Force:

1. When a force acts on _____ body, the body goes in linear motion.
A. Stationary rigid body.
B. Stationary flexible body.
C. The pivoted rigid body.
D. None of the Above.
Ans: A.

2. When a force acts on _____ body, the body goes in rotational motion.
A. A rigid body pivoted at a point.
B. Stationary flexible body.
C. The pivoted rigid body.
D. None of the Above.
Ans: A.

3. S.I. Unit of moment of force is,
A. newton meter.
B. N m.
C. Dyne cm.
d. Kgf m.
Ans: A.

4. The rotation is always produce by a
A. Applied force.
B. Pair of forces.
C. Pull and push.
D. All of the above.
And: B.

5. A book kept on a table is an example of,
A. Dynamic equilibrium.
B. Static equilibrium.
C. Both.
D. None.
Ans: B.

6. A body is said to be in equilibrium when,
A: It does not move.
B. It has equal forces on both the sides.
C. When the algebraic sum of moment of all forces acting on the body is zero.
D. When body is balanced in all sides.
Ans: C.

7. A body is pivoted and a force of 20 N is applied at a distance of 60 cm from the pivot. The moment of the force is,
A. 12 N
B. 1200 N. m
C. 12 N m.
D. 1200 N cm.

Ans: C

8. Calculate the moment of force F1 at O

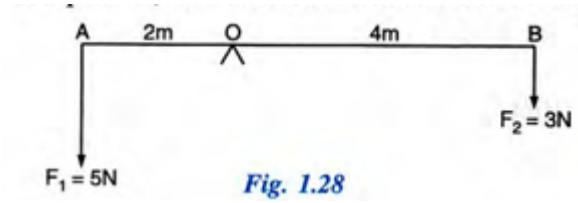


Fig. 1.28

A. 10 N m clockwise.

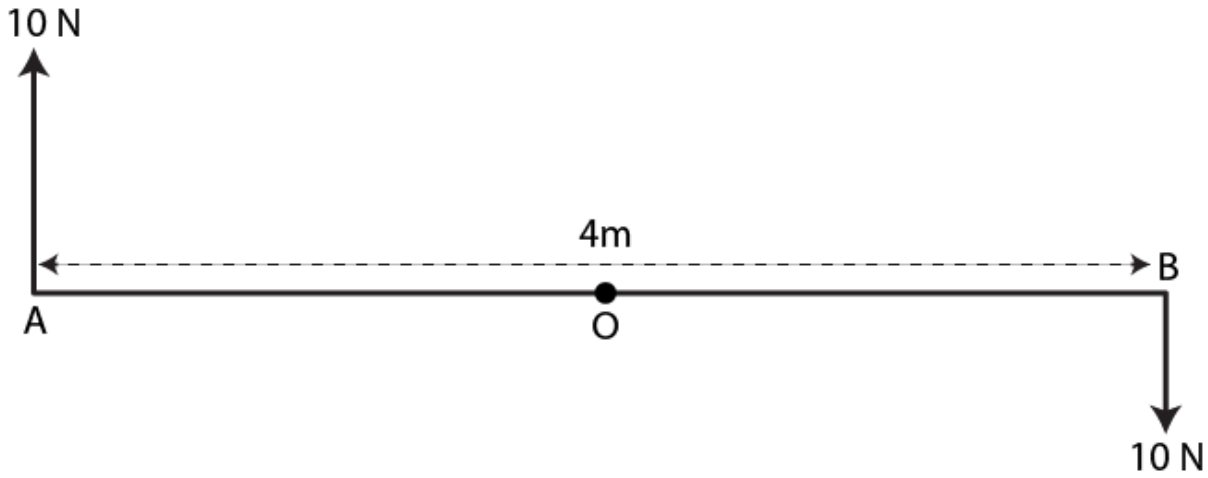
B. 10 N m anticlockwise.

