

PHYSICS

UNIT-1 LAWS OF MOTION

I. Choose the Correct answer

1. _____ deals with the bodies which are at rest under the action of forces.
a) Statics b) kinematics c) Dynamics d) mechanics
2. The resistance of a body to change its direction of motion is _____.
a) force b) momentum c) inertia of motion d) inertia of direction
3. The act of cleaning a carpet by beating it with a stick is an example for inertia of _____.
a) motion b) direction c) rest d) momentum.
4. A luggage is usually tied with a rope on the roof of the buses due to _____.
a) inertia of motion b) inertia of direction
c) inertia of rest d) momentum.
5. The momentum of a heavy object at rest will be _____.
a) large b) infinity c) zero d) small
6. A and B two objects with masses 100 kg and 75 kg respectively, then _____.
a) both will have same inertia
b) B will have more inertia
c) A will have more inertia
d) both will have less inertia.
7. The Physical quantity which is the measure of inertia is _____.
a) density b) weight c) force d) mass
8. The sparks produced during sharpening a knife against a grinding wheel leaves the rim of the wheel tangentially. This is due to _____.
a) inertia of rest b) inertia of motion
c) inertia of direction d) force applied

9. The rotating or turning effect of a force is —
 a) momentum b) torque c) Couple d) none.
10. The acceleration in a body is due to —
 a) balanced force b) unbalanced force
 c) equilibrant d) Couple.
11. A force of 20N is acting on an object of mass 10kg. The acceleration produced is —
 a) 1 ms^{-2} b) 2 ms^{-2} c) 20 ms^{-2} d) 10 ms^{-2}
12. An example for a vector quantity is —
 a) speed b) acceleration c) force d) impulse
13. The gravitational force of Earth acting on a body of mass 1kg is —
 a) 8.9N b) 9.8N c) 980N d) 1N
14. A water tanker filled up to $\frac{2}{3}$ of its height is moving with a uniform speed, on sudden application of the brake, the water in the tank would —
 a) move backward b) be unaffected
 c) rise upwards d) move forward.
15. The ball is thrown up, the value of g will be —
 a) zero b) +ve c) -ve d) negligible
16. Action of a lever is an example of — force.
 a) balanced b) unbalanced c) Parallel force
 d) like parallel force.
17. — stated that the natural state of all Earthly bodies is at rest.
 a) Aristotle b) Galileo
 c) Newton d) Pluto direction

- 18 At the Surface of Earth an Object falling freely experiences an acceleration of — a) 9.4 ms^{-2} b) 9.1 ms^{-1} c) 9.8 ms^{-2} d) 9.6 ms^{-2}
- 19 The value of acceleration due to gravity on Surface of the moon is — ms^{-2}
a) 9.8 b) 16.25 c) 9.812 d) 1.625
- 20 The weight of an object in a satellite orbiting around the Earth is —
a) zero b) actual weight c) less than the actual weight d) greater than the actual weight
- 21 Which quantity is zero at the Centre of the Earth?
a) mass b) weight c) both mass and weight d) none
- 22 The apparent weight of a person moving upward in a lift is given by —
a) $R=W$ b) $R=0$ c) $R>W$ d) $R<W$
- 23 The value of Universal gravitational Constant is —
a) $6.743 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-1}$ b) $6.674 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$
c) $6.743 \times 10^{-11} \text{ Nm}^2 \text{ kg}$ d) $6.673 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-1}$
- 24 The gravitational force between two objects becomes — when the masses of both objects are halved without altering the distance between them
a) $\frac{f}{4}$ b) $\frac{f}{2}$ c) f d) $2f$
- 25 The force required to produce an acceleration of 1 cm s^{-2} on a body mass 1g is —
a) 1N b) 10 c) 10^2 dyne d) 1dyne

ADDITIONAL SHEET

Reg. No. _____

Additional Sheet No. :

