FULL LENGTH PAPER PHYSICS

Q.1 The dimensions for angular displacement is

A) $[L^{-1}]$
B) [T]
C) [L]
D) Dimensionless

Q.2 Which of the following is not a S.I. base quantity

A) Mass
B) Intensity of light
C) Velocity
D) Length

Q.3 Which of the following objects have every point on its surface equidistant from its centre of weight (centre of gravity):

A) An egg
B) A cubic box
C) A table tennis ball
D) A triangle

Q.4 Which of the following statements is false

A) The centre of gravity of a rectangular plate is at the point of intersection of its diagonals
B) The centre of gravity of a thin uniform rod is halfway along the rod
C) The centre of gravity of a square plate is at the point of its balance
D) The centre of gravity of a triangular plate is at one of its vertices

Q.5 Ideal fluid is

A) Incompressible
B) Steady flow
C) Non – viscous
D) All of these

Q.6 A fluid entering a pipe from a point of larger cross section and exits from the point of the same pipe having smaller cross section. Its pressure energy at the exit would

A) Decrease because of high velocity
B) Increase because of high velocity
C) Remains the same as inlet pressure
D) Increases because of low velocity

$P \propto \frac{1}{v} \propto A$

Q.7 What do you infer from the Bernoulli's equation:

A) This theorem is valid only for the turbulent flow of the fluid
B) Where the speed of the fluid is high, the pressure would be low
C) Where the speed is high, the pressure would be low

D) All of the above

Q.8 The value of absolute zero on Fahrenheit scale:

A) 359.4°F
B) -459.4°F
C) 100°F
D) -259.4°F

Q.9 1 Sv is equal to

(A) 0.01 rem
(C) 1 rad
(B) 100 rem
(D) 0.01 Gy

Q.10 The normal temperature of a human body on centigrade scale is:

A) 98.6°
B) 40°
C) 37°
D) 459.4°

Q.11 In S.H.M the K.E at the equilibrium position is:

A) Zero as the acceleration is zero
B) Minimum as the instantaneous displacement is zero
C) Minimum as the instantaneous displacement is zero
D) Maximum as the velocity is maximum

Q.12. Maximum acceleration with zero velocity is possible only for:

A) Non inertial frame of reference
B) Rotational motion
C) Simple harmonic motion
D) Random motion

Q.13 When a source is moving towards a stationary observer, the apparent change in frequency will be:

A) Greater than the original frequency
B) Remains the same as that of original frequency
C) Smaller than the original frequency
D) None of the above

Q.14 A technique for detecting the pressure of objects under water by acoustical echo is called

A) Doppler effect
B) Sonar
C) Radar
D) Red shift

Q.15 Two unequal resistances are connected parallel across a battery. Which of the following statement is true?

A) Same current will flow through both resistances.
B) Current through smaller resistance is higher.
C) Current through larger resistance is higher.
D) Current can be higher in any resistance depending on emf of the cell.

Q.16 If the waves interfere constructively, the amplitude of the resulting wave would be:

A) Less than either of the individual wave
B) Greater than either of the individual wave
C) Equal to the shortest of the individual waves

D) Equal to the greatest of the individual wave

Q.17 **Thin film of oil on water shows colour pattern when illuminated by white light due to**

A) Interference
B) Dispersion
C) Polarization
D) Scattering

Q.18 **Monochromatic light means the light having:**

A) One colour
B) Single frequency
C) Single wavelength
D) All of above

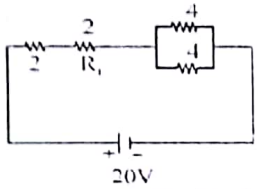
Q.19 **If two or more resistors are joined side by side, this combination is called:**

A) Series combination of resistors
B) Parallel combination of resistors
C) Y delta combination of resistors
D) None of the above

Q.20 **Which of the following quantities remain the same in/across the resistors connected in series Combination?**

A) Charge flow
B) Current
C) Both of the above
D) Voltage

Q.21 **What is voltage across R_L is the given circuit**



A) 3.6 V
B) 6.3 V
C) 12 V
D) 10V

Q.22 **The strength of the magnetic field outside a solenoid is weak because:**

A) Lines of force are quite far from each other
B) The lines of force are in the same direction and tend to cancel out the effect of each other
C) The lines of force are opposite to each other and tend to cancel out the effect of each other
D) Both a and c are correct