C. 12 N m clockwise.

D. 12 N m anticlockwise.

Ans: B.

9. Two forces each of magnitude 10N act vertically upwards and downwards respectively at the two ends A and B of a uniform rod of length 4m which is pivoted at its mid-point O as shown. Determine the magnitude of resultant moment of forces about the pivot O.



A. 40 N m anticlockwise.

B. 40 Nm (clockwise).

C. 0.

D. 80 N m Anticlockwise

Ans: B

10. The factor on which the position of centre of gravity of a body depend,

A. Its shape i.e. on the distribution of mass.
B. It does not depend upon shape but only on size.
C. Position on the earth.
D. All.
Ans: A.

11. When a boy weighing 20 kgf sits at one end of a 4m long see-saw, it gets depressed at its end. He can be brought to the horizontal position by a man weighing 40 kgf by applying the force at

A. 2 m.
B. 1 m.
C. 2 cm
d. 4 m

Ans: B.

12. The center of gravity of a circular ring is

A. On the ring.
B. At half the distance from the center.
C. At the center of the ring.
D. None of the above.

Ans: C.

13. The centre of gravity of a hollow cone of height h is at distance x from its vertex where the value of x is:

(a) h/3
(b) h/4
(c) 2h/3
(d) 3h/4

Ans: C.

14. The centripetal force is defined as the

A. Force acting on a body moving in a circular path, in a direction towards the centre of circular path.
B. The force acting on a body moving in a circular path, in a direction away from the centre of circular path.
C. The force acting on a body moving in a circular path, tangent to the circle.
D. None.

Ans: A.

15. This force is fictitious force.

A. Moment of force.
B. Centrifugal force.
C. Centripetal force.
D. Electrostatic force.

Ans: B.

16. Which of the following quantity remains constant in uniform circular motion:

(a) Velocity
(b) Speed
(c) Acceleration
(d) Both velocity and speed Solutions:

Ans: B

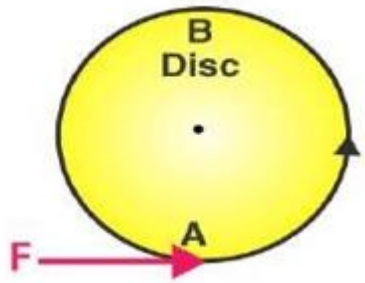
17. The moment of force is a

A. Scalar quantity.
B. Vectar Quantity.
C. Non measurable quantity.

D. None.
Ans: B.

20. One of the factors affecting the turning effect of a force.
A: The magnitude of the energy applied.
B. The magnitude of the force applied.
C. The magnitude of the gravity working.
D. The friction between the moving parts.
Ans: D.

21.



The disc will rotate in
A. Circular direction.
B. In the direction of the applied force.
C. Clockwise moment.
D. Anticlockwise moment.
Ans: D.

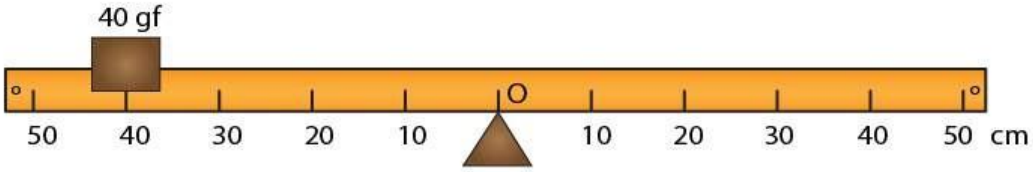
22. The moment of force about a given axis depends:
(a) Only on the magnitude of force
(b) Only on the perpendicular distance of force from the axis
(c) Neither on the force nor on the perpendicular distance of force from the axis
(d) Both, on the force and its perpendicular distance from the axis. Solution:
Ans: D.

23. A body is acted upon by two unequal forces in opposite directions, but not in the same line. The effect is that:
(a) The body will have only the rotational motion
(b) The body will have only the translational motion
(c) The body will have neither the rotational motion nor the translational motion
(d) The body will have rotational as well as translational motion. Solution:
Ans: D.