UNIT - 2 OPTICS

I. Choose the Correct answer

1. Velocity and wavelength of light are related by a relation ____
 a) $g = c\lambda$ b) $v = c/\lambda$ c) $c = v\lambda$ d) both b and c
2. Violet light has the ____ wavelengths
 a) lowest b) highest c) same d) standard
3. For air, the refractive index is ____
 a) 1 b) infinity c) 0 d) 2
4. The splitting up of white light into Colours is called ____
 a) reflection b) refraction c) scattering d) dispersion
5. Red light is used in traffic signals because ____
 a) It has highest wavelength b) scatters least
 c) red is symbol of danger d) both a and b
6. A star appears twinkling in the sky because of ____ by the atmosphere.
 a) Scattering of light b) reflection of light
 c) refraction of light d) both a and b
7. If the energy of the incident and scattered beam of light are same, then it is called ____ Scattering.
 a) Ray light b) Inelastic c) Mie d) Elastic
8. The Scattering of light by pure light is ____ Scattering.
 a) Rayleigh's b) Mie c) Raman d) Tyndall
9. A Concave lens is a ____
 a) Converging lens b) diverging lens
 c) inverting lens d) diverging lens
10. Convex lens always forms a real image, if the object is situated beyond ____
 a) optic centre b) Centre of Curvature
 c) focus d) radius of curvature

11. To get real, inverted and Same Size of the object, the Object is Placed in Convex lens is —
 a) At F b) At 2F c) below O and F d) At infinity
12. An Object is placed at 12 cm from a Convex lens whose focal length is 10 cm. The image must —
 a) Virtual and enlarged b) real and reduced in size
 c) Virtual and reduced size d) real and enlarged size
13. An Object is placed 25 cm from a Convex lens whose focal length is 10 cm. The image distance is — cm.
 a) 50 b) 16.66 c) 6.66 d) 10
14. The image formed by retina of human eye is —
 a) Virtual and erect b) Real and inverted
 c) Virtual and inverted d) Real and erect
15. The least distance of distinct vision is —
 a) 25 m b) 20 cm c) 20 m d) 25 cm
16. The diameter of eyeball is —
 a) 2.3 cm b) 23 cm c) 2.3 mm d) 23 mm
17. A person cannot see objects clearly beyond 50 cm. The power of lens to correct the vision is —
 a) +5D b) -0.5D c) -2D d) +2D
18. Cylindrical lens is used to correct —
 a) Myopia b) Hypermetropia
 c) Presbyopia d) Astigmatism
19. Simple microscopes are used —
 a) TO Observe Parts of flower
 b) Watch repair
 c) Observe finger prints
 d) All the above.

20 In Compound microscope, — lenses are used.

- a) 2 b) 3 c) 4 d) 1

21 — is an optical instrument used to see distant objects

- a) Microscope b) Telescope
c) Kaleidoscope d) None of the above

22 The Speed of light in Vacuum is — ms^{-1}

- a) 3.8×10^8 b) 388×10^8 c) 0.38×10^8 d) 3.6×10^8

23 Power of accommodation is achieved by changing the — of the eye lens

- a) Curvature b) retina
c) focal length d) vision.

24 If one the faces of a biconcave lens is plane, it is known as — lens

- a) Concave b) Convex
c) Plano-Concave d) plano-Convex

25 The Scattered light in Raman Scattering Contains — lines

- a) Rayleigh's b) Stokes c) Antistokes
d) all the above.

ADDITIONAL SHEET

Reg. No. _____

Additional Sheet No. :

UNIT -3 THERMAL PHYSICS

I Choose the Correct answer

1. Which of the following has the fastest process of heat transfer?

- a) Conduction b) Convection
c) Radiation d) all the above

2. At what temperature are Celsius and Fahrenheit equal?

- a) 40° b) -40° c) 0° d) 100°

3. The relation between Celsius to Kelvin

- a) $k = c + 273$ b) $k = c - 273$ c) c d) k

4. SI unit of temperature is _____

- a) Celsius b) Fahrenheit
c) Kelvin d) none.

5. SI unit of heat is _____

- a) Calorie b) Joule c) kilocalorie d) Kelvin

6. Increase in area due to heating is called _____

- a) Linear expansion b) Superficial expansion
c) Cubical expansion d) real expansion

7. Change in Volume of a solid during heating is _____

- a) linear expansion b) Superficial expansion
c) Cubical expansion d) apparent expansion

