

**NTSE - MATERIAL  
PHYSICS - IX**

1. A student used vernier callipers to measure the length of his pencil . He found callipers showed a reading of -0.02 cm .When the jaws of callipers are firmly closed .When he used the callipers to measure the length of the pencil , the callipers showed a reading of 8.25 cm .The correct length of pencil is  
 a) 80.25 cm                      b) 8.27 cm                      c) 8.23 cm                      d) None
2. A vernier callipers with no zero error is used to determine diameter of soft drink can .The zero in division of vernier scale is at equidistance from 6.4 cm and 6.5 cm and V.C.D is noted as 5. The diameter of can is  
 a) 6.5 cm                      b) 6.45 cm                      c) 6.6 cm                      d) 6.4 cm
3. A vernier callipers has 10 division on vernier scale and is M.S.d is 0.5 mm .When a hollow cylinder is held between the jaws the M.S.R and V.C.D of callipers are 1.2 c, and 10 respectively .The diameter of englander is  
 a) 1.3 cm                      b)1.15 cm                      c) 1.25 cm                      d) 1.35 cm
4. The least count of table count is  
 a) 1 min                      b) 1 Hour                      c) 1 day                      d) 1 sec
5. The difference between HRP and ZRP of physical balance when 47.86 gm of a substance is placed in its pan is 3 .When 10 mg is added to its pans ,the difference between HRP and LRP is 5 . The most accurate mass of the body is  
 a) 47.875                      b)47.845                      c) 47.866                      d) 47.854
6. The working of a physical balance is based on principle momentum . A meter scale of unifrom density is balanced at its centre .If a mass of 3kg is suspended at an edge of the scale, the mass should be suspended at  $\frac{1}{4}$  length of the other side of the scale to maintain Horizontal position is  
 a) 2 kg                      b) 1.5kg                      c) 6 kg                      d) 3 kg
7. Which of following is true . for a simple pendulum  
 a)  $T \propto l$                       b)  $T \propto \sqrt{l}$                       c)  $T \propto l^2$                       d) None
8. The sensiticeity of a physical balance is increased by the use of  
 a) Knife edges                      b) Leveling screws                      c) Plumb line                      d) light pans
9. Instrument having fixed fulcrum and unequal shoulder is  
 a)Table balance                      b) Electronic balance                      c) Common balance                      d) Triple beam steal yard
10. Single pan balance used in laboratories measure the mass accurately up to  
 a) 0.1 mg                      b) 0.1 gm                      c) 1 mg                      d) 1 gm
11. Balance used to measure weight of a substance is  
 a) Common balance                      b)Electronic balance                      c) Spring balance                      d) None
12. When a balance is used to measure the mass of a body Z.R.P , H.R.P and L.R.P are noted as 3,5 and 4 respectively .Then the correction to mass is  
 a) 0.02 gm                      b) 0.01 gm                      c) 0.04 gm                      d) None
13. The physical quantity which has common unit in all systems of unit is  
 a) Mass                      b) Time                      c) Length                      d) Speed
14. Length of simple pendulum is 80cm and its time period is 1.5 cm .If the time period is 0.75 sec then the length is  
 a) 40 cm                      b) 60 cm                      c) 80 cm                      d) 20 cm

---

**SRIGAYATRI EDUCATIONAL INSTITUTIONS**

---

15. Frequency of simple pendulum depends on  
a) Mass of the bob      b) Amplitude      c) Length      d) None
16. Oscillating simple pendulum comes to rest at  
a) Left extraem position      b) Plight extream position  
c) Mean position      d) None
17. Which of the following gives most accurate time  
a) Sundial      b) Stop clock      c) Atomic clock      d) None
18. Time taken by a simple pendulum to complete 20 oscillations is 10 sec .The time period of simple pendulum is  
a) 20 sec      b) 1 sec      c) 0.5 sec      d) None
19. At a given place for a simple pendulum  $\frac{l}{T^2}$  is  
a) Variable      b) Constant      c) Neither variable nor constant      d) None
20. Angular displacement for an oscillating simple displacement for an oscillating simple pendulum shunt not be more than  
a)  $5^\circ$       b)  $10^\circ$       c)  $20^\circ$       d) None

**OUR UNIVERS**

1. Light year is an unit of  
a) Intensity of light      b) Measure of time      c) Distance      d) None
2. Under ocean basins most of the rock is made of  
a) Granite      b) Basalt      c) Iron      d) None
3. A single huge super continent of the earth about 200 million years ago is called  
a) Laurasia      b) Gondwana      c) Panged      d) None
4. The average density of crustal rocks of earth is  
a) 2.8 gm /e.c      b) 5.5 gm ie.c      c) 8.3 gm /e c      d) None
5. A temporarily inactive volcano is know as  
a) Active volacano      b) Dorment vol cano      c) Intermil ter vol cano      d) None
6. The range of temperature of lava is  
a)  $60^\circ$  to  $120^\circ C$       b)  $600^\circ C$  to  $700^\circ C$       c)  $600^\circ C$  to  $1000^\circ C$       d)  $6000^\circ C$  to  $1200^\circ C$
7. “ Nature selected those organisms best suited to survive in the struggle for existence “.This was stated by  
a) Galileo      b) Aristotle      c) Newton      d) Dar win
8. An example for sudden change in earth crust  
a) Earth quake      b) Formation of mountains  
c) Formation of fossile      d) None
9. Life first began in water on the earth about  
a) 3.5 billion year ago      b) 2.5 billion years ago      c) 4.5 billion year ago      d) None
10. Igneous rocks are formed by the solidification of  
a) Water      b) Oil      c) Lava      d) None
11. Thicknes of the earth layer  
a) Mantle      b) Crust      c) Core      d) None

12. The density earth is  
 a) 5.5 gms /c.c      b) 2.8 gm /c.c      c) 3.8 gm /c c      d) None
13. Which of following is denser substance  
 a) Basalt      b) Water      c) Granite      d) Air
14. Under long acting stress viscous liquid is available in  
 a) Crust      b) Inner core      c) Outer core      d) Mantle
15. Land mass of northern hemisphere is  
 a) Gondwama      b) lauraria      c) Pangea      d) None

**KINEMATICS**

1. Two birds are flying directly opposite to each other at same speed . If the first bird is flying with a velouts  $v$  ,the velouts of second bird is  
 a)  $V$       b)  $-V$       c)  $2V$       d) Impossible to determine
2. A body starting from rest travels a distance 20m in 4 sec .The acceleration is  
 a)  $2.5 \text{ m / sec}^2$       b)  $2 \text{ m / sec}^2$       c)  $4 \text{ m / sec}^2$       d) None
3. A body starting from rest is travelling with an uni form acceleration  $5 \text{ m / sec}^2$  . The distance travelled by the body in 5<sup>th</sup> second is  
 a) 225 m      b) 2.25 m      c) 22.5 m      d) None
4. A car moving with a speed 54 kmph on applying breaks comes to rest in 4 sec. The acceleration is  
 a)  $\frac{-15}{4} \text{ m / sec}^2$       b)  $\frac{-15}{2} \text{ m / sec}^2$       c)  $\frac{15}{4} \text{ m / sec}^2$       d) None
5. A car takes 20 seconds to stop after the breaks are applied. If the retardation is  $1.5 \text{ m / sec}^2$  its initial velocity is  
 a)30 m/sec      b) 20 m/sec      c) 40 m/sec      d) None
6. A car moving with a speed of 10m/sec and attains an acceleration  $8 \text{ m / sec}^2$  in 4 seconds. The maximum speed of the car is  
 a)45 m/sec      b) 60 m/sec      c) 50 m/sec      d) 42 m/sec
7. A car moves with a constant velocity of 10m/sec along a straight track .Then it moves with an moves acceleration of  $2 \text{ m / sec}^2$  for 5 seconds . The total displace of the car is  
 a)175 m      b) 200 m      c) 150 m      d) None
8. A bike moving along a straight road covers 35min the 4<sup>th</sup> second and 40 m in the 5<sup>th</sup> second the acceleration of car is  
 a)  $10 \text{ m / sec}^2$       b)  $15 \text{ m / sec}^2$       c)  $20 \text{ m / sec}^2$       d)  $5 \text{ m / sec}^2$
9. A car moving with a speed of 30 m/ sec up on application of breaks comes to rest with in a distance of 5m . The retarolation is  
 a)  $90 \text{ m / sec}^2$       b)  $9 \text{ m / sec}^2$       c)  $90 \text{ cm / sec}^2$       d)  $9 \text{ cm / sec}^2$
10. Equation used to determine the distance travelled by a body in nth second is  
 a)  $S = ut + \frac{1}{2} at^2$       b)  $v^2 - u^2 = 2as$       c)  $S_n = 4 + \frac{9}{2}(2n - 1)$       d) None

**DYNAMICS**

1. The product of force and displacement is known as  
a) Energy                      b) Power                      c) Work                      d) None
2. Product of 1 N and 1 m is equal to  
a) 1 Dyne                      b) 1 Joule                      c) 1 Calorie                      d) None
3. 1 Newton is equal to  
a)  $10^5$  Dynes                      b)  $10^7$  Dynes                      c)  $10^3$  Dynes                      d) None
4. 1 Joule is equal to  
a)  $10^5$  ergs                      b)  $10^3$  ergs                      c)  $10^{12}$  ergs                      d)  $10^7$  ergs
5. 1 kilogram weight is  
a) 9.8 N                      b) 98 N                      c) 980 N                      d) None
6. The angle between force and displacement is  $\theta$ . Then the work done is  
a)  $F.S \sin \theta$                       b)  $F.S \cos \theta$                       c)  $F S \tan \theta$                       d) None
7. Rate of work done is  
a) Energy                      b) Work                      c) Power                      d) None
8. Newton meter per second is  
a) 1 Joule                      b) 1 Walt                      c) 1 Erg                      d) None
9. Potential energy of a body of mass 10 kg at a height 5 m is  
a) 490 J                      b) 980 J                      c) 98 J                      d) None
10. The work done in bringing a moving body to rest a distance of 2m by applying a force 4 N is  
a) 8 J                      b) 10 J                      c) 6 J                      d) 4 J
11. An electric motor exerts a force of 30 N on a body and pulls it through a distance of 20 m. The power of motor is  
a) 30 W                      b) 600 W                      c) 60 W                      d) 80 W
12. A 2kg block is dropped from a height 5m. Its potential energy is  
a) 50 J                      b) 100 J                      c) 5 J                      d) 20 J
13. A body of 5kg moving with a velocity 3m/sec. Its kinetic energy is  
a) 2.25 J                      b) 22.5 J                      c) 225 J                      d) None
14. Wood burn in an insufficient supply of air gives  
a) Coal                      b) Char coal                      c) Petro                      d) None
15. Percentage of carbon in lignite coal is  
a) 96                      b) 65                      c) 38                      d) 40
16. Percentage of carbon in bitumen our coal is  
a) 96                      b) 65                      c) 38                      d) None
17. Percentage of carbon in anthracite coal is  
a) 96                      b) 65                      c) 38                      d) None
18. The process of obtaining useful products from petroleum is known as  
a) Filtration                      b) Sublimation                      c) Fractional distillation                      d) None
19. Main component of natural gas is  
a) Methane                      b) Ethane                      c) Propane                      d) Butane
20. L.P.G mainly consists of  
a) Methane                      b) Ethane                      c) Propane                      d) Butane
21. Biogas mainly consists of  
a) Ethane                      b) Methane                      c) Butane                      d) None

22. The fuel used for space travel is  
 a)  $CO_2$                       b) Helicon                      c) Hydrogen                      d) None
23. Breaking down heaving nucleus in to two nuclei of nearly equal masse is known as  
 a) Nucleus fission              b) Nuclear fusion              c) Both                      d) None
24. The process of combination of two or more light nuclei to form a heaving nucleus is  
 a) Nuclear fission              b) Nuclear fusion              c) Both the Above              d) None
25. Solar energy is due to  
 a) Nuclear fission              b) Nuclear fusion              c) Both the above              d) None

LIGHT

1. For an equilateral prism the angle of prison is  
 a)  $30^0$                       b)  $60^0$                       c)  $80^0$                       d)  $120^0$
2. Refractive index of prison can be determined by using the formula  
 a)  $\frac{\sin(A + Dm)}{2 \sin(A/2)}$               b)  $\frac{\sin(A - Dm)}{2 \sin(A/2)}$               c)  $\frac{\sin(A/2)}{\sin(D/2)}$               d) None
3. If the angle of refraction is  $90^0$  for a given pair of media , than that angle is know as  
 a) Angle of indene                      b) Angle of minimum Deviation  
 c) Critical angle                      d) None
4. Light with fixed wave length is called  
 a) Colour                      b) Primary colour              c) Secondary colour              d) None
5. Red + Green gives  
 a) Magneta                      b) Cyon                      c) White                      d) Yellow
6. Combination of red and blue gives  
 a) Cyon                      b) Magneta                      c) White                      d) Red
7. Combination red , Green and blue gives  
 a) White                      b) Cyon                      c) Magneta                      d) None
8. A refracting medium having a pair our red ,surface is called  
 a) Prism                      b) Mirror                      c) Lens                      d) None
9. The line passes through optic centre of a lens is called  
 a) Axial line                      b) Principal focus              c) Radius of curvature              d) None
10. The point at which all the refracted rays will must is called  
 a) Optic centre                      b) Principal focus              c) Central plane                      d) None
11. The distance between optic write and principal focus is known as  
 a) Focal length                      b) Radius fo curvature              c) Centre of curvature              d) None
12. When an object is placed at centre of curvature of one refracting surface , the image is formed on other side at  
 a) Principal focus                      b) Centre curvature  
 c) Between opic centre and principal focus              d) None
13. To get the virtual erect and magnified image by using convex lens ,the object must be placed at  
 a) Beyond centre of curvature                      b) At principal focus  
 c) Between focus and optic centre                      d) None

14. Focal length of connexions can be determined by using the formula  
 a)  $\frac{u-v}{u+v}$                       b)  $\frac{u \times v}{u+v}$                       c)  $\frac{u+v}{u \times v}$                       d) None
15. Focal length of a concave lens can be estimated by using the formula  
 a)  $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$                       b)  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$                       c)  $\frac{1}{u} = \frac{1}{f} + \frac{1}{v}$                       d)  $\frac{1}{f} = \frac{1}{u} - \frac{1}{v}$
16. The ratio of height of the image and height of the object is known as  
 a) Power                      b) Magnification                      c) Refractive of convex lens                      d) None
17. An object of height 5cm is placed inform of a convex lends .An image of height 15 cm is observed . The magnification of lens is  
 a) 5                      b)10                      c) 15                      d) 3
18. Which of the following work like eye  
 a) T.V                      b) Radio                      c) computer                      d) Camera
19. Convex lens is used to rectify  
 a) Myopia                      b) Hypermetropia                      c) Both the above                      d) None
20. Myopia can be ratified by using  
 a) Concave lens                      b) Convex lens                      c) Con eave mirror                      d) Convex mirror
21. The reciprocal of focal length is known as  
 a) Radius of curvature                      b) Magnification                      c) Power                      d) None
22. Focal length of a lens 25 cm .The power of the lens is  
 a) 40 D                      b) 20 D                      c) 60 D                      d) 25 D
23. The power of a lens having a focal length 2.5 cm  
 a) 40 D                      b) 20 D                      c) 60 D                      d) 25 D
24. Lens having positive power  
 a) Convex                      b) Concave                      c) Concave convex                      d) None
25. Lens having negative power  
 a) Convex                      b) Concave                      c) Concave convex                      d) None
26. Telescope consists of two convex lenses form  
 a) Errect image                      b) Inverted image                      c) Both                      d) None
27. Telescope consisting of erecting lens is know as  
 a) Astronomical Telescope                      b) Camera  
 c) Terrestrial telescope                      d) None
28. A true statement rega relling compound microscope is  
 a) Focal length of eyepiece is less than objective  
 b) Focal length of eye piece is more than objective  
 c) Both are same focal length                      d)None
29. An object placed at distance of 30 cm form a convex luns of focal length 20 cm . The distance of image is  
 a) 30 cm                      b) 50 cm                      c) 60 cm                      d) None
30. As an object moves towards a convex lens  
 a) Magnification increase                      b) Magnification decrease  
 c) Both the above                      d) None

31. Choose the correct statement  
a) The final image is formed by a terrestrial telescope  
b) The final image is formed by a terrestrial telescope  
c) Both a and b  
d) None

**KEY SHEET**

**MEASUREMENT**

1. B   2. A   3. C   4. D   5. C   6. C   7. B   8. A   9. D   10. A  
11. C   12. A   13. B   14. D   15. C   16. C   17. C   18. C   19. B   20. A

**OUR - UNIVERSE**

1. C   2. B   3. C   4. A   5. B   6. C   7. D   8. A   9. A   10. C  
11. C   12. A   13. C   14. D   15. B

**KINEMATICS**

1. B   2. A   3. C   4. A   5. A   6. D   7. A   8. D   9. A   10. C

**DYNAICS**

1. C   2. B   3. A   4. D   5. A   6. B   7. C   8. B   9. A   10. A  
11. B   12. B   13. B   14. B   15. C   16. B   17. A   18. C   19. A   20. D  
21. B   22. C   23. A   24. B   25. B