24. A nut is opened by a wrench of length 20 cm. If the least force required is 5.0N, find the moment of force needed to turn the nut.
A: 0.5 Nm
B. 1 N m.
C. 10 N cm.
D. 100 N cm
Ans: B.

0.2x5

25. The diagram shows a uniform bar supported at the middle point O. A weight of 40 gf is placed at a distance 40cm to the left of the point O. How can you balance the bar with a weight of 80 gf?



A: 40 cm from 0.
B. 20 cm from 0.
C. 40 cm from 50 cm on the left side.
D. At the center of gravity.
Ans: B.

26. It is easier to turn the steering wheel of a large diameter than that of a small diameter because,
A. To turn the steering wheel of a large diameter need less force which is at a large distance from the centre of rim.
B. To turn the steering wheel of a large diameter need negligible force which is at a large distance from the centre of rim.
C. To turn the steering wheel of a large diameter maximum force which is at a large distance from the centre of rim.
D. large wheels can turn easily.
Ans: A.

27. A jack screw is provided with a long arm
A. Trucks need more powerful jack screw.
B. Long arms can easily reach the interior of the wheel.
C. A long arm of a jack screw which is used to lift a heavy load like a vehicle will help to apply less effort which is required to rotate it to raise or lower the jack.
D. All of the above.
Ans; C.

28. A _____is always required to produce the rotation.
A: Energy.
2. Force.
C. Couple.
D. All the above.
Ans: C.

29. _____ is always taken to be positive.
A. Clockwise moment.
B. Anticlockwise of moment.
C. Moment of force.
D. Principle of moment.
Ans: B.

30. The center of gravity of triangular lamina lies at

A. Midpoint.
B. The midpoint of interaction of medians.
C, At 3/4th h.
D. At the 1/4th h of the median.
Ans: B.

Work, Energy, Power:

Q1. **What is the SI unit of Work?**

A: Joule
B: erg
C: g-cm
D: Watt

Answer: A

Q2. **1 joule = _____ erg.**

A: 10^9
B: 10^5
C: 10^7
D: 10^{10}

Answer: C

Q3. **Which of the followings is an example of work done against force?**

A: Getting up with the stairs
B: Get down with the stairs
C: Walking on the flat ground
D: Dropping any object down from the top

Answer: A

Q4. **What is the unit of energy in SI system?**

A: Joule
B: erg
C: Watt
D: Newton

Answer: A

Q5. **1 Horse Power (HP) = _____ Watt.**

A: 446
B: 766
C: 746
D: 674

Answer: C

Q6. **If a person walks on horizontal road with a suitcase on his hand then the work done is zero.**

A: This statement is true
B: This statement is false

Answer: A

Q7. **An object of mass 200 g moving with velocity 50 cm/s. What is its kinetic energy?**

A: 2.1 × 105 erg
B: 2.0 × 105 erg
C: 2.8 × 105 erg
D: 2.5 × 10^5 erg

Answer: D

Q8. A machine does a work of 100 joule in 20 second. What is its power?

A: 120 watt
B: 80 watt
C: 5 watt
D: 2000 watt

Answer: C

Q9. Joule/second is related to –

A: Watt
B: Newton
C: Pascal
B: Torr

Answer: A

Q10. A particle is thrown upward with some kinetic energy. What happened to its kinetic energy at the highest point or height it reaches.

A: Its kinetic energy is lost;
B: It's all kinetic energy is absorbed by the air;
C: Its kinetic energy is converted to potential energy
D: Its kinetic energy is remain same

Answer: C

Q11. Due to application of 5 N force an object moves 10 meter along perpendicular direction of the force. What amount work is done?

A: 50 Joule
B: 15 Joule
C: 5 Joule
D: 0 Joule

Answer: D

Q12. Which of the following is equal with Newton-meter?