Q.23 **The direction of magnetic field as given by Fleming's rule for the solenoid is along:**

A) Normal to the solenoid
B) The axis of the solenoid
C) Can't be taken
D) None of the above

Q.24 **The direction of magnetic field at a point on the magnetic lines of force can be taken along:**

A) Normal at that point
C) The tangent at that point

B) Axis of the magnetic line of force at that point D) Perpendicular to the axis of the solenoid

Q.25 Shear stress addresses to the:

A) Volume changes due to the applied stress **C)Shape changes due to the applied stress**

B) Length changes due to the applied stress D) All of the above

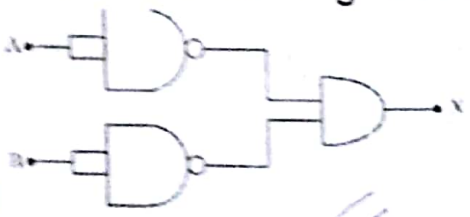
Q.26. The substances undergoing plastic deformation until they break are known as

A) Brittle substances C) Elastic substances

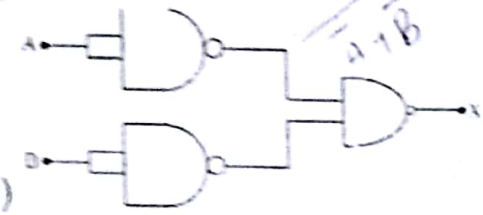
B) Ductile substances D) Plastic substances

Q.27 Which of the following will represent OR gate

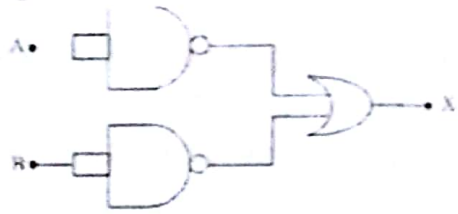
A)



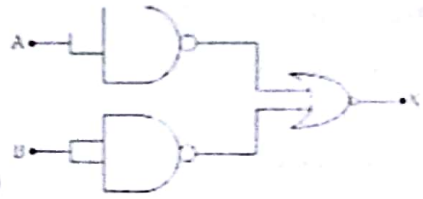
B)



C)



D)



Q.28 Energy of the electromagnetic radiation is far more than 1.02 MeV. The dominant process will be

A) photoelectric effect **C) materialization of energy**

B) Compton scattering D) all are equally probable

Q.29 The target in the X ray unit is given a:

A) Zero potential C) Low negative potential

B) High negative potential **D) positive potential**

Q.30 X rays are similar in nature to:

A) Cathode rays **C) Gamma rays**

B) Canal rays D) Beta rays

Q.31 The velocity of X rays is equal to that of:

A) Speed of sound C) Speed of α-particles

B) Speed of electron **D) Speed of light and γ-rays**

Q.32 X rays are affected by:

A) Electric field only C) Electric and magnetic field

B) Magnetic field only **D) None of these**

Q.33 The penetrating power of X rays increases with:
A) Decrease in velocity
B) Increase in frequency
C) Increase in velocity
D) Decrease in their intensity

Q.34 Q.31 Display in CRO would be stationary if input signal and saw tooth signal have same
A) Time period
B) Voltage
C) Both "A" and "B"
D) Amplitude

Q.35 K_α characteristic X rays are produced due to the transition of electrons:
A) From M to L shell
B) From N to M shell
C) From L to K shell
D) From K to L shell

Q.36 Name of the atom not used for tracer:
A) Na-34
B) I-131
C) C-14
D) C-12

Q.37 Which one is more energetic x-ray

(a) K_α x-ray
(b) K_β x-ray
(c) K_γ x-ray
(d) all kind of x-rays have same energy

Q.38 The characteristic x-rays appear as discrete lines on a
A) Discrete spectrum
B) Continuous spectrum
C) Band spectrum
D) All of these

Q.39 A detector which can count fast and operate at low voltages is
A) G.M. counter
B) Solid state detector
C) Wilson could chamber
D) Bubble chamber

Q.40 Biological effect of radiation depends upon
A) Ionization power of radiation
B) Nature of part of body
C) Both "A" and "B"
D) Nature of material emitting the radiation

Q.41 The unit of the rate of absorption of a radiation to have the same biological effects on different parts of the human body is called a:
A) roentgen
B) rem
C) rad
D) curie

Q.42 A method of recording and producing three dimensional image is named as
(A) interference
(B) diffraction
(C) holography
(D) topography

Q.43 Pressure of a gas is:

A) Proportional to the average translational K.E.
B) Proportional to the absolute temperature
C) Both of the above
D) Proportional to the volume only

Q.44 In solid state detector ____ is used.

