Units and measurements

1. Which of the following is not fundamental quantity?
   a) Length
   b) Temperature
   c) Luminous intensity
   d) Force

2. Derived unit is the combination of ……
   a) Fundamental
   b) C.G.S
   c) F.P.S
   d) All

3. Which of the following is the SI unit of pressure?
   a) Pascal
   b) N/m^2
   c) Both a and b
   d) None

4. The extended form of M.K.S system is,
   a) C.G.S
   b) S.I
   c) F.P.S
   d) All

5. The SI unit of momentum is,
   a) Kgm/sec
   b) Kg/m sec
   c) N/sec
   d) Nm/sec

6. The SI unit of youngs modulus is,
   a) Nm^2
   b) N/m^2
   c) Kgm^2
   d) Kg/m^2

7. The SI unit of frequency is,
   a) Hz
   b) per Second
   c) second
   d) Both a and b

8. The dimensional formula of force is,
   a) $[MLT^{-2}]$
   b) $[M^{-1} LT^{-2}]$
   c) $[ML^2 T^{-2}]$
   d) $[M^{-2} LT^{-3}]$

9. The dimensional formula of gravitational constant is,
   a) $[ML^2 T^{-2}]$
   b) $[M^{-1} LT^{-2}]$
   c) $[M^{-1} L^3 T^{-2}]$
   d) $[M^{-1} L^2 T^{-3}]$

10. The dimensional formula of gravitational field intensity is,
    a) $[M^0 LT^{-2}]$
    b) $[MLT^{-2}]$
    c) $[M^{-1} LT^{-2}]$
    d) $[ML^2 T^{-2}]$

11. Which of the following is dimensionless quantity?
    a) mass
    b) density
    c) viscosity
    d) angle

12. One light year is equal to,
    a) 9.46×10^{15}m
    b) 10.46×10^{15}m
    c) 9.46×10^{15}km
    d) 10.46×10^{15}km

13. 1Joule is equal to
    a) 10^6 ergs
    b) 10^7 ergs
    c) 10^8ergs
    d) 10^9 ergs

14. 1N =
    a) 10^5 dyne
    b) 10^6 dyne
    c) 10^7 dyne
    d) 10^8 dyne

15. The dimensional formula of $2\pi\sqrt{\dfrac{l}{g}}$ is,
    a) $[M^0 L T^{-2}]$
    b) $[M^0 L^0 T^{-2}]$
    c) $[M^0 L^0 T^{-1}]$
    d) $[M^0 L^0 T]$

16. 1 Angstron (A) =
    a) 10^{-8} m
    b) 10^{-9} m
    c) 10^{-10} m
    d) 10^{-11} m

17. The unit of upthrust is
    a) N/m^2
    b) N
    c) Nm
    d) Nm^2

18. Electron Volt is the unit of,
    a) force
    b) energy
    c) work
    d) capacitance

19. What is the unit of a in equation x = at + bv, where x is displacement, t is time and v is speed.
    a) meter
    b) m/sec
    c) second
    d) per second

20. The density of wood is 0.5 gm/cc. Its value in SI system is,
    a) $2500 kg/m^3$
    b) $250 kg/m^3$

21. The dimensional formula of impulse is,
    a) $[ML^2 T^{-2}]$
    b) $[ML T^{-2}]$
    c) $[MLT^{-1}]$
    d) $[ML^2 T^{-3}]$

22. The dimensional formula of coefficient of viscosity is,
    a) $[ML^2 T^{-2}]$
    b) $[ML^{-1} T^{-1}]$
    c) $[ML T^{-2}]$
    d) $[M T^{-2}]$

23. The position x of a particle at time t is given by $x = v_0/a\,(1 - e^{-at})$ where v_0 is constant and a> 0. The dimension of v_0 and a is,
    a) $[ML^2 T^{-2}]$ and $[ML^0 T^{-2}]$
    b) $[M^0 L T^{-1}]$ and $[T^{-1}]$
    c) $[ML^{-1} T^{-2}]$ and $[T^{-2}]$
    d) $[ML^2 T^0]$ and $[T^2]$

24. The dimension of impulse is equal to that of
    a) force
    b) pressure
    c) angular momentum
    d) linear momentum

25. The dimensional formula of calorie is
    a) $[ML^2 T^{-2}]$
    b) $[ML T^{-2}]$
    c) $[ML T^{-1}]$
    d) $[M^{-1} L^2 T^{-2}]$

26. Which of the following is not a unit of time
    a) Lunar month
    b) Leap year
    c) Light year
    d) Solar day

27. The time taken by the light to cross a window plane of thickness 3 mm thick is

(from previous column, continuation of Q20:)
    c) $500 kg/m^3$
    d) $5000 kg/^3$

a) 10^{-8} sec
b) 10^{-11} sec
c) 3×10^{-8} sec
d) 10^{-15} sec

Answers

1d   2a   3c   4b   5a   6b   7a   8a   9c

10a 11d 12a 13b   14a 15d 16c   17b 18b

19b 20c 21c 22b   23b 24d 25a   26c 27b

Scalars and vectors

1. Which of the following is a vector?
   a) Energy
   b) Power
   c) Force
   d) Mass
2. Which of the following is a vector?
   a) Time
   b) Work
   c) Heat
   d) Momentum
3. Which of the following is a scalar?
   a) Elementary area
   b) Kinetic energy
   c) Weight
   d) Wind velocity
4. Moment of inertia is
   a) A scalar
   b) A vector
   c) A tensor
   d) none of above
5. Electric current in a circuit is shown by arrow current is,
   a) A scalar
   b) A vector
   c) Sometimes scalar and sometimes vector
   d) Neither scalar nor vector
6. F.S is
   a) A scalar
   b) A vector
   c) A tensor
   d) none of above
7. r x F is

a) A scalar
b) A vector
c) A tensor
d) none of above

8. Minimum number of coplanar vectors of unequal magnitudes whose vector sum can be equal to zero is
   a) 1
   b) 2
   c) 3
   d) Any

9. Minimum number of space vectors of unequal magnitudes whose vector sum is equal to zero is
   a) 2
   b) 3
   c) 4
   d) Any

10. When two vectors of magnitudes a and b are added. The magnitude of resultant vector is always
    a) Equal to a + b
    b) Equal to a − b
    c) Equal to ($a^2 + b^2$)
    d) Not greater than (a + b)

11. At what angle do the scalar product and vector product of two vectors are equal?
    a) 0^0
    b) 45^0
    c) 90^0
    d) 180^0

12. For the resultant of two vectors to be maximum, the angle between them should be
    a) 0^0
    b) 45^0
    c) 90^0
    d) 180^0

13. Two forces of 6N and 8N can be applied to produce an effect of a single force of
    a) 1N
    b) 11N
    c) 15N
    d) 48N

14. Forces F_1 and F_2 act on a point mass in two mutually perpendicular directions. The magnitude of the resultant force on the point mass will be
    a) $F_1 + F_2$
    b) $F_1 - F_2$
    c) $(F_1^2 + F_2^2)^{1/2}$
    d) $(F_1^2 + F_2^2 - 2F_1F_2)^{1/2}$

15. A boat is sent across a river with a velocity of 8 km/h. If the resultant velocity of the boat is 10 km/h, the velocity of river is
    a) 12.8 km/h
    b) 6 km/h
    c) 8 km/h
    d) 10 km/hr

16. At what angle should the two vectors 2F and $\sqrt{2F}$ act so that the resultant force is F$\sqrt{10}$?
    a) 120^0
    b) 90^0
    c) 60^0
    d) 45^0

17. The angle between two vectors A = 3i + 4j +5k and B = 3i + 4j + 5k is
    a) zero
    b) 45^0
    c) 90^0
    d) 180^0