A: Joule
B: Horse Power
C: Watt
D: Pascal

Answer: A

Q13. Work done in raising a box on to a platform depends on ____.

A. how fast it is raised

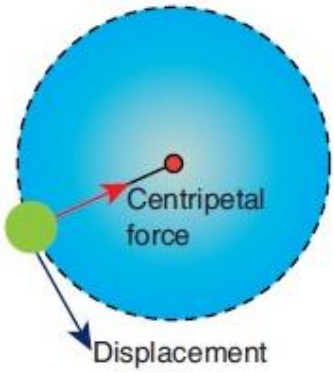
B. strength of the man

C. the height to which it is raised

D. the path through which it is raised

Answer: C

Q14. What is the work done by the centripetal force on the object moving in circular motion?



A. Positive

B. Negative

C. Zero

D. None of the above

Answer: C

Q15. With what velocity a student of mass 60 kg run so that his K.E. becomes 270 J

A. 10m/s

B. 3m/s

C. 20m/s

D. 2.5m/s

Answer: 3m/s

Q16. How much power is required to lift a body of mass 100 kg to a height of 60 m in 1 minute? Take g = 9.8m/s^2

A. 100 W

B. 980 W

C. 9.8 W

D. 1980 W

Answer: B

Q17. The Bullet That Has Fired from a Gun Can Pierce a Target Due to Its _____?

A. Heat energy.

B. Mechanical energy.

C. Acceleration.

D. Kinetic energy.

Answer: D

Q18. A Person Holds a Bucket by Applying a 10n Force. He Then Moves a Horizontal Distance of 5m and Climbs up a Vertical Distance of 10m. Find out the Total Work Done by him?

A. 100J

B. 150J

C. 50J

D. 200J

Answer: A

Q19. When the displacement along the opposite direction of the force. Then the work is said to be_____

A. Zero

B. Negative

C. Positive

D. Infinitive

Answer : B

Q20. Ocean thermal energy is due to

A. Energy stored by waves in the ocean
B. Temperature difference at different levels in the ocean
C. Pressure difference at different levels in the ocean
D. Tides arising out in the ocean

Answer: B

Q21. In an electric cell while in use, the change in energy is from:

A. Electrical to Mechanical
B. Electrical to chemical
C. Chemical to mechanical
D. Chemical to electrical

Answer: D

Q22. In a battery, chemical energy is converted into

A. Sound energy.
B. Electrical Energy
C. Solar Energy
D. Mechanical Energy.

Ans: B.

Q23. Running water possesses

A. Kinetic energy
B. Potential Energy
C. Chemical Energy
D. Sound Energy

Answer: A

Q24. Water stored in dam has

A. Kinetic Energy
B. Rotational Energy
C. Vibrational Energy
D. Potential Energy

Answer: D

Q 25. Light energy to electrical energy

A. Photoelectric cell
B. Electric cell
C. Electric Bulb
D. None of these

Answer: A

Q26. Total mechanical energy is equal to

A. Sum of K.E and P.E.
B. Difference of K.E. and P.E.

C. Product of K.E and P.E.

D. Both A and B

Answer: A

Q27. One joule of work is done when

A. A force is 1N and displacement is 1 cm

B. A force is 1 N and displacement is 1m.

C. A force is 1N and displacement is 1km.

D. None of the above

Answer: B

Q28. Work done on a body is a _____ quantity

A. Scalar

B. Vector

C. Both A & B

D. None of the above

Answer: A

Q29. A body of mass 50 kg has a momentum of 3000 kg m/s Calculate its K.E. and velocity.