(A) silicon
(B) germanium
(C) tin
(D) both Si and Ge

Q.45 Which of the following is not a S.I. base unit:

A) kg
B) ampere
C) cd
D) Coulomb

Q.46 Which of the materials is/are fluorescent?

A) zinc sulphide
B) sodium iodide
C) barium platinocyanide
D) all of these

Q.47 Centre of gravity of a body lies:

A) Inside a body
B) Outside a body
C) May be inside or outside a body
D) None of the above

Q.48 A body is moving in a circle with constant speed, which of the following statement about the body is true:

A) There is no force acting towards the centre of the circle
B) There is no any acceleration
C) There is a force acting at a tangent to a circle
D) K. E of body remains constant

Q.49 Blood pressure measuring instrument is called:

A) Stethoscope
B) Sphygmomanometer
C) Sino scope
D) Spectroscope

Q.50 If m = mass of electron h = Planck's constant and C = speed of light then the dimension of $\frac{h}{mc}$ is

A) T
B) L
C) L^{-1}
C) T^{-1}

Q.51 If earth stop spinning about polar axis then weight of object on earth

A) Remain same
B) Increases
C) Decreases
D) Become zero

Q.52 During an adiabatic expansion of 2 moles of gas, the internal energy of the gas is found to decrease by 2 joule, the work done during the process on the gas will be equal to

A) 1 J
B) -1 J
C) 2 J
D) -2 J

Q.53 **Mercury is used as a thermometric substance because:**
A) Its expansion is linear over a wide range of temperature
B) Its is sensitive to heat because of its low specific heat
C) It is easily distinct able and visible
D) All of the above

Q.54 **At what temperature, the Fahrenheit and Kelvin scale will have the same reading:**
A) 574.25°
B) 425.4°
C) 450.4°
D) 375.4°

Q.55 **An oil film spreading over a wet footpath shows colour shows colour due to:**
A) Dispersion of light waves
B) Diffraction of light waves
C) Interference of light waves
D) Polarization of light waves

Q.56 **The property of the bending of light around the obstacle is known as:**
A) Interference
B) Diffraction
C) Reflection
D) Less for sharp edges

Q.57 **Diffraction is the characteristic of:**
A) Particle nature of light
B) Wave nature of light
C) Dual nature of light
D) None of the above

Q.58 **Diffraction effects are:**
A) More for sharp edges
B) Less for cylindrical
C) Less for round edges
D) Polarization

Q.59 **Doppler's effect can be applied to:**
A) Sound waves in space
B) Electromagnetic waves
C) Both of the above
D) High frequency sound waves only

Q.60 **When the source of the sound approaches the listener, the frequency of the sound received by the observer will be:**
A) Less than the frequency of the sound produced by the source
B) Greater than the frequency of the sound produced by the source
C) Same as that produced by the source
D) Zero

Q.61 **A source of sound having a frequency "f" is moving with the velocity "u" towards a stationary listener. If "v" is the velocity of the sound, then the apparent frequency of the sound heard by the observer would be:**
A) vf/(v + u)
B) (v ± u/v)f
C) vf/(v - u)
D) (v - u/v)f

Q.62 In a Radar system designed in accordance with Doppler's effect, if an airplane is approaching the Radar, then the wavelength of the reflected wave from the airplane would be:

A) Either smaller or larger than the transmitting wave
B) Larger than the transmitting wave
C) Same as that of the transmitting wave
D) Smaller than the transmitting wave

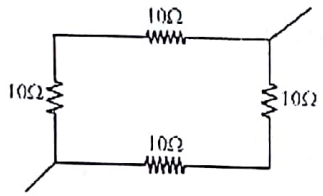
Q.63 When resistances are connected in series, the equivalent resistance is equal to:

A) Product of the reciprocals of the individual resistances
B) Sum of the reciprocals of the individual resistances
C) Product of the individual resistances
D) Sum of the individual resistances