**LIGHT**

1. B   2. A   3. C   4. A   5. D   6. B   7. A   8. C   9. A   10. B  
11. A   12. B   13. C   14. B   15. A   16. B   17. D   18. D   19. B   20. A  
21. C   22. B   23. A   24. A   25. B   26. A   27. C   28. A   29. C   30. A  
31. C

**HEAT**

1. "Heat lost by a body at higher temperature is equal to Heat gained by a body at lower temperature". The statement is known as  
 a) Principle of heat  
 b) principle of calorimetry  
 c) principle of thermal efficiency  
 d) None
2. Unit of heat in C.G.S units is  
 a) Calorie  
 b) Joule  
 c) watt  
 d) None
3. 4.18 Joules is equal to  
 a) 1 kilo calorie  
 b) 1 calories  
 c) 4.18 Calories  
 d) None
4. One kilo calories is equal to  
 a) 4.18J  
 b) 418J  
 c) 4180J  
 d) None
5. Specific Heat of a substance depends on  
 a) Length  
 b) Cross-sectional area  
 c) Material  
 d) None
6. The substance having highest Specific heat is  
 a) Water  
 b) olive oil  
 c) Iron  
 d) Mercury
7. 0.09cal of Heat is required the temperature of one gm of copper through 1°C. Then the specific heat of copper is  
 a) 0.5 cal/gm°C  
 b) 0.045 cal/gm°C  
 c) 0.18 cal/gm°C  
 d) 0.09 cal/gm°C
8. The quantity of heat produced by burning of unit mass of a substance is known as  
 a) Thermal efficiency  
 b) Specific energy  
 c) Latent heat  
 d) None
9. S.I unit of calorific value is  
 a) cal/gm  
 b) cal/gm°C  
 c) J/kg  
 d) None
10. By burning unit mass of petrol the amount of Heat produced is  
 a) 47MJ/kg  
 b) 34MJ/kg  
 c) 24MJ/kg  
 d) None
11. Specific energy of a substance can be determined by using  
 a) Calori Meter  
 b) Hydrometer  
 c) Thermo meter  
 d) Bomb calori meter
12. Calorimeter value of banana per each 100gm is  
 a) 345k.cal  
 b) 116k.cal  
 c) 340k.cal  
 d) None
13. The ratio between heat utilised to total heat produced is known as  
 a) Specific energy  
 b) calorific value  
 c) thermal efficiency  
 d) None
14. the heat required to convert unit mass of a substance from a lower state to a higher state, without the rise in temperature is called  
 a) Specific heat  
 b) Thermal efficiency  
 c) Specific latent heat  
 d) None
15. Which of following expands to a maximum extent  
 a) Iron  
 b) Water  
 c) Oxygen  
 d) Mercury
16. Bimetallic strips are used as  
 a) Rheostat  
 b) Heater  
 c) Thermostat  
 d) None
17. Thermostats are used in  
 a) Iron boxes  
 b) refrigerators  
 c) Fire alarms  
 d) All the above
18. The principle of pressure coefficient is used in the construction  
 a) Liquid Thermometer  
 b) Thermistors  
 c) Air Thermometers  
 d) None
19.  $\alpha : \beta : \gamma =$   
 a) 1:2:3  
 b) 2:3:1  
 c) 3:2:1  
 d) None



20. the Heat needed to raise the temperature of 20gm of water from  $25^{\circ}C$  to  $75^{\circ}C$   
 a) 10,000 cal                      b) 1000 cal                      c) 100cal                      d) 50cal

**ELECTRICITY**

1. The process of transferring electrons from one surface to another surface by friction is called  
 a) Discharging                      b) Magnatisation                      c) Electrification                      d) None
2. During Electrification the body loses electrons acquire  
 a) Positive charge                      b) Negative charge                      c) Nocharge                      d) None
3. During Electrification the body gains electrons acquire  
 a) Positive charge                      b) Negative charge                      c) Nocharge                      d) None
4. Solid have large number of conducting electrons are called as  
 a) Insulator                      b) Conductor                      c) Semi Conductor                      d) None
5. Solids have negligible Conducting electrons are known as  
 a) Insulators                      b) Conductor                      c) Semi Conductor                      d) None
6. The device used to detect presence of charge on a body is  
 a) Electroscopes                      b) Capacitor                      c) Resister                      d) None
7. The equation used to find force between two electric charges in any medium is  
 a)  $\frac{1}{4\pi\epsilon_0} \frac{q_1q_2}{d^2}$                       b)  $4\pi\epsilon_0 \frac{q_1q_2}{d^2}$                       c)  $\frac{1}{4\pi\epsilon} \frac{q_1q_2}{d^2}$                       d)  $4\pi\epsilon \frac{q_1q_2}{d^2}$
8. The Magnitude of permittivity of air or vacuum is  
 a)  $8.85 \times 10^{-12} C^2 N^{-1} m^{-2}$                       b)  $8.85 \times 10^{-10} C^2 N^{-1} m^{-2}$                       c)  $8.85 \times 10^{-12} C^2 N^{-1} m^{-2}$                       d) None
9.  $\frac{1}{4\pi\epsilon_0}$  value is equal to  
 a)  $9 \times 10^8 Nm^2 C^{-2}$                       b)  $9 \times 10^6 Nm^2 C^{-2}$                       c)  $9 \times 10^9 Nm^2 C^{-2}$                       d) None
10. Two point charged bodies of charges  $3\mu C$  and  $4\mu C$  are separated by 2m in air. The force between two charges is  
 a)  $27 \times 10^{-3} N$                       b)  $2.7 \times 10^{-3} N$                       c)  $0.27 \times 10^{-3} N$                       d)  $270 \times 10^{-3} N$
11. A force of  $45 \times 10^{-3} N$  acts between two like charges separated by 4m in air. If the magnitude of one charge is  $8\mu C$ , the magnitude of other charge is  
 a)  $4\mu C$                       b)  $6\mu C$                       c)  $8\mu C$                       d)  $10\mu C$
12. Equation used to determine current in a conductor is  
 a)  $i=q/t$                       b)  $t=q/i$                       c)  $t=qi$                       d) None
13. A charge of 60c flows through a conductor per two minutes. The current in the conductor is  
 a) 2A                      b) 0.2A                      c) 5A                      d) 0.5A
14. 2A current flows through a conductor per 3 minutes the charge pass. Through conductor is  
 a) 360C                      b) 180C                      c) 720C                      d) None
15. The unit of capacity  
 a) volt                      b) Amphere                      c) Watt                      d) farad
16. The device used to store electric charge is  
 a) Volt meter                      b) ammeter                      c) Capacitor                      d) Electroscopes

17. Equation for capacity of capacitor is  
 a)  $C = Q / V$                       b)  $Q=V/C$                       c)  $C=QV$                       d) None
18. The unit of potential difference is  
 a) Ampere                      b) coulomb                      c) Volt                      d) Ohm
19. 1 ampere is equal to  
 a)  $\frac{1 \text{ coulomb}}{1 \text{ sec}}$                       b)  $1 \text{ coulomb} \times 1 \text{ sec}$                       c)  $1 \text{ coulomb} - 1 \text{ sec}$                       d) None
20. Capacitor having capacity 0.2 Farads is connected to main of 220v. The charge stored in the capacitor is  
 a) 22 coulombs                      b) 44 coulombs                      c) 11 coulombs                      d) None

**Modern Physics**

1. A Gas at room temperature and ordinary pressure  
 a) Good conductor                      b) semi conductor                      c) Insulator                      d) None
2. Gases become Conductors at  
 a) Low pressure and low voltage                      b) high pressure and low voltage  
 c) Low pressure and high voltage                      d) None
3. The device used to produce cathode rays is  
 a) Coolidge tube                      b) Discharge tube                      c) Random tube                      d) None
4. Velocity of Cathode rays is  
 a) 0.1 of velocity of light                      b) 0.01 of velocity of light  
 c) Equal to velocity of light                      d) None
5. Modified cathode ray tube are  
 a) television picture tubes                      b) Computer display tubes  
 c) Glow sign boards                      d) All the Above
6. Mass of Hydrogen 1840 times greater than  
 a) Mass of proton                      b) Mass of neutron                      c) Mass of cathode ray particle                      d) None
7. Cathode ray fall on Hard metals to produce  
 a) Anode ray                      b) Alpha ray                      c)  $\beta - ray$                       d) X-ray
8. Speed of X-rays  
 a)  $3 \times 10^8 \text{ m / sec}$                       b)  $3 \times 10^6 \text{ m / sec}$                       c)  $3 \times 10^{10} \text{ m / sec}$                       d) None
9. Nature of X-ray  
 a) Mechanic Waves                      b) Stationary waves                      c) Electromagnetic waves                      d) None
10. Which of the following are not having particles  
 a) x-ray                      b) Cathode rays                      c) Anode ray                      d) None
11. X-rays are used in  
 a) Medicine                      b) Industries                      c) Crime Investigation                      d) All the Above
12. X-ray were discovered by  
 a) J.J. Thomson                      b) Goldstier                      c) Rourtgen                      d) None
13. gm coolidge tube target is made up of  
 a) Light Metal                      b) heavy Metal                      c) Non-metal                      d) None
14. Invisible rays are  
 a) Cathode rays                      b) Anode rays                      c) Light rays                      d) x-rays

15. X-ray used in industries are  
a)Soft X-rays                      b)Hard X-rays                      c)Cathode rays                      d)None

### WAVE MOTION

- 1) The distance between two success crests is 20cm. The wavelength of the wave is  
a)10cm                      b)40cm                      c)30cm                      d)20cm
- 2) The distance between crest and next trough is 15cm. The wave length of the wave is  
a)30cm                      b)15cm                      c)7.5cm                      d)None
- 3) For the propagation of mechanical waves a medium should have property of  
a)Expansion                      b)Contraction                      c)Elasticity and Inertia                      d)None
- 4) The distance between three successive crest is 40cm . The wave length of the wave is  
a)20cm                      b)10cm                      c)40cm                      d)30cm
- 5) The distance between two successive node of a stationsry wave is 10cm. The wave length of the wave is  
a)10cm                      b)40cm                      c)20cm                      d)None
6. The distance between Node and next antinode of a stationary wave is them. the wave length of the wave is  
a)60cm                      b)30cm                      c)15cm                      d)None
7. gn a stationary wave the point at which particle have minimum displacement are called  
a)Antinodes                      b)Crest                      c)Compression                      d)Nodes
8. Time period of a sound ave is 0.5sec. Its frequency is  
a)2Hz                      b)5Hz                      c)50Hz                      c)10Hz
9. frequency of wave is 20HZ . Its time period is  
a)0.5sec                      b)0.05sec                      c)0.25sec                      d)None
10. Time period and frequency of wave are  
a)Equal                      b)Reciprocal to each other                      c)No relation                      d)None
11. Equation for velocity of a progressive wave is  
a)  $v = r\lambda$                       b)  $\lambda = rv$                       c)  $r = v\lambda$                       d)None
12. Given a stationary Wave the point at which displacement of practiles is maximum is called  
a)Antinode                      b)Node                      c)Crest                      d)Trough
13. Velocity of Mechanical wavves in vaccum is  
a)Zero                      b)280m/sec                      c)330m/sec                      d)None
14. The displacement between three successive nodes is 30cm. The wave length of the wave is  
a)15cm                      b)60cm                      c)30cm                      d)20cm
15. Light rays are  
a)Mechanical waves                      b)Seismic waves                      c)Electro magnetic waves                      d)None

### SOUND

- 1) Sound waves of Frequency lower than audible limit are called  
a)Supersonics                      b)Ultrasonic                      c)Infrasonic                      d)None
- 2) Sound waves of Frequency greater than audible limit are called  
a)Supersonics                      b)Ultrasonic                      c)Infrasonic                      d)None
3. Which of following produces Infrasonics  
a)Ringing Bell                      b)Musical Instrument                      c)Vibrating Simple Pendulum                      d)None

4. The Sound waves reaching the ear drum vibrate the eardrum. These vibration are carries to the brain through  
 a)Blood                      b)Nerves                      c)Muscles                      d)None
5. Velocity of sound in vaccum is  
 a)Zero                      b)330m/sec                      c)350m/sec                      d)280m/sec
6. Newton's equation used to find velocity of sound in air is  
 a) $v = \sqrt{rp/p}$                       b) $v = \sqrt{\frac{rp}{p}}$                       c) $V = E/P$                       d) $v = \sqrt{\frac{E}{p}}$
7. The theoretical value of velocity of sound in air obtained by Newtons was  
 a)280m/sec                      b)335m/sec                      c)331m/sec                      d)None
8. Newton's Lapace equation used to find velocity of sound in air is  
 a) $v = v\lambda$                       b) $v = \frac{vP}{p}$                       c) $v = \sqrt{\frac{rp}{p}}$                       d) $v = \sqrt{\frac{E}{p}}$
9. Velocity of sound in solids is given by  $v = \sqrt{\frac{Y}{\rho}}$ , Here 'Y' is  
 a)Newton's modules      b) Caplace modulus      c) Joule's modulus      d) Young modulus
10. A source of longitudinal waves vibrate 160 times in two seconds velocity of this wave 240 m/sec. The wave length of the wave is  
 a) 2 m                      b) 1.5 m                      c) 3 m                      d) 4 m
11. Velocity of sound is maximum in  
 a) Oxygen                      b) water                      c) Alcohol                      d) Copper
12. Velocity of sound is minimum in  
 a) Hydrogen                      b) Kerosene                      c) Water                      d) Iron
13. The relation between velocity of sound in air and its density  
 a)  $V \propto P$                       b)  $V \propto \frac{1}{p}$                       c)  $V \propto \sqrt{p}$                       d)  $V \propto \frac{1}{\sqrt{P}}$
14. The velocity of sound in a gas at  $27^\circ C$  is 30m/sec .the velocity of sound in the same gas at  $127^\circ C$  Is  
 a)20m/sec                      b)30m/sec                      c)m/sec                      d)60m/sec
15. A body tavelling with a speed more than the velocity of sound in air is said to travel with  
 a)Supersonic Speed      b)Hypersonic Speed      c)Ultrasonic Speed      d)Infrasonic Speed
16. Velocity of Sound in at is 272m/sec.The velocity of sound in at is  
 a)288m/sec                      b)278m/sec                      c)298m/sec                      d)None

1. The study of earth magnetic field is known as  
 a) Extraterrestrial magnetism                      b) Terrestrial magnetism  
 c) Vacuum magnetism                      d) None
2. Following are used to know the direction of magnetic field  
 a) Dip                      b) Declination                      c) Magnetic lines of force                      d) None
3. The number of magnetic lines of force present in unit area is known as  
 a) Magnetic flux                      b) Intensity of magnetiefield  
 c) Dip                      d) Magnetic flux density

---

**SRIGAYATRI EDUCATIONAL INSTITUTIONS**

---

4. The true statement is  
a) Two lines of force never intersect      b) lines of force start at N- pole and end at S – pole  
c) Both a and B      d) None
5. The range of declination is  
a)  $0^{\circ}$  to  $90^{\circ}$       b)  $0^{\circ}$  to  $45^{\circ}$       c)  $0^{\circ}$  to  $60^{\circ}$       d)  $0^{\circ}$  to  $17^{\circ}$
6. Range of inclination is  
a)  $0^{\circ}$  to  $90^{\circ}$       b)  $0^{\circ}$  to  $45^{\circ}$       c)  $0^{\circ}$  to  $60^{\circ}$       d)  $0^{\circ}$  to  $17^{\circ}$
7. Elements of terrestrial magnetism are  
a) Dip      b) Delineation      c) Horizontal Component      d) All the above
8. The angle between geographical meridians and magnetic meridians is known as  
a) Dip      b) Horizontal component      c) Delineation      d) All the above
9. The angle between horizontal component and total component of magnetic field of earth is known as  
a) Dip      b) Delineation      c) Flux      d) None
10. The resultant force experienced by a unit N- pole placed in a magnetic field is known as  
a) Magnetic flux      b) Magnetic flux density  
c) Intensity of magnetic field      d) None
11. The lines passing through mid point and joining n- Pole and S – pole of a bar magnet is called  
a) Magnetic meridian      b) magnetic axis      c) Equatorial line      d) None
12. Which of the following property is shown by magnet  
a) Attractive property      b) Directive property      c) Induction      d) All the above
13. Magnetic field due to a bar magnet  
a) Has same direction at any point      b) Is uniform  
c) Is non uniform      d) None
14. Earth magnetic north pole is close to  
a) Geographical north      b) Geographical south  
c) Magnetic south      d) None
15. The perpendicular bisector line of a bar magnet is known as  
a) Equatorial line      b) Magnetic axis      c) Geographical line      d) None

**KEY SHEET**

**HEAT**

1. B    2. A    3. B    4. C    5. C    6. A    7. D    8. B    9. C    10. A  
11. D    12. B    13. C    14. C    15. C    16. C    17. D    18. C    19. A    20. B

**ELECTRICITY**

1. C    2. A    3. B    4. B    5. A    6. A    7. C    8. A    9. C    10. A  
11. D    12. A    13. D    14. A    15. C    16. C    17. A    18. C    19. A    20. B