18. A force of 20N acts on a particle of mass 2 kg and displaces it by 5 m at an angle 30^0. What is the work done?
    a) 40J

b) 50J

c) 100J

d) $50\sqrt{3}$

19. A stone is projected making acute angle with the horizontal, the path of the stone is

a) Straight line

b) Circular

c) Elliptical

d) parabolic

20. For hitting a taget, one must aim

a) Directly at the target

b) Higher than target

c) Lower than target

d) Higher or lower than target depending on velocity of projection

21. To make maximum horizontal range, one must throw making angle

a) 0^0

b) 30^0

c) 45^0

d) 90^0

Answers

1c	2d	3b	4c	5a	6a	7b
8c	9c	10d	11b	12a	13b	14c
15b	16d	17a	18d	19.d	20b	21.c

Force and Motion

1. Newton's first law of motion supplies the definition of

a) Force

b) velocity

c) Acceleration

d) Momentum

2. Newton's first law of motion gives the concept of

a) energy

b) Work

c) Inertia

d) Momentum

3. Which of the Newton's law is most general

a) First law

b) Second law

c) Third law

d) All

4. Which of the Newton's law is related to the rate of change of linear momentum

a) First law

b) Second law

c) Third law

d) All

5. Rocket works on the principle of conservation of

a) Mass

b) energy

c) Linear momentum

d) Angular momentum

6. When a bus starts suddenly, the upper part of sitting passenger experiences a jerk in forward direction due to

a) Inertia of rest

b) Inertia of motion
c) Change in momentum
d) Centripetal force

7. A cannon after firing recoils due to
   a) Conservation of energy
   b) Backward thrust of gases produced
   c) Newton's third law of motion
   d) Newton's first law of motion

8. When the resultant force on a body is not zero, it produces
   a) Linear acceleration
   b) Angular acceleration
   c) Constant velocity
   d) Inertia

9. On applying a constant force to a body, it moves with uniform
   a) Momentum
   b) Angular velocity
   c) Velocity
   d) Acceleration

10. 72 km/hr is equal to
    a) 10m/s
    b) 20m/s
    c) 30m/s
    d) 40m/s

11. When a mass of a body is thrown vertically upward with 20m/s then its maximum height is
    a) 20m
    b) 30m
    c) 15m
    d) 10m

12. Steam engine is based on
    a) First law of motion
    b) Second law of motion
    c) Third law of motion

d) None

13. Which of the following can never be zero?
    a) work
    b) mass
    c) weight
    d) a and b

14. When the masses of two bodies are halved, the value of gravitational constant becomes,
    a) Four times
    b) Two times
    c) One fourth
    d) Remains same

15. A lift is accelerating upwards, then the apparent weight
    a) Increases
    b) Decreases
    c) becomes zero
    d) Equal to g

16. A body is said to be In equilibrium if all the force acting on it
    a) are in same direction
    b) are equal in magnitude
    c) have zero resultant
    d) point towards the body

17. There are three Newton's laws first, second and third. We can derive
    a) First and third law from second law
    b) First and second law from third law
    c) Second and third law from first law
    d) All laws are independent to each other

18. The product of force and time of application of force gives
    a) Linear momentum
    b) Impulse
    c) Energy
    d) Torque

19. The impulse is equal to
    a) Linear momentum

b) Change in linear momentum

c) Work

d) Torque

20. In which of the following cases, forces may not be required to keep
    a) particle going along a circular path
    b) particle going along a straight line on a rough surface
    c) momentum of the particle constant
    d) Acceleration of the particle constant

21. An athlete runs some distance before taking a long jump because
    a) It helps to apply large force
    b) By running action and reaction force increases
    c) He gains energy to take him through long distance
    d) By running the athlete gives himself larger inertia of motion

22. In case of a book lying on a table
    a) Action of book on table and reaction of table on book are equal and opposite and are inclined to vertical
    b) Action of book on table and reaction of table on book are equal and opposite and act perpendicular to the surfaces of contact
    c) Action and reaction are equal but act in different directions
    d) Action and reaction are unequal but act in different directions

23. A ball of mass m is moving with speed v. The ball strikes the wall and rebounds with same speed v. The change in momentum is
    a) mv
    b) 2mv
    c) – 2mv
    d) zero

24. A passanger in a moving train tosses a coin. If the coin falls behind him, the train must be moving

a) with an acceleration

b) with a uniform speed

c) with a deceleration

d) none

25. A man is standing in a lift acceleration upward. The apparent weight of man
    a) Is equal to actual weight
    b) Is more than the actual weight
    c) Is less than the actual weight
    d) Is more than his actual weight at equation and less than at poles

26. A bullet is fired by a light rifle and the other by a heavy rifle by the same force. Which rifle will cause more injury to the shoulder
    a) Light rifle
    b) Heavy rifle
    c) Bothe will cause the same journey
    d) more information is required

27. Which of the following force is conservative
    a) Electrostatic force
    b) Frictional force
    c) Viscous force
    d) Air resistance

28. The frictional force arises because of
    a) Interaction force between molecules of two bodies
    b) Repulsive force between nuclei of two bodies
    c) Gravitational force between two bodies
    d) Attraction between two nucleus

29. Which of the following is maximum
    a) Static friction
    b) Limiting friction
    c) Kinetic friction
    d) Rolling friction

30. Which of following statements about friction is true?
    a) Friction can be reduced to zero

b) Frictional force can accelerate a body
c) Frictional force is proportional to area of contact between the surfaces
d) Kinetic friction is always greater than a rolling friction

31. The frictional force always proportional to
   a) Weight of body
   b) Normal reaction
   c) Area of surface in contact
   d) Absolute temperature

32. A vehicle gains speed from rest to 60km/hr in a half minute. What is the acceleration produced by the engine of the vehicle?
   a) 2 m/s^2
   b) 3 m/s^2
   c) 4 m/s^2
   d) 5 m/s^2

33. A bus starts from the rest and has an acceleration 0.8m/s^2. How long does it take to reach the velocity of 40 km/hr?
   a) 10m
   b) 20m
   c) 50m
   d) 13.9m

34. What acceleration is produced on a mass of 200 gm when a force of 10N is applied?
   a) 20 m/s^2
   b) 30m/s^2
   c) 40m/s^2
   d) 0 m/s^2

Answers

1.a   2.c   3.b   4.b   5.c   6.a 7.c   8.d   9.d   10.b
11.a   12.c   13.b   14.d   15.a   16.c 17.a 18. b   19. b   20. c
21. d 22. b   23.b   24. a 25. b 26.a 27.a 28. a   29. b   30. d
31.b   32. c   33. d   34. a

Work, Energy and Power

1. The unit of work is
   a) Joule
   b) Nm
   c) Both a and b
   d) watt

2. Unit of energy is equal to the unit of
   a) work
   b) power
   c) impulse
   d) momentum

3. Potential energy is
   a) flowing of water in river
   b) water in dam
   c) a rolling body
   d) vehicle moving with uniform velocity

4. What is the energy of a body whose mass is 20 kg moving with velocity 10 m/s?
   a) 200 Joule
   b) 20 Joule
   c) 2000 Joule
   d) 1000 Joule

5. The energy posses by virtue of motion is
   a) kinetic energy
   b) potential energy
   c) both kinetic and potential energy
   d) none

6. Stretched rubber is an example of
   a) kinetic energy
   b) potential energy
   c) electric energy
   d) none

7. Moving fan is
   a) mechanical energy
   b) heat energy
   c) light energy
   d) electrical energy

8. A flying bird is
   a) kinetic energy
   b) potential energy
   c) heat energy
   d) both a and b

9. Hydrogen bomb is based on
   a) nuclear fusion
   b) nuclear fission
   c) both a and b
   d) none

10. Atom bomb is based on
    a) nuclear fusion
    b) nuclear fission
    c) both a and b
    d) none

11. A body at rest may have
    a) speed
    b) momentum
    c) velocity
    d) energy

12. A wound watch spring has
    a) Thermal energy
    b) electrical energy
    c) kinetic energy
    d) potential energy

13. A gas molecules at room temperature possesses
    a) potential energy
    b) kinetic energy
    c) electrical energy
    d) no energy

14. Which one of the following possess only kinetic energy
    a) bob of a pendulum at the extreme position
    b) compressed spring
    c) bus moving up a hill
    d) cricket ball moving on the ground