A. 90000J & 60m/s

B. 900J & 60m/s

C. 90000J & 6m/s

D. 6000J & 630m/s

Answer: A

Q30. When mass and velocity of the body is doubled then the K.E. will ____

A. Increase by 8 times

B. Decrease by 8 times

C. Increase by 4 times

D. Remains the same

Answer: A

1. Machine is a device used to overcome the _____.

a. Load
b. Effort
c. M.A
d. V.R

Ans: A

2. Which statement is not true for the machine?

a. It can multiply force

b .It can increase speed

c. It can Change the direction of applied force

d. Its output can be more than input.

Ans: D

3. Which of the statements is not true for an actual machine?

a. Its mechanical advantages is less than velocity ratio

b. Its efficiency is always less than 100%

c. M.A > V.R

d. Output of the machine is always less than input.

Ans: C

C

4. Which of the statements is not true for an Ideal machine?

a. M.A = V.R

b. M.A < V.R

c. Work output = Work Input

d. η=100 %

Ans: B

5. The correct relationship between the effort (E), load (L) and M. A is :

a. M.A = L X E

b. M.A X E = L

c. M.A X L = E

d. None of these

Ans: B

6. The correct relationship between velocities (V.R), the distance through which effort act

(d_E)and the distance through which load (d_L) moves.

a. V.R X d_L= d_E

b. V.R = d_EX d_L

c. V.R X d_E = d_L

d. None of these

Ans: a

A

7. A machine is 80 % efficient ;What does this imply?

a. 80 % of the total energy supplied to the machine at the load point is obtained as useful energy at the effort point.

b. 80 % of the total energy supplied to the machine at the effort point is obtained as useful energy at the load point.

c. η > 1

d. M.A > V

Ans: B

8. The point at which the energy is supplied to a machine by applying the effort is:

a. M.A

b. Effort Point

c. oOutput energy

d. Load point

Ans: B

9. The point where the energy is obtained by overcoming the load is:

a. Output point

b. Load point

c. Input point

d. V.R

Ans: B

10. Relationship between $\boldsymbol{\eta}$, M.A and V.R:

a. $\boldsymbol{\eta} = \frac{M.A}{V.R}$

b. $\boldsymbol{\eta} = \frac{V.R}{M.A}$

c. $\boldsymbol{\eta}$ X M. A = V.R

d. $\boldsymbol{\eta}$ = M.A X V.R

Ans: A

11. Output Energy is equal to:

a. Load X Displacement of the point of application of load

b. Effort X Displacement of the point of application of load

c. Effort X Displacement of the point of application of effort

d. Load X Displacement of the point of application of effort

Ans: A

12. Input Energy is of Machine is:

a. Load X Displacement of the point of application of load

b. Effort X Displacement of the point of application of load

c. Effort X Displacement of the point of application of effort

d. Load X Displacement of the point of application of effort

Ans: C

C

13. A machine is 80 % efficient; what does this imply?

a. The remaining 20 % of the energy supplied is lost in overcoming the force of friction

b. It appears as heat energy in different parts of the machine

c. $\frac{M.A}{V.R} = 0.8$

d. All the above

Ans: D

14. A machine in which the displacement of load is more than the displacement of effort Will have:

a. V.R < 1

b. V.R > 1

c. V.R = 1

d. M.A < 1

Ans: A

15. A machine in which the displacement of load is less than the displacement of effort Will have :

a. V.R < 1

b. V.R > 1

c. V.R = 1

d. M.A > 1

Ans: B

16. A machine having M.A > 1 acts as a force multiplier.

a. True

b. False

Ans: A

17. A machine having M.A < 1 acts as a Velocity multiplier.

a. True

b. False

C. Can be both.

D.

Ans: A

18. A machine having M.A < 1 acts as a Force multiplier.

a. True

b. False

Ans: B

19. In machine if the displacement of load is equal to the displacement of effort:

a. Act as force multiplier

b. Act as speed multiplier

c. Used to change the direction of effort

d. None of the above

Ans: C

20. The Block and Tackle system, has V.R= 4 and efficiency =75% Find M.A

a. 4

b. 3

c. 2

d. 2.5.

