Past Papers of NET (Physics)

(1)

80. Laser is device which can produce
    a. Intense beam of light
    b. Coherent beam of light
    c. Monochromatic beam of light
    d. All of above

81. A magnetic needle lying parallel to a magnetic field is turned through 60^0 the work done on it is

w. the torque required to maintain the magnetic needle in the position mentioned above is

   a. $\sqrt{3}$ w
   b. $\frac{\sqrt{3}}{2}$ w
   c. w/2
   d. 2 w

82. A parallel plate capacitor has a capacity 80×10^{-6} when air is present between the plates. The volume between the plates is then completely filled with a

dielectric slab of dielectric constant 20. The capacitor is now connected to a battery of 30 v by wires the dielectric slab is then removed. Then the charge that passes now through the wire is

a. 45.6×10^{-3}c

b. 25.3×10^{-3} c

c. 120×10^{-3} c

d. 120×10^{-3} c

83. Four resistor A, B, C and D form a whetstones bridge is balanced when C =100́Ω. If A and B are interchanged, the balances. For c 121́Ω the value of D is

a. 10́Ω

b. 100́Ω

c. 110́Ω

d. 120́Ω

84. The magnitude of the resultant of two forces is F. The Magnitude of each force id F. the angle between the forces must be

    a. 300
    b. 600
    c. 450
    d. 1200

85. A primary coil and secondary coil are placed close to each other. The current which changes at the rate of 25 amps. In a millisecond, is present in the primary coil. If the mutual inductance is

    92 x 10^{-6} henneries, then the value of

    induced Emf in the secondary coil is a.

    4.6v
    b. 2.3 v
    c. 0.368mV
    d. 0.23mV

86. The de Broglie wave length of an electron moving with a velocity of 1.5×10^8 m/s is equal to that of photon. the ration of K.E of the electron to that of photon (C = 3×10^8 m/s) a. 2

   b. 4

   c. ½

   d. ¼

87. The maximum K.E of emitted photoelectrons depend on

   a. Intensity of the incident light

   b. Frequency of the incident light

   c. Temperature of the photosensitive surface

   d. None

88. The half-life of Ra ^{226} is 1620 years then the number of atoms decay in one second in 1 gm of radium (Avogadro number = 6.023×10^{23})

   a. 4.23×10^{9}

   b. 3.16×10^{10}

c. 3.61×10^{10}

d. 2.16×10^{10}

89. The half-life of a radioactive element is 10 hours. The fraction of initial radio activity of the element that will remain after 40 hours is

½

1/16

1/8

¼

90. In a transistor if $l_C / l_E = \alpha$ and $l_C / l_B = \beta$. If α varies between 20/21 and 100 /101. Then value of β lies between

a. 1-10

b. 0.95-0.99

c. 20-100

d. 200-300

91. Let $[\varepsilon_0]$ denote the dimensional formula of the permittivity of vacuum. It M = mass , L = length, T = time and A =electric current, then

   a. $[\varepsilon_0]$ = $[M^{-1}L^{-3} T^4 A^2]$

   b. $[\varepsilon_0]$ = $[M^{-1}L^2 T^1 A^{-2}]$

   c. $[\varepsilon_0]$ = $[M^{-1}L^2 T^{-1} A]$

   d. $[\varepsilon_0]$ = $[M^{-1}L^{-3} T^2 A]$

93. The gravitational field in a region is given by equation is E = (5i +12j) N/kg. if a particle of mass 2 kg is moved from the origin to the point (12m ,5m) in this region, the change in gravitational P.E is a. -225 j

   b. -240 j

   c. -245 j

   d. -250 j

94. The time period of a particle in simple harmonic motion is 8s. At t=0 it is at the mean position.

the ratio of the distances travelled by it in the first and second seconds is

    a. ½

    b. $\overline{\sqrt{2}}1$

    c. $\overline{\sqrt{2}-1}$

    d. $\frac{1}{\sqrt{3}}$

95.   A tension of 22N is applied to a copper wire of cross sectional area 0.02cm. young's modulus of copper is 1.1 x 10 ^{11} N/m^2 and Poisson's ratio 0.32 the decrease in cross sectional area will be

    a. 1.28 x 10^{-6}cm^2

    b. 1.6 x 10^{-6}cm^2

    c. 2.56 x 10^{-6}cm^2

    d. 0.64 x 10^{-6}cm^2

96.   The total energy of H-atom in its ground state is

    –ive

    +ive

    0

None

97.   A pipe having an internal diameter 'D' to another pipe of same size, water flow into the second pipe through 'n' holes, each of diameter 'd' . if the water in the first pipe has speed 'V' the speed of water leaving the second pipe is

a. $D^2 v/nd^2$

b. $nD^2 v/d^2$

c. $nd^2 v/D^2$

d. $d^2 v/nd^2$

98.   When a liquid is heated in copper vessel its coefficient of apparent expansion is 6×10^{-6} C. when same liquid is heated in a steel vessel its coefficient of apparent   expansion is 24×10^{-6} C. If coefficient of linear expansion for copper is 18×10^{-6} C the coefficient of linear expansion for steel is

99. When the temperature of a body increases from the T to T +ΔT, its moment of inertia increases from I to I +ΔI. if α is the coefficient of linear expansion of the material of the body then is ΔI/I

(neglect higher orders of α)

   a. αΔT
   b. 2 αΔT
   c. ΔT/α
   d. 2α/ΔT

100. Work done to increase the temperature of one mole of an ideal $v \propto T^{2/3}$ is ,(R =80314 j/mole/^{0}K) gas by 30^0 C. if it is expanding under the $v \propto T^{2/3}$ is,(R =80314 j/mole/^{0}K) condition

   a. 116.2j
   b. 136.2j
   c. 166.2j
   d. 186.2j

101. Power radiated by black body at temperature T1 is P and it radiates maximum energy at a wavelength λ1. If the temperature of the black body is changed from T1 to T2, it radiates max energy at a wavelength of λ1/2. The power radiated at T2 is.

a. 2P

b. 4P

c. 8P

d. 6P

102. Which of the following has the high energy photon
Visible light
X rays
Ultraviolet
rays Gamma
rays   103.
       What   is
minimum

energy required to launch a satellite of mass m from the surface of a planet of mass m and radius r in a circular orbit at an altitude of 2R

a. 2GmM/3R
b. GmM/2R
c. GmM/3R
d. 5GmM/6R

104. When the engine is switched off a vehicle of mass 'M' is moving on a rough horizontal road with momentum P. if the coefficient of friction between the road and tires of the vehicle is μ_k , the distance travelled by the vehicle before it comes to rest is

   a. $P^2 / 2 \mu_k M^2 g$

   b. $2 \mu_k M^2 g / P^2$

   c. $P^2 / 2 \mu_k g$

   d. $P^2 M^2 / 2 \mu_k g$

105. A projectile is given an initial velocity of I + 2 j where I is along the ground and j is along the vertical if g = 10m/s^2, the equation of its trajectory is :

   a. $Y = 2x - 5x^2$

   b. $4Y = 2x - 5x^2$

   c. $4Y = 2x - 25x^2$

   d. $Y = x - 5x^2$

106. The escape velocity from the earth gravitational field depend upon
   a. Rotation of earth
   b. Mass of body
   c. Radius of earth
   d. Mass of earth