15. The work done on a body depends upon
    a) displacement
    b) force applied
    c) angle between force and displacement
    d) all

16. If external force acting on a system is zero, then
    a) its momentum remains constant
    b) its kinetic energy remains constant
    c) momentum and kinetic energy both remains constant
    d) neither momentum not kinetic energy remains constant

17. If external force is zero and the collision is elastic then which of the following remains constant
    a) momentum
    b) kinetic energy
    c) momentum and kinetic energy
    d) neither momentum nor kinetic energy

18. A man pushes a wall and fails to displace it. He does
    a) no work
    b) maximum work
    c) negative work
    d) positive work but not maximum

19. When a body is moving in a horizontal circular path with a fixed speed, which one of the following physical quantities remains constant
    a) momentum
    b) centripetal acceleration
    c) kinetic energy of the body
    d) displacement

20. A force f is applied on a body and it moves with a velocity v, the power will be
    a) Fv

b) F/v

c) Fv^2

d) F/v^2

21. A mass of 3g is moving with a velocity of 4 cm/s, the kinetic energy of the body is

a) 24 J

b) 2.4J

c) 24×10^{-7}J

d) 2.4×10^{-7}J

22. A body of mass 5 kg posses momentum 100 kgm/s. the kinetic energy of the body is,

a) 200J

b) 400J

c) 1000J

d) 2000J

23. When a body moves with a constant speed around a circle, then

a) no acceleration is produced in the body

b) the velocity remains constant

c) no force acts on the body

d) no work is done on it

24. A stone is released from a tower, its total mechanical energy during its fall

a) increases

b) decreases

c) remains constant

d) first increases and then becomes constant

Answers

1.a	2.a	3.b	4.d	5.a	6.b	7.a	8.d
9. a	10. b	11. d	12. d	13. b	14.d	15.d	16.a
17. c	18.a	19. c	20. a	21.c	22.c	23.d	24.c

Circular Motion

1. A particle is moving in a circle of radius r with a uniform speed. The angular velocity is

a) v^2/r

b) vr

c) v/r

d) r/v

2. A particle is moving along a circular path with uniform speed. Its acceleration is

a) zero

b) directed towards centre

c) directed along the axis of path

d) directed along the tangent

3. As time period increases, angular velocity

a) decreases

b) increases

c) do not depend on time period

d) uncertain

4. A particle is moving in a circle of radius r with a uniform speed. Its centripetal acceleration is

a) v/r towards centre

b) v^2/r towards centre

c) v^2/r away from centre

d) zero

5. A particle is moving in a circle of radius r with a uniform speed. Its angular acceleration is

a) v/r towards centre

b) v^2/r towards centre

c) v^2/r away from centre

d) zero

6. The centripetal force is given by
   a) mv/r
   b) v/r
   c) mv^2/r
   d) none
7. Why moon do not fall towards earth?
   a) due to less gravity of earth
   b) moon is far from earth
   c) moon gets sufficient centripetal force
   d) sun attracts with greater force than earth
8. When an aeroplane is looping the loop, the pilot does not fall because his weight
   a) acts against gravity
   b) provides the centripetal force
   c) is balanced by centrifugal force
   d) disappears as g=0
9. A 0.5 kg ball moves in a circle of radius 0.4 m at a velocity of 4m/s. The centripetal force on the ball is
   a) 10N
   b) 20N
   c) 40N
   d) 80N
10. The angular speed of a second hand of a watch in radian/sec is
    a) $\pi/6$
    b) $\pi/30$
    c) $\pi/60$
    d) $\pi/180$

Answers

1.c   2.b   3.b   4.b   5.d   6.c
7.c   8.c   9.c   10.b

Gravity and Gravitation

1. The value of g depends on
   a) mass of earth only
   b) radius of earth only
   c) mass and radius of earth
   d) is a constant independent of mass and radius of earth
2. The value of G depends on
   a) mass of earth only
   b) radius of earth only
   c) mass and radius of earth
   d) is a constant independent of mass and radius of earth
3. The value of universal gravitational constant G in SI system is
   a) 9.8 m/s^2
   b) $6.67 \times 10^{-7} \text{ Nm}^2/\text{kg}^2$
   c) $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$
   d) $6.67 \times 10^{11} \text{ Nm}^2/\text{kg}^2$
4. If distance between two point masses is doubled, the gravitational attraction between them
   a) is doubled
   b) becomes four times
   c) is reduced to half
   d) is reduced to a quarter
5. The atmosphere is held to the earth by
   a) gravity
   b) winds
   c) clouds
   d) rotation of earth around the sun
6. The value of G depends upon
   a) the nature and the size of bodies
   b) the medium between the two masses

c) the temperature of the bodies

d) it is independent

7. The gravitational potential due to the earth on its surface is

a) negative

b) zero

c) positive

d) infinity

8. The weight of a body at the centre of earth is

a) zero

b) infinite

c) slightly more than at the poles

d) slightly less than at the equator

9. As we go from the equator to the poles, the value of g

a) decreases

b) increases

c) decreases up to a latitude to 45^0

d) remain the same

10. All bodies large and small fall under gravity with same

a) force

b) velocity

c) acceleration

d) momentum

11. If g is acceleration due to gravity at earth's surface, then the acceleration due to gravity at a planet whose mass and radius are both half of that of the earth will be

a) g/4

b) g/2

c) g

d) 2g

12. If the speed of rotation of the earth increases, then the weight of the body

a) increases

b) decreases

c) remains unchanged

d) may increase or decrease

13. If the earth stops rotating about its axis, the value of g will

a) increase

b) decrease

c) remain unchanged

d) may increase or decrease

14. The escape velocity from the earth's surface in km/s is about

a) 4.2

b) 7.2

c) 11.2

d) 9.2

15. The relation between escape velocity v_e and orbital velocity v_o is given by

a) $v_e = v_o\sqrt{2}$

b) $v_e = 2v_o$

c) $v_e = v_o/\sqrt{2}$

d) $v_e = v_o/2$

16. The height of communication satellite from earth's surface is

a) 3600km

b) 36000km

c) 6400km

d) 42000km

17. The time period of geostationary satellite is

a) one year

b) one month

c) one day

d) depends on height above earth's surface

18. The escape velocity of mass 2kg from earth's surface is

a) 4.2km/s

b) 7.2km/s

c) 11.2km/s

d) 9.2km/s

19. When an object is taken from terai region to maountain, its weight

a) increases

b) decreases
c) remains same
d) becomes zero at the top of the mountain
20. A man inside an artificial satellite feels weightlessness because the force of attraction due to earth is
a) zero at that place
b) is balanced by the force of attraction due to moon
c) is not effective due to design of satellite
d) balanced by the centrifugal acceleration

Answers

1.c	2.d	3.c	4.d	5.a	6.d	7.a	8.a
9.b	10.c	11.d	12.b	13.c	14.c	15.a	16. b
17.c	18.c	19.b	20.d				

Wave motion and sound

1. The waves which do not need medium to propagate are
a) Electromagnetic waves
b) Mechanical waves
c) Longitudinal waves
d) none
2. Which of the following are electromagnetic?
a) Mechanical
b) Transverse
c) longitudinal
d) All
3. Which of the following are mechanical waves?
a) X- rays
b) Microwaves
c) Radio waves
d) sound waves
4. Which of the following is not transverse wave?
a) heat waves
b) water waves
c) light waves
d) whistle of train
5. In which medium does sound travel fastest?
a) Air
b) Water
c) Steel
d) Vacuum
6. The velocity of sound in vacuum is
a) 332 m/s
b) 1500 m/s
c) 5000 m/s

d) zero

7. If the temperature of the medium increases, then speed of sound
   a) Decreases
   b) Increases
   c) Remains same
   d) none