8. Linear expansion is the change in _____ when object is heated or cooled.

- a) length b) area c) Volume d) density

9. Fundamental laws of gases are _____

- a) Boyle's law b) Charles's law
c) Avogadro's law d) All the above

10. According to Charles's law

- a) $P \propto \frac{1}{V}$ b) $V \propto T$ c) $V \propto n$ d) none

11. SI unit of Co-efficient of linear expansion is _____

- a) K^{-1} b) K c) P d) V

- 12 Absolute Scale is also called as —
 a) kelvin scale b) Celsius scale
 c) Centrigrade scale d) Fahrenheit scale
- 13 Heating is the process in which heat energy flows from — temperature to — temperature Objects
 a) higher, lower b) lower, higher
 c) Equal d) None
- 14 Value of — is $1.38 \times 10^{-23} \text{ J K}^{-1}$
 a) Boltzmann Constant b) Boyle's law
 c) Charles's law d) Avogadro's law
- 15 Value of universal gas Constant is —
 a) $8.31 \text{ J mol}^{-1} \text{ K}^{-1}$ b) $83.1 \text{ J mol}^{-1} \text{ K}^{-1}$
 c) $831 \text{ J mol}^{-1} \text{ K}^{-1}$ d) 8.31 J K^{-1}
- 16 The Coefficient of Cubic expansion of water is — K^{-1}
 a) 20.7×10^{-5} b) 7×10^{-5} c) 6×10^{-5} d) 2.5×10^{-5}
- 17 Ideal gas equation is —
 a) $PV = RT$ b) $PV = T$ c) $P = V$ d) $P = RT$
- 18 Heat is a — quantity
 a) Scalar b) Vector c) both (a) and (b)
 d) None
- 19 — is used in thermometer
 a) Mercury b) Hydrogen
 c) Aluminium d) Boron
- 20 $0^\circ \text{K} = \text{—}^\circ \text{C}$
 a) 273°C b) 243°C c) -273°C d) -243°C
- 21 When two bodies have the same temperature, they are said to be in —
 a) thermo static b) thermal equilibrium
 c) thermal energy d) thermodynamic temperature
- 22 the amount of heat energy required to rise the temperature of 1 gram of water through 1°C is —
 a) one kilo calorie b) one joule c) one kelvin
 d) one calorie

23. If the atoms or molecules of a gas do not interact with each other, then the gas is said to be an —
a) Inert gas b) Ideal gas
c) Imperfect gas d) Pure gas

24. If boiling point of water is 95°F , what will be the reading in kelvin scale?
a) 308 K b) 307 K c) 309 K d) 310 K

25. The value of Avogadro number —
a) $6.023 \times 10^{23} \text{ mol}$ b) $60.23 \times 10^{23} \text{ mol}$
c) $6.023 \times 10^{22} \text{ mol}$ d) $6.023 \times 10^{23} \text{ K}$

IDEAL & ADHARSH

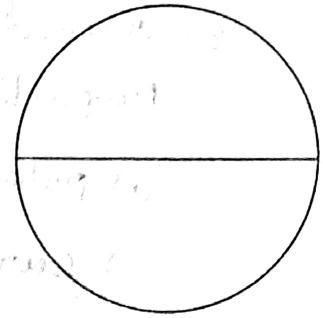
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Class : X-

Subject : Physical Science

Date : PHYSICS

Unit - 4 - Electricity

I. Choose the correct answer!-

1. The SI unit of electric current _____

- a) A b) V c) C d)
- ϕ

2. A charge of 5C flows through a bulb in 5s. what is the current through the bulb?

- a) 2.4 A b) 2 A c) 1 A d) 3 A

3. Which is used to measure the potential difference?

- a)
- 
- b)
- 
- c)
- 
- d) All the above

4. If V_A is more than V_B the potential difference between the points A and B is _____

- a)
- $V_A - V_B$
- b)
- $V_B - V_A$
- c)
- $V_B = V_A$
- d)
- $V_A - V_B = 0$

5. Calculate the number of electrons constituting one coulomb of charge.

- a)
- 6×10^{18}
- electrons b)
- 6.25×10^{18}
- electrons
-
- c)
- 8×10^8
- electrons d)
- 3×10^8
- electrons.