MODERN PHYSICS

1. C 2. C 3. B 4. A 5. D 6. C 7. D 8. A 9. C 10. A  
11. D 12. C 13. B 14. D 15. B

WAVE MOTION

1. D 2. A 3. C 4. A 5. C 6. A 7. D 8. A 9. B 10. B  
11. C 12. A 13. A 14. C 15. C

SOUND

1. C 2. B 3. C 4. B 5. A 6. D 7. A 8. C 9. D 10. C  
11. D 12. A 13. D 14. C 15. A 16. A

MAGNETISON

1. B 2. C 3. D 4. C 5. D 6. A 7. D 8. C 9. A 10. C  
11. B 12. D 13. C 14. B 15. A

**PHYSICS - X**  
**MEASUREMENT OF LENGTH - Level – I & II**

1. Principle of Screwgauge [     ]
  - A) Pitch of the screw                      B) Least Count                      C) Screw in nut                      D) No. of divisions
  
2. Least count of screw gauge in meters : [     ]
  - A) 0.1 m    B) 0.01 m    C) 0.0001 m    D) 0.00001 m
  
3. Pitch of the Screw of a Screw gauge. [     ]
  - A)  $\frac{1MSD}{N}$     B)  $\frac{Distance\ travelled\ by\ tip}{Number\ of\ rotations}$
  - C)  $\frac{Distance\ travelled\ by\ tip}{No.\ of\ Circular\ division}$     D) None of these
  
4. Least Count of Screwgauge. [     ]
  - A)  $\frac{No.\ of\ MSD}{No.\ of\ rotations}$     B)  $\frac{No.\ of\ MSD}{No.\ of\ Circular\ divisions}$
  - C)  $\frac{1MSD}{No.\ of\ rotations}$     D)  $\frac{Pitch\ of\ the\ Screw}{No.\ of\ C.D.V\ (N)}$
  
5. By using which instrument we measure more accurate reading. [     ]
  - A) Vernier Callipers                      B) Screwgauge                      C) Meter Scale                      D) A, B
  
6. If 17 divisions of the Circular Scale of a Screwgauge is below the index line of the pitch scale then the zero error is ..... circular divisions. [     ]
  - A) + 17    B) – 17    C) 83    D) 34
  
7. If the zero error correction of a Screwgauge with least count 0.01mm is +0.05mm [     ]
  - A) The number of C.S.D is 100, and Zero of the Circular Scale is 5 divisions above the index line.
  - B) The number of C.S.D is 100, Zero of the Circular Scale 5 divisions below the index line
  - C) The number of C.S.D is 50 and Zero of the Circular Scale is 5 divisions above the index line
  - D) A , C
  
8. A Screwgauge has 1.0 mm pitch and 200 divisions on Circular Scale. What is the least count of the instrument. [     ]
  - A)  $5 \times 10^{-3}$  mm    B)  $4 \times 10^{-3}$  mm    C)  $5 \times 10^{-4}$  mm    D)  $2 \times 10^{-2}$  mm
  
9. The thimble of a Screwgauge has 100 divisions engraved on it. If the thimble advances 2 mm. When four complete rotations are given. [     ]
  - A) 0. 01 mm    B) 0.05 cm    C) 0.05 mm    D) 0.005 mm

10. In the above problem pitch of the Screw. [      ]  
 A) 0.5 cm                                      B) 0.05 m                                      C) 0.05 cm                                      D) None

**Level – II**

11. A micrometer Screwgauge has a negative error of B divisions while measuring the diameter of a wire the reading on main scale is 3 divisions and 24<sup>th</sup> circular scale division coincides with base line. If the number of divisions on the main scale are 20 to a centimeter and circular scale has 50 divisions.  
 i) Pitch of the scale  
 A) 0.01 cm                                      B) 0.5 cm                                      C) 0.05 cm                                      D) 0.01 mm
12. Least count of screwgauge in the above problem [      ]  
 A) 0.01 cm                                      B) 0.001 mm                                      C) 0.001 mm                                      D) 0.05 mm
13. Observed diameter of wire in the above problem. [      ]  
 A) 0.174 cm                                      B) 1.74.6 m                                      C) 0.74 cm                                      D) 0.3 cm
14. Corrected diameter in the above problem. [      ]  
 A) 0.82 mm                                      B) 0. 182 m                                      C) 1.82 mm                                      D) None of these

\* \* \*

**KEY - MEASUREMENT OF LENGTH - Level – I & II**

- 1) C            2) D            3) B            4) D            5) B            6) A            7) A  
 8) A            9) B            10) C            11) C            12) B            13) A            14) C

\*\*\*

**OUR UNIVERSE – GRAVITATION ( LEVEL – I )**

1. Following physical quantity of a planet that revolves around sun in an elliptical orbit is constant. [      ]  
 A) Kinetic energy      B) Potential energy      C) Angular momentum      D) All
2. When there is a smaller gravitational effect is present in one of the following is [      ]  
 A) Viscous force      B) Archemedes up lift      C) Electrostatic force      D) Magnetic force
3. Out of the following interactions the weakest one is [      ]  
 A) Gravitational      B) Electromagnetic      C) Nuclear                      D) Electrostatic
4. A hole is drilled through the earth along a diameter and a stone is dropped into it. When the stone is at the centre of earth it has fine. [      ]



- A) Weight                      B) Acceleration                      C) P.E                      D) Mass
5. In the above case weight of the body. [      ]  
 A) Increases                      B) Decreases                      C) O                      D) Remain same
6. Weight of a body in a coal mine sea level at the top of mountain are respectively  $w_1$ ,  $w_2$  and  $w_3$  then. [      ]  
 A)  $w_1 < w_2 < w_3$                       B)  $w_1 = w_2 = w_3$                       C)  $w_1 > w_2 > w_3$                       D)  $w_1 < w_2 > w_3$
7. 1 kg sugar is weighed with same spring balance at the equator and at the poles. Then we get. [      ]  
 A) More sugar at the poles                      B) More sugar at equator  
 C) Same quantity                      D) None of these
8. Acceleration due to gravity at a height  $h$  [ $h$  is very small] [      ]  
 A)  $g_h = g \frac{R^2}{(R+h)^2}$                       B)  $g_h = g \left[ 1 - \frac{h}{R} \right]$                       C)  $g_h = g \left[ 1 - \frac{2h}{R} \right]$                       D)  $g = g_h \left[ 1 - \frac{2h}{R} \right]$
9. Acceleration on due to gravity is maximum at [      ]  
 A) Poles                      B) Equator                      C) At centre                      D) On the surface
10. When we move the body from the centre of earth to over its surface weight of the body is [      ]  
 A) Decrease                      B) Increase  
 C) First Increases than Decreases                      D) None of these
11. A mango of 0.3 kg falls from a tree on to the earth. Calculate the acceleration of mango towards the earth ..... [      ]  
 A)  $4 \text{ ms}^{-2}$                       B)  $8.9 \text{ ms}^{-2}$                       C)  $10 \text{ ms}^{-2}$                       D)  $9.8 \text{ ms}^{-2}$
12. In the above problem Calculate the acceleration of earth towards the mango. [      ]  
 A)  $9.8 \text{ ms}^{-2}$                       B)  $3 \times 10^{-24} \text{ ms}^{-2}$                       C)  $9.8 \times 10^{-25} \text{ ms}^{-2}$                       D)  $4.9 \times 10^{-25} \text{ ms}^{-2}$
13. Acceleration due to gravity at a height [ $h=R$ ] is ..... [      ]  
 A)  $4.9 \text{ ms}^{-2}$                       B)  $2.45 \text{ ms}^{-2}$                       C)  $4.9 \text{ cms}^{-2}$                       D)  $2.95 \text{ ms}^{-2}$
14. Acceleration due to gravity at a depth  $\left[ d = \frac{R}{2} \right]$  is ..... [      ]  
 A)  $2.5 \text{ ms}^{-2}$                       B)  $4.9 \text{ ms}^{-2}$                       C)  $9.8 \text{ ms}^{-2}$                       D)  $5 \text{ ms}^{-2}$
15. Value of G. universal gravitation constant. [      ]  
 A)  $6.67 \times 10^{-11} \text{ m}^2 \text{ kg}^{-2} \text{ N}^{-1}$                       B)  $6.67 \times 10^{-11} \text{ cm}^2 \text{ N kg}^{-2}$





A)  $\sqrt{\frac{GM}{r}}$                       B)  $\sqrt{\frac{GM}{4r}}$                       C)  $\sqrt{\frac{GM}{2r}}$                       D)  $\sqrt{\frac{2GM}{r}}$

10. Two spherical balls each of mass 1kg and 4kg are separated by a distance of 12cm. The distance from 1kg at which the gravitational force on any mass becomes zero [     ]  
 A) 4 cm                      B) 12 cm                      C) 6 cm                      D) 8 cm
11.  $g_e$  and  $g_p$  denote the acceleration due to gravity on the surface of earth and another planet whose mass and radius are twice that of the earth, then ..... [     ]  
 A)  $g_p = g_e$                       B)  $g_p = g_e/2$                       C)  $g_p = 2 g_e$                       D)  $g_p = g_e$
12. Mass of the moon is 1/81 of the earth but gravitational pull is 1/6<sup>th</sup> of the earth. It is due to the fact that [     ]  
 A) Radius of the moon is 81/6 of the earth  
 B) Radius of the earth is  $\sqrt{\frac{81}{6}}$  of the moon  
 C) Moon is the satellite of the earth  
 D) None
13. Average density of earth is [     ]  
 A) is directly proportional to  $g$                       B) is inversely proportional to  $g$   
 C) is a complex function on  $g$                       D) does not depend on  $g$
14. The altitude at which the weight of a body is only 64% of its weight on the earth. Find the height [R=6400 km] [     ]  
 A) 1600m                      B) 16 m                      C) 160 km                      D) 1600 km
15. The acceleration due to gravity at a depth of 1600 km inside the earth. [     ]  
 A) 0                      B)  $9.8 \text{ ms}^{-2}$                       C)  $7 \text{ ms}^{-2}$                       D)  $7.35 \text{ ms}^{-2}$
16. Mass 1kg is divided into two parts 'x' kg and (1-x) kg for a given separation the value of x for which the gravitational attraction between the two pieces becomes maximum is [     ]  
 A) 1/2 kg                      B) 3/5 kg                      C) 1 kg                      D) 2 kg
17. The mass of ball is four times the mass of another ball when these balls are separated by a distance of 10 cm. The gravitational force between them is  $6.67 \times 10^{-7} \text{ N}$ . Then the mass of the each ball in kg.. [     ]  
 A) 0.5, 2                      B) 50, 200                      C) 2, 8                      D) 5, 20
18. If the distance between the earth and moon were doubled then gravitational force between will be [     ]  
 A) Halved                      B) Doubled                      C) Quadrupled                      D) Reduced to 1/4<sup>th</sup>

19. The radius and acceleration due to gravity of moon are  $1/4^{\text{th}}$  and  $1/5^{\text{th}}$  that of earth the ratio of mass of earth to mass of moon is. [     ]  
 A) 1 : 80                      B) 80 : 1                      C) 1 : 20                      D) 20 : 1
20. If the radius of the earth were shrink by 10% of. Its mass remaining same. The acceleration due to gravity on the earth surface would. [     ]  
 A) Decrease                      B) Remain unchanged                      C) Increase                      D) None

\* \* \*

**KEY - GRAVITATION – UNIT – 2 (LEVEL – II)**

- |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| 1)D  | 2)C  | 3)C  | 4)D  | 5)A  | 6)D  | 7)A  |
| 8)C  | 9)B  | 10)A | 11)B | 12)B | 13)D | 14)D |
| 15)D | 16)A | 17)D | 18)D | 19)B | 20)C |      |

\*\*\*

**KINEMATICS ( LEVEL – I )**

1. The distance covered by a moving body is directly proportional to the square of the time. The acceleration of the body. [     ]  
 A) Increasing                      B) Decreasing                      C) Zero                      D) Constant
2. A person sitting in a train moving with uniform velocity tossed a coin vertically up the coin will fall \_\_\_\_\_ [     ]  
 A) Back into the hands of the person                      B) Behind the person  
 C) Before the person                      D) By the side of the person
3. Among the following one which moves with non uniform velocity is \_\_\_\_\_ [     ]  
 A) Light in homogenous medium                      B) Sound  
 C) Freely falling body                      D) A, B
4. The numerical ratio of displacement to distance is. [     ]  
 A) Always less than 1                      B) Always greater than 1  
 C) Always equal to 1                      D) None of these
5. In horizontal plane in circular motion acceleration on of a body is due to [     ]  
 A) Change in magnitude                      B) Change in direction                      C) Zero                      D) Magnitude, direction

6. A ball dropped from one meter above the top of a window crosses the window in  $t_1$  second. If the same ball is dropped from 2m above the top of the same window. Time taken to cross the window  $t_2$ s then. [      ]
- A)  $t_1 = t_2$                       B)  $t_2 = 2t_1$                       C)  $t_2 > t_1$                       D)  $t_2 < t_1$
7. To reach the same height on the moon as on the earth a body must be projected up with [      ]
- A) Higher velocity on the moon                      B) Lower velocity on the moon  
C) Same velocity on the moon and earth                      D) It depends on mass of the body
8. A man standing in a lift falling under gravity releases a ball from his hand. As seen by him. The ball. [      ]
- A) Fall down                      B) Remains stationary                      C) Goes up                      D) in S.H.M
9. S – t graph of a body projected vertically up is [      ]
- A) A straight line                      B) A parabola                      C) A hyperbola                      D) A circle
10. At maximum height of a body thrown vertically up. [      ]
- A)  $V = 0, g = 0$                       B)  $V \neq 0, g=0$                       C)  $V = 0, g \neq 0$                       D)  $V \neq 0, g \neq 0$
11. In the presence of air resistance relation between  $t_a$  and  $t_d$  [      ]
- A)  $t_a = t_d$                       B)  $t_a > t_d$                       C)  $t_a < t_d$                       D)  $t_a \leq t_d$
12. A body is dropped from a height 19.6m. time of fall [      ]
- A) 2 sec                      B)  $\frac{2}{\sqrt{g}}$  sec                      C) 4 sec                      D)  $\sqrt{2}$  sec
13. A body is projected with velocity of  $9.8 \text{ ms}^{-1}$  maximum height reached by the body [      ]
- A) 9.8 m                      B) 19.6 m                      C) 4.9 m                      D) None of these
14. A body is projected up with a velocity of  $80 \text{ ms}^{-1}$  time of flight [ $g=10 \text{ ms}^{-2}$ ] [      ]
- A) 8 sec                      B) 12 sec                      C) 16 sec                      D) 20 sec
15. A body is moving with uniform velocity, acceleration of a body. [      ]
- A)  $a \text{ ms}^{-2}$                       B) zero  $\text{ms}^{-2}$                       C) Changing with time                      D) None
16. A body is projected with initial velocity  $u \text{ ms}^{-1}$ . Maximum height reach by the body [      ]
- A)  $\frac{u}{2g}$                       B)  $\frac{u^2}{2g}$                       C)  $\frac{2u}{g}$                       D)  $\frac{u^2}{2g^2}$
17. Displacement of a particle is proportional to the cube of time. The magnitude of acceleration [      ]
- A) Increases with time      B) Constant                      C) Zero                      D) Decreases with time

\* \* \*

**KEY - KINEMATICS ( LEVEL - I )**

- |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 1) D  | 2) A  | 3) C  | 4) D  | 5) B  | 6) D  |
| 7) B  | 8) B  | 9) B  | 10) C | 11) C | 12) A |
| 13) C | 14) C | 15) B | 16) B | 17) A |       |

\*\*\*

**KINEMATICS – LEVEL - II**

1. If a cyclist takes one minute to complete half revolution on a circular path 120 m radius. What is the average velocity ? [     ]  
 A) 1 m/s                      B) 2 m/s                      C) 3 m/s                      D) 4 m/s
2. If a car covers  $\frac{2}{5}$ <sup>th</sup> of the total distance with  $V_1$  speed and  $\frac{3}{5}$ <sup>th</sup> distance with  $V_2$  then average speed is. [     ]  
 A)  $\frac{1}{2}\sqrt{V_1V_2}$               B)  $\frac{V_1+V_2}{2}$                   C)  $\frac{2V_1V_2}{V_1+V_2}$               D)  $\frac{V_1+V_2}{2}$
3. A particle starts moving from rest with uniform acceleration. It travels a distance x in the first 2 sec and a distance y in the next 2 sec. Then. [     ]  
 A)  $y = x$                       B)  $y = 2x$                       C)  $y = 3x$                       D)  $y = 4x$
4. For a body travelling with uniform acceleration, its final velocity is  $V = \sqrt{180 - 7x}$ , where x is the distance travelled by the body. Then acceleration is. [     ]  
 A)  $-8 \text{ m/s}^2$                   B)  $-3.5 \text{ m/s}^2$                   C)  $-7 \text{ m/s}^2$                   D)  $180 \text{ ms}^2$
5. A car moving on a straight road accelerates from a speed of 4.1 m/s to a speed of 6.9 m/s in 5.0s. What was its average acceleration ? [     ]  
 A)  $0.56 \text{ m/s}^2$                   B)  $1.56 \text{ m/s}^2$                   C)  $5.6 \text{ m/s}^2$                   D)  $1.2 \text{ m/s}^2$
6. A body falls from 80m. Its time of descent is [ $g=10 \text{ ms}^{-2}$ ] [     ]  
 A) 3 s                          B) 4 s                          C) 5 s                          D) 6 s
7. Two bodies whose masses are in the ratio 2:1 are dropped simultaneously at two places A and B where the accelerations due to gravity are  $g_A$  and  $g_B$  respectively. If they reach the ground simultaneously, the ratio of the heights from which they are dropped is. [     ]  
 A)  $g_A : g_B$                       B)  $2 g_A : g_B$                       C)  $g_A : 2g_B$                       D)  $\sqrt{g_a} : \sqrt{g_b}$
8. A body falls for 5s from rest. If the acceleration due to gravity of earth ceases to act, the distance it travels in the next 3s is. [     ]  
 A) 80 m                          B) 45 m                          C) 160 m                          D) 40 m