8. Which does not affect the speed of sound?
   a) Density
   b) Humidity
   c) Temperature
   d) Pressure

9. Ultrasound has frequency
   a) More than 20Khz
   b) Less than 20 Hz
   c) 20 Hz to 20Khz
   d) None

10. Threshold of hearing is
    a) 10dB
    b) 5dB
    c) 20dB
    d) 50dB

11. For an echo, the reflecting surface must be at least
    a) 17m
    b) 19m
    c) 20m
    d) 18m

12. With the propagation of longitudinal wave through a material medium, the quantities transmitted in the direction of propagation are
    a) energy only
    b) momentum only
    c) energy and mass
    d) energy and momentum

13. Mechanical waves can be

a) longitudinal waves
b) transverse wave
c) both longitudinal and transverse
d) neither longitudinal nor transverse

14. For a mechanical wave, the required material media must possess
    a) inertia and surface tension
    b) inertia and elasticity
    c) surface tension and viscosity
    d) rigidity and conductivity

15. With the sound waves one cannot observe the phenomenon of
    a) refraction
    b) interference
    c) diffraction
    d) polarization

16. Bells are made of metal and not of wood, because
    a) the thermal conductivity of metal is greater than that of wood
    b) the density of metal is greater than that of wood
    c) the sound is not conducted by metals but is radiated
    d) wood dampens vibrations while metals are elastic

17. A bomb explodes on the moon. You will hear its sound on earth after
    a) 10 min
    b) 20 min
    c) 2 hours 16 minutes
    d) never

18. Which of the following is not longitudinal in nature
    a) sound waves in air
    b) waves in a spring
    c) radio waves
    d) waves produced in a rod rubbed along its length

19. With an increase in temperature, the frequently of sound from an organ pipe

a) decreases

b) increases

c) remains unchanged

d) changes erratically

20. A source of sound and the observer are moving away from each other. The apparent pitch will

a) decreases

b) increases

c) remains unchanged

d) uncertain

21. Which of the following emits sound of higher pitch

a) lion

b) man

c) donkey

d) mosquito

22. Quality of sound depends upon

a) pitch

b) loudness

c) overtones

d) wavelength

23. The pitch of a sound depends on

a) amplitude

b) frequency

c) intensity

d) number of overtones

24. The unit of intensity level of sound is

a) m

b) watt/m^2

c) decibel

d) watt/m

25. A source of sound moves towards a stationary observer. the apparent frequency heard bny the observer is

a) more than the actual frequency

b) less than the actual frequency

c) equal to actual frequency

d) depends on velocity

26. Which of the following does not affect the reverberation time

a) nature of walls

b) frequency of sound

c) area of walls, ceiling and floor

d) size of auditorium

27. Which of the following is correct for frequency

a) $f = 1/T$

b) $f = T$

c) $f = T^2$

d) $f = 1/T^2$

28. If the string is thicker, then pitch is

a) greater

b) equal

c) lower

d) none

29. We cannot hear the voice of man while talking at moon. This is because

a) too much sun light

b) too cold at the moon

c) not air at the moon

d) not water on the moon surface

30. If the amplitude of the sound is doubled, then intensity of sound becomes

a) 2 times

b) 3 times

c) 4 times

d) 5 times

31. If the speed of sound is 400 m/s and its wavelength is 5m, then its frequency is

a) 2000 Hz

b) 200 Hz

c) 80 Hz

d) 50 Hz

32. Ultrasound has frequency
    a) more than 20 KHz
    b) less than 20 KHz
    c) 20 Hz to 20 KHz
    d) All
33. Bat produce
    a) infrasound
    b) ultrasound
    c) both infrasound and ultrasound
    d) sound of frequency ranging from 20 Hz to 20 KHz
34. The voice of woman is shriller due to
    a) high pitch
    b) high power
    c) high velocity of sound
    d) all

Answers

1.a	2.b	3.d	4.d	5. c	6.a	7.b	8.d
9.a	10.a	11.a	12.d	13.c	14.b	15.d	16. d
17. d	18.c	19. b	20. a	21. d	22. c	23.b	24. c
25.a	26. b	27.a	28. c	29. c	30. c	31. c	32. a
33. b	34. a						

Heat and thermodynamics

1. At what temperature does the centigrade and Fahrenheit scale show same reading?
    a) 40
    b) -40
    c) 35
    d) 50
2. When water is heated from 0 to 100, then volume of water
    a) First increase and then decreases
    b) Remains same
    c) First decreases and then increases
    d) None of above
3. The maximum volume of water is at
    a) 0^0C
    b) 100^0 C
    c) 4^0 C
    d) -4^0 C
4. Water freezes at
    a) 0^0F
    b) 32^0F
    c) 18^0F
    d) 40^0F
5. The boiling point of mercury at STP is
    a) 100^0C
    b) 212^0C
    c) 357^0C
    d) 457^0C
6. The absolute zero temperature is the temperature at which
    a) Molecular motion stops
    b) Molecular motion is maximum

c) Transmission of energy takes place

d) None

7. What is the amount of heat required to raise the temperature of 1 gm of water from 20^0C to 21^0C
   a) 1200J
   b) 4.2J
   c) 420J
   d) 4200J

8. Water has lowest density at
   a) 0^0
   b) 4^0
   c) -4^0
   d) 100^0

9. The alcohol thermometer can be used to measure temperature of
   a) Boiling water
   b) Desert
   c) Very cold place
   d) Temperature of hot bath

10. At the top of mountain, water boils at temperature
    a) 100^0
    b) More than 100^0
    c) Less than 100^0
    d) Water do not boil

11. The average human body temperature is
    a) 37^0
    b) 98.6^0
    c) Both a and b
    d) None

12. The thermal state of a body is given by
    a) Heat
    b) Temperature
    c) Cold
    d) Specific heat

13. The branch of physics that deals with the relation between heat and mechanical energy is
    a) Heat
    b) Thermodynamics
    c) Thermoelectricity
    d) Calorimetry

14. In an isothermal process
    a) Pressure remains constant
    b) Temperature remains constant
    c) Volume remains constant
    d) Thermal energy remains constant

15. The thermodynamic process in which pressure remains constant
    a) Isothermal
    b) Adiabatic
    c) Isobaric
    d) Isochoric

16. The triple point of the substance
    a) Is unique
    b) Has two values
    c) Has three values
    d) Doesnot exist

17. In which process medium is not required
    a) Conduction
    b) Convection
    c) Radiation
    d) All of above

18. In steady state the temperature of the rod
    a) Decreases with time
    b) Increases with time
    c) Does not change with time and is same at every point of rod
    d) Does not change with time but is different at different points of the rod

19. Heat produced by friction is transferred by
    a) Conduction
    b) Convection

c) Radiation

d) None

20. The phenomenon of land and sea breeze is as a result of

a) Conduction

b) Convection

c) Radiation

d) Evaporation

21. The most appropriate material for a cooking pot possesses following characteristics

a) High specific heat and low conductivity

b) High specific heat and high conductivity

c) Low specific hat and low conductivity

d) Low specific heat and high conductivity

22. Arrange copper iron and silver in increasing order of thermal conductivity

a) Iron, silver, copper

b) Copper, silver, iron

c) Silver, copper, iron

d) Iron, copper, silver

23. Temperature gradient is

a) A scalar quantity

b) A vector quantity

c) Neither scalar nor vector quantity

d) Dimensionless

24. Newton's law of cooling is used to find

a) Specific heat of gases

b) Specific heat of liquids

c) Latent heat of liquids

d) Density of liquids

25. It is hotter for the same distance over the top of the fire than it is up the side of it mainly because

a) Air conducts heat upward

b) Heat is radiated upward

c) Convection takes more heat upward

d) Conduction, convection and radiation all contribute significantly in transferring heat upwards

26. Hot water is poured in a glass tumbler. If it cracks, it is due to following property of glass

a) Low thermal conductivity

b) High thermal conductivity

c) High specific heat

d) High melting point

Answers

1.b	2.c	3.b	4.b	5.c	6.a	7.d	8.d
9.c	10.c	11.c	12.b	13.b	14.b	15.c	16.
17.c	18.	19.a	20.b	21.d	22.c	23.b	24.b
25.c	26.a						