107. If the earth is treated as a sphere of radius R and mass m its angular momentum about the axis of its rotation with period T is :
   a. $\pi MR^3/T$
   b. $\pi MR^2/T$
   c. $2\pi MR^2/5T$
   d. $4\pi MR^2/5T$

108. The velocity 'V' reached by a car of mass 'm' at certain distance from the starting point driven with constant power 'P' is such that
   $V\alpha\ 3P/m$
   $V^2\ \alpha\ 3P/m$

$V^3 \alpha\ 3P/m$

$V \alpha\ (3P/m)^2$

109. It is possible to project a particle with a given velocity in two possible ways so as to make them pass through a point P at a horizontal distance r from the point of projection, if t1 and t2,are times taken to reach this going in two possible ways, then the product t1t2 is proportional to

   a. 1/r
   b. r
   c. r^2
   d. $1/r^2$

110. Sum of magnitudes of two forces acting at appoint is 16N, if their resultant is normal to smaller force and has a magnitude 8N, and then forces are

   a. 6N, 10N
   b. 8N, 8N
   c. 4N , 12N
   d. 2N , 1!4N

111. The length of a pendulum is measured as 1.01 m and time for 30 oscillations is measured as one minute 3 sec. error length is 0.01 m and

error in time is 3 sacs. The percentage error in the measurement of acceleration due to gravity is

a. 1

b. 5

c. 10

d. 15

112. A tension of 20 N applied to a copper wire of cross sectional area 0.01cm², young's modulus of copper is 1.1 x 10¹¹N/m² and Poisson's ratio is 0.32. the decrease in cross sectional area of wire is

a. 1.16 x 10 ⁻⁶ cm²

b. 1.16 x 10 ⁻⁵ m²

c. 1.16 x 10 ⁻⁴ m²

d. 1.16 x 10 ⁻³ cm²

113. A capillary tube of radius r is immersed in water and water rises to a height of 'h'. Mass of water in the capillary tube is5 x 10 ⁻³kg. The same capillary tube in now immersed in a liquid

whose surface tension is √2 times the surface tension of water. The angle of contact between the capillary tube and this is liquid is 45^0. The mass of liquid which rises into the capillary tube now is .(in kg)

    a. 5 x 10 $^{-3}$

    b. 5 x 10 $^{-3}$

    c. $5\sqrt{2} \times 10^{-3}$

    d. 3.5 x 10 $^{-3}$

114. The terminal velocity of a liquid drop of radius 'r' ; falling through air is v if two such drops are combined to form a bigger drop, the terminal velocity with which the bigger drop falls through air is (ignore any buoyant force due to air)

    a. √2V

    b. $2v$

    c. $\sqrt[3]{4}v$

    d. $\sqrt[3]{2}v$

115. A glass flask of volume one liter is filled completely with mercury at 0^{0}c. The flask is now

heated to 100^0c. Coefficient of volume expansion of mercury is $1.82 \times 10^{-4/0}$C and coefficient of linear expansion of glass is $0.1 \times 10^{-4/0}$C. during this process, amount of mercury which overflow is

a. 21.2cc
b. 15.2cc
c. 2.12cc
d. 18.2cc

116. On a temperature scale y, water freezes at -160^0 y and boils at -50^0y. on this y scale, a temperature of 340K is

a. -106.3^0 y
b. -96.3^0 y
c. -86.3^0 y
d. -76.3^0 y

117. Efficiency of heat engine whose sink is at a temperature of 300k is 40%. To increase the efficiency to 60% , keeping the sink temperature constant, the source temperature must be increased by

a. 750K

b. 500K

c. 250K

d. 1000K

118. We can hear sound around the corner but cannot see because of:

a. Interference

b. Diffraction

c. Polarization

d. Dispersion

119. An air column in a tube 32 cm long closed at one end, is in resonance with; a tuning fork. The air column in another tube, open at both ends of length 66cm is in resonance with another tuning fork. When these two tuning forks are sounded together, they produce 8 beats per second then the frequencies of the two tuning

forks are. (Consider fundamental frequencies only).

    a. 250 Hz. 258 Hz

    b. 240 Hz. 248 Hz

    c. 264hz. 256 Hz

    d. 280 Hz. 272 Hz

120. A wire of uniform cross section A , length 1 and resistance R is cut into two equal pieces. The resistivity of each piece will be

    a. The same

    b. One fourth

    c. Double

    d. One half

121. A microscope consist of an objective of focal length 1.9 cm and eye piece of focal length 5 cm. the two lenses are kept at a distance of 10.5 cm. if the image is to be formed at least distance of distinct vision, the distance at which the object is to be placed before the objective is (least distance of distinct vision is 25 cm).

    a. 6.2cm

    b. 2.7cm

c. 21.0cm

d. 4.17cm

122. Fresnel diffraction is produced due to light rays falling on a small obstacle. The intensity of light at a point on a screen beyond an obstacle depends on

a. The focal length of lens used for observation

b. The number of half period zones that superpose at the point

c. The square of the sum of the number of half period zones

d. The thickness of the obstacle

123. A short bar magnet having magnetic moment 4 Am², placed in a vibrating magneto meter, vibrates with a time period of 8 seconds. Another short bar magnet having a magnetic moment 8 Am² vibrates with a time period of 6 seconds. If the moment of inertia of the second magnet is 9 x10⁻²kg m² the moment of inertia of the first magnet is (assume that both

magnets are kept in the same uniform magnetic induction field)

    a. 9×10^{-2} kg m²

    b. 8×10^{-2} kg m²

    c. 5.33×10^{-2} kg m²

    d. 12.2×10^{-2} kg m²

124. Two short bar magnets have their magnetic moments 1.2Am² and1.0 Am². They are placed on a horizontal table parallel to each other at a distance of 20 cm between their centers, such that their north poles pointing towards geographic south. They have common magnetic equatorial line. Horizontal component of earth's field is 3.6×10^{-5}T.then,the resultant horizontal magnetic induction at mid-point of the line joining their centers

    a. 3.6×10^{-5}T

    b. 1.84×10^{-4}T

    c. 2.56×10^{-4}T

    d. 5.8×10^{-5}T

125. The S.I unit of magnetic flux is weber which is equal to

a. NmA^{-1}

b. Nm^2/A

c. NA/m

d. Nm/A^{-2}

126.   If E.M, J and g respectively denote energy ,mass, angular momentum and universal gravitational constant the quantity, which has the same dimensions as dimensions of EJ^2 /M^2G^2 a. Time

b. Angle

c. Mass

d. length

127.   the work done in moving an object from origin to a point whose position vector is r =3i +2j -5k by a force F= 2i –j –k is

a. 1 unit

b. 9 units

c. 13 units

d. 60 units

128.   A particle is projected from the ground with an initial speed of v at an angle of projection q the

average velocity of the particle between its time of projection and times it reaches highest point of trajectory is

a. $v/2(\sqrt{1 + 2cos2\,q}\,)$

b. $v/2(\sqrt{1 + 2sin2\,q}\,)$

c. $v/2(\sqrt{1 + 3cos2\,q})$

d. $v\cos q$

129. A ball at rest is dropped form a height of 12m. It loses 25% of its K.E on striking the ground and bounces back to a height 'h'. then value of 'h' is

a. 3m

b. 6m

c. 9m

d. 12m

130. Two bodies of mass 4kg and 5 kg are moving along east and month directions with velocities 5 m/s and 3m/s respectively .magnitude of the velocity of center of mass of the systems is

a. 25/9 m/s

b. 9/25 m/s

c. 41/9 m/s

d. 9 /41 m/s

131. A mass of 2.9 kg is suspended from a string of length 50cm and is at rest. Another body of mass 100g. Which is moving horizontally with a velocity of 150 m/s strikes and sticks to it. Subsequently when the string makes an angle of 60^0 with vertical, the tension in the string is (g =10 m/s²).