9. A body released from the top of a tower of height  $h$  takes  $T$  seconds to reach the ground. The position of the body at  $T/4$  seconds is. [     ]
- A) at  $\frac{h}{16}$  from the ground                      B) at  $\frac{h}{4}$  from the top of the tower
- C) at  $\frac{15h}{16}$  from the ground                      D) at  $\frac{3h}{16}$  from the top of the tower
10. A body is dropped from a height 122.5m. If its stopped after 3 seconds and again released the further time of descent is. [     ]
- A) 2 s                      B) 3 s                      C) 4 s                      D) 5 s
11. A ball dropped on to the floor from a height of 10m rebounds to height of 2.5m. If the ball is in contact with the floor for 0.02s, its average acceleration during contact is. [     ]
- A)  $2100 \text{ ms}^{-2}$                       B)  $1050 \text{ ms}^{-2}$                       C)  $4200 \text{ ms}^{-2}$                       D)  $9.8 \text{ ms}^{-2}$
12. A splash is heard 3.12s after a stone is dropped into a well 45m deep. The speed of sound in air is [ $g=10\text{ms}^{-2}$ ] [     ]
- A)  $330 \text{ ms}^{-1}$                       B)  $375 \text{ ms}^{-1}$                       C)  $340 \text{ ms}^{-1}$                       D)  $346 \text{ ms}^{-1}$
13. A body is projected with a velocity  $50\text{ms}^{-1}$ . Distance travelled in 6<sup>th</sup> second is [ $g=10\text{ms}^{-2}$ ] [     ]
- A) 5 m                      B) 10 m                      C) 15 m                      D) 20 m
14. A body is projected vertically up with  $u$ . Its velocity at half its maximum height is. [     ]
- A)  $\frac{u}{2}$                       B)  $\frac{u^2}{2}$                       C)  $\sqrt{2}u$                       D)  $\frac{u}{\sqrt{2}}$
15. A bullet fired vertically up from the ground reaches a height 40m in its path from the ground and in it takes further time 2 seconds to reach the same point during descent. The total time of flight is ( $g=10 \text{ ms}^{-2}$ ) [     ]
- A) 4 s                      B) 3 s                      C) 6 s                      D) 8 s
16. A body is projected up with velocity  $u$ . It reaches a point in its path at times  $t_1$  and  $t_2$  seconds from the time of projection. The  $(t_1 + t_2)$  [     ]
- A)  $\frac{2u}{g}$                       B)  $\frac{u}{g}$                       C)  $\sqrt{\frac{2u}{g}}$                       D)  $\sqrt{\frac{u}{g}}$
17. A stone is dropped from top of a tower 300 m high and at the same time another is projected vertically upward with a velocity of  $100 \text{ ms}^{-1}$ . Find when and where the two stones meet. [     ]
- A) 2 s, 200.9 m                      B) 3 s, 255.9m                      C) 4 s, 250.8m                      D) 5 s, 255.10m

\* \* \*



**KEY KINEMATICS – LEVEL – II**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. D  | 2. D  | 3. C  | 4. B  | 5. A  |
| 6. B  | 7. A  | 8. C  | 9. C  | 10. C |
| 11. B | 12. B | 13. A | 14. D | 15. C |
| 16. A | 17. B |       |       |       |

\*\*\*\*

**UNIT – 4.3 SIMPLE HARMONIC (Level – I)**

1. Motion of earth around the sun is [     ]  
 A) Linear motion      B) Vibratory motion      C) Periodic motion    D) S.H.M
2. Displacement of a particle is S.H.M [     ]  
 A)  $y = A \sin \omega t$     B)  $y = A \sin kx$       C)  $y = A \sin [kt + \omega x]$       D) None of these
3. Velocity of a particle at a point in S.H.M [     ]  
 A)  $V = \omega \sqrt{A^2 - x^2}$       B)  $V = \omega x$       C)  $V = A \sqrt{\omega^2 - x^2}$       D)  $V = \omega \sqrt{x^2 - A^2}$
4. Acceleration of a particle in a S.H.M at extreme position. [     ]  
 A)  $a = \omega^2 A \sin(\omega t + \phi)$     B)  $a = \omega^2 \phi$       C)  $a = \omega^2 A$       D)  $a = \omega A \sin(\omega t - \phi)$
5. When a hole is drilled along the diameter of the earth and if a body is dropped in it and it moves to and from about the centre of earth and it is in S.H.M with time period of [     ]  
 A)  $T = 2\pi \sqrt{\frac{l}{g}}$       B)  $T = 2\pi \sqrt{\frac{R}{g}}$       C)  $T = 2\pi \sqrt{\frac{g}{R}}$       D)  $T = 2\pi \sqrt{\frac{l}{R}}$
6. Unit of frequency \_\_\_\_\_ [     ]  
 A) Sec      B) Hertz      C) Radian      D)  $\text{rad sec}^{-1}$
7. Phase difference between velocity and acceleration is [     ]  
 A)  $0^0$       B)  $\pi/2$       C)  $\pi$       D)  $2\pi^0$
8. Phase difference between displacement and acceleration is [     ]  
 A)  $0^0$       B)  $\pi/2$       C)  $\pi$       D)  $\frac{3\pi}{2}$
9. Phase difference between displacement and velocity is [     ]  
 A)  $0^0$       B)  $\pi/2$       C)  $\pi$       D)  $2\pi$

10. Time period of a seconds pendulum. [     ]  
 A) 1 sec                      B) T sec                      C) 2 sec                      D) None of these
11. Force acting on S.H.O at a displacement  $x$  from mean position is \_\_\_\_ [     ]  
 A)  $F = mwx$                       B)  $F = mw^2x$                       C)  $F = max$                       D)  $F = -mwx$
12. Time period of a simple pendulum of length  $l/4$  is..... [     ]  
 A)  $T = 2\pi\sqrt{\frac{l}{g}}$                       B)  $T = \pi\sqrt{\frac{l}{4g}}$                       C)  $T = \pi\sqrt{\frac{l}{g}}$                       D)  $T = 2\pi\sqrt{\frac{4l}{g}}$
13. Find the time period of simple pendulum. Whose length is 100m. [ $g=9.8\text{ms}^{-2}$ ] [     ]  
 A)  $T = 1\text{sec}$                       B)  $T = 4\text{sec}$                       C)  $T = 2\text{sec}$                       D)  $T = 3\text{sec}$
14. Acceleration due to gravity is directly proportional to ..... [     ]  
 A)  $l$                       B)  $g$                       C)  $\sqrt{l}$                       D)  $\sqrt{g}$
15. Find the length of a simple pendulum whose time period is 1.2 sec. [     ]  
 A)  $l=50\text{cm}$                       B)  $l=30\text{cm}$                       C)  $l=35\text{cm}$                       D)  $l=75\text{cm}$
16. If  $T_1$ ,  $T_2$  and  $T_3$  are the time periods of a given simple pendulum on the surface of the earth, at a depth 'h' in a mine and at an altitude 'h' above the earth's surface respectively then. [     ]  
 A)  $T_1 = T_2 = T_3$                       B)  $T_2 < T_1 > T_3$                       C)  $T_1 > T_2 > T_3$                       D)  $T_2 > T_1 > T_3$
17. If a pendulum clock is shifted from earth, to the surface of moon. Then it. [     ]  
 A) Loses time    B) Gains time    C) Keeps correct time    D) Does not function
18. A girl is in standing position in an oscillating swing. If the girl sits in the swing. The frequency of oscillation. [     ]  
 A) Increases                      B) Decreases                      C) Does not                      D) Becomes zero
19. Displacement of a particle in S.H.M  $y=2\text{Sin}(100\pi t + \pi/2)$  Amplitude of a particle is. [     ]  
 A) 100 m                      B) 4 m                      C) 2 m                      D) 1 m
20. Angular velocity of a particle in above problem..... [     ]  
 A)  $100\text{rad S}^{-1}$                       B)  $\pi\text{rad S}^{-1}$                       C)  $314\text{radS}^{-1}$                       D)  $3.14\text{ms}^{-1}$
21. Angular velocity of the earth about its own axis. [     ]  
 A)  $180\text{radS}^{-1}$                       B)  $\frac{\pi}{86400}\text{rad S}^{-1}$                       C)  $\frac{2\pi}{86400}\text{rad S}^{-1}$                       D)  $\frac{\pi}{43200}\text{rad}$
22. In a uniform circular motion. If the radius is doubled the centripetal force now. [     ]  
 A)  $\frac{1}{4}$  of great as be force                      B)  $\frac{1}{2}$  as great as be force  
 C) 2 times as great be force                      D) 4 times as great be force

23. A car moves on a curved but level road. The necessary centripetal force on the car is provided by \_\_\_\_\_ [     ]  
 A) inertia                      B) gravity                      C) friction                      D) normal reaction
24. A car of mass 1200 kg taken a turn of a curved road of radius 180 m with a speed of  $6 \text{ ms}^{-1}$ . The centripetal force acting on the car is. [     ]  
 A) 50N                      B) 147 N                      C) 240 N                      D) 440 N

\* \* \*

**KEY - SIMPLE HARMONIC**

**UNIT – 4.3 ( Level – I )**

- |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|
| 1) C  | 2) A  | 3) A  | 4) C  | 5) B  | 6) B  | 7) B  | 8) C  |
| 9) B  | 10) C | 11) B | 12) C | 13) C | 14) A | 15) C | 16) B |
| 17) B | 18) A | 19) C | 20) C | 21) C | 22) C | 23) C | 24) C |

\*\*\*

**PHYSICS SIMPLE HARMONIC MOTION – UNIT – 4.3 (LEVEL – II)**

1. The motion of a particle in S.H.M is represented by the equation  $y = A \sin \omega t + B \cos \omega t$ . The resultant amplitude is. [     ]  
 A) A                      B) B                      C) A + B                      D)  $\sqrt{A^2 + B^2}$
2. The ratio of maximum acceleration to maximum displacement of a simple Harmonic motion is equal to. [     ]  
 A) Square of angular velocity                      B) Square of time period  
 C) Time period                      D) Angular velocity
3. A particle is executing S.H.M. Then the graph of acceleration as a function of displacement is [     ]  
 A) A sine curve                      B) A circle                      C) A straight line                      D) Parabola
4. The graph plotted between force and displacement of particle executing S.H.M is [     ]  
 A)                      B)                      C)                      D)
5. If iron sphere is replaced by wooden sphere of same mass time period. [     ]  
 A) Increase                      B) Decrease                      C) Remains same                      D) none of these
6. A simple pendulum hanging freely and at its vertical position because in the position. [     ]  
 A) K.E is zero                      B) K.E minimum                      C) P.E is zero                      D) P.E. minimum

7. The time period of stiffer spring as compared to that of a soft spring is [     ]  
 A) Less                      B) More                      C) Infinity     D) Depends upon the spring material
8. The maximum displacement of an oscillating particle is 0.05m. If its time period is 1.57 s (i) What is the velocity at the mean position (ii) What is its acceleration at the extreme position. [     ]  
 A)  $0.2 \text{ ms}^{-1}$ ,  $0.2 \text{ ms}^{-2}$                       B)  $0.8 \text{ ms}^{-1}$ ,  $0.8 \text{ ms}^{-2}$   
 C)  $0.2 \text{ ms}^{-1}$   $0.8 \text{ ms}^{-2}$                       D)  $0.8 \text{ ms}^{-1}$ ,  $0.2 \text{ ms}^{-2}$
9. The time period of a particle performing linear S.H.M is 12 sec. the time taken by it to make a displacement equal to half its amplitude is ? [     ]  
 A) 1 sec                      B) 2 sec                      C) 3 sec                      D) 4 sec
10. The equation motion of a particle in S.H.M is  $a + 16\pi^2x = 0$ . In the equation a is the linear acceleration (in  $\text{m/sec}^2$ ) of the particle at a displacement x in meter. The time period of S.H.M in seconds is [     ]  
 A)  $\frac{1}{4}$                       B)  $\frac{1}{2}$                       C) 1                      D) 2
11. For a body in S.H.M the velocity is given by the relation  $V = \sqrt{144 - 16x^2} \text{ ms}^{-1}$ . The maximum acceleration is [     ]  
 A)  $12 \text{ ms}^{-2}$                       B)  $16 \text{ ms}^{-1}$                       C)  $36 \text{ ms}^{-2}$                       D)  $48 \text{ ms}^{-2}$
12. The time period of simple pendulum is 'T' when length increased by 10cm, its period is  $T_1$  when the length is decreased by 10cm. Its period is  $T_2$ , then the relation between T,  $T_1$ ,  $T_2$  is. [     ]  
 A)  $\frac{2}{T^2} = \frac{1}{T_1^2} + \frac{1}{T_2^2}$                       B)  $\frac{2}{T^2} = \frac{1}{T_1^2} - \frac{1}{T_2^2}$                       C)  $2T^2 = T_1^2 + T_2^2$                       D)  $2T^2 = T_1^2 - T_2^2$
13. The period of oscillation of a simple pendulum of length L suspended from the ceiling of a vehicle which moves with friction down in an inclined plane of inclination ' $\alpha$ ' is given by. [     ]  
 A)  $2\pi\sqrt{\frac{L}{g \cos\alpha}}$                       B)  $2\pi\sqrt{\frac{L}{g \sin\alpha}}$                       C)  $2\pi\sqrt{\frac{L}{g}}$                       D)  $2\pi\sqrt{\frac{L}{g \tan\alpha}}$
14. Two springs of force constants  $1000\text{Nm}^{-1}$  and  $200\text{Nm}^{-1}$  are stretched by same force. The ratio of their respective potential energies is [     ]  
 A) 2 : 1                      B) 1 : 2                      C) 4 : 1                      D) 1 : 4
15. Which of the following quantities are always negative [     ]  
 A)  $\bar{F} \cdot \bar{a}$                       B)  $\bar{V} \cdot \bar{r}$                       C)  $\bar{a} \cdot \bar{r}$                       D)  $\bar{F} \cdot \bar{v}$

\* \* \*

**KEY PHYSICS SIMPLE HARMONIC MOTION – UNIT – 4.3 (LEVEL – II)**

1. D      2. A      3. C      4. C      5. C      6. D      7. A      8. C  
 9. A      10. B      11. D      12. C      13. A      14. A      15. C

\*\*\*

**UNIT- 4 – DYNAMICS (Level – I)**

1. Type s of motion of a particle are \_\_\_\_\_ [    ]  
 A) Two                      B) Four                      C) Three                      D) None of these
2. In translatory motion body is moving along \_\_\_\_ [    ]  
 A) Circular path   B) Rotatory motion   C) Oscillatory motion   D) Straight line motion
3. Dimentional formula for Angular displacement. [    ]  
 A) L                      B)  $LT^{-1}$                       C)  $L^2$                       D) None of these
4. Unit of Angular velocity is [    ]  
 A) Radian                      B) Radian  $Sec^{-1}$                       C) Rad sec.                      D) Rad  $Sec^{-2}$
5. In uniform circular motion \_\_\_\_\_ is constant. [    ]  
 A) Angular displacement                      B) Acceleration  
 C) Angular velocity                      D) Linear velocity
6. Relation between  $\omega$  and  $v$  [    ]  
 A)  $V = \bar{\omega} \times \bar{r}$                       B)  $W = \bar{\omega} \times \bar{v}$                       C)  $W=Vr$                       D)  $V = \bar{r} \times \bar{\omega}$
7. Centripetal acceleration is [    ]  
 A)  $a_c = \frac{v}{t}$                       B)  $a_c = vr$                       C)  $a_c = \frac{v^2}{r}$                       D)  $a_c = \frac{v}{r^2}$
8. Electron going around the nucleus in an atom. Centripetal force is provided by [    ]  
 A) Gravitational force   B) Nuclear force      C) Electrostatic force      D) None
9. In uniform circular motion direction of velocity ..... [    ]  
 A) Same                      B) Changes                      C) towards the centre      D) Away from centre
10. In circular motion force is proportional [    ]  
 A) Acceleration   B) Velocity                      C) Square of the velocity      D) Radius