6. How much work is done in moving a charge of 2C across two points having a potential difference of 12V?

- a) 2 J b) 12 J c) 24 J d) 30 J

7. $1 \text{ mA} =$
- a) 10^{-2} A b) 10^2 A c) 10^{-6} A d) 10^{-3} A
8. According to Ohm's law, current is directly proportional to the _____
- a) potential difference b) resistance
c) current d) volt
- 9) whose substance which have very low electrical resistance are called —
- a) conductors b) Insulators c) Semiconductors
d) resistors.
- 10) The substance having infinitely high electrical resistance is called —
- a) conductor b) Insulator c) Superconductor
d) resistor.
- 11) Keeping the potential difference constant, the resistance of a circuit is doubled. The current will become _____
- a) Double b) Half c) one-fourth
d) four times $V = IR, I = \frac{V}{R} = \frac{V}{2R} = \frac{I}{2}$
- 12) Keeping the potential difference constant, the resistance of a circuit is halved. The current will become _____
- a) double b) Half c) one-fourth d) four times
 $I = \frac{V}{R} = \frac{V}{\frac{R}{2}} = \frac{2V}{R} = 2I$
13. The SI unit of resistivity is _____
- a) $\Omega \text{ m}$ b) Ω c) $\Omega \text{ m}$ d) $\Omega \text{ m}^{-1}$
14. The Nichrome has _____
- a) very high resistivity b) very low resistivity
c) very high conductivity d) very low conductivity

- 15) The resistance of a wire of length 300 m and cross-section area 1.0 mm^2 made of material of resistivity $1.0 \times 10^{-7} \text{ } \Omega \text{ m}$ is —
 a) $2 \text{ } \Omega$ b) $3 \text{ } \Omega$ c) $20 \text{ } \Omega$ d) $30 \text{ } \Omega$
- 16) When the diameter of a wire is doubled, its resistance becomes —
 a) double b) four times c) ~~one~~ one half
 d) one-fourth $R \propto \frac{1}{A}$ $R \propto \frac{1}{(2)^2}$ $R \propto \frac{1}{4}$
- 17) If the area of cross-section of a conductor is doubled, its resistance becomes —
 a) double b) half c) four times d) one-fourth
 (or) $R = \frac{\rho L}{A}$ $R = \frac{\rho L}{2A}$
- 18) If 5 resistances, each of values $0.2 \text{ } \Omega$ are connected in series, what will be the resultant resistance?
 a) $1 \text{ } \Omega$ b) $2 \text{ } \Omega$ c) $3 \text{ } \Omega$ d) $4 \text{ } \Omega$
- 19) The SI unit of electrical power
 a) Volt b) Watt c) Ampere d) Resistance.
- 20) $1 \text{ kWh} = \text{ — — — — —}$
 a) $3.6 \times 10^6 \text{ J}$ b) $36 \times 10^5 \text{ J}$ c) 3600000 J
 d) ~~all~~ All the above.
- 21) An electric heater is rated at 2 kW . electrical energy ~~and~~ costs $\text{₹} 4$ per kWh. what is the cost of using the heater for 3 hours?
 a) $\text{₹} 12$ b) $\text{₹} 24$ c) $\text{₹} 36$ d) $\text{₹} 48$
- 22) How much energy does a 100 W electric bulb transfer in 1 minute?
 a) 100 J b) 600 J c) 3600 J d) 6000 J

- a) chemical effect of current
- b) magnetic effect of current
- c) lighting effect of current
- d) heating effect of current

24) In a filament type light bulb, most of the electric power consumed appear as —

- a) visible light
- b) Infra-Red rays
- c) ultra-violet rays
- d) fluorescent light

25) which of the following characteristic is not suitable for a fuse wire?

- a) thin and short
- b) thick and short
- c) low melting point
- d) higher resistance than rest of wiring

Unit-5 :- Acoustics

1) Sound waves are —

- a) Longitudinal waves
- b) Transverse waves
- c) Audible waves
- d) Infrasonic waves

2) The frequency which is can't audible to the human ear is —

- a) Below 20 KHZ
- b) above 20 KHZ
- c) Below 20 HZ
- d) above 20 HZ

3) Sound wavelength ranges from —

- a) 1.65 cm - 7.1 km
- b) 1.65 cm - 3.02 m
- c) 1.65 cm - 1.65 m
- d) 1.65 m - 1.65 km

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4) Sound waves travel in air with a speed of about _____ at NTP.

- a) 331 ms^{-1} b) 340 ms^{-1} c) 343 ms^{-1}
d) 434 ms^{-1}

5) The SI unit of velocity is _____

- a) m b) kg s^{-1} c) ms^{-1} d) ms^{-2}

6) The velocity with which the wave travels through the medium is _____

- a) particle velocity b) wave velocity
c) frequency d) wavelength.