Q.64 If a radio and a bulb each of resistance 3Ω are connected in series to a 12V battery, the potential difference across each will be:

A) 3V
B) 6V
C) 9V
D) 12V

Q.65 Four wires of equal length and of resistance 10 W each are connected in the form of a square. The equivalent resistance between two opposite corners of the square is



A) 10 W
B) 20 Ω
C) 40 Ω
D) 5/2Ω

Q.66 Path difference for constructive interference is written as

(A) $\frac{nl}{2}$
(B) nλ
(C) $(2n+1)\frac{\lambda}{2}$
(D) $(2n+\frac{1}{2})\frac{\lambda}{2}$

Q.67 Which of the following can be used in visualizing detailed internal human structures:

A) Magnetic resonance imaging (MRI)
B) Magnetic resonance tomography (MRT)
C) CT scanning
D) All of the above

Q.68 MRI is preferred over computed tomography (CT) because:

A) It involves no any ionizing radiations
B) Differentiate between soft and hard tissues and is more beneficial for brain and heart scanning as compared to CT scanning
C) Both of the above

D) Nuclear magnetic resonance imaging (NMRI)

Q.69 Within the elastic limit, the ratio between the applied tensile stress to the produced tensile strain is called:

A) Elasticity modulus
B) Bulk modulus
C) Young's modulus
D) Shear modulus

Q.70 The ratio of shear stress and shear strain is called

A) Young's modulus
B) Shear modulus
C) Bulk modulus
D) Compressive modulus

Q.71 A NOR gate is ON only when:

A) Both inputs 0
B) Both inputs 1
C) Either inputs 0
D) All of above

Q.72 Which one of the following is not a logic operation:

A) AND operation
B) OR operation
C) Division
D) NOT operation

Q.73 X rays can cause ionization in:

A) Conductors
B) Semi-conductors
C) Solid insulators
D) Gases

Q.74 X rays are diffracted by:

A) Diffraction grating
B) Crystal lattice
C) Glass grating
D) None of Above

Q.75 An electron from K shell is knocked out and an other electron jumps from a higher shell to fill it. The energy is released by the second electron in the form of:

A) Light rays
B) X rays
C) Gamma rays
D) Beta rays

Q.76 X – rays break molecular bonds and create highly reactive free radicals which in turn can disturb molecular structure of proteins especially

A) Bones
B) Blood Cells
C) Genetic material
D) None of these

Q.77 The electron structures of atoms are not involved in the emission of:

A) Spectral lines
B) Gamma rays
C) Photo electrons
D) X rays

Q.78 Laser is an intense beam of light which is:

A) Mono chromatic
B) Collimated
C) Coherent
D) All of the above

Q.79 Laser beam can be used to generate three dimensional images of objects in a process called:
A) Tomography
B) Holography
C) Electrography
D) Xerography

Q.80 Alpha radiations are not recommended for the treatment of patients because:
A) They are highly ionizing
B) They are helium nuclei
C) They are less penetrating
D) They are positively charged

Q.81 Which of the following radiation are suitable for the treatment of flesh just under the skin:
A) Alpha radiations
B) Beta radiations
C) Gamma radiations
D) X rays

Q.82 In Wilson cloud chamber, the gamma rays leave:
A) Thick and continuous tracks
B) Thick and discontinuous tracks
C) Dense and continuous tracks
D) No definite tracks

Q.83 When a radioactive isotope $_{88}Ra^{228}$ decays is series by the emission of three a-particles and a b-particle the isotope finally formed is
A) $_{84}X^{220}$
B) $_{86}X^{222}$
C) $_{83}X^{216}$
D) $_{83}X^{215}$

Q.84 Polymeric solids have _____ as compared with lightest metals
A) High specific gravity
B) Specific gravity equal to lightest metals
C) Low specific gravity
D) None of these

Q.85 The reciprocal of decay constant of a radioactive element is called its:
A) Half life
B) Mean life
C) None of the above
D) Two life

Q.86 A naturally occurring disintegration involving the emission of high energy electrons is called:
A) Alpha decay
B) Beta decay
C) Gamma decay
D) Sigma decay

Q.87 Which of the following is correct about Kinetic molecular theory of gases:
A) Momentum and K.E. after collisions among gas molecules are not conserved
B) Momentum is conserved but K.E. is not conserved
C) Both K.E. and momentum are conserved
D) None of the above