Optics

1. The velocity of light in air is
   a) 3×10^8 m/s
   b) 2×10^8 m/s
   c) 2×10^{-8} m/s
   d) 4×10^8 m/s
2. The angle made by incident ray to the surface is called
   a) Glancing angle
   b) Grazing angle
   c) Incident angle
   d) Reflected angle
3. In critical angle
   a) Angle of incidence = 90
   b) Angle of refraction = 90
   c) Angle of incidence is greater than 90
   d) Angle of refraction is greater than 90
4. The critical angle of glass is
   a) 42
   b) 50
   c) 60
   d) 40
5. The critical angle of water is
   a) 42
   b) 50
   c) 49
   d) 2
6. The critical angle of ice is
   a) 49
   b) 50
   c) 46
   d) 24

7. Cutting diamond shows
   a) Total internal reflection
   b) Reflection of light
   c) Refraction of light
   d) All
8. It is difficult to catch fish inside the pond due to
   a) Reflection of light
   b) Refraction of light
   c) Total internal reflection
   d) Both a and b
9. Water is seen on the black pitched road during summer due to
   a) Total internal reflection
   b) Mirage
   c) Reflection
   d) Both a and b
10. When object is placed 2F of convex lens then
    a) Image is real
    b) Image is inverted
    c) Size of image is equal to size of object
    d) All
11. The unit of magnification is
    a) Diopter
    b) Newton
    c) Candela
    d) Unitless
12. As focal length increases, power
    a) Decreases
    b) Increases
    c) Remains same
    d) Sometimes increases and sometimes decreases
13. The unit of power of lens is
    a) Diopter
    b) Newton
    c) Candela
    d) Unitless

14. Persistence of vision is
    a) 10 second
    b) 1/10 second
    c) 1/8 seecond
    d) 2 second
15. In myopia, image is formed
    a) On the retina
    b) In front of retina
    c) Behind retina
    d) None
16. Which of the following has maximum wavelength?
    a) Radio waves
    b) X- ray
    c) Gamma ray
    d) Ultraviolet ray
17. Which is visible?
    a) infrared ray
    b) X- ray
    c) Gamma ray
    d) Ultraviolet ray
18. Compound microscope consists of
    a) One convex lens
    b) Two convex lens
    c) Three convex lens
    d) Two concave lens
19. The lens used to remove hypermetropia is
    a) Concave lens
    b) Convex lens
    c) Both
    d) At first concave and then convex
20. The lens used to remove myopia is
    a) Concave lens
    b) Convex lens
    c) Both
    d) At first concave and then convex

21. Which mirror is used for saving?
    a) Convex
    b) Concave
    c) Both
    d) None
22. Twinkling of star is due to
    a) Refraction of light
    b) Reflection of light
    c) Total internal reflection of light
    d) Dispersion of light
23. Dispersion of light is caused by
    a) Different frequency
    b) Different velocity
    c) Different amplitude
    d) Different wavelength
24. If the angle between incident and reflected ray is 90^0, find the angle of reflection
    a) 120
    b) 60
    c) 45
    d) 30
25. How many lenses are arranged in terrestrial telescope?
    a) 1
    b) 2
    c) 3
    d) 4
26. Focal length of eyepiece lens in compound microscope is
    a) Smaller
    b) Larger
    c) Neither smaller not larger
    d) None
27. When ray of light enters a glass slab from air
    a) Its wavelength decreases
    b) Its wavelength increases
    c) Its frequency increases

d)   Wavelength and frequency remain same

28. A mirror has one focus and a lens has
    a)   One focus
    b)   Two foci
    c)   More than two foci
    d)   No focus

29. The focal length of a convex lens will be maximum for
    a)   Yellow light
    b)   Blue light
    c)   Red light
    d)   Green light

30. The property of light which doesnot vary with the medium is
    a)   Amplitude
    b)   Velocity
    c)   Frequency
    d)   Wavelength

31. The speed of light in vacuum depends upon
    a)   Amplitude
    b)   Frequency
    c)   Wavelength
    d)   None

32. Which of the following statement is true in the case of image of a real object formed by plane mirror
    a)   The image is inverted
    b)   The image is enlarged
    c)   The image is real
    d)   The image is laterally inverted

33. The number of images formed of an object between two parallel plane mirrors and facing each other is
    a)   2
    b)   4
    c)   6
    d)   infinity

34. The number of images formed by a polished thick plate is
    a)   2

b)   6
c)   Infinity

35. The thick plate is polished at its back surface. It forms number of images. The brightest images is
    a)   First
    b)   Second
    c)   Last
    d)   All are equally bright

36. The focal length of concave mirror is
    a)   Maximum for red color
    b)   Maximum for violet color
    c)   Maximum for yellow color
    d)   Same for all colors

37. The focal length of convex mirror is
    a)   Maximum for red color
    b)   Maximum for violet color
    c)   Maximum for yellow color
    d)   Same for all colors

38. A convex mirror has a focal length f. a real object at a distance f in front it from pole, produces an image at
    a)   F
    b)   2f
    c)   f/2
    d)   infinity

39. A concave mirror of focal length 15 cm forms an image at a distance of 40 cm from it. The distance of the object from the mirror is
    a)   10 cm
    b)   20 cm
    c)   24 cm
    d)   30 cm

40. The velocity of light in vacuum is 3×10^8 m/s. The speed of light in a medium of refractive index 2 will be
    a) 3×10^8 m/s
    b) 1.5×10^8 m/s

c) 2.5×10^8 m/s

d) 6×10^8 m/s

41. A fish in water appears to be at 60 cm from the surface. If refractive index of water is 4/3, the true depth of the fish from water surface is
a) 45 cm
b) 60 cm
c) 80 cm
d) Infinity

42. A plane glass slab is placed over letters o f different colors. Which letter appears to be raised most?
a) Red
b) Violet
c) Yellow
d) All colored letter appear equally raised

43. The critical angle of light from glass to air is maximum for
a) Violet
b) Red
c) Green
d) Yellow

44. A converging lens
a) Collects rays
b) Spread rays
c) Forms real image
d) Forms virtual image

45. In optical fibers, following principle is used
a) Successive reflection
b) Refraction
c) Total internal reflection
d) Scattering

46. The power of a lens having focal length 20 cm is
a) 5D
b) 0.05D
c) 0.5D
d) 1.5D

47. Two thin lenses of focal lengths 20 cm and 25 cm are placed in contact. The effective power of the combination is
a) 6D
b) 9D
c) 1/9D
d) 45D

48. A prism causes
a) Deviation only
b) Dispersion only
c) Deviation and dispersion both
d) Neither dispersion nor dispersion

49. Larger aperture of telescope are used for
a) Greater magnification
b) Greater resolution
c) Reducing lens aberration
d) Ease of manufacture

50. A person wearing spectacles wants to use the microscope, then he should
a) Remove spectacles
b) Keep on wearing the spectacles
c) Not use the microscope
d) Remove or keep on wearing the spectacles as it makes no difference

51. A reflecting astronomical telescope uses
a) A concave mirror
b) A convex mirror
c) A prism
d) A plano convex lens

52. The resolving power of a telescope depends upon
a) The focal length of eye lens
b) The length of objective lens
c) The length of telescope
d) The diameter of objective lens

53. An endoscope is a
a) Narrow telescope

b) Largest telescope
c) Simple microscope
d) Type of camera

54. A spectrometer is used to
a) Study rainbow
b) Study solar eclipse
c) Measure deviation caused by a prism
d) All of above

55. The formation of rainbow is a natural example of
a) Interference
b) Dispersion
c) Diffraction
d) Reflection

Answers

1.a	2.b	3.b	4.a	5.b	6.b	7.a	8.b	9.b
10.d	11.d	12.a	13.a	14.b	15.b	16.a	17.a	18.b
19.b	20.a	21.b	22.a	23.d	24.c	25.b	26.b	27.a
28.b	29.c	30.c	31.d	32d	33.d	34.c	35.b	36.d
37.d	38.c	39.c	40.b	41.c	42.b	43.b	44.a	45.c
46.a	47.b	48.c	49.b	50.a	51.a	52.d	53.a	54.c
55.b								