7) In which medium is the velocity of a sound is maximum?

- a) Liquid b) gas c) Solid d) water

8) In which medium is the velocity of a sound are more elastic in nature?

- a) Liquid b) gas c) solid d) water

9) The velocity of sound in solids decreases as the density _____

- a) decreases b) increased c) same
d) equal to zero

10) The speed of sound is directly proportional to the _____

- a) square root of the density
b) square root of the elastic modulus
c) Temperature d) density

11) When humidity increases the speed of sound _____

- a) decreases b) increases c) Same
d) zero.

12) The sound waves bouncing back from the ~~at~~ reflecting surface are called _____
~~reflex~~ a) Refraction waves b) Reflection waves
c) Radio waves d) Sound waves

13) According to laws of reflection _____

- a) $\angle i = \angle r$ b) $\angle i \neq \angle r$ c) $\angle i > \angle r$ d) $\angle i < \angle r$

14) which place located in a acoustical wonder of Colconda _____

- a) Delhi b) Chennai c) Hyderabad
d) Keral

15) The medium in which the velocity of sound increases compared to other medium is called _____

- a) denser medium b) rarer medium
c) glass medium d) water medium

16) when the sound waves are reflected from the ~~at~~ curved surfaces, the _____ is changed.

- a) density of the reflected waves
b) Intensity of the reflected waves
c) pressure of the reflected waves
d) All the above

- 17) When reflected from a convex surface, the reflected waves are diverged out and the intensity is ____
- a) Increased b) decreased c) same
d) Remains constant.
- 18) The minimum time gap between the original sound and echo must be ____
- a) 0.01 s b) 1 s c) 0.1 s d) 10 s
- 19) The minimum distance required to hear an echo is ~~15.2 m~~ ____
- a) 15 m b) 16.2 m c) 15.2 m d) 17.2 m
- 20) To measure the speed of an automobile ____
- a) peltier effect b) Thomson effect
c) Doppler effect d) Raman effect
- 21) Ultrasonic waves are sound waves with a frequency ____
- a) $> 20 \text{ Hz}$ b) $< 20 \text{ Hz}$ c) 20 Hz d) 20 kHz
- 22) The ~~uses~~ uses of RADAR
- a) Submarines b) speed of marine animals
c) Aeroplanes d) Track the over speeding vehicles
- 23) The SI unit of frequency ____
- a) s b) m/s c) ms^{-1} d) s^{-1}

- 24) When listener at rest, source moves towards the listener, then distance between source and listener _____
- a) increases b) ~~decreased~~ decreased
c) Remains constant d) Same

- 25) when both source and listener move, they move away from each other, apparent frequency is _____

- a) $>$ actual frequency b) $<$ actual frequency
c) equal to actual frequency d) All the above.

Unit - 6 - Nuclear physics

- 1) Who is discovered the chargeless particles?
- a) James Chadwick b) J.J. Thomson
c) Goldstein d) Rutherford

- 2) Which is elementary particles _____
- a) Photon b) Meson c) positron d) All the above

- 3) Who is discovery of radioactivity?
- a) Henri Becquerel b) Curie c) Rutherford
d) Roentgen

- 4) Who is discovered induced radioactivity?
- a) Marie Curie b) Pierre Curie c) Irene Curie and F. Joliot
d) Both a and b

- 5) When the projectile hits parent nucleus it is converted into an _____ nucleus.
- a) stable b) unstable c) Zero d) All the above

b) ${}_4\text{Be}^9 + {}_2\text{He}^4 \rightarrow X + Y$. In the above nuclear reaction define x and y.

- a) ${}_6\text{C}^{12}$, ${}_0\text{e}^{-1}$ b) ${}_6\text{C}^{12}$, ${}_0\text{n}^{-1}$ c) ${}_6\text{C}^{12}$, ${}_0\text{n}^1$ d) ${}_6\text{C}^{12}$, ${}_0\text{e}^1$

7) 1 curie is equal to the _____

- a) 3.7×10^{10} per second b) 3.7×10^{-10} per second
c) 3.7×10^{10} disintegration/second d) 3.7×10^{-10} disintegration per second

8) Becquerel (Bq) is equal to _____

- a) one disintegration per second b) $2.58 \times 10^{-4} \text{ C/kg}^1$
c) 3.7×10^{10} disintegration per second d) 3.7×10^{10} /second

9) The electromagnetic wave is _____

- a) α -ray b) β -ray c) γ -ray d) All the above

10) The alpha decay process, ${}_{92}\text{U}^{238} \rightarrow {}_{90}\text{X}^{234} + {}_2\text{He}^4$
In the above equation define X.