Ans: B

21. A fixed pulley is driven by 100kg mass and lifts the load of 75 kgf. Calculate:

The efficiency of the pulley.

a. 0.85

b. 1

c. 0.75

d. 0.80

Ans: C

22. A single fixed pulley is used because it:

a. Has the efficiency 100%

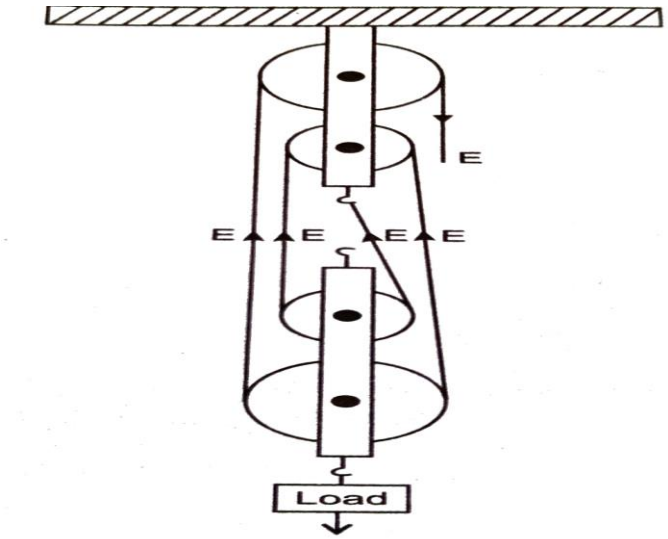
b. Has the velocity ratio less than 1

c. Has the Mechanical advantages greater than 1

d. Helps to apply the effort in a convenient direction

Ans: D

23. Observe the diagram and write V.R and M.A if the efficiency is 80 %.



a. V.R = 4 and M.A = 3.4

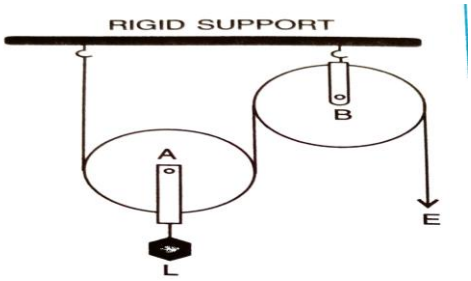
b. V.R = 4 and M.A = 3.2

c. V.R = 4 and M.A = 4

d. V.R = 4 and M.A = 3.6

Ans: B

24. Observe the diagram and write the V.R and M.A.



a. V.R = 2 and M.A = 2

b. V.R = 2 and M.A = 1

c. V.R = 1 and M.A = 1

d. V.R = 1 and M.A = 2

Ans: A

25. A pulley system has three pulleys. A load of 120 N is overcome by applying an effort

50 N. Calculate the Mechanical advantages and efficiency of this system.

a. η = 80 % & M.A = 3.2

b. η = 70 % & M.A = 2.3

c. η = 80 % & M.A = 2.4

d. η = 70 % & M.A = 2.4

Ans: C

26. The efficiency of lifting the machine is the ratio of

a. Output to the input

b. Work done by the machine to work done on the machine

c. M.A to V.R

d. All of the above

Ans: D

27. There is a machine in which the V.R is 4 and M.A is nearly 4. If the friction in machine increases :

a. V.R and M.A will remain same

b. V.R will decrease

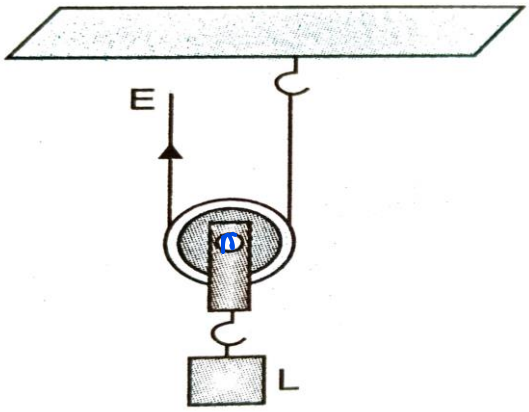
c. M.A will increase

d. M.A Will decrease

Ans: D

28. The diagram shows a single pulley system when a load of 20 Kgf is attached to it.

if efficiency is 80 % calculate effort applied.