a. 140N

b. 135N

c. 125N

d. 90N

132. The upper half of an inclined plane with an angle of inclination f, is smooth while the lower half is rough. A body starting from rest at the top of the inclined plane comes to rest at the bottom of the inclined plane. Then the coefficient of friction for the lower half is a. 2tanf

b. tanf

c. 2sinf

d. 2cosf

133. Moment of inertia of a body about an axis is 4 kg /m^2. The body is initially at rest and a torque of 8 Nm starts acting on it along the same axis. Work done by the torque in 20 sec. in Joules, is

a. 40

b. 640

c. 2560

d. 3200

134. A uniform circular disc of radius R, lying on a frictionless horizontal plane is rotating with an angular velocity 'w' about its own axis. Another identical circular disc is gently placed on the top of the first disc coaxially. The loss in rotational K.E due to friction between the two disc, as they acquire common angular velocity is (1 is moment of inertia of the disc) a. 1/8 Iw^2

b. 1/4 Iw^2

c. 1/2 Iw^2

d. Iw^2

135. The ratio of volumetric stain to volumetric stress is called
   a. Compressibility
   b. Young's modulus
   c. Bulk's modulus
   d. Shear's modulus

136. The base current in a transistor circuit changes from 45 mA to 140 mA. Accordingly, the collector current changes from 0.2mA to 4 mA. The gain in current is
   a. 9.5
   b. 1
   c. 40
   d. 20

137. A U^{235} nuclear reactor generates energy at the rate of 3.70 x 10^7 j/s .each fission liberates 185 MeV useful energy. If the reactor has to operate for 144 x 10^4 seconds, then, the mass of the

fuel needed is (Assume Avogadro's number =6 x 10^{23}, 1eV =1.6 10^{-19}j) a. 70.5kg

b. 0.705kg

c. 13.1 kg

d. 1.31kg

138. Fissions reaction can be produced in $_{92}U^{238}$ by:

    a. Fast neutron

    b. Slow neutron

    c. Thermal neutron

    d. All of these

139. The work function of a metal is 2 eV. If a radiation of wavelength 3000 A^0 is incident on it, the maximum K.E of the emitted photoelectrons is (Planck's constant h =6.6 x 10^{-34} is velocity of light c =3 $x10^8$ m/s 1 eV =1.6 x 10^{-19}j)

    a. 4.4 x 10^{-19}j

    b. 5.6 x 10^{-19}j

    c. 3.4 x 10^{-19}j

    d. 2.5 x 10^{-19}j

140. Initially a photon of wavelength 11 falls on photocathode and emits an the wavelength of the incident photon is changed to I_2, the maximum energy of electron emitted becomes E_2.

Then value of hc (Planck's constant =h ,c = velocity of light) is

a. $hc = \frac{(E1+E2)I1I2}{I2-I1}$

b. $hc = \frac{(E1-E2)I1I2}{I2-I1}$

c. $hc = \frac{(E1+E2)(I2-I1)}{I1I2}$

d. $hc \frac{(I2-I1)}{I1I2 \ E2} E1$

(2)

12. If the measuring scale has a least count of 10 kg then in 8000 kg the significant figures are a. 4

b. 1

c. 3

d. 0

13. Which one of the following series are observed in the visible region of electromagnetic radiation

a. Lyman series

b. Balmer series

c. Bracket series

d. Pfunds series

14. The number 1678.9 should be written in scientific notation as

a. 16.789×10^3

b. 1.6789×10^3

c. 1678.9×10^3

d. None

15. Which one of the following groups has quantities that do not have the same dimensions a. Velocity, speed

b. Pressure, stress

c. Force, impulse

d. Work , energy

16. The %age errors in the measurement of mass and speed are 3% and 4% respectively. The maximum error in the measurement of K.E is

a. 11%

b. **10 5**

c. **8%**

d. **9%**

17. The vector product of two vectors is zero, when

a. They are parallel to each other

b. They are equal vectors

c. They are perpendicular to each other

d. They are inclined at angle of 60^0

18. In right hand rule, the direction of the product vector will be

a. Along the thumb erect

b. Perpendicular to the erect thumb

c. Along the rotation of fingers

d. None

19. When an object slides at constant speed down an inclined plane, the coefficient of friction may be approximately be

a. $\sin\Theta$

b. $\cos\Theta$

c. $\tan\Theta$

d. $\cot\Theta$

20. Two forces 3N and 2N are at an angle Ө such that the resultant is R the first force is now increased to 6N and the resultant becomes 2R. the value of Ө is

a. 30^0

b. 60^0

c. 90^0

d. 120^0

21. Torque acting on a body determines

a. Acceleration

b. Linear acceleration

c. Angular acceleration

d. Direction of motion of the body

22. If the velocity of a body is uniform the velocity –time graph is a straight line which is a. Parallel to x axis

b. Parallel

c. At an angle of 45^0 with the x-axis

d. Along the y-axis

23. At what angle of projection the horizontal range of a projectile is max? a. 30^0

b. 45^0

c. 60^0

d. 90^0

24. What will be the ratio of the distance moved by a freely falling body from rest in 4th and 5th second of journey

a. 4: 5

b. 7:9

c. 16:25

d. 1:1

25. According to the postulates of the theory of relativity, a fourth dimension has been added to the three dimensions already associated with a Cartesian frame of reference. Which is the fourth dimension?

a. Space

b. Inertial frame of reference

c. Speed of light

d. Time

26.   If the water fall from a dam to into a turbine wheel 19.6m below, then the velocity of water at the turbine is (Take g =9.8m/s^2)

a. 9.8m/s

b. 19.6 m/s

c. 39.2 m/s

d. 98.0 m/s

27.   The escape velocity of earth in Km/s

a. 9.75

b. 11.2

c. 12.3

d. 15.6

28.   Which is constant for a satellite in orbit?

a. Velocity

b. K.E

c. Angular momentum

d. P.E

29.   How much water a pump of 2kw can raise in one minute to a height of 10 m, (Take g =10m/s^2) a. 1000 liters

b. 1200 liters

c. 100 liters

d. 2000 liters

30. The escape velocity from the earth's surface is 11km/s. A certain planet has a radius twice that of the earth but its mean density is the same as that of the earth. The value of the escape velocity from this planet would be

a. 24km/s

b. 11km/s

c. 5.5km/s

d. 16.5km/s

31. If force and displacement of particle in the direction of force are doubled. work would be

a. Double

b. 4 times

c. Half

d. ¼ time

32. An electric motor is required to haul a cage of mass 400kg up a mineshaft through a vertical height of 1200m in 2 minutes. What will be the

electrical power required if the overall efficiency is 80%

a. 3.2kw

b. 5kw

c. 32kw

d. 50kw

33. A couple produces

a. Purely linear motion

b. Purely rotational motion

c. Linear and rotational motion

d. No motion

34. The units of angular acceleration I s

a. Radian

b. Radian per second

c. Radian per second^2

d. None

35. Once the space shuttle is in orbit at a radius R from earth's center, what force does the seat exerts on the astronaut?