- a) Th b) Ba c) Kr d) Pu

11) The natural uranium consists of _____

- a) 99.28 of ${}_{92}\text{U}^{235}$ b) 99.28 of ${}_{92}\text{U}^{238}$
c) 0.72% of ${}_{92}\text{U}^{235}$ d) Both b and c

12) which one is fissionable material _____

- a) U^{235} b) U^{238} c) Th^{234} d) Ba^{141}

13) which one is fertile materials _____

- a) U^{238} b) Th^{232} c) Pu^{240} d) All the above.

- 14) If the atomic number and mass number of the radioactive nucleus remain the same is called _____
- a) α -decay b) β -decay c) γ -decay d) X-ray
- 15) The controlled chain reaction is used in a _____
- a) Atom bomb b) Nuclear reactor
c) Hydrogen bomb d) All the above
- 16) If the mass of the fissible material is more than the critical mass it is termed as _____
- a) Subcritical b) Supercritical c) Critical mass d) All the above
- 17) The atom bomb is based on the principle of _____
- a) Controlled chain reaction
b) Uncontrolled chain reaction
c) Both a and b d) None of these
- 18) The energy released in a nuclear fission process is about _____
- a) 20 MeV b) 10 MeV c) 100 MeV d) 200 MeV
- 19) 1 eV is equal to _____
- a) 1.602×10^{19} C b) 1.602×10^{-19} C
c) 1.602×10^{19} J d) 1.602×10^{-19} J

- 20) Nuclear fusion is possible only at an extremely high temperature of the order of _____
- a) 10^7 to 10^9 K b) 10^{-7} to 10^9 K
c) 10^7 to 10^9 K d) 10^{-7} to 10^{-9} K
- 21) Hydrogen bomb is based on the principle of _____
- a) Nuclear fission b) Nuclear fusion
c) Controlled ^{chain} nuclear reaction d) Uncontrolled ^{chain} nuclear reaction
- 22) If the safe limit of receiving the radiation is about _____
- a) 100 R b) 100 mR/week c) 600 R d) 60 R
- 23) _____ is used to cure goiter
- a) Na^{24} b) I^{131} c) Fe^{59} d) P^{32}
- 24) _____ is used to convert non-fissionable materials into fissionable materials.
- a) Nuclear reactor b) Breeder reactors
c) Atom bomb d) Hydrogen bomb
- 25) Who is the first chairman of Indian Atomic energy commission?
- a) Dr. A.P.J. Abdul Kalam b) Dr. Homi Jahangir Bhabha
c) F. Strassman d) Otto Hahn

Q.NO	4. ELECTRICITY	Q.NO	5. ACOUSTICS
1.	a) A (ampere)	1	a) Longitudinal waves
2.	c) 1 A	2	b) 20 KHz
3.	b) 	3	c) 1.65 cm - 1.65 m
4.	b) $V_A - V_B$ a) $V_A - V_B$	4	b) 340 ms^{-1}
5.	b) 6.25×10^{18} electrons (or 0.625×10^{19} electrons)	5	c) ms^{-1}
6.	c) 24 J	6	b) wave velocity
7.	a) $1 \text{ mA} = 1 \times 10^{-2} \text{ A} = 10^{-2} \text{ A}$	7	c) Solid
8.	a) Potential difference	8	c) solid
9.	a) Conductors	9	b) increased
10.	b) Insulator	10	b) Square root of the elastic modulus
11.	b) Half ($\frac{1}{2} I$)	11	b) increases
12.	a) double.	12	b) Reflection
13.	a) 2 m	13	a) $L_i = L_r$
14.	a) Very high resistivity (Nichrome $= 1.5 \times 10^{-6} \text{ } \Omega \text{ m}$)	14	c) Hyderabad, Telangana
15.	d) $30 \text{ } \Omega$	15	b) rarer medium
16.	d) one - fourth	16	b) Intensity of the reflected waves
17.	b) Half	17	b) decreased
18.	a) $1 \text{ } \Omega$	18	c) 0.1 s
19.	b) Watt (W)	19	d) 17.2 m
20.	d) All the above.	20	c) Dopple effect
21.	b) Rs. 24	21	a) $> 20 \text{ KHz}$
22.	d) 6000 J	22	c) Aeroplanes track
23.	d) Heating effect of current	23	d) 3^{-1}
24.	b) Infra-red rays (IR-Rays)	24	b) decreased
25.	b) Thick and Short.	25	b) less than actual frequency