Simple harmonic motion

1. The necessary and sufficient condition for simple harmonic motion is
a) Constant time period
b) Constant acceleration
c) Proportionality between restoring force and velocity
d) Proportionality between restoring force and displacement

2. Acceleration of the particle executing SHM is
a) Maximum at extreme points
b) Minimum at extreme points
c) Maximum at mean position
d) Same in each point

3. When the amplitude of a particle executing SHM increases, the time period
a) Increases
b) Decreases
c) Remains unchanged
d) None

4. In SHM the acceleration of the particle is zero when its velocity is
a) Zero
b) Maximum
c) Half of the maximum value
d) One fourth of its maximum value

5. Which of the following is SHM
a) Motion of earth around the sun circular path
b) Up and down motion of a mass attached to a spring
c) Motion of an electron around the nucleus
d) A particle moving along the straight path

6. A second pendulum has time period
a) 2 second
b) 1 second

c) 3 second
d) 4 second

7. A pendulum clock giving correct time at earth is taken to the moon. Then it
a) Becomes fast
b) Becomes slow
c) Remains unaffected
d) Stops

8. If the length of simple pendulum is increased by four times, then it time period
a) Increases by two times
b) Increases by three times
c) Remains unaffected
d) Becomes half

9. A girl is swinging on a swing in the sitting position. if another girl also sits on the swing then the time period of swing
a) Increases
b) Decreases
c) Remains unchanged
d) Uncertain

10. The time period of a simple pendulum in a stationary lift is T. when the lift falls freely, its time period becomes
a) T
b) 2T
c) Infinite
d) Zero

Answers

1.d   2.a   3.c   4.b   5.b   6.a   7.b   8.a

9.c   10.c

Fluid Mechanics

1. The pressure of liquid depends upon
a) density of liquid
b) acceleration due to gravity
c) height of liquid column
d) all

2. The unit of relative density is
a) kg/m^3
b) N/m
c) Pa
d) unit less

3. Hydraulic brake is based on
a) Archimedes principle
b) Pascal law
c) law of floation
d) none

4. The water wets the glass of surface but mercury doesnot, it is because water has greater
a) adhesive force
b) cohesive force
c) specific heat capacity
d) none

5. A liquid tends to assume a spherical shape because of
a) surface tension
b) viscous force
c) gravity
d) elastic force

6. The surface tension arises due to
a) adhesive force between molecules
b) cohesive force between molecules
c) gravitational force between molecules

d) none
7. When salt is added to pure water, the surface tension
    a) increases
    b) decreases
    c) remains unchanged
    d) becomes zero
8. When surf is added to pure water, the surface tension
    a) remains unchanged
    b) decreases
    c) increases
    d) becomes zero
9. A drop of water breaks into two droplets of equal size. In this process, which of the following statements is true
    a) the sum of temperatures of two drops is equal to the original temperature
    b) the sum of masses of two droplets is equal to the radius of the original drop
    c) the sum of radii of two droplets is equal to the radius of the original drop
    d) the sum of surface areas of two droplets is equal to surface area of the original drop
10. The unit of surface tension is
    a) N/m^2
    b) N/m
    c) Nm
    d) J/m
11. When two tubes of different diameters are dipped vertically, the rise of liquid is
    a) same in both tubes
    b) more in tube of larger diameter
    c) more in tube of smaller diameter
    d) none of above
12. An iron needle floats on the surface of water. This phenomenon is attributed to
    a) upthrust of liquid

    b) viscosity
    c) surface tension
    d) gravitational force
13. At which temperature the surface tension of water is minimum?
    a) 4^0C
    b) 20^0C
    c) 30^0C
    d) 70^0C
14. The pressure of water at 100 cm depth is
    a) 100Pa
    b) 1000Pa
    c) 10000Pa
    d) 100000Pa
15. Viscosity is most closely related to
    a) friction
    b) adhesive molecular force
    c) cohesive force
    d) Bernoulli's theorem
16. A hole is made near a bottom of a tank. The volume of liquid emerging from the hole does not depend upon
    a) area of hole
    b) height of liquid level above the hole
    c) density of liquid
    d) acceleration due to gravity
17. The cloud floats in the sky because of
    a) their low temperature
    b) their low viscosity
    c) their low density
    d) low pressure
18. The rains falls with constant speed because of
    a) upthrust of air
    b) viscous force of liquid
    c) density of liquid
    d) surface tension of liquid

19. Which of the following substance has greatest viscosity?
    a) mercury
    b) water
    c) oxygen
    d) glycerin

Answers

1.d	2.d	3.b	4.b	5.a	6.a	7.a	8.b
9.b	10.b	11.c	12.b	13.d	14.c	15.a	16.c
17.c	18.b	19.d					

Electricity and Magnetism

1. Current is
   a) Vector
   b) Scalar
   c) Neutral
   d) None
2. Potential difference is always………than EMF
   a) Less
   b) More
   c) Equal
   d) None
3. One coulomb contains
   a) 6.25×10^{16} electrons
   b) 6.25×10^{17} electrons
   c) 6.25×10^{18} electrons
   d) 6.25×10^{19} electrons

4. Ammeter must be connected in
   a) Parallel
   b) Series
   c) Mixed
   d) All
5. Voltmeter must be connected in
   a) Parallel
   b) Series
   c) Mixed
   d) All
6. A capacitor is a device for storing
   a) Charge
   b) Voltage
   c) Current
   d) Power

7. The unit of capacitance is
   a) Ohm
   b) Farad
   c) Volt
   d) Ampere
8. The electric current in a metallic conductor dueto the flow of
   a) Electrons only
   b) Positive ions only
   c) Electrons and positive ions only
   d) Neutral atoms only
9. Voltmeter is connected in
   a) series
   b) parallel
   c) mixed
   d) none
10. When the resistance of the wire is doubled then the resistivity
    a) is doubled
    b) becomes three times
    c) remains same
    d) becomes four times
11. If 5A current flows within 5 seconds in a wire, then what is the charge produced?
    a) 5C
    b) 1C
    c) 25C
    d) 50C
12. The angle of dip at the equator is
    a) 0^0
    b) 45^0
    c) 90^0
    d) 60^0
13. Direction of induced current is given by
    a) Fleming's left hand rule
    b) Fleming's right hand rule
    c) Right hand screw rule

d) none
14. At the neutral point, the compass needle indicates
    a) north
    b) south
    c) east
    d) none
15. An electric bulb of 100 watt runs for one minute. What is the energy consumed?
    a) 6KJ
    b) 6J
    c) 60KJ
    d) 60J
16. The strength of electromagnet increased by
    a) increasing the value of current
    b) increasing the number of turns of the wire
    c) using soft iron core in the solenoid
    d) all above
17. The law that governs the force between electric charges is called
    a) Newton's law
    b) Coulomb's law
    c) Faraday's law
    d) Ampere's law
18. When the distance between charged particles is halved, force between them becomes
    a) one half
    b) double
    c) one fourth
    d) four times
19. The minimum value of charge of an object cannot be less than
    a) $1.6x10^{-19}$C
    b) $3.2x10^{-19}$C
    c) 1C
    d) $1.6x10^{-13}$C
20. A body is given negative charge. its mas
    a) remains unchanged