Q.88 Pressure of a gas is directly proportional to:
A) Average K.E. of its molecules
B) Average vibrational K.E. of its molecules

C) Average translational K.E. of its molecules
D) All of the above

Q.155 The dimensional formula $ML^{-1}T^{-2}$ corresponds to
A) Velocity
B) Momentum of force
C) Modulus of elasticity
D) Acceleration

Q.156 The most suitable unit for expressing nuclear radius is
A) Micron
B) Fermi
C) Angstrom
D) Nanometer

Q.157 A body acted on by two forces P and Q is in equilibrium. If force P holds the body in equilibrium which vector triangle could represent the relationship between these forces

A)


C)


B)


D)


Q.158 Which of the following objects have every point its surface equidistant from its center of weight (center of gravity)
A) An egg
B) Tennis ball
C) A triangle
D) A cubic box

Q.159 Bernoulli's principle is applicable to
A) Viscosity
B) Flow of fluids
C) Surface tension
D) Static fluid pressure

Q.160 A hole is made in the bottom of container having water filled up to height h. The velocity of water flowing out of hole is proportional to
A) h^2
B) $h^{\frac{1}{2}}$
C) h
D) h^2

Q.161 A fluid entering a pipe from a point of larger cross section exists from the point of the same pipe having smaller cross section. Its pressure energy at
A) Decrease because of high velocity
B) Remain same at this pressure
C) Increase because of high velocity
D) Increase because of low velocity

Q.162 The least binding energy per nucleon is for
A) Helium-4
B) Deuterium
C) Tritium
D) Both "B" and "C"

Q.97 If path difference between the interfering waves is n λ, the fringes obtained the screen will be

A) coloured
B) Bright
C) Dark
D) No fringe

Q.98 The refractive index of diamond is 2. The velocity of light in diamond in cms^{-1}

A) 1.5×10^{10} (1.5×10^8 m/s)
B) 6×10^{10}
C) 2×10^{10}
D) 1.5×10^{8}

Q.99 Two sources of light are said to be coherent if waves produce by them have same

A) Wavelength difference
B) Amplitude
C) Wavelength and constant phase
D) Amplitude and same wavelength

Q.100 In compound microscope intermediate image is

A) Real, erect, magnified
B) Real, inverted, magnified
C) Virtual erect, reduced
D) Virtual, erect, magnified

Q.101 Sound waves donot exhibit the phenomenon of

A) Reflection
B) Polarization
C) Diffraction
D) Refraction

Q.102 Which type of oscillation give rise to resonance

A) Free
B) Forced
C) Damped
D) All

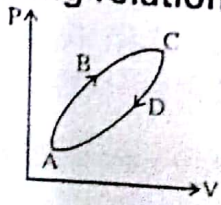
Q.103 During an adiabatic compression of 5 moles of a gas, 250 J of work was done The change in the internal energy will be

A) 50J
B) 250 J
C) -150 J
D) -250J

Q.104 A carnot engine absorbs heat at 127°C and rejects heat at 87°C. The efficiency of the engine is

A) 10%
B) 20%
C) 50%
D) 30%

Q.105 The fig shows P-V graph of cyclic process. If DQ is the heat energy supplied to the system, DU is the internal energy of the system and DW is the work done by the system, then which of following relation is correct



A) $\Delta Q = \Delta U - \Delta W$
C) $\Delta Q = \Delta W$

B) $\Delta U = 0$

D) $\Delta Q = -\Delta U$

Q.106 The first law of thermodynamics confirms the law of conservation of

A) Momentum
B) Man
C) Charge
D) None

Q.107 For certain gas C_P/C_V=1.5 for gas

A) $C_v = 3R$
B) $C_p = 3R_1$
C) $C_p = 5R$
D) $C_v = 5R$

Q.108 Certain substances loose their resistance completely at finite low temperature are called

A) Dielectric
B) Perfect conductors
C) Super conductors
D) Semi-conductors

Q.109 A nuclear reaction is represented by the eq: $^{16}_{8}O + ^{4}_{2}He \longrightarrow ^{19}_{9}F + X$ **What is particle X?**

A) An X-particle
B) A neutron
C) A *b* -particle
D) A proton

Q.110 A capacitor is a perfect insulator for

A) A.C
B) D.C
C) Both
D) None of these

Q.111 Four resistances 2W, 4W, 6W, 8W are connected in series having current 10A. find potential differences