Q. No	6. NUCLEAR PHYSICS	
1	a) James Chadwick	
2	d) All the above	
3	a) Hendri Becquerel	
4	c) Irene Curie & F. Joliot	
5	b) Unstable	
6	c) ${}_6\text{C}^{12}$ and ${}_0\text{n}^1$	
7	c) 3.7×10^{10} disintegration per second	
8	a) one disintegration per second	
9	c) γ -ray (Gamma ray)	
10	a) $\text{Th}({}_{90}\text{Th}^{234})$	
11	d) Both b) and c)	
12	a) U^{235} (Uranium-235)	
13	d) All the above	
14	c) β -decay	
15	b) Nuclear reactor	
16	b) super critical	
17	b) Uncontrolled chain reaction	
18	d) 200 MeV (Mega electron volt) (or) (Million electron volt)	
19	d) $1\text{eV} = 1.602 \times 10^{-19} \text{ J}$	
20	c) 10^7 K to 10^9 K	
21	b) e) Both b) and d)	
22	b) 100 mR / week	
23	b) I^{131}	
24	b) Breeder Reactor	
25	b) Dr. Homi Jahangir Bhabha.	

Solution Unit-4.
Electricity

② $Q = 5C$
 $t = 5s$

$$I = \frac{Q}{t} = \frac{5}{5} = 1A$$

③ $V_A > V_B$

$$V = V_A - V_B$$

④ $Q = 1C$

$$Q = ne$$

$$n = \frac{Q}{e} = \frac{1}{1.6 \times 10^{-19}} = 0.625 \times 10^{19} = 6.25 \times 10^{18}$$

⑤ $Q = 2C$

$$V = 12V$$

$$V = \frac{W}{Q} \Rightarrow W = V \times Q = 12 \times 2 = 24J$$

⑥ $V = IR$, $V = \text{constant}$,
 $I = \frac{V}{R}$, $R' = 2R$, $I = ?$

$$I' = \frac{V}{R'}, I' = \frac{V}{2R} \Rightarrow \frac{1}{2} \left(\frac{V}{R} \right) = \frac{1}{2} I$$

⑦ same

$$I = \frac{V}{R}, R' = \frac{1}{2}R, I = ?$$

$$I' = \frac{V}{R'} \Rightarrow \frac{V}{\frac{1}{2}R} = \frac{2V}{R}$$

$$I' = 2I$$

15. $l = 300m$

$$a = 1.0mm^2 = 1.0 \times 10^{-6}m^2$$

$$\rho = 1.0 \times 10^{-7} \Omega m$$

$$R = ? \quad \rho = \frac{RA}{L}$$

$$R = \frac{\rho L}{A}$$

$$= \frac{1.0 \times 10^{-7} \times 300}{1.0 \times 10^{-6}}$$

$$= 300 \times 10^{-7} \times 10^6$$

$$R = 300 \times 10^{-1} \Omega$$

$$R = 30 \Omega$$

16. $d' = 2d$, $R = ?$

$$R = \frac{\rho L}{A} = \frac{\rho L}{\pi r^2}$$

$$d' = \frac{r}{2} \Rightarrow d r = d' \frac{r'}{2}$$

$$\therefore R' = \frac{\rho L}{\pi \left(\frac{d}{2} \right)^2}$$

$$= \frac{\rho L}{\pi d^2} = \frac{\rho L}{\pi (2r)^2}$$

$$= \frac{\rho L}{\pi 4r^2} = \frac{\rho L}{4\pi r^2}$$

$$R' = \frac{\rho L}{4A} = \frac{1}{4} R$$

16. (or) $P = \frac{RA}{L}$
 $R = \frac{PL}{A}$

$\therefore A = \pi r^2 \quad \therefore r = \frac{d}{2}$
 $= \pi \left(\frac{d'}{2}\right)^2$