b) increases

c) decreases

d) may increases or decrease depending on the material and size of body

21. The unit of permittivity is

a) Volt/metre

b) C/m

c) Nm/C^2

d) $C^2/N\text{-}m^2$

22. When a glass rod is rubbed with silk, both become

a) oppositely charged by conduction

b) similarly charged by conduction

c) similarly charged by friction

d) oppositely charged by friction

23. When negatively charge is given to a soap bubble its radius

a) increases

b) decreases

c) remains unchanged

d) becomes zero

24. When one penetrates a uniformly charged conducting sphere, the electric field strength (E)

a) increases

b) decreases

c) remains same as on the surface

d) is zero at all points

25. An electron moving with a finite velocity enters in an electric field parallel to lines of force, then

a) it gets accelerated

b) it gets retarded

c) is continues to move with constant speed

d) its path becomes parabolic

26. The energy of an electron can be increased by allowing them

a) to fall from great height

b) to fall through lead block

c) to fall through electric potential

d) to move in high magnetic field

27. The surface of a conductor

a) is an equipotential surface

b) is a non equipotential surface

c) has only two points at the same potential

d) is always at zero potential

28. An electric field can deflect

a) X-rays

b) Neutrons

c) ionized helium atom

d) gamma rays

29. If a unit charge is taken from one point to another over an equipotential surface, then

a) Work is done on the charge

b) Work is done by the charge

c) Work on the charge is constant

d) work done is zero

30. A hollow sphere of charge does not produce an electric field at any

a) interior point

b) outer point

c) surface point

d) none of the above

31. If the electric field is uniform then the electric lines of forces are

a) divergent

b) convergent

c) circular

d) parallel

32. In bringing an electron towards another electron, electrostatic potential energy of system

a) decreases

b) increases

c) remains unchanged

d) becomes zero

33. When the temperature of a metallic conductor is increased, its resistance
    a) increases
    b) decreases
    c) remains unchanged
    d) sometimes increases and sometimes decreases

34. When the temperature of a semiconductor is increased, its resistance
    a) increases
    b) decreases
    c) remains unchanged
    d) sometimes increases and sometimes decreases

35. A piece of copper and another of germanium are cooled from room temperature to 80K. The resistance of
    a) each of them increases
    b) each of them decreases
    c) copper increases, germanium decreases
    d) copper decreases, germanium increases

36. The resistance of a metallic conductor increases with the rise of temperature. This is due to
    a) the increases in mass of free electrons
    b) the increase in the relaxation time
    c) the decrease in the relaxation time
    d) the decrease in the electron density

37. A hollow metal sphere of radius 10 cm is charged such that the potential at its surface is 80Volts. The potential at the centre of the sphere is
    a) 8V
    b) 80V
    c) 800V
    d) zero

38. The electric field intensity at the surface of a charged conductor is
    a) zero
    b) directed normally to the surface

    c) directed tangentially to the surface
    d) directed along 45^0 to the surface

39. Two conducting spheres of radii R_1 and R_2 are at the same potential. The ration of their charges is
    a) R_1/R_2
    b) R_2/R_1
    c) $(R_1/R_2)^2$
    d) $(R_2/R_1)^2$

40. Two conducting spheres of radii R_1 and R_2 are at the same charges The ration of their potential is
    a) R_1/R_2
    b) R_2/R_1
    c) $(R_1/R_2)^2$
    d) $(R_2/R_1)^2$

41. The substances which contain free charge cariers are called
    a) conductors
    b) insulators
    c) dielectrics
    d) capacitors

42. The potential V, charge q and capacitance C of a conductor are related by
    a) $q = C/V$
    b) $q = V/C$
    c) $q = CV^2$
    d) $q = CV$

43. In a charged capacitor the energy is stored in
    a) the field between the plates
    b) outside the plates
    c) on the plates
    d) nowhere

44. The capacitance of a parallel plate capacitor doesnot depend upon
    a) area of plates
    b) medium between the plates
    c) distance between the plates

d)   metal of the plates

45. When a thick plate of a dielectric is introduced in the air space of a parallel plate capacitor, then
a)   capacitance decreases
b)   capacitance increases
c)   capacitance remains unchanged
d)   capacitance becomes zero

46. Three different capacitors are connected in series. On them there will be
a)   equal charge
b)   equal potential
c)   equal charge and equal potential
d)   unequal charge and unequal potential

47. The electrical conductivity of atmosphere is mainly due to
a)   stream of electrons
b)   stream of cosmic rays
c)   ionization of its molecules
d)   thunder clouds

48. When a person standing on ground wearing insulating shoe comes in contact with a high power line, he is likely to
a)   experience a fatal shock
b)   experience a moderate shock
c)   die immediately
d)   remain unaffected

49. Two capacitors of capacitances 2µf and 3µf are connected in series. The ratio of charge on these capacitors will be
a)   1:1
b)   2:3
c)   3:2
d)   4:9

50. Three different capacitors are connected in parallel. On them there will be
a)   equal charge
b)   equal potential
c)   equal charge and equal potential

d)   unequal charge and unequal potential

Answers

1.b	2.a	3.c	4.b	5.a	6.a	7.b	8.a	9.b
10.c	11.c	12.a	13.b	14.d	15.a	16.d	17.b	18.b
19.a	20.b	21.d	22.d	23.a	24.d	25.d	26.c	27.a
28.c	29.d	30.a	31.d	32.b	33.a	34.b	35.c	36.c
37.d	38.b	39.a	40.b	41.a	42.d	43.a	44.d	45.b
46.a	47.c	48.d	49.b	50.b				

Challenging Objective Questions

1. The precise value is very close to
   a) standard value
   b) mean value
   c) observed value
   d) none
2. The accurate value is very close to
   a) standard value
   b) mean value
   c) observed value
   d) none
3. If the displacement of the body is directly proportional to square of time than acceleration of such body is
   a) constant
   b) decreasing
   c) increasing
   d) first increases and then decreases
4. The numerical value of average velocity to average speed is always
   a) less than 1
   b) equal to 1
   c) greater than 1
   d) equal to or less than 1
5. A lift moves with constant acceleration a. A person in the lift drops an object. If g is acceleration due to gravity, then the acceleration of the object with respect to object is'
   a) g
   b) g-a
   c) g + a
   d) a
6. An object starts from rest and accelerates uniformly down an incline. If the object reaches with a speed of 40m/s in 5s, its average speed is

   a) 8 m/s
   b) 10 m/s
   c) 20m/s
   d) 30 m/s
7. A balloon is at a height of 80 m above the ground. Now a packet is dropped from the balloon, it will reach the earth in (g = 9.8 m/s^2)
   a) 5s
   b) 16/5s
   c) 10s
   d) 4s
8. Two vectors have magnitude 6 units and 8 units and are inclined at an angle 60^0. The resultant of these vectors is
   a) 14N
   b) 2N
   c) 10N
   d) 12.2N
9. Which of the following pair of forces can be added to give a resultant of 5N?
   a) 2N and 8N
   b) 3N and 10N
   c) 3N and7N
   d) 12N and 20N
10. The scalar product of vectors A = 2i + 3j – 4k and B = I – 3J – 3k is
    a) 3
    b) 4
    c) 5
    d) 6
11. The resultant of two vectors have magnitude of 7 and 4 is 3. The magnitude of the cross product is
    a) 15
    b) 4
    c) 6
    d) zero

12. A person moves 30 m north, then 20 m east and finally $30\sqrt{2}$ m south west. His displacement from initial point is
    a) 14 m south west
    b) 28 m south
    c) 10 m west
    d) 15 m east

13. In still water crosses a river of width 1 km along the shortest possible path is 15 minutes. The velocity of river water in km/hr is
    a) 1
    b) 3
    c) 4
    d) 5

14. A car accelerates from 8 m/s to 14 m/s in 3 seconds. Its acceleration is
    a) 1 m/s^2
    b) 2 m/s^2
    c) 3 m/s^2
    d) 5 m/s^2

15. A body is thrown vertically upward with speed 100 m/s. The time to reach the body back to the ground is
    a) 10 s
    b) 20 s
    c) 15 s
    d) 5 s

16. A force 20N acting on a body imparts an acceleration of 2 m/s^2. What is the mass of the body?
    a) 40 kg
    b) 2 kg
    c) 5 kg
    d) 10 kg

17. A boy having a mass of 60 kg holds in hands a school bag of weight 40N. With what force the floor will push up on his feet? (g= 10 m/s^2)
    a) 100N

    b) 200N
    c) 640N
    d) 64N

18. A car starts from rest and has an acceleration 1 m/s^2. How long does it take to reach the velocity of 20 m/s?
    a) 20 sec
    b) 10 sec
    c) 30 sec
    d) 40 sec

