 10^{-5}\ K^{-1}$

95.A ball is released from rest and rolls down an inclined plane, as shown in the following figure, requiring 4 s to cover a distance of 100 cm along the plane:



Which one of the following is the correct value of angle θ that the plane makes with the horizontal? ($g = 1000\ cm/s^2$)

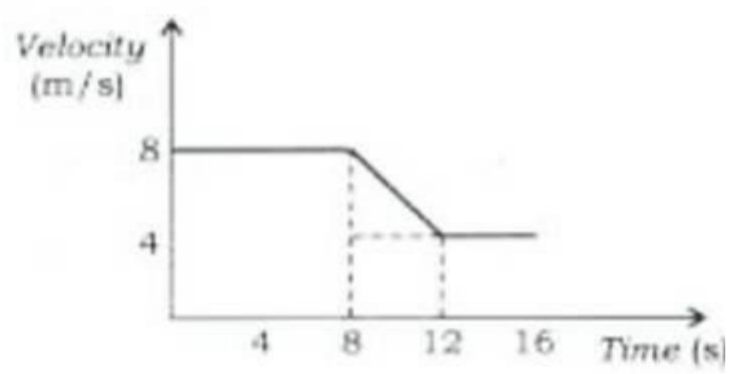
A. $\theta = \sin^{-1}(1/9.8)$
B. $\theta = \sin^{-1}(1/20)$
C. $\theta = \sin^{-1}(1/80)$

D. $\theta = \sin^{-1}(1/100)$

96.If the focal length of a convex lens is 50cm, which one of the following is its power?

A. +2 dioptre
B. +0.02 dioptre
C. -0.5 dioptre
D. +0.5 dioptre

97.Consider the following velocity and time graph :



Which one of the following is the value of average acceleration from 8s to 12s?

A. 8 m/s^2
B. 12 m/s^2
C. 2 m/s^2
D. -1 m/s^2

98.The wavelength of X-rays is of the order of

A.1A
B. 1 μm
C. 1 mm
D. 1 cm

99.Step-up transformers are used for –

A. increasing Electrical Power
B. decreasing Electrical Power
C. decreasing Voltage

D. increasing Voltage

100.Which one of the following statements about energy is correct?

A. Energy can be created as well as destroyed.
B. Energy can be created but not destroyed.
C. Energy can neither 'be created nor destroyed.
D. Energy cannot be created but can be destroyed.

101.Light year is a measure of –

A. time
B. distance
C. the total amount of light falling on the Earth in a year
D. the average intensity of light falling on the Earth in a year

102.If some object is weighed when submerged in water, what will happen to its weight compared to its weight in the air?

A. Increase
B. Decrease
C. Remain exactly the same
D. Increase or decrease cannot be predicted

103.Concave Mirror is used in headlights of vehicles because it

A. focuses light from the bulb onto nearby vehicles
B. sends parallel rays
C. fits well into the shape of the headlight
D. is cheaper than other mirrors

104.Water boils at a lower temperature at high altitudes because

A. the air pressure is less
B. outside temperature is less
C. latent heat is less
D. None of the above

105.The ionization energy of the hydrogen atom in the ground state is -

A. 13.6 MeV
B. 13.6 eV
C. 13.6 Joule
D. Zero

106.The majority charge carriers in a p-type semiconductor are –

A. Free Electrons
B. Conduction Electrons
C. Ions
D. Holes

107.Which one of the following waves is used for detecting forgery in currency notes?

A. Ultraviolet Waves
B. Infrared Waves
C. Radio Waves
D. Microwaves

108.The mirrors used as rear-view mirrors in vehicles are –

A. Concave
B. Convex
C. Cylindrical
D. Plane

109.Radioactivity is measured by –

A. GM Counter
B. Polarimeter
C. Calorimeter
D. Colorimeter

110.How long does light take to reach the Earth from the Sun?

A. About 4 minutes
B. About 8 minutes
C. About 24 minutes
D. About 24 hours

111.Electron Emission from a metallic surface by application of light is known as –

A. Thermionic Emission
B. Photoelectric Emission
C. High field Emission
D. Auto electronic Emission

112.In a vacuum, a five-rupee coin, a feather of a sparrow bird and a mango are dropped simultaneously from the same height. The time taken by them to reach the bottom is t_1, t_2 and t_3 respectively. In this situation, we will observe that

A. $t_1 > t_2 > t_3$
B. $t_1 > t_3 > t_2$
C. $t_3 > t_1 > t_2$
D. $t_1 = t_2 = t_2$

113.The symbol of the SI unit of inductance is H. It stands for –

A. Holm
B. Halogen
C. Henry
D. Hertz

114.Which one of the following statements is not correct?