$\therefore d' = 2d \quad d = 2r$

$A = \pi \left(\frac{2d}{2}\right)^2 = \pi d^2$

$= \pi (2r)^2 = \pi 4r^2$
 $= 4\pi r^2$

$A = 4\pi r^2$

$R' = \frac{PL}{4\pi r^2} = \frac{PL}{4A}$

$R' = \frac{1}{4} \left(\frac{PL}{A}\right) = \frac{1}{4} R$

17. $R = \frac{PL}{A}, \quad A' = 2A$

$R' = \frac{PL}{2A} = \frac{1}{2} \left(\frac{PL}{A}\right)$

$R' = \frac{1}{2} R$

18. $R = 5 \Omega \quad R = 0.2 \Omega$

● $R_s = R_1 + R_2 + R_3 + R_4 + R_5$
 $= 0.2 + 0.2 + 0.2 + 0.2 + 0.2$
 $R_s = 1 \Omega$

21. $P = 2 \text{ kW}, \quad t = 3 \text{ h}$

~~$t = 4 \text{ h}$~~ $E = 4 \text{ kWh}$

$E = P \times t = 2 \times 3 = 6 \text{ kWh}$

So, cost, $= 6 \times 4 = 24 = \text{Rs. } 24$

22) $P = 100 \text{ W} \quad t = 1 \text{ m}$

$\therefore E = P \times t = 1 \times 60$

$= 100 \times 60 \quad t = 60 \text{ s}$

$E = 6000 \text{ J}$

20) Unit-5 - Acoustics

- 1) a) statics
- 2) d) inertia of direction
- 3) c) rest
- 4) a) Inertia of motion
- 5) c) zero
- 6) c) A will have more inertia
- 7) d) mass
- 8) c) inertia of direction.
- 9) b) torque
- 10) b) Unbalanced force
- 11) b) 2 ms^{-2}
- 12) b, c, d a) scalar quantity - speed
- 13) b) 9.8 N
- 14) d) move forward
- 15) c) -ve
- 16) b) Unbalanced
- 17) a) Aristotle
- 18) c) 9.8 ms^{-2}
- 19) d) 1.625
- 20) a) zero
- 21) b) weight
- 22) c) $R > W$
- 23) b) $6.673 \times 10^{-11} \frac{\text{Nm}^2}{\text{kg}^2}$
- 24) a) $\frac{f}{4}$
- 25) d) 1 dyne.

Unit - 2

- 1) d) both b and c
- 2) a) lowest
- 3) a) 1
- 4) d) dispersion
- 5) d) both a and b
- 6) c) refraction of light
- 7) d) Elastic
- 8) c) Raman
- 9) b) diverging lens
- 10) c) focus
- 11) b) At 2F
- 12) d) real and enlarged size
- 13) b) 16.66
- 14) b) Real and inverted
- 15) d) 25 cm
- 16) a) 2.3 cm
- 17) c) -2 D
- 18) d) Astigmatism
- 19) d) All the above.
- 20) a) 2
- 21) b) Telescope
- 22) a) 3.8×10^8
- 23) c) focal length
- 24) c) Plano - Concave
- 25) d) all the above

Unit-3

- 1) c) Radiation
- 2) b) -40°
- 3) a) $k = c + 273$
- 4) c) kelvin
- 5) b) joule
- 6) b) Superficial expansion
- 7) c) Cubical expansion
- 8) a) length
- 9) d) All the above
- 10) b) $V \propto T$
- 11) a) k^{-1}
- 12) a) Kelvin Scale
- 13) a) higher, ~~to~~ lower
- 14) a) boltzmann Constant
- 15) b) $8.31 \text{ J mol}^{-1} \text{ K}^{-1}$
- 16) a) 20.7×10^{-15}
- 17) a) $PV = RT$
- 18) a) scalar
- 19) a) mercury
- 20) c) -273°C
- 21) b) Thermal Equilibrium
- 22) d) 1 calorie.
- 23) b) Ideal gas
- 24) a) 308 K
- 25) a) ~~6.023~~ $6.023 \times 10^{23} / \text{mol}$