19. A crane can lift a load of 200 N to the height of 5 m in 10 seconds. Calculate the power of the crane.
    a) 50 watt
    b) 100 watt
    c) 150 watt
    d) 300 watt

20. How fast should a man of 50 kg run so that his kinetic energy is 625 J?
    a) 5 m/s
    b) 10 m/s
    c) 15 m/s
    d) 20 m/s

21. A bullet of mass 100 gm is fired from a gun with velocity 100 m/s. How much kinetic energy is produced?
    a) 500000J
    b) 50000J
    c) 5000J
    d) 500J

22. A bullet is fired by a light rifle and the other by a heavy rifle by the same force. Which rifle will cause more injury to the shoulder?
    a) light rifle
    b) heavy rifle
    c) both will cause the same injury
    d) more information is required

23. A boy of weight 60 kg is standing in a lift moving upward with constant speed of 10 m/s, then apparent weight of man is
    a) 60 kg wt
    b) 90 kg wt
    c) zero
    d) 30 kg wt

24. A force of 100 N acts on a particle and displaces it by 2 m at an angle of 30^0.What is the work done by the force?
    a) 200N
    b) 160N
    c) 173N
    d) zero

25. A body of mass 3gm is moving with a velocity of 4 cm/s, the kinetic energy of the body is
    a) 24J
    b) 2.4J
    c) 24×10^{-7}J
    d) none

26. A body of mass 5 kg posses momentum 100 kgm/s. The kinetic energy of the body is
    a) 200 J
    b) 400J
    c) 1000J
    d) 2000J

27. When a body moves with a constant speed around a circle, then
    a) no acceleration is produced
    b) velocity remains constant
    c) no force acts on the body
    d) no work is done on it

28. A stone is released from a tower, its total mechanical energy during its fall
    a) increases
    b) decreases
    c) remains constant
    d) first increases and then becomes constant

29. There is no atmosphere on the moon because
    a) it is closer to earth
    b) it revolves around the earth
    c) the rms velocity of gas molecules is less than the escape velocity from moon
    d) the rms velocity of gas molecules is greater than the escape velocity from moon

30. A body weight 1kg at the North Pole. How much it will weight at the equatior?
    a) 1 kg
    b) more than 1 kg
    c) less than1 kg
    d) zero

31. Which one of the following has more elasticity?
    a) steel
    b) rubber
    c) wood
    d) plastic

32. With a rise of temperature, the Young's modulus
    a) increases
    b) decreases
    c) remains unchanged
    d) none

33. What is the power of a lens having focal length 20 cm?
    a) 5 D
    b) 2.5 D
    c) 0.5D
    d) 0.05 D

34. A person with defective eyesight cannot see clearly objects beyond 50 cm. What is the focal length of the lens that would enable him to clearly see the distant objects?
    a) 10 cm
    b) 20 cm
    c) 50 cm
    d) 40 cm

35. A person can see clearly up to 3 m only recommended a lens for him so that he can see clearly up to 12 m,
   a) 2 m
   b) 4 m
   c) 6 m
   d) 8 m

36. What is the wavelength of radio wave which has frequency of 100 MHz?
   a) 200 m
   b) 300 m
   c) 400 m
   d) 1 cm

37. What is the frequency of a wave whose time period is 1 sec
   a) 1 Hz
   b) 2 Hz
   c) 3 Hz
   d) 4 Hz

38. A bulb of 100 watt is connected to 220 V. What is the resistance of the filament of the bulb?
   a) 50Ω
   b) 100Ω
   c) 4Ω
   d) 10Ω

39. What is the equivalent resistance when 3Ω and 6Ω are connected in parallel and then series?
   a) 2Ω9Ω
   b) 3Ω3Ω
   c) 4Ω9Ω
   d) 3Ω6Ω

40. A bulb has resistance 22.5 w and requires a current of 0.2 A for its working. What potential is required for it?
   a) 2.5V
   b) 3.5 V
   c) 4.5 V
   d) 5 V

41. An electric heater draws 2 A current when connected to 220 V mains. What is the power of the heater?
   a) 440 watt
   b) 220 watt
   c) 660 watt
   d) 900 watt

42. A ball is thrown up with a speed of 9.8 m/s. What is velocity at maximum height?
   a) 19.6 m/s
   b) 9.8 m/s
   c) 29.4 m/s
   d) zero

43. With what initial speed must a ball be thrown up so as to reach a height of 5 m. Take g = 10 m/s^2.
   a) 5 m/s
   b) 10 m/s
   c) 20 m/s
   d) 9.8 m/s

Answers

1.b	2.a	3.a	4.d	5.c	6.a	7.d	8.d	9.c
10.c	11.d	12.c	13.b	14.b	15.b	16.d	17.c	18.a
19.b	20.a	21.d	22.a	23.a	24.c	25.c	26.c	27.d
28.c	29.d	30.c	31.a	32.b	33.a	34.a	35.b	36.b
37.a	38.d	39.a	40.c	41.a	42.d	43.b		

Astronomy and Geology

1. The light of sun reaches the earth in
   a) 7 minutes 20 seconds
   b) 8 minutes and 20 seconds
   c) 8 minutes 50 seconds
   d) 6 minutes 20 seconds
2. The nearest star from solar system is
   a) Alpha century
   b) Gamma century
   c) sun
   d) none
3. The mass of sun is
   a) $2x10^{30}$ kg
   b) $1x10^{30}$ kg
   c) $3x10^{30}$ kg
   d) $4x10^{30}$ kg
4. In which galaxy solar system lies?
   a) Andromeda
   b) Milky way
   c) Sculpture
   d) none
5. Milky way galaxy is
   a) elliptical
   b) irregular
   c) spiral
   d) none
6. Andromeda galaxy is
   a) elliptical
   b) irregular
   c) spiral
   d) none
7. Group stars forming some shapes is

   a) galaxy
   b) constellation
   c) universe
   d) none
8. Total number of constellations are
   a) 88
   b) 90
   c) 86
   d) 87
9. The diameter of sun is
   a) $1.4x10^5$ km
   b) $1.4x10^6$ km
   c) $2.4x10^6$ km
   d) $2.4x10^5$ km
10. The surface temperature of sun is
    a) 5700^0C
    b) 6000^0C
    c) 5000^0C
    d) 6200^0C
11. The nearest planet from the sun is
    a) Earth
    b) Mars
    c) Mercury
    d) Jupitor
12. Which is brightest planet?
    a) Earth
    b) Venus
    c) Mars
    d) Saturn
13. Which is called red planet?
    a) Mars
    b) Venus
    c) Saturn
    d) Uranus
14. Which is the coldest planet?

a) Mars

b) Saturn

c) Uranus

d) Neptune

15. The average distance of moon from the earth is

a) 3×10^5 km

b) 4×10^5 km

c) 4.5×10^5 km

d) 2×10^5 km

16. Sidereal month equals to

a) $26\frac{1}{3}$ days

b) $27\frac{1}{3}$ days

c) $28\frac{1}{2}$ days

d) $29\frac{1}{3}$ days

17. Which planet has maximum satellites?

a) Neptune

b) Jupiter

c) Uranus

d) Saturn

18. What are the comets?

a) Ball of fire

b) Ball of ice

c) Ball of dust

d) Ball of planet

19. Triton is satellite of

a) Neptune

b) Jupiter

c) Uranus

d) Saturn

20. Death of stars means

a) white dwarf

b) red giant

c) black hole

d) pulsars

21. outer surface of the earth is

a) crust

b) outer core

c) inner core

d) mantle

22. Wind speed is measured by

a) anemometer

b) Venturimeter

c) Hygrometer

d) calorimeter

Answers

1. b	2. a	3.a	4.a	5.c	6.c	7.b	8.a
9. b	10.b	11.c	12.b	13. a	14. d	15. b	16.b
17. d	18. b	19. d	20. a	21. a	22. a		