A) 600V
B) 400V
C) 200V
D) 220V

Q.112 A truth table is shown below

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

Which of the following gate has this truth table

A) XOR
B) NOR
C) AND
D) OR

Q.113 A b-particle is emitted by a radioactive nucleus at the time of conversion of

A) A neutron into proton
B) A neutron into energy
C) A proton into neutron
D) A positron into energy

Q.114 Hardness or softness of X-rays is determined by

A) Filament current
B) Hardness of target

C) Low pressure of Coolidge tube
D) Potential difference between cathode and anti cathode

Q.115 The greatest stress that a material can endure with out losing straight line proportionality between stress and strain is called
A) Plasticity
B) Fracture stress
C) Proportional limit
D) Brittle stress

Q.116 Low level radiation effects are
A) Loss of hair
B) Ulceration
C) Also in white cells
D) All of these

Q.117 $_{90}Th^{234}$ is a source of
A) α-particle
B) β-particle
C) γ radiation
D) All

Q.118 Which controls the brightness of graph in CRO
A) Deflecting plates
B) Grid
C) Cathode
D) Anode

Q.119 X – rays are
A) Electromagnetic radiation of high frequency
B) B) Electromagnetic radiation of low frequency
C) Beam of electrons
D) Beam +ve ions

Q.120 X–rays which can penetrate through longer distances in substances are called
A) Soft x – rays
B) Hard x – rays
C) Continuous x – rays
D) None of these

Q.121 If the electron in the K shell is removed and an electron from L shell jumps to occupy the hole in the K shell, it emits a photon of energy
A) $hf_{k\alpha} = E_L - E_K$
B) $hf_{k\alpha} = E_K - E_L$
C) $hc = E_L - E_K$
D) $h/\lambda_{k\alpha} = E_L - E_K$

Q.122 In beta decay
A) The parent or daughter nuclei have same number of protons
B) The daughter nucleus has one proton less than parent nucleus
C) The daughter nucleus has one proton more than nucleus
D) The daughter nucleus has one neutron more than the parent nucleus

Q.123 The K-series characteristic X-rays photons have energy given by the formula
A) $E_L - E_K$
B) $E_M - E_K$
C) $E_P - E_K$
D) All of these

Q.124 Which of the following is emitted with the same energy from a radioactive substance
A) α – partied
B) β – partied
C) γ – rays
D) All of these

Q.125 G.M counter is not suitable for fast counting because of its
A) Small dead time
C) Small pulse time

B) Long dead time
D) Long pulse time

Q.126 Tracers are widely used in
A) Medicine
B) Agriculture
C) Identifying faults in metals
D) All of these

Q.127 In case of normal adjustment of microscope final image is formed at
A) 2f
B) Near point
C) f
D) Infinity

Q.128 The radioactive elements polonium and radium were discovered by the
A) Curies
B) Rutherford
C) Chadwick
D) Enrico Fermi

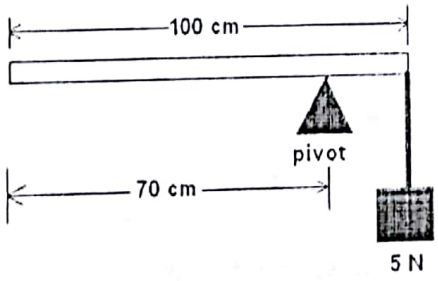
Q.129 The continuous X-ray spectrum is due to an effect known as:
A) Continuous radiation
B) Braking radiation
C) Decreasing radiation
D) Stopping radiation

Q.130 The wavelength of gamma rays is of the order of
A) 10^{-12}m
B) 10^{-12}cm
C) 10^{-12}mm
D) 10^{-12}μm

Q.131 Compton effect is associated with
A) Ultraviolet
B) X-rays
C) α-rays
D) All of these

Q.133 The velocity of a particle is given in terms of time 't' by the equation $v = at$. The dimensions of a are
A) L^2
B) LT^2
C) LT^{-2}
D) L

Q.134 A uniform rod of weight 2 N is pivoted at 70 cm mark. When the rod is horizontal, what is the resultant torque about the pivot?