11. A satellite revolving around a planet centripetal force arises due to [     ]  
 A) Centrifugal force    B) Viscous force    C) Gravitational force    D) Normal force
12. Direction of centrifugal force. [     ]  
 A) Straight line            B) Vertically up    C) Down            D) Away from the centre
13. Newton's law's are not applicable in [     ]  
 A) Co-ordinate system    B) Inertial frame    C) Non inertial frame    D) None
14. Centripetal and centrifugal forces are \_\_\_\_\_ [     ]  
 A) Same magnitude and direction    B) Different magnitude and same direction  
 C) Different magnitude and direction    D) Same magnitude and opposite in direction
15. Centrifuge, laundry driers are working based on. [     ]  
 A) Circular motion    B) Centripetal force    C) Centrifugal force    D) Linear motion
16. Banking Angle  $\theta$  is [     ]  
 A)  $\sin^{-1}\left[\frac{V^2}{rg}\right]$             B)  $\tan^{-1}\left[\frac{V^2r}{rg}\right]$             C)  $\tan^{-1}\left[\frac{V^2}{rg}\right]$             D)  $\cos^{-1}\left[\frac{V^2}{rg}\right]$
17. In banking of a road  $R \sin \theta$  is Balanced by \_\_\_\_\_ [     ]  
 A) Weight            B)  $\frac{V^2}{rg}$             C)  $\frac{mv^2}{r}$             D)  $R \cos \theta$
18. Natural satellite of earth ..... [     ]  
 A) Moon            B) Sun            C) Aryabatta            D) PSLV-2
19. Banking Angle ( $\theta$ ) depends on [     ]  
 A) Velocity            B) Radius            C) a, b            D) None of these
20. 1 radian = [     ]  
 A)  $180^0$             B)  $90^0$             C)  $57.29^0$             D)  $57'. 18^0$

\* \* \* \*

**KEY - UNIT- 4 – DYNAMICS (Level – I)**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1. C  | 2. D  | 3. D  | 4. B  | 5. C  | 6. A  | 7. C  |
| 8. C  | 9. B  | 10. C | 11. C | 12. D | 13. C | 14. D |
| 15. C | 16. C | 17. A | 18. A | 19. C | 20. D |       |

\*\*\*

**DYNAMICS [Level – II]**

1. A car is moving in a circular path with a uniform speed V. The magnitude of change in its velocity. When the car rotates through an angle  $\theta$ . [     ]  
 A)  $2V\cos\theta$                       B)  $2V\cos\theta/2$                       C)  $2V\sin\theta/2$                       D)  $2V\sin^2\theta/2$
2. The linear velocity of a person at equator of earth due to its spinning motion. [     ]  
 A)  $460\text{ ms}^{-1}$                       B)  $461\text{ ms}^{-1}$                       C)  $465\text{ ms}^{-1}$                       D)  $476\text{ ms}^{-1}$
3. A motor cyclist takes U-turns in 4sec. The average angular velocity of the motor cyclist. [     ]  
 A)  $1\text{ rads}^{-1}$                       B)  $0.8\text{ rads}^{-1}$                       C)  $8\text{ rads}^{-1}$                       D)  $80\text{ rads}^{-1}$
4. Angular velocity of seconds hand. It complete one revolution. [     ]  
 A)  $\frac{\pi}{15}\text{ rads}^{-1}$                       B)  $\frac{2\pi}{30}\text{ rads}^{-1}$                       C)  $\frac{\pi}{30}\text{ rads}^{-1}$                       D) None
5. Angular velocity of hours hand it completes one revolution in 12 hours. [     ]  
 A)  $\frac{\pi}{84,600}\text{ rads}^{-1}$                       B)  $\frac{\pi}{43,600}\text{ rads}^{-1}$                       C)  $\frac{\pi}{21,600}\text{ rads}^{-1}$                       D)  $\frac{2\pi}{11,800}\text{ rads}^{-1}$
6. The magnitude of net acceleration of a particle in non uniform circular motion. [     ]  
 A)  $\sqrt{r^2+w^2}$                       B)  $\sqrt{r^2w^2+at^2}$                       C)  $\sqrt{(rw^2+at^2)}$                       D)  $\sqrt{\left(\frac{r}{v}\right)^2+(r\alpha)^2}$
7. Many great rivers flow towards the equator what effect does the sediment they carry to sea have on the rotation of the earth. [     ]  
 A) The rotation of the earth slow down                      B) The rotation of the earth speed up  
 C) No effect on the rotation of earth                      D) None
8. If the velocity of a rotating body of mass 50kg is given by  $\vec{V}=3\hat{i}+4\hat{j}+5\hat{k}$  and radius vector  $\vec{r}=2\hat{i}+3\hat{j}+4\hat{k}$  then its angular momentum. [     ]  
 A)  $50\text{ i} + 50\text{ J} + 50\text{K}$     B)  $50\hat{i}+100\text{J} + 50\text{K}$     C)  $50\text{ i} + 50\text{J} + 100\text{K}$     D)  $-50\text{ i} + 100\text{ J} - 50\text{ K}$
9. The centripetal force required for 1000kg car travelling at 36 kmph to take a turn  $90^\circ$  in travelling along on arc of length 628m is [     ]  
 A) 250 N                      B) 500 N                      C) 1000 N                      D) 125 N

10. The safe maximum velocity of the vehicle moving around a curved path of radius  $r$  is.

[     ]

- A)  $V_{\max} = \frac{F}{\omega^2}$       B)  $V_{\max} = \mu gr$       C)  $V_{\max} = \sqrt{\mu gr}$       D)  $V_{\max} = \sqrt{\mu r}$

\* \* \*

**KEY - DYNAMICS [Level – II]**

1. C      2. C      3. B      4. C      5. C      6. C      7. A  
 8. D      9. D      10. C

\*\*\*

**ELECTROMAGNETIC SPECTRUM [Level – I]**

1. The speed of light in vacuum is.....

[     ]

- A)  $5 \times 10^8$  m/s    B)  $3 \times 10^5$  m/s    C)  $3 \times 10^8$  m/s    D)  $3 \times 10^{-8}$  m/s

2. The wavelength range of visible spectrum is .....

[     ]

- A)  $0.4 \mu\text{m} - 0.7 \mu\text{m}$     B)  $0.7 \mu\text{m} - 100 \mu\text{m}$     C)  $0.001 \text{ nm} - 10 \text{ nm}$     D)  $1 \text{ m} - 100 \text{ km}$

3. The types of electromagnetic radiation used in **RADAR** are.....

[     ]

- A) Radio waves      B) microwaves      C) X - rays      D) gamma rays

4. The type of electromagnetic radiations used for physiotherapy is.....

[     ]

- A) Microwaves      B) infrared      C) X - rays      D) gamma rays

5. The wavelength range of soft X - rays is about.....

[     ]

- A)  $1 \text{ \AA} \text{ to } 10 \text{ \AA}$       B)  $0.01 \text{ \AA} \text{ to } 1 \text{ \AA}$       C)  $0.01 \text{ nm} \text{ to } 1 \text{ nm}$     D)  $10 \text{ \AA} \text{ to } 100 \text{ \AA}$

6. Electromagnetic radiation with wavelength of the order of  $10^{-14}$  m is called.....

[     ]

- A) Ultraviolet radiation    B) infrared radiation    C) gamma radiation    D) microwave radiation

7. An electromagnetic wave is a.....

[     ]

- A) Mechanical wave    B) transverse wave    C) longitudinal wave

D) Combination of a longitudinal and transverse wave.

8. Which of the following has the highest frequency?

[     ]

- A) Radio waves      B) Micro waves      C) Visible light      D) Ultraviolet radiation



9. Which of the following has the longest wave length? [     ]  
 A) Microwaves                      B) Visible light                      C) Gamma radiation    D) Ultraviolet radiation
10. Electromagnetic radiations with the shortest wave lengths are..... [     ]  
 A) Infrared radiations    B) Gamma radiations    C) Ultraviolet radiations    D) X - rays
11. The most penetrating electromagnetic radiations are..... [     ]  
 A) X - rays                      B) UV rays                      C) IR rays                      D)  $\gamma$  - rays
12. Infrared radiations can be detected by ..... [     ]  
 A) A thermometer    B) a red glass    C) a glass prism                      D) a satellite dish
13. Which of the following rays are used to take photographs of object in darkness? [     ]  
 A) Infrared rays                      B) Microwaves                      C) Ultraviolet rays    D) Gamma rays
14. Light of wave length 7000 Å (in vacuum ) corresponds to .....color. [     ]  
 A) Blue                      B) green                      C) red                      D) yellow
15. Short wave length X - rays are used to determine the structure of ..... [     ]  
 A) Crystalline solids    B) amorphous solids    C) both A&B                      D) none
16. .... radiations are thermal radiations. [     ]  
 A) Gamma radiations    B) X - rays                      C) infrared                      D) ultraviolet
17. 1 Å = ..... m [     ]  
 A)  $10^8$  m                      B)  $10^{10}$  m                      C)  $10^6$  m                      D)  $10^{-10}$  m
18. 1 Å = ..... nm [     ]  
 A) 0.1 nm                      B) 0.01 nm                      C) 1 nm                      D) 0.001 nm
19. 1 Å = ..... Pico meters. [     ]  
 A) 10                      B) 100                      C) 1000                      D) 0.1
20. The use of X - rays in the treatment of diseases like cancer is called..... [     ]  
 A) Radiography                      B) radio astronomy    C) radiotherapy                      D) physiotherapy

\* \* \*

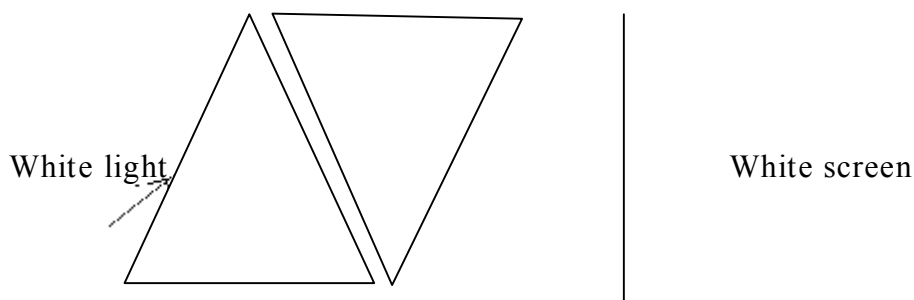
**KEY - ELECTROMAGNETIC SPECTRUM**

- 1) C      2) A      3) B      4) B      5) D      6) C      7) B  
 8) D      9) A      10) B      11) D      12) A      13) A      14) C  
 15) A      16) C      17) D      18) A      19) B      20) C

\*\*\*

**ELECTRO MAGNETIC SPECTRUM – LEVEL - II**

1. Ultraviolet radiations when absorbed by the skin stimulate the body to produce vitamin \_\_\_\_ [      ]  
 A) A                      B) C                      C) B                      D) D
2. Any source of light at a temperature of \_\_\_\_ is a good source of ultraviolet radiation [      ]  
 A)  $< 100^{\circ}\text{C}$               B)  $< 1000^{\circ}\text{C}$               C)  $< 1500^{\circ}\text{C}$               D)  $> 2500^{\circ}\text{C}$
3. Observe the diagram given below and explain the color produced on the screen. [      ]



- A) red                      B) blue                      C) VIBGYOR                      D) White
4. A light, which is a mixture of several colours is called \_\_\_\_ [      ]  
 A) polychromatic              B) monochromatic      C) both A&B              D) None
5. \_\_\_\_\_ rays are least scattered by fog, mist, etc. [      ]  
 A) UV rays                      B) Infrared rays              C) X – rays                      D) None
6. Experiments for UV radiations are best conducted with \_\_\_\_\_ prisms. [      ]  
 A) glass                      B) quartz                      C) rock salt                      D) B & C
7. \_\_\_\_\_ radiations are used to detect adulteration in ghee [      ]  
 A) Infrared                      B) X – rays                      C) Ultraviolet                      D) None
8. \_\_\_\_\_ radiations are used to detect forgery of cheque or important documents. [      ]  
 A) Infrared                      B) Ultraviolet                      C) X – ray                      D) None
9. Arrange the following in the ascending order of frequency: X – rays, radio waves, infrared rays, UV-rays &  $\gamma$ -rays [      ]  
 A)  $\gamma$ -rays, x- rays, UV – rays, infrared rays, radio waves

- B)  $\gamma$  -rays, x-rays, UV – rays, radio waves, infrared rays  
 C) radio waves, infrared rays, UV – rays, x – rays,  $\gamma$  -rays  
 D) None
10. Which of the following shows fluorescence, on absorbing Ultraviolet radiation. [     ]  
 A) Zinc sulphide     B) Braium platino cyanide C) Barium sulphide     D) All
11. Wavelength range of television waves. [     ]  
 A) 1 m to 1 cm     B) 1 nm to 10 nm     C) 1 cm to 0.1 cm     D) 1 nm to 10 nm
12. For harder X – rays [     ]  
 A) Wavelength is higher     B) intensity is higher  
 C) Frequency is higher     D) all of these

\* \* \*

**KEY - ELECTRO MAGNETIC SPECTRUM – LEVEL – II**

- |      |      |      |       |       |       |
|------|------|------|-------|-------|-------|
| 1) D | 2) D | 3) D | 4) A  | 5) B  | 6) B  |
| 7) C | 8) C | 9) C | 10) D | 11) A | 12) C |

\*\*\*

**SOUND – (LEVEL – I)**

1. The frequency of the simple pendulum depends only on its..... [     ]  
 A) Length     B) mass     C) A&B     D) none
2. Periodic vibrations of decreasing amplitude are called..... [     ]  
 A) Stationary waves     B) damped vibrations     C) longitudinal waves     D) none
3. On reflecting from a rigid or fixed end a wave undergoes a phase change of..... [     ]  
 A)  $\frac{\pi}{2}$      B)  $\pi$      C)  $2\pi$      D)  $\frac{3\pi}{4}$
4. The distance between one crest & next trough is..... [     ]  
 A)  $\frac{\lambda}{2}$      B)  $\frac{\lambda}{4}$      C)  $\lambda$      D)  $\frac{\lambda}{3}$
5. The distance between two successive nodes or antinodes is..... [     ]  
 A)  $\frac{\lambda}{2}$      B)  $\frac{\lambda}{4}$      C)  $\lambda$      D)  $\frac{\lambda}{3}$
6. The distance between one node and next anti node is..... [     ]  
 A)  $\frac{\lambda}{2}$      B)  $\frac{\lambda}{4}$      C)  $\lambda$      D)  $\frac{\lambda}{3}$
7. The velocity of sound in air is given by..... [     ]  
 A)  $v = \sqrt{\frac{\gamma\rho}{p}}$      B)  $v = \sqrt{\frac{p}{\gamma\rho}}$      C)  $v = \sqrt{\frac{\gamma p}{\rho}}$      D) None

8. Adiabatic constant ( $\gamma$ )=..... [     ]  
 A)  $\frac{C_p}{C_v}$      B)  $\frac{C_v}{C_p}$      C)  $C_p C_v$      D) None
9. In a “closed-end-tube” at the closed end always.....is formed [     ]  
 A) Anti node   B) node     C) crest     D) trough
10. In a resonating air-column. In the first mode of vibration, the length of air column  $l_1$ =.....[     ]  
 A)  $\frac{\lambda}{2}$      B)  $\frac{\lambda}{4}$      C)  $\lambda$      D)  $\frac{\lambda}{3}$
11. In a “closed-end-tube” at the open end always.....is formed [     ]  
 A) Anti node   B) node     C) crest     D) trough
12. In a.....wave, energy remains trapped in a fixed region. [     ]  
 A) Longitudinal     B) transverse wave     C) stationary     D) progressive wave
13. Velocity of sound in air is..... [     ]  
 A) 200 m/sec     B) 330 m/sec     C) 400 m/sec     D) 150 m/sec
14. In a resonating air-column. In the second mode of vibration, the length of air column  $l_2$ =...[     ]  
 A)  $\frac{\lambda}{2}$      B)  $\frac{3\lambda}{4}$      C)  $\lambda$      D)  $\frac{\lambda}{3}$
15. A medium transmits a sound wave through it by virtue of its ..... [     ]  
 A) Elasticity   B) inertia     C) density     D) elasticity & inertia
16. The distance between a node and the next anti node in a stationary wave is 10 cm. Then the wave length is [     ]  
 A) 5 cm     C) 40 cm     C) 20 cm     D) 10 cm
17. In a resonating air column experiment with a close-end tube, the first resonance occurs when the length of the air column is 10 cm. The second resonance occurs at... [     ]  
 A) 5 cm     B) 20 cm     C) 30 cm     D) 40 cm
18. In a resonating air column experiment with a tube closed at one end, resonances are obtained for sound waves of wave length 91.2 cm. The difference in the length of the air column for the first and the second resonances is [     ]  
 A) 22.8 cm     B) 182.4 cm     C) 45.6 cm     D) 273.6 cm

19. In a stationary wave, the point at which the displacement is maximum is called ..... [     ]  
 A) a node     B) an anti node     C) a crest     D) a trough
20. The vibrations of a body left to itself after excitation are called ..... [     ]  
 A) Natural vibrations     B) Forced vibrations     C) Damped vibrations     D) None of these.