A. Ultrasonic Waves cannot get reflected, refracted or absorbed.
B. Ultrasonic Waves are used to detect the presence of defects like cracks, porosity, etc. in the internal structure of common Structure materials.
C. Ultrasonic Waves can be used for making holes in very hard materials like Diamond.
D. Ultrasonic Waves cannot travel through a vacuum.

115.Which one of the following waves does not belong to the category of the other three?

A. X-rays
B. Microwaves
C. Radio waves
D. Sound waves

116.The statement that 'heat cannot flow by itself from a body at a lower temperature to a body at a higher temperature', is known as

A. Zeroth law of thermodynamics
B. First law of thermodynamics
C. Second law of thermodynamics
D. Third law of thermodynamics

117.Bats detect obstacles in their path by receiving the reflected -

A. Infrasonic waves
B. Ultrasonic waves
C. Radio waves
D. Microwaves

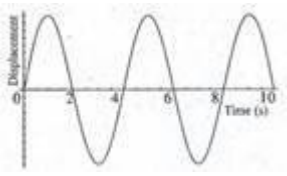
118.An object moves in a circular path with a constant speed. Which one of the following statements is correct?

A. The Centripetal Acceleration of the object is smaller for a gentle curve (i.e., the curve of larger radius) than that for a sharp curve (i.e., the curve of smaller radius).
B. The Centripetal Acceleration is greater for a gentle curve than that for a sharp curve.
C. The Centripetal Acceleration is the same for both the gentle and sharp curves.
D. The Centripetal Acceleration causes the object to slow down.

119.A circular coil of single turn has a resistance of 20 Ω. Which one of the following between the ends of any diameter of the coil?

A.5Ω
B.10Ω
C.20Ω
D.40Ω

120.The following figure shows displacement versus time curve for a particle executing simple harmonic motion:



Which one of the following statements is correct?

A. Phase of the oscillating particle is same at t = 1 s and t = 3 s
B. Phase of the oscillating particle is same at t = 2 s and t = 8 s
C. Phase of the oscillating particle is same at t = 3 s and t = 7 s
D. Phase of the oscillating particle is same at t = 4 s and t = 10 s

121.A positive charge +q is placed at the centre of a hollow metallic sphere of inner radius a and outer radius b. The electric field at a distance r from the centre is denoted by E. In this regard, which one of the following statements is correct?

A. E = 0 for a < r < b
B. E = 0 for r < a
C. E = $q/4\pi\varepsilon_0 r$ for a < r < b
D. E = $q/4\pi\varepsilon_0 a$ for r < a

122.If the absolute refractive indices of glass and water are 3/2 and 4/3 respectively, what will be the ratio of the velocity of light in glass and water?

A.3:4
B.4:3
C.8:7
D.8:9

123.Why is it difficult to measure the coefficient of expansion of a liquid than solid?

A. Liquids tend to evaporate at all temperatures
B. Liquids conduct more heat
C. Liquids expand too much when heated
D. Their containers also expand when heated

124.Which one of the following statements is true for the relation $F = G\frac{m_1 m_2}{r^2}$?

(All symbols have their usual meanings)

A. The quantity G depends on the local value of g, acceleration due to gravity
B. The quantity G is greatest at the surface of the earth

C. The quantity G is used only when the earth is one of the two masses D. The quantity G is a universal constant

125.If the potential difference applied to an X-ray tube is doubled while keeping the separation between the filament and the target as same, what will happen to the cutoff wavelength?

A. Will remain same
B. Will be doubled
C. Will be halved
D. Will be four times of the original wavelength

126.A Kelvin thermometer and a Fahrenheit thermometer both give the same reading for a certain sample. What would be the corresponding reading in a Celsius thermometer?

A. 574
B. 301
C. 273
D. 232
E. None of the above/More than one of the above

127.Which one of the following is the correct relation between frequency f and angular frequency ω?

A.$f=\pi\omega$
B. $\omega=2\pi f$
C. $f = 2\omega/\pi$
D. $f=2\pi\omega$

128.Suppose a rod is given a negative charge by rubbing it with wool. Which one of the following statements is correct in this case?

A. The positive charges are transferred from rod to wool
B. The positive charges are transferred from wool to rod
C. The negative charges are transferred from rod to wool
D. The negative charges are transferred from wool to rod