a. Mg

b. Zero newton

c. M/g

d. Ng/R^2

36. In which case application of angular velocity is useful?

When body is rotating

b. When velocity of body is in a straight line

c. When velocity is in a straight line

d. None

37. If the area of a circle is equal to its circumference the radius of this circle is a. 1

b. 2

c. 3

d. 4

38. Rotational K.E of a disc is

a. $K.E_{rot} = 1/2 \ mv^2$

b. $K.E_{rot} = 1/3 \ mv^2$

c. $K.E_{rot} = 1/4 \ mv^2$

d. None

39. Which of these statements is not correct

a. Moment of inertia is independent of shape and size of the body

b. Moment of inertia depends on choice of axes

c. Momentum of inertia does not depend on the mass of body

d. None

40. A particle is moving in a vertical circle. The tensions the string when passing through two positions at angles 30^0 and 60^0 from vertical (lowest positions) are T_1 and T_2 respectively. Then a. $T_1 = T_2$

b. $T_2 > T_1$

c. $T_1 > T_2$

d. Tension in the string always remains the same

41. At terminal velocity, fluid friction is

a. Maximum

b. Minimum

c. Zero

d. Decreasing

42. $v = \sqrt{2g(h1 - h2)}\ shows\ the$

a. Equation of continuity

b. Bernoulli's theorem

c. Torricelli's theorem

d. Equation for compressible fluids

43. With the increase of temperature viscosity

Increase

b. Decrease

c. Remain constant

d. Doubles

44. In case of streamed lined flow of liquid the loss of energy is

a. Maximum

b. Minimum

c. Infinite

d. Equal to what is in turbulent flow

45. A car engine is based on the principle of

a. Bernoulli's equation

b. Ventura relation

c. Torricelli's theorem

d. None

46. When a beam of light traveling in a rare medium is reflected from a denser medium it

a. Suffers no phase change

b. Undergoes a phase change of 180^0

c. Undergoes a phase change of 270^0

d. Undergoes a phase change of 90^0

47. Two water pipes of diameters 4 cm and 8 cm are connected with a supply line. The velocity of flow of water in the pipe 4 cm diameter is

a. ¼ times

b. 4 times

c. Twice

d. ½ of 8 cm diameter pipe

48. The density of water in F.P.S system is

a. 50lb/ft²

b. 50ft/lb

c. 50ft/lb³

d. 50lb/ft³

49. Total pressure on 1 m x 1 m gate immersed vertically at a depth of 2 m below the free water surface will be

a. 1000 kg

b. 2000kg

c. 4000kg

d. 8000 kg

50. The frequency of second pendulum is

1 hertz

b. 2 hertz

c. 0.5 hertz

d. None

51. The type of motion in which an oscillating disturbance is transmitted from one position to the next without the actual rectilinear translation of the particles of the medium is called

a. Periodic motion

b. Rotatory motion

c. Wave motion

d. Rectilinear motion

52. A ball is just allowed to fall from the window of a moving train it will hit the ground following a

a. Circular path

b. Hyperbolic path

c. Straight line path

d. Parabolic path

53. Which one of the following is a simple harmonic motion?

a. Wave moving through a string fixed at both end

b. Earth spinning about its own axis

c. Ball bouncing between two rigid vertical walls

d. Particle moving in a circle with uniform speed.

54. A block weighting 40 kg extends a spring by 0.16m from its unscratched position. What is the value of k

a. 170 kg/s^2

b. 245 kg/s^2

c. 215 kg/s^2

d. 201 kg/s^2

55. A simple harmonic oscillator has a period T and energy E. the amplitude of the oscillator is doubled choose the correct answer

a. Period and energy get double

b. Period gets doubled while energy remain same

c. Energy gets doubled while Period remain same

d. Period remain same and Energy becomes 4 times

56. A particle performs simple harmonic motion of amplitude 0.020 m and frequency 2.5Hz. What is its max speed?

a. 0.008m/s

b. 0.050 m/s

c. 0.125 m/s

d. 0.314 m/s

57. Which if electromagnetic radiation has the longest wavelength? γ rays

b. UV

c. Microwaves

d. X rays

58. The length of a spring is α when a force of 4 N is applied on it the length is β when 5 N forces is applied then the length of spring when 9N force is applied is

a. 5β - 4α

b. β - α

c. 5α -4β

d. 9(β – α)

59. Two springs of spring constant k1 and K2 are joined in series. The effective spring constant of combination is given by

a. (k1 +k2)/2

b. K1+ K2

c. K1k2/(k1 + k2)

d. $\sqrt{k1 k2}$

60. The various features of wave phenomenon can be very conveniently studies by an apparatus called

a. Sonometer

b. Ripple tank

c. hydrometer

d. barometer

61. A highly directional beam of ultrasonic wave can be made to travel in water in a. many meters

b. many kilometers

c. several kilometers

d. none

62. Applications of the result of scientific studies of sound in the designs of building etc. is called

a. Optics

b. Wave mechanics

c. Acoustics

d. Statics

63. Laplace formula is derived from

a. Isothermal; change

b. Adiabatic change

c. Isobaric change

d. Isochoric change

64. In the absence of an external torque the angular momentum of a rotating body is

Constant

b. Variable

c. Unstable

d. Zero

65. Progressive waves of frequency 300 Hz are superimposed to produce a system of stationary waves in which adjacent nodes are 1.5m apart. What is the speed of the progressive waves?

a. 100m/s

b. 200m/s

c. 450 m/s

d. 900 m/s

66. Which one of the following could be the frequency of ultraviolet radiation a. 1.0×10^6 Hz

b. 1.0×10^9 Hz

c. 1.0×10^{12} Hz

d. 1.0×10^{15} Hz

67. To hear a clear echo, the reflecting surface must be at a minimum distance of a. 10m

b. 16.5m

c. 33m

d. 66m

68. Which one is not a produced by sound wave in air

a. Polarization

b. Diffraction

c. Refraction

d. Reflection

69. The conduction due to charges produced by pair generation in a semi-conductor is called

a. Polarity

b. Intrinsic conduction

c. Electrostatic

d. Amplitude modulation

70. Ever point of a wave front may be considered as a

a. Source

b. Source of wave front

c. Source of secondary wave front

d. None

71. The phenomenon of polarization occurs only in which of the following wave type

   Electromagnetic

   b. Longitudinal

   c. Mechanical waves

   d. Matter waves

(3)

1. Mass defect of an atom refers to

   a. Inaccurate measurement of mass of nucleons

   b. Mass annihilated to produce energy to bind the nucleus

   c. Packing fraction

   d. Difference in number of neutron and protons in the nucleus

2. In alternating current the average value of current in cycle is

   a. 0

   b. Constant

c. +ive

d. Max

3.   Radioactivity is purely a nuclear phenomenon , and is not affected by

a. Physical or chemical reaction

b. Temperature

c. Pressure

d. All

4.   A radioactive reaction $_{92}U^{238} \rightarrow {_{82}}Pb^{206}$. How many α and β particles are emitted? a. 10α and 6β

b. 4 proton and 8 neutrons

c. 6 electron and 8 proton

d. 8α and 6β

5.   The time taken by the entire electron pulse to reach anode , n Geiger Muller tube is a. 1 ms

b. Less than $1\mu s$

c. More than 1 μs

d. None of these

6.   Geiger Muller counter can be used to determine the

a. Range of ionizing particle

b. Mass of ionizing particle

c. Charge of ionizing particle

d. None

7. In a nuclear reaction, which of the following is conserved?

a. Atomic number only

b. Mass number only

c. Atomic number , mass number and energy

d. Energy only

8. The half-life (T) and the disintegration constant (λ) of a radioactive substance are related as a. $\lambda T = 1$

b. $\lambda T = 0.693$

c. $T/\lambda = 0.693$

d. $\lambda/T = 0.693$

9. Which of the following is true?

a. Lyman series is a continuous spectrum

b. Ballmer series is a line spectrum in the ultraviolet

c. Panchen series is a line spectrum in the infrared

d. The spectral series formula can be derived from the Ruther ford model of the hydrogen atom