\* \* \*

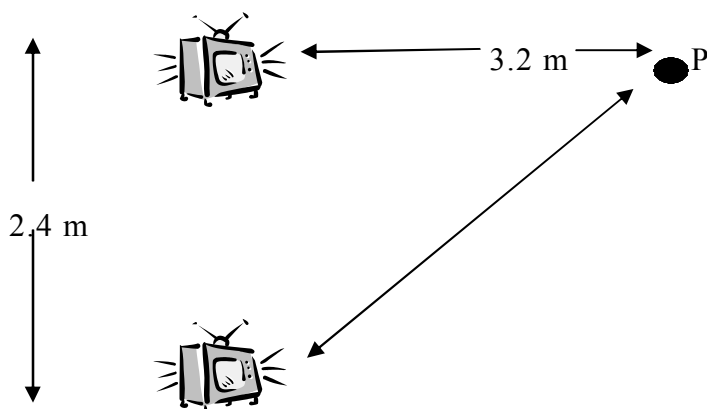
**KEY - SOUND – Level – I**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) A  | 2) B  | 3) B  | 4) A  | 5) A  | 6) B  | 7) C  |
| 8) A  | 9) B  | 10) B | 11) A | 12) C | 13) B | 14) B |
| 15) D | 16) C | 17) C | 18) C | 19) B | 20) A |       |

\*\*\*

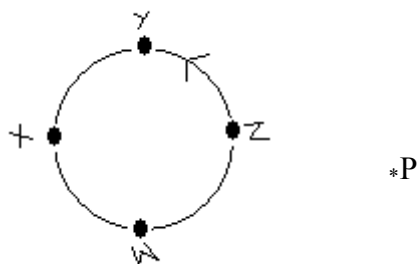
**SOUND – LEVEL - II**

1. If fundamental frequency of an open pipe is  $f_0$ . Its fundamental frequency when it is half-filled with water is [     ]  
 A)  $f_0$      B)  $\frac{f_0}{2}$      C)  $2f_0$      D) None
2. In the experiment for determination of the speed of sound in air using resonance tube method. The length of air column that resonates with fundamental mode with a tuning fork is 0.1 m. When its length is changed to 0.35 m, the same tuning fork resonates with a length 0.35 m in first over tone. Then end correction is. [     ]  
 A) 0.012 m     B) 0.025 m     C) 0.05 m     D) 0.0024 m
3. Two stereo speakers are separated by a distance of 2.4 m. A person stands at a distance of 3.2 m as shown directly in front of one of the speakers. Find the frequency in audible range for which the listener will hear a minimum sound intensity. (Speed of sound in air is 320 m/s)



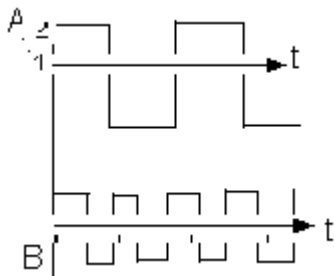
- A) 160 (2n+1)     B) 320 (2n+1)     C) 200 (2n+1)     D) 100 (2n+1)

4. Velocity of sound is maximum in \_\_\_\_\_ season [     ]  
 A) Rainy                                      B) Winter                                      C) Summer                                      D) None
5. A sound source rotates anti clock wise with an angular velocity  $\omega$ . Radius of the circle is R. A person is at 'P'. The maximum frequency is heard when position of the source is at [     ]



- A) Y                                      B) X                                      C) Z                                      D) W
6. In the absence of teacher a class of 50 students make a noise level of 50 dB. 50 more students enter the class. Assuming each student on an average produces same intensity of sound then the noise level increases by [ $\log 2 = 0.3010$ ]  
 A) 50 dB                                      B) 25 dB                                      C) 8.33 dB                                      D) 3 dB
7. Which of the following is mechanical wave [     ]  
 A) Light waves                                      B) Sound waves                                      C) X – rays                                      D) Radio waves
8. A pendulum vibrates with a time period of 1S. The sound produced by it is in the \_\_\_ [     ]  
 A) Audible range                                      B) Infrasonic range                                      C) Ultrasonic range                                      D) Supersonic range
9. The pressure of air increased by 100 mm. Of Hg. The temperature decreases by  $1^{\circ}\text{C}$ . What will be the change in the speed of sound in air? [     ]  
 A) 61 m/s                                      B)  $61 \text{ mm}^{-1}$                                       C) 61 cm/se                                      D) None
10. A resonance tube of length 1m is resonated with a tuning fork of frequency 300 Hz. If the velocity of sound in air is 300 m/sec. Then the number of harmonics produced in the tube will be. [     ]  
 A) 1                                      B) 2                                      C) 3                                      D) 4
11. As a wave propagates [     ]  
 A) The intensity remains constant for a plane wave  
 B) The wave intensity falls as the inverse of the distance from source for a spherical wave  
 C) The wave intensity falls as the inverse square of the distance from a spherical wave  
 D) Total intensity of the spherical wave over the spherical surface centred at the source remains constant at all times.
12. A piezo electric quartz crystal of thickness 0.005 m is vibrating in resonate conditions. Calculate the fundamental frequency  $f_0$  for quartz. [     ]  
 ( $Y = 8 \times 10^{10} \text{ Nm}^{-2}$ ) and ( $\rho = 2.65 \times 10^3 \text{ kg m}^{-3}$ )  
 A) 5.5 MHz                                      B) 55 MHz                                      C) 0.55 MHz                                      D) 5.5 KHz

13. Two mono atomic ideal gases 1 and 2 of molecular masses  $m_1$  and  $m_2$  respectively are enclosed in separate containers kept at the same temperature. The ratio of the speed of sound in gas 1 to gas 2 is given by. [     ]
- A)  $\frac{m_1}{m_2}$      B)  $\sqrt{\frac{m_1}{m_2}}$      C)  $\frac{m_2}{m_1}$      D)  $\sqrt{\frac{m_2}{m_1}}$
14. The velocity of sound is  $V_s$  in air. If density of air is increased twice then the new velocity of sound will be. [     ]
- A)  $V_s$      B)  $\frac{V_s}{\sqrt{2}}$      C)  $\sqrt{2} V_s$      D)  $\frac{3}{2} V_s$
15. Calculate the ratio of speed of sound wave in Neon to that in  $H_2O$  vapour at any temperature. [     ]
- A)  $\frac{9}{8}$      B)  $\frac{3}{2\sqrt{2}}$      C)  $\frac{3}{2}$      D)  $\frac{8}{9}$
16. Find the speed of sound in a mixture of 1 mole of He and Z mole of  $O_2$  at  $27^\circ C$ . [     ]
- A) 480 m/sec     B) 621 m/sec     C) 401 m/sec     D) 601 m/sec
17. Which of the following will pair up to produce stationary wave. [     ]
- A)  $Z_1 = A \cos$       $Z_1 = A \cos(Kx - wt)$      B)  $Z_2 = A \cos(Kx + wt)$
- C)  $Z_3 = A \cos(Ky - wt)$      D)  $Z_4 = A \cos(Kz + wt)$
18. A and B are two wave trains shown in the fig. 18.11, the ratio of intensity of A to B is [     ]



- A) 1     B) 2     C) 4     D) 8
19. Velocity of sound is not effected by \_\_\_\_\_ [     ]
- A) medium     B) density     C) pressure     D) none
20. \_\_\_\_\_ tube is used to demonstrate interference of sound. [     ]
- A) kundt's     B) quinke's     C) a & b     D) none

\* \* \*

**KEY - SOUND – LEVEL – II**

- |      |      |      |            |      |      |      |
|------|------|------|------------|------|------|------|
| 1)A  | 2)B  | 3)C  | 4)A        | 5)D  | 6)D  | 7)B  |
| 8)B  | 9)C  | 10)B | 11)A, C, D | 12)C | 13)D | 14)C |
| 15)B | 16)C | 17)A | 18)A       | 19)C | 20)B |      |

\*\*\*

**LIGHT [Level – I]**

1. In quantum theory of radiation. Light is treated as consisting of quanta of radiation called..... [     ]
 

A) Protons    B) photons    C) electrons    D) None
2. According to corpuscular theory of light various colors of light are due to..... [     ]
 

A) Different wave lengths    B) different frequencies                      C) different sizes of corpuscles  
D) None
3. The corpuscles are repelled near the reflecting surface in such a way that [     ]
 

A)  $\angle i < \angle r$               B)  $\angle i > \angle r$               C)  $\angle i = \angle r$               D)  $\angle r < \angle i$
4. According to Newton when corpuscles enter the denser medium from a rarer medium their speed [     ]
 

A) Increases              B) decreases              C) never change              D) None
5. Newton corpuscular theory could not explain..... [     ]
 

A) Interference              B) diffraction              C) polarization              D) all the above
6. The corpuscular theory of light attempted to explain.....of light [     ]
 

A) Reflection and refraction    B) double refraction    C) interference and diffraction    D) polarization
7. The bending of waves around an obstacle is called..... [     ]
 

A) Interference              B) refraction              C) polarization              D) diffraction
8. Huygens hypothesized that propagation of light waves is made possible by an all pervading elastic medium called..... [     ]
 

A) Water              B) air              C) glass              D) ether or luminiferous ether
9. When a light wave passes through a medium, all the particles of the medium in the same phase constitute a surface called a..... [     ]
 

A) Wavelet              B) wave front              C) both A&B              D) None
10. For constructive superposition of two waves, the phase difference between them should be equal to [     ]
 

A) Zero              B) integral multiple of  $2\pi$     C) both A&B    D) None
11. For destructive superposition of two waves, the phase difference between them should be equal to [     ]
 

A) Zero              B) integral multiple of  $2\pi$     C) both A&B    D) odd integral multiples of  $\pi$
12. In an interference pattern, an anti nodal line connects the points of.....amplitude [     ]
 

A) Maximum              B) minimum              C) both A&B              D) None



13. In an interference pattern.....line connects the points of minimum amplitude [    ]  
 A) a nodal                      B) an anti nodal                      C) both A&B                      D) None
14. visual photometry is concerned with the measurement of.....of light sources [    ]  
 A) brightness                      B) luminous intensities                      C) illuminations                      D) luminous fluxes.
15. The amount of radiant energy coming from a source and passing through any surface per second is called..... [    ]  
 A) Luminous intensity                      B) luminance                      C) luminous flux                      D) illumination
16. Luminous intensity of a point source of light is defined as the luminous flux emitted by the source per unit..... [    ]  
 A) Solid angle                      B) area                      C) candela                      D) lumen.
17. The SI unit of solid angle is..... [    ]  
 A) The lumen                      B) the steradian                      C) the candela                      D) the lumen / steradian
18. The process of achieving population inversion is called..... [    ]  
 A) Stimulation                      B) emission                      C) pumping                      D) testing
19. In a laser, light amplification is achieved by ..... [    ]  
 A) Spontaneous emission    B) stimulated emission    C) radioactive emission    D) population explosion
20. In a He - Ne laser, pumping is achieved by a ..... [    ]  
 A) xenon discharge tube                      B) neon discharge tube  
 C) radio frequency generator                      D) helium discharge tube
21. Light from a ruby laser has a wavelength of ..... [    ]  
 A) 6943 Å                      B) 6328 Å                      C) 5893 Å                      D) 5500 Å
22. Laser is used in the treatment of diseases of..... [    ]  
 A) The heart                      B) bone fracture                      C) lungs                      D) the brain.
23. The SI unit of plane angle is..... [    ]  
 A) Steradian                      B) radian                      C) candela                      D) lumen
24. The transverse nature of light was proposed by.....and..... [    ]  
 A) Young , Huygens    B) Huygens, Fresnel                      C) Young , Fresnel                      D) Newton

\* \* \* \*

**KEY – LIGHT**

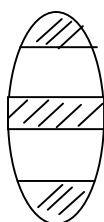
- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) B  | 2) C  | 3) C  | 4) A  | 5) D  | 6) A  | 7) D  |
| 8) D  | 9) B  | 10) C | 11) D | 12) A | 13) A | 14) A |
| 15) C | 16) A | 17) B | 18) C | 19) B | 20) C | 21) A |
| 22) C | 23) B | 24) C |       |       |       |       |

\*\*\*

**LIGHT – LEVEL - II**

1. When a ray of light enters a glass slab from air. [     ]  
 A) its wave length decreases                      B) remains unchanged  
 C) Its frequency increases                          D) its wavelengths increases
2. A person can see the objects lying between 25 cm and 10 cm from his eye. His vision can be corrected by using lens of power [     ]  
 A) – 0.25 D                      B) 4 D                      C) – 0. 1 D                      D) 10 D
3. Huygen’s principle of secondary wavelets is not used to explain [     ]  
 A) Snell’s law                      B) velocity of light    C) New position of a wave front    D) diffraction
4. If red light is incident on sea water it appears - [     ]  
 A) red                      B) green                      C) blue                      D) yellow
5. A cube of glass has an air bubble. When seen from one face it appears 12 cm. The size of cube is \_\_\_\_\_ [     ]  
 A) 18 cm                      B) 27 cm                      C) 9 cm                      D) 21 cm
6. What should be the minimum value of refractive index of the material of prism for reflections to take place as shown in fig.

- A) 1.4                      B) 1.7                      C) 2.7                      D) 1.2
7. To get three images of a single object, one should have two plane mirrors at an angle of \_\_\_ [     ]  
 A)  $90^0$                       B)  $120^0$                       C)  $30^0$                       D)  $160^0$
8. The wave length of sodium light in air is  $5890\text{A}^0$ . The velocity of light in air  $3 \times 10^8$  m/s. The wavelength of sodium light in glass ( $\mu=1.6$ ) is \_\_\_\_\_ [     ]  
 A)  $5890\text{A}^0$                       B)  $3680\text{A}^0$                       C)  $9424\text{A}^0$                       D) None
9. The time taken for light ray to penetrate 2 mm of glass slab ( $\mu=1.5$ ) is \_\_\_\_\_ [     ]  
 A)  $10^{-7}$ sec                      B)  $10^{-16}$ sec                      C)  $10^{-19}$  sec                      D)  $10^{-11}$  sec
10. Finger prints on paper are identified by sprinkling fluorescent power on it and observing it under \_\_\_\_\_ [     ]  
 A) sun light                      B) Sodium light                      C) infrared                      D) UV
11. Which part of the spectrum is most visible \_\_\_\_\_ [     ]  
 A) red                      B) violet                      C) yellow                      D) yellow - green
12. If shaded part of the lens is covered with black paper than for an object in front of lens [     ]



- A) image will be fractured                      B) image will be complete but faint
- C) image will not be formed                      D) complete image with full intensity is formed

13. The eye specialist prescribes spectacles having a combination of convex lens of focal length 40 cm and a concave lens of  $-25$  cm. The power of lens combinations is. [     ]  
 A)  $+1.5$  D                      B)  $-1.5$  D                      C)  $+6.67$  D                      D)  $-6.67$  D
14. Just before setting, the sun may appear to be elliptical. This happens due to [     ]  
 A) diffraction                      B) reflection                      C) dispersion                      D) refraction
15. On reflection from a rarer medium, a light wave suffers a phase difference of \_\_\_\_ [     ]  
 A)  $\pi$                                   B)  $\frac{\pi}{2}$                                   C)  $\frac{\pi}{4}$                                   D) None
16. A mirror is rotated through angle ' $\theta$ ' about an axis passing through the point of incidence and in the plane of the mirror. The reflected ray will be rotated through \_\_\_\_ [     ]  
 A)  $2\theta$                                   B)  $\theta$                                   C)  $\frac{4}{\theta}$                                   D)  $\frac{\theta}{2}$
17. A red flower when viewed through blue light appears [     ]  
 A) red                                  B) black                                  C) violet                                  D) blue
18. Out of the following whose velocity is equal to that of light ? [     ]  
 A) thermal waves                      B)  $\beta$  rays                      C) Sound waves                      D) Ultrasonic waves
19. Shining of an air bubble inside water is due to - [     ]  
 A) deviation                      B) scattering                      C) reflection                      D) total internal reflection
20. The sky appears blue because of - [     ]  
 A) refraction                      B) scattering                      C) reflection                      D) total internal reflection
21. That light is an electromagnetic waves was first shown by [     ]  
 A) boyl                                  B) marconi                                  C) maxwell                                  D) Hertz
22. Diamond shines due to [     ]  
 A) reflection                      B) refraction                      C) total internal reflection D) None
23. In refraction phenomenon, which quantities remains unchanged ? [     ]  
 A) wavelength                      B) velocity                      C) frequency                      D) none

\* \* \*

**KEY - LIGHT – LEVEL – II**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) A  | 2) C  | 3) A  | 4) C  | 5) B  | 6) A  | 7) A  |
| 8) B  | 9) D  | 10) D | 11) D | 12) B | 13) B | 14) D |
| 15) D | 16) A | 17) B | 18) A | 19) C | 20) B | 21) C |
| 22) C | 23) D |       |       |       |       |       |