A) zero
B) 1.9 N m
C) 1.1 N m
D) 1.5 N m

Q.135 Torque is _____ of moment arm and force
A) Scalar product
B) Vector product
C) Product
D) None of these

Q.136 A steel ball of mass m falls in a viscous liquid with a terminal velocity V. Another steel ball of mass 64m will fall through the same liquid with a terminal velocity

A) V
B) 4V
C) 8V
D) 16V

Q.137 A ball of mass m and radius r is released in a viscous medium of negligible density. Its terminal velocity is proportional to

A) $\sqrt{\frac{r}{m}}$
B) $\frac{m}{r}$
C) $\frac{r}{m}$
D) $\sqrt{\frac{m}{r}}$

Q.138 An incompressible fluid flows steadily through a cylindrical pipe which has radius 2R at point A and radius R at point B further along the flow direction. If the velocity at A is V, then that at B is

A) $\frac{V}{2}$
B) V
C) 2V
D) 4V

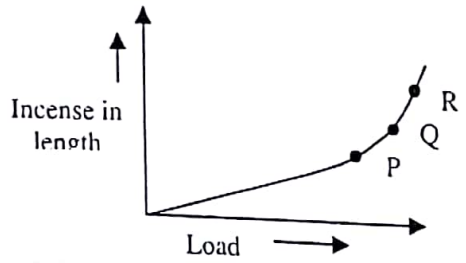
Q.139 A physical system under going forced vibrations is known as

A) harmonic oscillator
B) free oscillator
C) forced harmonic oscillator
D) driven harmonic oscillator.

Q.140 If the phase difference between two interfering beams is p. The path difference is

A) $\lambda/2$
B) λ
C) $3\lambda/2$
D) 2λ

Q.141 In the load-extension graph for a wire, the elastic limit lies between the points



(a) R and P
(c) P and R
(b) Q and P
(d) Q and R

Q.142 The thyroid uptake scans are obtained using

A) iodine-125
B) iodine-131
C) technetium-99
D) sodium-24

Q.143 A particle of mass 0.5 kg executes SHM. Its energy is 0.04 J if its time period is p seconds, its amplitude is

A) 10 cm
C) 30 cm

B) 20 cm

D) 40 cm

Q.144 The length of a second's pendulum on the surface of moon is about

A) 1/36 m

C) 6m

B) 1/6 m

D) 36m

Q.145 The radioactive isotopes carbon-14 functions as

A) γ-source

C) b-source

B) α-source

D) neutron source

Q.146 IN SHM, at the point of maximum potential energy, the ratio of v/w is

A) x_o

C) $2x_o$

B) 0

D) $x_o\sqrt{2}$

Q.147 What force is required to stretch a steel wire, $1cm^2$ in cross section, to increase its length by percent. Given young's modulus for steel = 2×10^{11} N/m^2.

A) 2×10^4N

C) 2×10^{-5}N

B) 2×10^5N

D) 2×10^6N

Q.148 Longitudinal strain can be produced in:

A) Glass

C) Water

B) Honey

D) Hydrogen gas

Q.149 At a certain temperature the rms speed of molecules of an ideal gas is $\bar{c}$. If the certain temperature of gas is changed so that its pressure is halved while keeping its volume constant, the new rms speed of molecules is

A) $\sqrt{2}\bar{C}$

C) $2\sqrt{2}\bar{C}$

B) $\frac{1}{\sqrt{2}}\bar{C}$

D) $\sqrt{\frac{3}{2}}\bar{C}$

Q.150 Product of pressure 'P' and volume 'V' of an ideal gas is

A) A constant

C) Directly proportional to temperature 'T'

B) Equal to universal gas constant (R)

D) Inversely proportional to temperature 'T'

Q.151 For hydrogen gas Cp – Cv = a and for Oxygen gas Cp – Cv = b, Cp and Cv being molar specific heats. The relation between a and b is

A) a = 16 b

C) a = 4b

B) 16 a = b

D) a = b

Q.152 A carnot engine takes 300 cal of heat at 500 k and rejects 150 cal of heat at 500 k, and rejects 150 cal of heat to the sink. The temperature of the sink is

A) 1000 K
B) 750 K
C) 250 K
D) 125 K

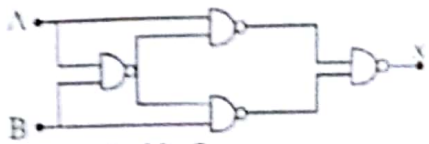
Q.153 The steam point of the water at Fahrenheit scale is

A) 32
B) 100
C) 212
D) 313.15

Q.154 The output waveform of sweep or time base generator is

A) Sine wave
B) Cosine wave
C) Square wave
D) Saw tooth wave

Q.155



In the above diagram, if A = 1, B = 0, X=?