10. Typical source of β- particle is

a. Radon 222

b. Cobalt 62

c. Strontium 94

d. None

11. The effect of the decrease in pressure with the increase in speed of the fluid in horizontal tube gives that

a. Torricelli effect

b. Bernoulli effect

c. Venture effect

d. Doppler's effect

12. For better resolution and clear visibility trough microscope we use

a. Longer wavelength light

b. Shorter wavelength light

c. Wavelength has no effect

d. It depend only on design of microscope not on a light

13. Which of the following processes will result into fission reaction?

a. $_{92}U^{235}$ is bombard with fast moving neutron

b. $_{92}U^{235}$ is bombard with thermal neutron

c. $_{92}U^{238}$ is bombard with slow moving neutron

d. $_{92}U^{235}$ is being unstable breaks into smaller fragments

14. Which one of the following is possible?

a. $_{7}N^{14} + {}_{0}n^{1} \rightarrow {}_{7}N^{16} + {}_{1}H^{1}$

b. $16S32 + 1H1 \rightarrow 17Cl35 + 2He4$

c. $8O16 + 0n1 \rightarrow 7N14 + 3 \ 1H1 + 2 \ -1 \ \beta \ 0$

d. $_{1}H^{1} + {}_{1}H^{1} \rightarrow {}_{2}He^{4}$

15. Which of the following is example of vector product of two vectors?

a. Linear momentum;

b. Angular momentum

c. Force

d. Electric flux

16. The radius of second orbit of hydrogen atom is
   a. $0.53A^0$
   b. $2.12A^0$
   c. $3.53A^0$
   d. $4.12 A^0$

17. Element with atomic number Z >82 are
   a. Stable
   b. Unstable
   c. Small
   d. None

18. The number of neutrons 'N' is equal to
   a. N = A-Z
   b. N = A+Z
   c. N = A x Z
   d. N = ½ A + Z

19. When sound waves move from one medium to other medium the quantity which remains unchanged is
   a. Wavelength

b. Frequency

c. Speed

d. Intensity

20. Rutherford's experiments on scattering of α particles proved that:

a. Atom is mostly empty

b. +ive charge is uniformly distributed in the atom

c. Number of +ive charge is equal to the number of -ive charge

d. Atoms contains electron

21. Which of the following source give discrete emission spectrum?

a. Incandescent electric bulb

b. Sun

c. Mercury vapor lamp

d. Candle

22. When a hydrogen atom is raised from the ground state to an excited state

a. P.E increases and K.E decreases

b. P.E decreases and K.E increases

c. Both P.E and K.E increases

d. Both P.E and K.E decreases

23. The half-life of a radioactive substance is 10 days. This mean that

a. The substance completely disintegrates in 20 days

b. The substance completely disintegrates in 40 days

c. 1/8 parts of the mass if the substance will be left intact at the end of 40 days

d. 7/8 parts of the mass if the substance disintegrates in 30 days

24. In step up transformer when the alternating voltage increases then the alternating current

a. Will increase

b. Will decrease

c. Will not change

d. None of the above

25. The transition of the electron takes place from n= 2 orbit to n=1 orbit . which if the following gives the shortest wavelength ?

a. Hydrogen atom

b. Deuterium atom

c. Single ionized helium

d. Doubly ionized helium

26. A one microfarad capacitor of a TV is subjected to 4000V Potential difference the energy stored in capacitor is

a. 8j

b. 16j

c. 4×10^{-3} j

d. 2×10^{-3} j

27. A parallel plate condenser with oil between the plates (dielectric constant of oil k =2) has a capacitance C. if the oil is removed then capacitance of the capacitor becomes

a. $\sqrt{2}\, c$

b. 2c

c. $c/\sqrt{2}$

d. c/2

28.   a metal plate of thickness half the separation
         between the capacitor plates of capacitance C is
         inserted the new capacitance is

a. C

b. C/2

c. 0

d. 2C

29.   As the electron in Bohr orbit of hydrogen atom
         passes from state n =2 to n= 1 the

Kinetic energy K and Potential energy U changes as

a. K two-fold, U also two-fold

b. K four-fold, U also four-fold

c. K four fold, U two fold

d. K two fold , U four fold

30.   In Bohr model of hydrogen atom let PE
         represent PE, and TE the total energy in going
         to a higher orbit

a. PE increases ,TE decreases

b. PE decreases,TE increases

c. PE increases ,TE increases

d. PE decreases,TE decreases

31. A photon of x rays of 10.2 eV energy is absorbed by hydrogen atom. This will raise an electron from n=1 orbit to which one of the following orbits?

a. N =2

b. n= 3

c. n =4

d. n= 5

32. aging process of the human body is slowed by motion at

a. very slow speed

b. very high speed

c. very high speed along a circular path

d. none of these

33. the amount of energy needed to remove electrons from the metal surface depends upon

a. work

b. work function

c. power

d. wavelength

34. when scattered x rays photons are observed at $\Theta =90^0$, the Compton shift $\Delta\lambda$ equal to   a. Compton shift

b. Compton wavelength

c. Full wavelength

d. None

35. The transitions of inner shell electrons in heavy atoms give

a. α rays

b. β rays

c. γ rays

d. x rays

36. the temperature scale which is independent of the nature of the working substance is a. Celsius scale

b. Fahrenheit scale

c. Centigrade scale

d. Thermodynamic scale

37.   The period of a pendulum is measured to be 3.0 s in the inertial frame of the pendulum find the period by an observer moving at 0.95 C with respect to pendulum a. 5.6s

b.   7.9s

c.   9.6s

d.   9.8s

38.   A photocell with a constant potential difference of V volt across it illuminated by a point source from a distance of 25 cm. when the source is moved to a distance of 1m. The electrons emitted by the photocell.

a.   Carry ¼th their previous energy.

b.   Are 1/16th as numerous as before

c.   Are 1/4th as numerous as before

d.   Carry 1/4th their pervious momentum

39.   The heat engine operating in reverse is called

a.   Electric generator

b.   Refrigerator

c.   Carnot engine

d.   Electric motor

40. Light of certain wave length and intensity ejects photoelectrons from a metal plate. Then this beam is replaced by another beam of smaller wavelength and smaller intensity. As a result:

   a. No change occurs
   b. Emission of photoelectrons stops
   c. K.E of the photoelectrons decreases but the strength of the photoelectric current increases
   d. K.E of the photoelectrons decreases but the strength of the photoelectric current decreases

41. In a nuclear reaction, which of the following is conserved?

   a. Atomic number only
   b. Atomic mass only
   c. Atomic number and mass number and energy
   d. Energy only