\*\*\*

**MAGNETISM – [LEVEL – I]**

1. Diamagnetic substances are characterized by [      ]  
 A) Low, Negative magnetic susceptibility  
 B) Low, Positive magnetic susceptibility  
 C) High, Negative magnetic susceptibility  
 D) High, Positive magnetic susceptibility
2. The permeability of paramagnetic substance is [      ]  
 A) Slightly more than vacuum                      B) Slightly less than vacuum  
 C) Much more than vacuum                      D) None of these
3. A diamagnetic substance is placed in a magnetic field of a bar magnet. Then it is. [      ]  
 A) repelled by magnet                      B) Attracted by magnet  
 C) Attracted by S-pole repelled by N-pole    D) Attracted by N-pole repelled by S-pole
4. Diamagnetic susceptibility is [      ]  
 A) Large, negative      B) Small, positive    C) Small, negative      D) Large, positive
5. Materials do not having permanent magnetic dipoles are [      ]  
 A) Paramagnetic      B) Ferromagnetic      C) Ferromagnetic    D) Diamagnetic
6. Relative permeability is related to magnetic susceptibility by [      ]  
 A)  $\mu_r = 1 - x$                       B)  $\mu_r = x - 1$                       C)  $\mu_r = 1 + x$                       D)  $\mu_r = 1/x$
7. An example for paramagnetic substance is [      ]  
 A) Cu                      B) NaCl                      C) Al                      D) Ni
8. The relative permeability for vacuum is [      ]  
 A) 0                      B) 1                      C) 1.22                      D) None
9. The ultimate source of magnetic field is believed to be [      ]  
 A) Magnetic monopole    B) magnetic dipole      C) Stationary charge    D) Electron motion
10. An external magnetic field induces magnetic dipoles [      ]  
 A) Only in ferromagnetic materials                      B) Only in paramagnetic materials  
 C) Only in diamagnetic materials                      D) In all the materials
11. In any magnetic domain of a ferromagnetic material, the magnetic dipoles of the adjacent atoms are. [      ]  
 A) Equal and anti parallel                      B) Equal and parallel  
 C) Unequal and parallel                      D) Unequal and antiparallel
12. The magnetic field due to a small magnetic dipole of magnetic moment  $M$ , at distance  $r$  from the centre on the equatorial line is given by (in M.K.S system) [      ]  
 A)  $\frac{\mu_o M}{4\pi r^2}$                       B)  $\frac{\mu_o M}{4\pi r^3}$                       C)  $\frac{\mu_o 2M}{4\pi r^2}$                       D)  $\frac{\mu_o 2M}{4\pi r^3}$

13. Water is [     ]  
 A) Paramagnetic      B) Ferromagnetic      C) Diamagnetic      D) No magnetic activity
14. The Scientist who developed molecular theory is [     ]  
 A) Ewing                  B) Curie                  C) Weber                  D) Coulomb
15. The material used in making electromagnets is [     ]  
 A) Steel                  B) Copper                  C) Iron                  D) Soft iron
16. Relation between  $\phi$ , B and A is [     ]  
 A)  $\phi = AB$                   B)  $A = \phi B$                   C)  $B = \phi A$                   D)  $AB \phi = 1$
17. Example for diamagnetic substance is [     ]  
 A) O<sub>2</sub>                  B) Bi                  C) Fe                  D) Ni
18. The temperature at which a ferromagnetic material gets converted into paramagnetic is known as [     ]  
 A) Neutral temperature                  B) Critical temperature  
 C) Inverse temp                  D) Curie temp
19. When all the molecule in a magnet arrange themselves in the direction of the magnetic field lines, the condition is called [     ]  
 A) Saturation                  B) Reluctance                  C) Retentivity                  D) Permeability
20. The unit of pole strength in S.I units is [     ]  
 A) Ampere – metre      B) Ampere / metre      C) Ampere – metre<sup>2</sup>      D) Weber
21. The permeability of free space  $\mu_0 =$  [     ]  
 A)  $44\pi \times 10^7$  Henry / metre                  B)  $4\pi \times 10^{-7}$  Henry / meter  
 C)  $4\pi \times 10^6$  Henry / metre                  D)  $4\pi \times 10^{-6}$  Henry / metre
22. The relation between absolute permeability ( $\mu$ ) and relative [     ]  
 A)  $\mu_r / \mu_0$                   B)  $\mu_0 / \mu_r$                   C)  $\mu_0 \mu_r$                   D) None

\* \* \*

**KEY - MAGNETISM – LEVEL – I**

- 1) A      2) A      3) A      4) C      5) D      6) C      7) C  
 8) B      9) D      10) D      11) B      12) B      13) C      14) A  
 15) A      16) C      17) B      18) D      19) A      20) B      21) B  
 22) C

\* \* \*

**MAGNETISM**

- A magnet weighs 75 g and its magnetic moment is  $2 \times 10^{-4} \text{ Am}^2$ . If the density of the material of the magnet is  $7.5 \times 10^3$ . Calculate the intensity of magnetisation. [     ]  
 A)  $20 \text{ Am}^{-1}$                       B)  $30 \text{ Am}^{-1}$                       C)  $25 \text{ Am}^{-1}$                       D)  $35 \text{ Am}^{-1}$
- In which type material the magnetic susceptibility does not depend on temperature. [     ]  
 A) Diamagnetic                      B) Paramagnetic                      C) Ferromagnetic                      D) Ferrite
- In a certain region of space, electric field  $\vec{E}$  and magnetic field  $\vec{B}$  are perpendicular to each other and an electron enters in region are to the direction of  $\vec{B}$  and  $\vec{E}$  both moves undeflected. Then velocity of electron is. [     ]  
 A)  $\left| \frac{\vec{E}}{\vec{B}} \right|$                       B)  $\left| \frac{\vec{B}}{\vec{E}} \right|$                       C)  $\vec{E} \times \vec{B}$                       D)  $\vec{E}, \vec{B}$
- Magnetic field intensity at the centre of a coil of 50 turns, radius 0.5m & carrying a current of 2 Amperes [     ]  
 A)  $0.5 \times 10^{-5} \text{ T}$                       B)  $1.26 \times 10^{-4} \text{ T}$                       C)  $3 \times 10^{-5} \text{ T}$                       D)  $4 \times 10^{-5} \text{ T}$
- A bar magnet has a magnetic moment of  $10 \text{ Am}^2$ . Its magnetic length is 5cm, calculate its pole strength. [     ]  
 A) 400 Am                      B) 200 Am                      C) 600 Am                      D) 100 Am
- A bar magnet of magnetic moment M is cut into two parts of equal lengths. The magnetic moment and pole strength of either part is. [     ]  
 A)  $M/2, M/2$                       B)  $M, M/2$                       C)  $M/2, m$                       D)  $M, m$
- A bar magnet has poles of strength 48Am which are 25cm a part. Find the magnetic moment of the magnet. [     ]  
 A)  $0.25 \text{ Am}^2$                       B)  $12 \text{ Am}^2$                       C)  $25 \text{ Am}^2$                       D)  $\frac{1}{12} \text{ Am}^2$
- A magnetic needle is kept in a non – uniform magnetic field. It experiences. [     ]  
 A) Force and Torque                      B) A force but not a torque  
 C) A torque but not a Force                      D) Neither a force nor a Torque
- Which of the following in motion can not be deflected by magnetic field. [     ]  
 A) Protons                      B) Cathode rays                      C) Alpha particles                      D) Neutrons
- A wire of length 2m carries a current of 10A. What is the force experienced by the wire when it is placed at an angle of  $45^\circ$  to a uniform magnetic field of 0.15T. [     ]  
 A) 1.5 N                      B) 3 N                      C)  $3\sqrt{2} \text{ N}$                       D)  $3\sqrt{12} \text{ N}$
- Two equal magnetic poles placed 25cm a part in air exert a force of  $4 \times 10^{-3} \text{ N}$  on each other. What should be the distance between them so that force exerted by them on each other becomes 0.1N. [     ]  
 A) 5 cm                      B) 10 cm                      C) 0.5 cm                      D) 1 cm

12. The magnetic field at the centre of a current carrying circular loop is B. If the radius of the loop is doubled, keeping the current same, the magnetic field at the centre of loop would be. [      ]  
 A)  $\frac{B}{4}$                       B)  $\frac{B}{2}$                       C) 2 B                      D) 4 B
13. For a paramagnetic material, the dependence of magnetic susceptibility X. On absolute temperature T is given by. [      ]  
 A)  $X = CT$                       B)  $X = C/T$                       C)  $X = CT^2$                       D)  $X = CT^{-2}$
14. When a magnetic material, originally unmagnetised, is subjected to a varying magnetic field 'H', the intensity of magnetisation. [      ]  
 A) Increases linearly, with H  
 B) Increases with H until it attains a maximum saturation value  
 C) Decreases with H until it attains a maximum negative value  
 D) Increases exponentially with H
15. In the region around a charge at rest, there is [      ]  
 A) Electric field only                      B) Magnetic field only  
 C) Neither electric nor magnetic field                      D) Electric as well as magnetic field
16. In region around a moving charge, there is [      ]  
 A) Electric as well as magnetic field only                      B) Magnetic field only  
 C) Neither electric nor magnetic field                      D) Electric as well as magnetic field
17. Torque acting on a current loop. [      ]  
 A)  $C = MB \sin \theta$                       B)  $T = NI \sin \theta$                       C)  $I = MB \cos \theta$                       D) None
18. 1 Gauss = [      ]  
 A)  $10^{-6}$  T                      B)  $10^{-2}$  T                      C)  $10^{-4}$  T                      D)  $10^{-8}$  T

\* \* \*

**KEY – MAGNETISM**

- |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 1) A  | 2) A  | 3) C  | 4) A  | 5) B  | 6) C  |
| 7) A  | 8) B  | 9) D  | 10) C | 11) A | 12) C |
| 13) B | 14) A | 15) A | 16) D | 17) A | 18) C |

\*\*\*

**UNIT-9 – CURRENT ELECTRICITY (LEVEL-I)**

1. The study of various effects of electrical charges in motion is called [     ]  
A) Current electricity    B) Current            C) Static electricity        D) None
2. The net charge flowing through a cross section of a conductor in unit time is called [     ]  
A) Potential                B) Current            C) Energy                D) None
3. The unit of electric current is [     ]  
A) Volt                      B) Coulomb            C) Ohm                    D) Ampere
4. The study of electric charges at rest is called [     ]  
A) Potential                B) Force                C) Power                D) Static electricity
5. Electric current is a [     ]  
A) Scalar quantity        B) Vector quantity    C) Fundamental quantity D) None
6. 1 ampere = [     ]  
A)  $6.25 \times 10^{19}$  electrons/sec.                    B)  $6.25 \times 10^{18}$  electrons / sec.  
C)  $\frac{1}{6.25 \times 10^{18}}$  electrons/sec.                    D) None
7. The direction of flow of positive charges is taken as [     ]  
A) Conventional current    B) Voltage            C) Volt                    D) None
8. Current detector is [     ]  
A) Voltmeter                B) Ammeter            C) Galvanometer        D) None
9. Work done in moving unit positive charge from infinite distance to a point in an electric field is called [     ]  
A) Current                    B) Electric potential    C) Coulomb                D) None
10. Potential difference is measured in [     ]  
A) Coulombs                B) Ohm-meter            C) Volts                    D) Amperes
11. Examples of power source [     ]  
A) Bulb                      B) Resistance            C) Cell                    D) Rheostats
12. The current flowing per unit normal area of cross section is defined as [     ]  
A) Current density        B) Density              C) Volume                D) None
13. An electric cell is a device which stores chemical energy and converts it into [     ]  
A) Mechanical energy    B) Heat energy        C) Light energy            D) Electrical energy
14. The internal resistance of an ideal cell is [     ]  
A) Zero                      B) Low                    C) High                    D) Infinity







**PHYSICS - ELECTRICITY**

- A resistor connected to a battery is heated due to current through it which of the following quantity does not vary. [     ]  
A) Resistance    B) Drift velocity    C) Resistivity    D) number of free electrons
- Find the resistance across AB in fig.  
A) R            B)  $\frac{2}{3}R$             C)  $\frac{R}{3}$             D)  $\frac{4}{3}R$
- Compute the equivalent resistance of the network shown in fig. [     ]  
A)  $2\Omega$             B)  $3\Omega$             C)  $6\Omega$             D)  $\frac{1}{2}\Omega$
- Calculate the resistance (i) between points A and B (ii) between points A and C [     ]  
A)  $1\Omega, 2\Omega$     B)  $2\Omega, 1\Omega$     C)  $\frac{1}{2}\Omega, 1\Omega$     D)  $\frac{1}{3}\Omega, 3\Omega$
- Calculate the equivalent resistance between A and C [     ]  
A)  $11.5\Omega$         B)  $12.5\Omega$         C)  $\frac{1}{11.5}\Omega$         D)  $10.5\Omega$
- An incandescent lamp of resistance  $40\Omega$  draws a current of 5A. Find the voltage. [     ]  
A) 300 v            B) 200 v            C) 100 v            D) 500 v
- Calculate equivalent resistance between points (i) A and B (ii) B and C (iii) A and C [     ]  
A)  $4\Omega, 3\Omega, 6\Omega$     B)  $7\Omega, 3\Omega, 4\Omega$     C)  $3\Omega, 4\Omega, 7\Omega$     D) None
- The effective resistance between points A and B is [     ]  
A) R            B)  $\frac{R}{3}$             C)  $\frac{2R}{3}$             D)  $\frac{3R}{5}$
- 1 Kwh is equal to [     ]  
A) 3.6 KJ        B) 36 J            C) 3.6 mJ        D) 3.6 MJ
- An electric iron which when hot has a resistance of  $80\Omega$ , is used on a 200v source. Calculate the electric energy spent in kilowatt – hour if it is used for 2 hours. [     ]  
A) 1 kwh        B) 2 kwh            C) 8 kwh            D) 32 kwh
- ECE of copper and silver are  $7 \times 10^{-6}$  and  $102 \times 10^{-6}$  kg/c. A certain current deposits 14g. Amount of silver deposited is [     ]  
A) 1.2 g            B) 1.6 g            C) 2.4 g            D) 1.8 g
- A  $10\Omega$  electric heater operates on a 110v line. The rate at which heat is developed in watts is [     ]  
A) 1310 w            B) 670 w            C) 810 w            D) 1210 w
- If a current of 2A liberates a certain amount of ions, a current of 8A will liberate. [     ]  
A) 6 times            B) 4 times            C) 6 times            D) 8 times

14. A silver zinc voltameter are connected in series and a current  $i$  is passed through them for a time  $t$ , liberating  $W$  grams of zinc. The weight of silver deposited is nearly. [     ]  
 A) 1.7  $W$  grams            B) 2.4  $W$  grams            C) 3.5  $W$  grams            D) 1.2  $W$  grams
15. A copper and a silver voltameter are connected in parallel. If 2000 coulombs of charge liberates the same mass of copper and silver then charge flowing in copper voltameter is. [z(cu) =  $3.36 \times 10^{-7}$  kg/c [z(Ag)= $1.008 \times 10^{-6}$  kg/c) [     ]  
 A) 1250 C                            B) 1500 C                            C) 1750 C                            D) 1000 C

\* \* \*

**KEY PHYSICS – ELECTRICITY**

- 1) A            2) C            3) C            4) B            5) A            6) B            7) C            8) C  
 9) D            10) C            11) B            12) D            13) B            14) A            15) C

\*\*\*

**10. MODERN PHYSICS – [Level – 1]**

1. An atomic model describes ..... [     ]  
 A) Charge    B) distribution of mass    C) both A&B    D) None
2. Atom of an element is electrically..... [     ]  
 A) Positive    B) negative                    C) neutral                    D) None
3. ....atomic model explained the spectral lines emitted by different elements. [     ]  
 A) Rutherford    B) Bohr                    C) Lenard                    D) Thomson's
4. Lenard atomic model could not explain ..... [     ]  
 A) Stability of an atom    B) mass of an atom    C) both A&B                    D) None
5. According to the Bohr atomic model, the electron in the hydrogen atom can revolve around the nucleus in stationary orbits for which the angular momentum is quantized in units of... [     ]  
 A)  $\frac{h}{2\pi}$                     B)  $h$                     C)  $\frac{h}{\pi}$                     D)  $\frac{h}{4\pi}$
6. The electron was discovered by. .... [     ]  
 A) Ernest Rutherford    B) J.J. Thomson            C) Max plank                    D) Niels Bohr
7. The neutron was discovered by..... [     ]  
 A) Ernest Rutherford    B) J.J. Thomson            C) James Chadwick    D) Niels Bohr



24. 8 mg of radium is placed in a sealed lead block. After four half-lives, the amount of radium left will be... [     ]  
 A) 8 mg                      B) 0.5 mg                      C) 2 mg                      D) 1 mg
25. Artificially-induced radioactivity was discovered by ..... [     ]  
 A) Iren and Frederic Joliot-Curie                      B) Rutherford and Chadwick  
 C) Lise Meitner and Fritz Strassman                      D) Cockcroft and Walton.
26. The mass of the  $\beta$ - particle is the same as the mass of..... [     ]  
 A) He                      B) the electron                      C) neutron                      D) None
27. One **amu** is equal to..... **MeV**. [     ]  
 A) 931.5                      B) 231.5                      C) 568.5                      D) 758.5
28.  ${}_{92}^{238}U \rightarrow {}_{90}^{234}Th + \dots\dots\dots$  [     ]  
 A)  ${}_{2}^{4}He$                       B)  ${}_{11}^{24}Na$                       C)  ${}_{1}^{2}H$                       D)  ${}_{-1}^{0}e$
29. The stable end product of all the three natural radioactive series is..... [     ]  
 A) Pb                      B) Th                      C) Po                      D) Bi
30. Moderator in a nuclear reactor reduces the .....of a neutron. [     ]  
 A) Speed                      B) kinetic energy                      C) both A&B                      D) None
31. .... Isotope is used in the determination of age of rocks [     ]  
 A)  ${}_{92}^{238}U$                       B)  ${}_{92}^{235}U$                       C) both A&B                      D)  ${}_{6}^{14}C$
32. .... Isotope is used in the determination of age of fossils. [     ]  
 A)  ${}_{92}^{238}U$                       B)  ${}_{92}^{235}U$                       C) both A&B                      D)  ${}_{6}^{14}C$
33. The half-life period of a radioactive element is 4 days. Find its decay constant. [     ]  
 A)  $1.17325 \text{ day}^{-1}$                       B)  $0.17325 \text{ day}^{-1}$                       C)  $0.693 \text{ day}^{-1}$                       D)  $11.7325 \text{ day}^{-1}$