A) x = 0
B) x = 1
C) x = A
D) $x = \overline{B}$

Q.156 A wire of resistance R is stretched till its length in increased to n times its original length. What is its resistance now?

A) nR
B) $(n^2 - 1)R$
C) n^2R
D) $\frac{R}{n^2}$

Q.157 The xenon exists in how many isotopic forms?

A) Three
B) Two
C) Thirty six
D) Four

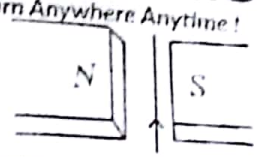
Q.158 A resistance of 6 ohm is connected in series with another resistance of 4 ohm across a battery of 20 V. the p.d. across the 6 ohm resistor is

A) 3V
B) 6V
C) 9V
D) 12V

Q.159 A charged particle is present in electric field E experiences a force 9×10^2N. when another particle with doubled charged is placed at same position the force exerted by field on it is

A) 9×10^2N
B) 4.5×10^2N
C) 18×10^2N
D) 27×10^2N

Q.160 The diagram shows a write, carrying a current I, placed between poles of a magnet



In which direction does the force on wire act?

A) Downwards
B) Upwards
C) Towards the N Pole of the magnet
D) Towards the S poke of magnet

Q.161 An electron is moving along the axis of a solenoid carrying a current. Which of the following is a correct statement about the electromagnetic force acting on the electron?

A) The force acts radically inwards
B) The force acts radically outwards
C) The force acts in the direction of motion
D) No force acts

Q.162 The potential difference applied to an X – ray tube is increased. As a result, in the emitted radiation

A) The intensity increases
B) Minimum wavelength increases
C) Intensity decrease
D) Minimum wavelength decreases

Q.163 The wavelength I of the K line of characteristic X – ray spectra varies with atomic number Z approximately as

A) $\lambda \propto Z$
B) $\lambda \propto \sqrt{Z}$
C) I $1/Z^2$
D) $\lambda \propto 1/\sqrt{Z}$

Q.164 X – rays which can penetrate through longer distances in substances are called

A) Soft x-rays
B) Continous x – rays
C) Hard x –rays
D) None of the above

Q.165 X-rays cannot produce

A) Compton effect
B) photoelectrons
C) electron-positron pair
D) all of these X-rays cannot produce

Q.166 Which of the following is not the characteristic of LASER radiation

A) High intensity
B) uni-directional
C) Incohernece
D) Monochromatic

Q.167 CAT scanning is used to detect the image of

A) Soft tissues
B) Hard tissues
C) Boxes
D) Both "B" and "C"

Q.168 Computerized tomography can detect the density difference of about

A) 0.1%
B) 0.2 %
C) 1%
D) 2%

Q.169 The energy equivalent of atomic mass unit is

A) 1.6×10^{-19}J
B) 6.02×10^{23}J
C) 931 MeV
D) 9.31 MeV

Q.170 Out of the following, the one which can pass through 20 cm thickness of steel is

A) α-rays
B) β – rays
C) γ –rays
D) Ultra – violet rays

Q.171 A radioactive nucleus X undergoes a series of decays according to the scheme $X \xrightarrow{\alpha} X_1 \xrightarrow{\beta} X_2 \xrightarrow{\alpha} X_3 \xrightarrow{\gamma} X_4$ if the mass number and atomic number of X are 180 and 72 respectively, the corresponding numbers for X_4 are

A) 176, 69
B) 172, 69
C) 176, 71
D) 172, 71

Q.172 The percentage of the original quantity of a radioactive material left after five half lives is approximately

A) 1%
B) 2%
C) 3%
D) 5%

Q.173 Curie is a unit of

A) Energy of gamma rays
B) Intensity of gamma rays
C) Half life
D) Radio activity

Q.174 The accelerating voltage across the Coolidge tube is from

A) 25 to 100 volt
B) 25 to 100 kilo volt
C) 25 to 100 million volt
D) 25 to 100 Giga volt

Q.175 As the mass number A varies which of quantity related to nucleus does not change

A) Mass
B) Volume
C) Binding energy
D) Density