42. When a rays pass through strong uniform magnetic field , then they

   a. Do not get deflection at all
   b. get deflected in the direction of the field
   c. get deflected in the direction opposite to the field

d. get deflected in the direction perpendicular to the field

43. the frequencies of x rays , γ rays and ultra violet rays are respectively a,b, and c. then a > b, b > c

   b. a < b, b > c

   c. a < b, b < c

   d. a > b, b< c

44. emitter of the transistor has greater concentration of impurity as compared to   a. base only

   b. collector only

   c. both base and collector

   d. none

45. Two inputs of nand gates are shorted. This gate is equivalent to

   a. or gate

   b. and gate

   c. not gate

   d. xor gate

46. In L.C.R series A.C circuit, the phase angle between current and voltage is

   a. Any angle between 0 and $\pm\frac{\pi}{2}$

   b. $\frac{\pi}{2}$

   c. π

    d. Any angle between 0 and π 2

47. The force on electron in electric field of 10^8 N/C

    a. 1.6×10^{-4}

    b. 1.6×10^{-8}

    c. 1.6×10^{-10}

    d. 1.6×10^{-11}

48. Cause of heat production in a current carrying conductors is

    a. Collisions of free electrons with one another

    b. High drift speed of free electrons

    c. Collision of free electrons with atoms or ions of conductor

    d. High resistance value

49. A point charge Q is placed at the mid-point of a line joining two charges, 4 q and q. if the net force on charges q is 0, then Q must be equal to

    –q

    +q

    -2q

    +4q

50. Find the average speed of oxygen molecule in the air at S.T.P

591m /s b. 461m/s

c. 396m/s

d. 372m/s

51.　　The life time of an ordinary excited state is

a. 10^{-35} sec

b. 10^{-8} sec

c. 10^{-3} sec

d. 0.1 sec

52.　　In case of a vibrating pendulum the potential energy is maximum at

a. Mean position

b. Extreme position

c. Both A and B

d. None

53.　　With the increase of temperature viscosity.

a. Increase

b. Decrease

c. Remain same

d. Doubles

54.　　The unit of angular acceleration is

a. Radian

b. Radian per second

c. Radian per second^2

d. None

55. A body moves a distance of 10 m along a straight line under the action of a force of 5 newton if the work done is 25 joules, the angle which the force takes with the direction of motion of the body is

a. 0^0

b. 30^0

c. 60^0

d. 90^0

56. The horizontal range of a projectile, at a certain place, depends upon:

a. The mass of the projectile

b. The velocity of the projection

c. The angle of the projection

d. The angle and as well as velocity of the projection

57. The dot product of two vectors is negative is

They are parallel vectors

b. They are perpendicular vectors

c. They are anti-parallel vectors

d. They are negative vectors

58. From the following pairs, choose the pair that does not have identical dimensions

a. Angular momentum and Planck constant

b. Moment of inertia and moment of force

c. Work and torque

d. Impulse and momentum 139. Resistive forces are:

a. Non conservative

b. Conservative

c. Both A and B

d. None

140. Si unit of the intensity of wave is

a. jm-2 s-2

b. jm-1 s-1

c. wm^{-2}

d. jm^{-2}

(4)

8. The angle subtended at the center of sphere by its surface area is equal to :
   a. $4/3\,\pi$ radian
   b. $4/3\,\pi$ steradian
   c. $4\,\pi$ steradian
   d. $2\,\pi$ steradian

9. If 7.635 and 4.81 are two significant numbers, their multiplication in significant digits is
   a. 36.72435
   b. 36.724
   c. 36.72
   d. 36.7

10. The magnitude of the resultant of two forces is 2F. if the magnitude of each force is F, then angle b/w these forces is
    a. 0^0
    b. 90^0
    c. 120^0
    d. 180^0

11. I(k x j) is equal to
    a. -1

b. **0**

c. **1**

d. **2**

12.   Three vectors of equal magnitude are acting on the three sides of an equilateral triangle. The magnitude of their resultant is

a. **0**

b. **3**

c. **√3**

d. **1.72**

13.   The physical quantity which produces angular acceleration in the body is

a. **Force**

b. **Moment of inertia**

c. **Impulse**

d. **Torque**

14.   The point at which an applied force produces linear motion but no rotatory motion is a. Mid-point

b. **Centre of gravity**

c. **Optical center**

d. **Pole**

15. Bodies which fall freely under the action of gravity is an example of

a. Uniform acceleration

b. Variable acceleration

c. Uniform velocity

d. Average velocity

16. Crystalline solids have the properties such as

a. Regular arrangement

b. Covalent arrangement

c. Somewhat defective

d. All of them

17. A man throws a ball vertically upward in a compartment of an accelerated train. The ball will fall a. In front of him

b. In his hand

c. Behind him

d. Beside him

18. A bomber drops a bomb, when it is vertically above the target. It misses the target because of

a. Vertical component of the velocity of bomber

b. Forces of gravity

c. Acceleration of the bomber

d. Horizontal component of the velocity of bomber

19. The property of the moving object by virtue of which it experts forces on the object that tries to stop it is

a. Inertia of body

b. Quantity of motion of body

c. acceleration of body

d. all of these

20. the dot product of force and velocity is equal to

a. power

b. impulse

c. couple

d. momentum

21. the escape velocity from the earth gravitational field depend upon

a. rotation of earth

b. mass of body

c. radius of body

d. mass of earth

22. if the velocity of a body becomes half, the kinetic energy of body will become

a. one fourth
b. double
c. four times
d. half

23. a 60kg man In a lift which is moving upward with an acceleration of 4.8m/s^2 will have apparent weight of

a. 588N
b. 294N
c. 58.8N
d. 882N

24. The apparent weight of pilot when diving down in a jet plane with an acceleration of 9.8m/s^2 will become

a. Double
b. Half
c. –ive
d. 0

25. The geostationary satellites are

a. Stationary W.R.T earth

b. rotating W.R.T earth

c. rotating very fast

d. rotating very slow

26. $[ML^{-1}T^{-1}]$ are the dimensions of

a. Angular momentum

b. Power

c. Impulse

d. Viscosity

27. A two meter high tank is full of water a hole is made in the middle of the tank. The speed of efflux is

a. 4.9m/s

b. 9.8m/s

c. 4.42m/s

d. 3.75m/s

28. The quantity which specifies the displacement as well as the direction of motion in simple harmonic motion is the

a. Phase angle

b. Angular frequency

c. Path difference

d. None

29. The number of loops in stationary waves depends upon

a. Velocity of waves

b. Wavelength of wave

c. Nature of the medium

d. Frequency of waves

30. When the light enters from air to glass, it suffers a change in the

a. Wavelength of light

b. speed of light

c. Frequency of light

d. Wavelength and speed of light

31. Which one of the following properties of light does not change with the nature of medium? a. Frequency of light

b. Wavelength of light

c. speed of light

d. all of these

32. we can hear sound around the corner but cannot see because of

a. interface

b. diffraction

c. polarization

d. dispersion

33. The powers of the objective and eye piece of telescope are 0.5 diopter and 10 diopter respectively. The magnifying power of telescope is

a. 0.5

b. 10

c. 20

d. 0.05

34. At constant temperature when the volume of the given mass of gas is doubled its density becomes

a. Double

b. one fourth

c. four times

d. half

35. the process which is performed quickly is

a. isobaric process

b. adiabatic process

c. isothermal process

d. isochoric process

36. the correct expression for the coulomb's law/force is

a. $F = (1/k)(q1q2/r^2)$

b. $F = (k)(q1q2/r^2)$

c. $F = 4\pi \in (q1q2/r^2)$

d. $F = (k)(r^2/ q1q2)$

37. The wave nature of an electron is illustrated by its

a. Photoelectric effect

b. Compton effect

c. Penetrating effect

d. Diffraction

38. The potential gradient between the two charged plates having , separation of 0.5cm and potential difference of 12 volts is

a. 240 NC^{-1}

b. 24 NC^{-1}

c. 2.4 NC^{-1}

d. 2400 NC^{-1}

39. The rate of change of electric potential w.r.t displacement is equal to
   a. Potential gradient
   b. Electric potential energy
   c. Electric intensity
   d. Electric flux