\* \* \*

**KEY - 10. MODERN PHYSICS – Level – 1**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) B  | 2) C  | 3) B  | 4) C  | 5) A  | 6) B  | 7) C  |
| 8) A  | 9) C  | 10) C | 11) A | 12) C | 13) C | 14) C |
| 15) A | 16) C | 17) D | 18) A | 19) B | 20) D | 21) B |
| 22) C | 23) D | 24) B | 25) A | 26) B | 27) A | 28) A |
| 29) A | 30) A | 31) A | 32) D | 33) A |       |       |

\*\*\*

**MODERN PHYSICS – LEVEL - II**

1. In an hydrogen atom the electron in a given orbit has total energy – 1.5 eV. The potential energy is [     ]  
 A) 1.5 eV                      B) – 1.5 eV                      C) 3.0 eV                      D) – 3.0 eV

2. An electron is moving round the nucleus of an hydrogen atom in a circular orbit of radius  $r$  [     ]  
 The coulomb force 'F' between the  $e^-$  is .....
- A)  $\frac{-Ke^2\bar{r}}{r^3}$                       B)  $\frac{Ke^2\bar{r}}{r^2}$                       C)  $\frac{-Ke^2\bar{r}}{r^2}$                       D)  $\frac{K.e^2\bar{r}}{r^3}$
3. Which of the following radiations are not emitted by electron transitions in the atoms ? [     ]
- A) infra-red radiations    B) visible rays                      C) ultraviolet                      D)  $\gamma$ -rays
4. The potential difference applied to an X – ray tube is increased as a result in the emitted radiation [     ]
- A) the intensity increases                      B) the minimum wavelength increases  
 C) the intensity remains unchanged                      D) the minimum wavelength decreases
5. Which of the following propertie is not exhibited by X –rays ? [     ]
- A) polarization                      B) deflection by electric field  
 C) interference                      D) diffraction
6. Which of the following wavelength lies in X – rays region ? [     ]
- A)  $10^{-3}A^0$                       B)  $1000A^0$                       C)  $10000 A^0$                       D)  $1 A^0$
7. X – rays are absorbed maximum by [     ]
- A) steel                      B) paper                      C) copper                      D) lead
8. In a nuclear reaction  ${}_{6}^{11}C \longrightarrow {}_{5}^{11}B + \beta^+ + X$ , what does X stand for ? [     ]
- A) an electron                      B) a proton                      C) a neutron                      D) a neutrino
9. A radioactive nucleus  ${}_{92}^{235}X$  decays to  ${}_{91}^{231}Y$ . Which of the following particles are emitted?[     ]
- A) one  $\alpha$ -particle & one  $e^-$                       B) 2 deuterons & 1 positron  
 C) 1  $\alpha$  - particle & 1 proton                      D) 1 proton & 4 neutrons
10. In a nuclear reaction  ${}_{92}^{238}U \longrightarrow {}_z^A Th + {}_2^4 He$ , the value of A and Z are ..... [     ]
- A) A = 234, Z = 94                      B) A = 238, Z = 94                      C) A = 234, Z = 90                      D) Z = 238, Z = 90
11. Nuclear weak force is experienced during [     ]
- A)  $\alpha$ -decay                      B)  $\beta$ -decay                      C)  $\gamma$ -decay                      D) All
12. The fission of  $U^{238}$  is possible by [     ]
- A) Fast protons                      B) Only slow neutrons  
 C) Only fast neutrons                      D) Fast as well as slow neutrons
13. The sun maintains its shining because of [     ]
- A) burning of carbon                      B) the fission of He  
 C) fusion of hydrogen nuclei                      D) chemical reaction
14. In a nuclear reactor, which of the following quantity is conserved ? [     ]
- A) momentum                      B) energy                      C) mass                      D) all of these

15. If  $\alpha, \beta$  and  $\gamma$  -rays of same energy are arranged in the ascending order of their ranges in air. The order will be. [     ]  
 A)  $\gamma, \beta, \alpha$                       B)  $\alpha, \beta, \gamma$                       C)  $\gamma, \alpha, \beta$                       D)  $\beta, \alpha, \gamma$
16. Out of both atom bomb and hydrogen bomb, which one is more harmful. [     ]  
 A) some times atom bomb, some times hydrogen bomb  
 B) atom bomb  
 C) hydrogen bomb                      D) can not said
17. Radio active radiations are harmful to the living organs. To avoid harm during storage, radio active samples are stored in lead boxes. Lead is used because it is a \_\_\_\_\_. [     ]  
 A) good absorber                      B) heavy                      C) bad conductor                      D) strong
18. The nucleus  ${}_{6}^{12}\text{C}$  absorbs an energetic neutron and emits beta particle  $\beta$ . The resulting nucleus is [     ]  
 A)  ${}_{6}^{13}\text{C}$                       B)  ${}_{7}^{14}\text{N}$                       C)  ${}_{5}^{13}\text{B}$                       D)  ${}_{7}^{13}\text{N}$
19. Nutrino emitted during  $\beta$  emission is [     ]  
 A) fermion                      B) boson                      C) max wellian particle                      D) none
20.  $\alpha$  -particles are detected using. [     ]  
 A) GM counter                      B) bubble cloud chamber  
 C) Scintillation counter                      D) None
21. To photograph a brain tumuor, the radio istope generally used is [     ]  
 A)  $\text{I}^{131}$                       B)  $\text{Hg}^{197}$                       C)  $\text{O}^{15}$                       D)  $\text{Ag}^{191}$

\* \* \*

**KEY - MODERN PHYSICS – LEVEL – II**

- |       |       |       |          |       |       |       |
|-------|-------|-------|----------|-------|-------|-------|
| 1) D  | 2) A  | 3) A  | 4) A & D | 5) B  | 6) D  | 7) D  |
| 8) D  | 9) A  | 10) C | 11) B    | 12) C | 13) C | 14) D |
| 15) B | 16) C | 17) A | 18) D    | 19) A | 20) C | 21) B |

\*\*\*

**UNIT-11 – ELECTRONICS (LEVEL-I)**

1. When a semiconductor is heated its resistance [     ]  
 A) Increases                      B) decreases                      C) same                      D) None
2. The binding in semiconductor is [     ]  
 A) Ionic                      B) Covalent                      C) Metallic                      D) Mutual



3. In solids, the group of closely lying energy levels is known as. [     ]  
 A) Energy band            B) Mutual band            C) Solid band            D) .....
4. The process of introducing impurities in small quantities into a material is called. [     ]  
 A) Coping                    B) doping                    C) closing                    D) none
5. A semiconductor is an insulator at [     ]  
 A)  $0^{\circ}\text{C}$                     B)  $0\text{K}$                     C)  $300\text{K}$                     D)  $237\text{K}$
6. The energy band gap is maximum in [     ]  
 A) Semiconductors        B) Superconductor        C) metals                    D) insulators.
7. To obtain electrons as majority charge carriers in a semiconductor the ..... mixed is [     ]  
 A) Monovalent            B) divalent                    C) trivalent                    D) Pentavalent
8. A hole is [     ]  
 A) Positively charged electron        B) an electron in valence band  
 C) an unfilled covalent band        D) an excess electron incovalent band
9. n – type semiconductor is [     ]  
 A) Positively charged    B) negatively charged        C) Neutral                    D) None
10. In a p-type semiconductor germanium is doped with. [     ]  
 A) Boron                    B) gallium                    C) aluminum                    D) all the above
11. Minority carriers present in a p-type semiconductor are due to [     ]  
 B) Addition of impurities                B) Ionisation of impurities  
 C) Bias voltage                                D) Thermal agitation
12. Trivalent impurities are called [     ]  
 A) Donors                    B) Acceptors                    C) Both                    D) None
13. Pentavalent impurities are called [     ]  
 A) Donors                    B) Acceptors                    C) Both                    D) None
14. In a semiconductor (Si) the energy gap between the valence and conduction band is [     ]  
 A)  $5\text{ eV}$                     B)  $10\text{ eV}$                     C)  $1.1\text{ eV}$                     D)  $15\text{ eV}$ .
15. If semiconductor is cooled from  $T_1\text{ K}$  to  $T_2\text{ K}$  then its resistance. [     ]  
 A) Will increase                                B) Will decrease  
 C) Will not change                                D) Will first decrease and then increase
16. In forward bias condition the width of depletion layer will be [     ]  
 A) Increase                    B) Remains unchanged        C) Decrease                    D) None
17. The potential barriers in the depletion layer is due to [     ]  
 A) Ions                    B) Electrons                    C) Holes                    D) Forbidden band

18. In order to forward bias a p-n junction, the negative terminal of battery is connected to [     ]  
 A) n-side            B) p-side            C) either p-side or n-side    D) None
19. The least doped region in a transistor is [     ]  
 C) Collector            B) Base            C) Emitter            D) None
20. The drift current in a p-n junction is from [     ]  
 A) p – Side to n- side    B) n – side to p-side    C) both            D) None
21. A transistor consists of these junctions [     ]  
 A) 2p-n            B) 4p-n            C) 3p-n            D) None
22. In radio the modulator is [     ]  
 A) AM            B) FM            C) PM            D) None
23. A device which converts AC to DC is [     ]  
 B) Rectifier            B) Amplifier            C) Inverter            D) Oscillator
24. Television is also known as [     ]  
 A) Calidiscop            B) Electroscope    C) Kinescope            D) Periscope
25. The process of separating the programme wave from carrier wave is called [     ]  
 B) Modulation            B) Detection            C) Brod casting            D) None
26. Out of following the forward biased diode is [     ]  
 A)  $\frac{-4V}{\triangle} \triangleleft \frac{-3V}{\triangle}$     B)  $\frac{3r}{\triangle} \triangleleft \frac{3V}{\triangle}$     C)  $\frac{or}{\triangle} \triangleleft \frac{-2r}{\triangle}$     D)  $\frac{-2v}{\triangle} \triangleleft \frac{2v}{\triangle}$
27. The relation between  $\alpha$  and  $\beta$  is [     ]  
 A)  $\beta = \frac{1-\alpha}{\alpha}$             B)  $\beta = \frac{\alpha}{1+\alpha}$             C)  $\beta = \frac{\alpha}{1-\alpha}$             D)  $\beta = \frac{1+\alpha}{\alpha}$
28. If  $\alpha = 0.98$  for a transistor through emitter.  $I_E = 20$  mH then value of  $\beta$  is [     ]  
 A) 4.9            B) 49            C) 96            D) 9.6
29. Forbidden energy gap in a pure conductor is [     ]  
 B) Oev            B) 0.7 ev            C) 1.1 ev            D) 4.6 ev
30. The energy gap in the energy bands of germanium at room temperature is about [     ]  
 B) 0.1ev            B) 0.67 ev            C) 1.1 ev            D) 6.7ev
31. Photo cells convert light signals to [     ]  
 B) Magnetic signals    B) electric signals    C) a & b            D) None
32. A combination of IC's is called \_\_\_\_\_ [     ]  
 B) Microscope            B) Telephone            C) Microphone            D) None
33. The process of fixing messages to r.f carries waves is called waves is called [     ]  
 B) Scanning            B) Modulation            C) A & B            D) None
34. In the 8 bit code first four are called [     ]  
 A) Numeric bits            B) BYTE            C) Zone bits            D) None
35. The frequencies used in TV communications are in the range of [     ]  
 A) 30 MKHZ to 30 MHZ    B) 3KHZ – 3 MHZ    C) 300 KHZ – 30 MHZ    D) None

\* \* \* \*

**KEY - UNIT-11 – ELECTRONICS (LEVEL-I)**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) B  | 2) B  | 3) A  | 4) B  | 5) B  | 6) D  | 7) D  |
| 8) A  | 9) B  | 10) B | 11) A | 12) B | 13) A | 14) C |
| 15) B | 16) C | 17) A | 18) A | 19) B | 20) C | 21) A |
| 22) A | 23) A | 24) C | 25) B | 26) C | 27) C | 28) B |
| 29) A | 30) B | 31) B | 32) C | 33) B | 34) C | 35) A |

\*\*\*

**UNIT-11 - ELECTRONICS (LEVEL-II)**

1. Find the maximum wavelength of electromagnetic radiation, which can create a hole-electron pair in germanium. Given that for bidden energy gap in germanium is 0.72 eV. [    ]  
 A)  $1.724 \times 10^{-4} \text{m}$       B)  $1.724 \times 10^{-6} \text{m}$       C)  $1.824 \times 10^{-6} \text{m}$       D)  $1.824 \times 10^{-4} \text{m}$
2. The energy liberated in the combination of a hole – electron pair is converted into electromagnetic radiation. If the maximum wavelength of the radiation emitted is 630 nm, what is the width of forbidden energy gap. [    ]  
 A)  $3.152 \times 10^{-15} \text{J}$       B)  $3.15 \times 10^{-12} \text{J}$       C)  $3.152 \times 10^{-19} \text{J}$       D) 1.97 eV
3. A voltage or current signal that varies continuously with time is called [    ]  
 A) analog signal      B) digital signal      C) logic signal      D) none
4. A p – n junction has a thickness of order of [    ]  
 A) 1 cm      B) 1 mm      C)  $10^{-6} \text{cm}$       D)  $10^{-12} \text{m}$
5. A semi conductor is known to have an electron concentration of  $8 \times 10^{13} \text{cm}^3$  and hole concentration of  $5 \times 10^{12} \text{cm}^{-3}$ . The semi conductor is. [    ]  
 A) n – type      B) p – type      C) intrinsic      D) insulator
6. In a good conductor, the energy gap between valence band and conduction band is of order of [    ]  
 A) infinity      B) wide      C) narrow      D) zero
7. Diode can work as [    ]  
 A) demodulator      B) modulator      C) amplifier      D) rectifier
8. A transistor has an  $\alpha = 0.95$  then  $\beta$  is equal to [    ]  
 A) 1/19      B) 19      C) 1.5      D) 0.95
9. The current gain  $\beta$  of a transistor, if current gain  $\alpha = 0.98$  [    ]  
 A) 49      B) 94      C)  $\frac{1}{49}$       D) 0
10. Which of the following represents the digital signal. [    ]  
 A)      B)      C)      D)
11. In the binary number system, III represents [    ]  
 A) one      B) three      C) seven      D) eight
12. A junction diode connected to an external resistance of  $100 \Omega$  and a source of emf of 3.0v. Assuming that the barriers potential developed in the junction diode is 0.7v then the current in circuit. [    ]  
 A) 29 mA      B) 25 mA      C) 23 mA      D) 33 mA

13. For a transistor working a common base amplifier, current gain is 0.96. If the emitter current is 7.2 mA calculate base current. [     ]  
 A) 0.29 mA                      B) 0.19 mA                      C) 1.29 mA                      D) 1.19 mA
14. The base current of a transistor is 105 mA and collector current is  $2.05 \mu A$  then find value of  $\beta$ . [     ]  
 A) 29.5                              B) 20.5                              C) 19.5                              D) 9.5
15. Binary representation of decimal number 37 is [     ]  
 A) 100101                      B) 110101                      C) 101011                      D) 111101
16. In which of the following figures, junction diode is forward biased [     ]  
 A)                                      B)                                      C)                                      D)
17. When n – p – n transistor is used as an amplifier, then [     ]  
 A) holes move from emitter to base                      B) electrons move from base to collector  
 C) holes move from base to emitter                      D) electrons move from collector to base
18. In p – n junction, the hole current to drift current charges is from [     ]  
 A) n – section to p – section                      B) p – section to n – section  
 C) n – section to p – section if junction is forward biased and opposite in reverse biased  
 D) p – section to n – section if junction is forward biased and opposite than the drift
19. In a p – n junction, the diffusion current is greater than the drift current (in magnitude) [     ]  
 A) If the junction is forward biased                      B) If the junction is reverse biased  
 B) If the junction is unbiased                      D) Can not be predicted
20. When the junction conductivity of a semiconductor is only due to breaking of covalent bonds, the semiconductor is called [     ]  
 A) donar                              B) acceptor                              C) intrinsic                              D) extrinsic

\* \* \*

**KEY - ELECTRONICS – [LEVEL-III]**

- |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| 1) B  | 2) C  | 3) A  | 4) C  | 5) A  | 6) D  | 7) D  |
| 8) B  | 9) A  | 10) D | 11) C | 12) C | 13) A | 14) C |
| 15) A | 16) A | 17) B | 18) A | 19) A | 20) C |       |

\*\*\*