40. A wire of uniform cross section A, length 1 and resistance R is cut into two equal pieces. The resistivity of each piece will be
   a. The same
   b. One fourth
   c. Double
   d. One half

41. Two metallic conductors have the same value of resistivity. These conductors can be differentiated from the values of their
   a. Temperature coefficient
   b. Resistance
   c. Conductance
   d. Conductivity

42. Two metallic wires are lying parallel. If the current in these wires be flowing in the same direction, the wires will :

a. Attract each other

b. Repel each other

c. Have no force of attraction or repulsion

d. Remain stationary

43. The S.I unit of magnetic flux is weber which is equal to :

a. Nm/A

b. Nm^2/A^1

c. NA/ m^1

d. NA/ m^2

44. An electron and proton are projected with same velocity normal to magnetic field which one will suffer greater deflection

a. Proton

b. Electron

c. Both will suffer greater defection

d. None

45. The magnetic field due to current in solenoids can be increased by

a. Increasing the number of turns per unit length

b. Using soft iron core

c. Increasing the current

d. All of these

46. Volt x second /ampere is equal to

a. Gauss

b. Weber

c. Henry

d. Tesla

47. The counter torque produced in the moving coil of generator is called

a. Restoring torque

b. Deflection torque

c. Back motor torque

d. All of these

48. The inductive reactance of the   coil having inductance of 0.5 henry in which AC of 50hz flows is   a. 94.2 ohm

b. 1.57 ohm

c. 157 ohm

d. 9.4 ohm

49. In RLC series circuit when the frequency of AC source is very low, The circuit is a/ an a. Resistive circuit

b. Capacitive circuit

c. Inductive circuit

d. Resonant circuit

50. Which of the following makes the motion of a perpetual   motion   machine   a   physical impossibility

a. First law of thermodynamics

b. Second law of thermodynamics

c. Third law of thermodynamics

d. None of these

51. The process of combining low frequency signal with high frequency carries waves is called a. Rectification

b. Amplification

c. Modulation

d. Magnification

52. The ratio of volumetric strain to volumetric stress is called

a. Compressibility

b. Young's modulus

c. Bulk's modulus

d. Plastic modulus

53. The substance which undergoes plastic deformation until it breaks is :

a. Ductile substance

b. Brittle substance

c. Plastic substance

d. All of these

54. Choose the region of the spectrum which would be used to determine the structure of crystalline solids

a. Visible

b. Infrared

c. X rays

d. Ultraviolet

55. The depletion region contains

a. Electron

b. Holes

c. Electrons and holes

d. No holes and electrons

56. The process by which the potential barrier of the depletion region can be increased or decreased is called

a. Amplification
b. Biasing
c. Modulation
d. Doping

57. The color of light emitted by light   emitting diode depends upon

a. Forward voltage
b. Reverse current
c. Forward current
d. Type of semiconductors

58. The combination of AND and NOT gate is called

a. NAND gate
b. NOR gate
c. OR gate
d. XOR gate

59.   If the temperature of the black body becomes double the intensity of radiation from it will become

a. Double

b. Four time

c. Six times

d. Sixteen time

60.   The scattering angle for which the Compton shift in wavelength is equal to Compton wavelength is

a. $\Theta = 90^o$

b. $\Theta = 0^o$

c. $\Theta = 45^o$

d. $\Theta = 180^o$

61.   The threshold frequency for a metal having work function 6.5e.V is

a. 6.4×10^{-19} HZ

b. 6.4×10^{-34} HZ

c. 1.5×10^{15} HZ

d. 1.5×10^{-15} HZ

62.   The uncertainty in energy of photon which is emitted from an atom radiating for 104 second is

a. 4×10^{-7} joules

b. 4×10^{-17} eV

c. 6.6×10^{-20} eV

d. 4×10 joule

63. If an atom exists in the excited state n =5, the maximum number of transition takes place is a. 6

b. 4

c. 10

d. 3

64. When the voltage of the target in the x ray tube increases then the

a. Penetrating power of x rays increase

b. Intensity of x ray increases

c. Wavelength of x ray increase

d. All of these

65. The frequency of light having wavelength 3×10^{-3}

a. 1×10^6

b. 1×10^7

c. 10×10^{10}

d. 1×10^{13}

66. The situation in which then excited state i.e metastable state contains more number of electrons than the ground is called
   a. Ionized state
   b. Stimulation state
   c. Population state
   d. All of these

67. The excited state which persists for unusually longer period of time is called
   a. Ground state
   b. Ionized state
   c. Metastable state
   d. Ordinary excited state

(5)

67) What type of science is physics?
   a. Living things
   b. Nonliving things
   c. Experimental science
   d. Study of action and reaction and experimental science

68) The magnitude of the resultant of two forces Is 2F. if the magnitude of each force Is F, then the angle between these forces is

a. 0^0

b. 90^0

c. 120^0

d. 180^0

69) If the measuring scale has a least count of 10kg then in 8000kg the significant figures are a. 4

b. 1

c. 3

d. 0

70) Supplementary S.I units of radian and steradian were established to measure

a. Geometrical quantities

b. Luminous intensity

c. Electric current

d. Temperature

71) S.I unit of magnetic flux is

a. Weber meter ^{2}

b. Weber

c. Weber /meter

d. Weber / meter^4

72) The physical quantity which produces angular acceleration in the body is

a. Force

b. Moment of inertia

c. Impulse

d. Torque

73) When a vector is multiplied by a scalar of positive value, the product of the quantity will be

a. Multiple of the vector quantity in same direction

b. Multiple of the vector quantity in opposite direction

c. Multiple of the vector quantity in perpendicular to the original vector

d. None of these

74) The magnitude of the vector A,B and C are respectively 12,5 and 13 units and vector A+B=C then the angle between vector A and B is

a. 0

b. π

c. $\pi/2$

d. $\pi/4$

90) No Work Is done by the body when angle between forces and displacement is a. 0^0

b. 45^0

c. 90^0

d. 60^0

91) If the acceleration due to gravity at the earth's surface I s $9.8m/s^2$ and the mass of the earth is 80 times that of the moon and radius of earth 4 times that moon, the value of g at the moon's surface will be

a. $9.8m/s^2$

b. $1.96 \ m/s^2$

c. $4.9m/s^2$

d. None

92) The particle of mass 'm' at rest is acted upon by a force 'p' for a time 't'. its kinetic energy after an interval 't' is

a. $P^2 \ t^2/m$

b. $P^2 \ t^2/2m$

c. $P^2 \ t^2/3m$

d. P t/2m

93) The dot product of force and velocity is equal to
a. Power
b. Impulse
c. Couple
d. Momentum

94) If a force acts on a body whose action line does not pass through its centre of gravity, then the body will experience
a. Angular acceleration
b. Linear acceleration
c. No acceleration
d. None of these

95) In which case application of angular velocity is useful?
a. When a body is rotating
b. When velocity of body is in a straight line
c. When velocity is in a straight line
d. None of these

96) Center of mass is a point
a. Which is geometric center of a body

b. From which distance of particles are same

c. Where the whole mass of the body is supposed to be cantered

d. Which is origin of reference frame

97) Angular momentum has the same unit as

a. Impulse x distance

b. Linear momentum x time

c. Work x frequency

d. Power x time

98) The flow is said to streamline or laminar when every particle

a. Moves in different direction

b. Moves along the same path as

c. Slowly moves in one direction

d. None of these

99) The pressure will be low where the speed of the fluid is

a. 0

b. high

c. low

d. constant

100) A two meter high tank is full of water. A hole is made in the middle of tank .The speed of efflux is

a. $4.9 m/s^1$

b. $9.8 m/s^1$

c. $4.42 m/s^1$

d. $3.75 m/s^1$

101) In case of a vibrating pendulum, the potential energy is maximum at

a. Mean position

b. Extreme position

c. Both a and b

d. None

102) Specific response of as system which is able to oscillate with a certain period, to an external force acting with the same period is called

a. TIME period

b. Wavelength

c. Resonance

d. Dopplar effects

103) A simple harmonic oscillator has period of 0.01 second and amplitude of 0.2m. the magnitude of the velocity in m/s at the center of oscillation is

a. 100
b. 100 π
c. 20 π
d. 40 π

104) A spherical wave front is that which has

a. A source
b. A point source
c. An extended source
d. None of these

105) We can hear sound around the corner but cannot see because of

a. Interference
b. Diffraction
c. Polarization
d. Dispersion

106) Huygens's wave theory of light cannot explain
a. Diffraction
b. Interference
c. Polarization
d. Photoelectric effect

107) The tip of a needle does not give a sharp image. It is due to
a. Polarization
b. Interference
c. Diffraction
d. none

108) sun has elliptical shape when it rises and sets due to
a. Refraction
b. Reflection
c. Scattering
d. Dispersion

109) Number of electric lines of force passing through a certain area is knownas a. Electric field
b. Electric flux
c. Electric intensity

d. Gravitational field

110) When a ray of light enters a glass slab from air

a. Its wavelength night increases

b. Neither Its wavelength nor its frequency changes

c. its frequency increases

d. Its wavelength decreases

111) Which of the following statements is correct for any thermodynamic system?

a. The internal energy changes in all processes

b. Internal energy and entropy are state functions

c. The change in entropy can never be 0

d. The work done in an adiabatic process is always 0

112) Kelvin scale can be applied ar very low temperature because

a. It is independent of nature of working substance

b. It is linear over a wide range of temperature

c. It is based on triple point of water

d. None

113) Two metal rods A and have their initial length in the ratio 2:3 and coefficients of linear expansion in the ratio of 4:3. When they are heated through same temperature difference the ratio of their linear expansion is

a. 1:2
b. 2:3
c. 3:4
d. 8:9

114) Melting point of ice is

a. Increases with increasing pressure
b. Decreases with increasing pressure
c. Is independent of pressure
d. Is proportional to pressure

115) Two metallic wires are lying parallel. If the current In these wires be flowing in same direction, the wires will :

a. Attract each other
b. Repel each other
c. Have no force of attraction or repulsion
d. Remain stationary

116) On moving a charge of 20 coulombs by 2 cm, 2J of work is done then the potential difference between the points is

a. 0.1v

b. 8v

c. 2v

d. 0.5v

117) In a millikan's oil drop experiment the charge on an oil drop is calculated to be 6.35 x 10^{-19}C. the number of excess electrons on the drop is

a. 3.9

b. 4

c. 4.2

d. 6

118) A charge Q is divided into two parts q and Q-q and separated by a distance R.The force of repulsion between them will be maximum when:

a. q = Q/4

b. q =Q/2

c. q =Q

d. none

119) The color coded resistances are made by
a. High grade silver rods
b. High grade ceramic rods
c. High grade copper rods
d. High grade iron rods

120) A wire of radius r has resistances R.if it is stretched to a wire of r/2 radius, then the resistance becomes
a. 2R
b. 4R
c. 16R
d. Zero

121) A uniform resistance wire of length L and diameter d has a resistance R.Another wire of same material has length, 4L and diameter 2d , the resistance will be
a. 2R
b. R
c. R/2
d. R/4

122) In RLC series circuit when the frequency of AC source is very low the circuit is a /an a. Resistive circuit
b. Capacitive circuit
c. Inductive circuit
d. Resonant circuit

123) An electron of charge e coulomb passes through a potential difference of V volts. Its energy in 'joules' will be
a. V/e
b. eV
c. e/V
d. V

124) The resistance of voltmeter must have very high resistance because
a. It does not draw any current
b. It is very accurate
c. It does not change circuit current considerably
d. None of these

125) The voltage that is applied across the X plates is usually provided by a circuit that is built in the CRO. It is known as

a. Time base generator

b. Electric base generator

c. X supplier

d. Power supply

126) A voltmeter has resistance of 2000 ohms and it can measure up to 2V. if we want to increase its range to 10V then required resistance in series will be

a. 2000 $\acute{\Omega}$

b. 4000 $\acute{\Omega}$

c. 6000 $\acute{\Omega}$

d. 8000 $\acute{\Omega}$

127) In A.C. through capacitor circuit the v and q are as

a. V leads q

b. V legs q

c. V and q are in phase

d. None of these

128) At resonance, the phase angle for RLC series resonance circuit equals a. 0^0

b. 90^0

c. 180^0

d. 270^0

129)   An inductor coil when consume no energy is called

a. A coil

b. Choke

c. Toroid

d. None

130)   The color of light by light emitting diode depends upon:

a. Forward voltage

b. Reverse current

c. Forward current

d. Type of semiconductor

131)   Which one of the following physical quantities does not have the dimensions of force per unit area

a. Stress

b. Strain

c. Young's modulus

d. Pressure

132) The bulk properties of materials such as their mode of fracture can be related to their a. Polymerization

b. Cleavage

c. Microstructure

d. Dislocation

133) The bonding in an inert gas crystal is due to

a. Metallic binding

b. Covalent bonding

c. Ionic binding

d. Vander waals binding

134) A certain transistor has collector current of 10 mA and a base current of 40uA. What is the current gain of the transistor?

a. 150

b. 250

c. 300

d. None

135) In a full wave rectifier with input frequency 50 Hz the ripple in the output is mainly of the frequency (in Hz).

a. 25

b. 50

c. 100

d. None

136) If an atom exists in the excited state n=5, the maximum number of transition takes place is :

a. 6

b. 4

c. 10

d. 3

137) In a common base amplifier, the phase difference between the input signal voltage and output voltage is

a. π

b. π/4

c. π/2

d. 0

138) If we consider electrons and photons of the same wavelength , then they will have the same

a. Velocity

b. Angular momentum

c. Energy

d. Momentum

139) The situation in which then excited state i.e. metastable state contains more number of electrons than the ground is called:

a. Ionized state

b. Stimulations

c. Population inversion

d. All of these

140) The minimum energy in electron volt required to strip off ten times ionized sodium atom (i.e. z=11) of its last electron is

a. 13.6MeV

b. 13.6 x11 eV

c. 13.6×11^2eV

d. 13.6×11^3eV