a. 12.0 Kgf

b. 12.5 N

c. 12.5 Kgf

d. 20 N

Ans: C

29. A pulley system in block and tackle system has 5 pulleys in all. Its velocity ratio is :

a. 5

b. Less than 5

c. More than 5

d. None of these.

Ans: A

30. A pulley system has 4 pulley in all and is 60 % efficient Calculate the effort required to lift 1200N

a. 450 N

b. 350 N

c. 500 N

d. 550 N.

Ans: C

Refraction from plane surface.

1. In optics an object which has higher refractive index is called

a. Optically denser
b. Optically rarer
c. Optical density
d. Refractive medium

Ans. A.

2. You are given kerosene, turpentine and water. In which of these does the light travels fastest .The value of refractive index for kerosene is 1.44, turpentine is 1.47 and water is is 1.33

a. Turpentine
b. Water
c. Data given is insufficient
d. Kerosene

Ans. B.

3. If the refractive index of two media are equal then

a. No refraction will occur
b. It will bend away from the normal
c. Interface will absorb the light
d. Light will reflect in the same medium

Ans. A.

4. Light is refracted when it travels at an angle from water to air because

a. Its speed remains the same
b. It is moving from a less dense medium to a denser medium
c. Its speed is increased
d. Its speed is decreased

Ans. C.

5. According to Snell's law the relation between angle of incidence and angle of refraction is

a. Angle of incidence is always equal to the angle of refraction
b. The ratio of sine of angle of incidence to the Sine of angle of refraction is defined as refractive index
c. The ratio of sine of angle of refraction to the Sine of angle of incidence is equal to refractive index
d. Angle of incidence is always greater than angle of refraction

Ans: b

6. A Ray of light falls on the surface of a rectangular slab of plastic material who's refractive is 1.6, if the incident ray makes an angle of 53 degree with the normal. The angle made by the refracted ray with the normal (sin 53 degree=4/5)

a. 35 degree.
b. 30 degree.
c. 20 degree.
d. 25 degree.

Ans. B.

7. Fish anticipates the presence of hunter farther due to

a. Scattering of light.
b. Reflection of light.
c. Dispersion of light.
d. Refraction of light.

Ans. Refraction of light

8. When a beam of light travels from a rarer medium to a denser medium

a. It goes undeviated.
b. Advance towards normal.
c. It bends away from the normal.
d. None of the above.

Ans. B.

9. A Ray of light suffers refraction through an equilateral prism. The deviation produced by the prism does not depend on the

a. Angle of incidence.
b. Colour of light.
c. Material of prism.
d. Size of the prism.

Ans. D.

10. An object in a denser medium when viewed from a rarer medium appears to be raised. The shift is maximum for

a. Red light.
b. Yellow light.
c. Violet light.
d. Green light.

Ans: C. violet light

11. A light ray of yellow colour is incident on an equilateral glass prism at an angle of incidence equal to 48 degree and suffers minimum deviation by an angle of 36 degree. If the angle of incidence is changed to 60 degree. The angle of deviation will be

a. Equal to 36 degree.
b. More than 36 degree.

c. Less than36 degree.
d. None of these.

Ans. C.

12. A person's leg appears to be short when standing in a tank is due to

a. Scattering of light.
b. Reflection of light.
c. Refraction of light.
d. Dispersion of light.

Ans. C.

13. A ray of light enters air from water and experiences refraction then

a. i=r.
b. i>r.
c. i<r.
d. i/r=0 degree.

Ans. C.

14. The critical angle for glass-air is 45 degree for the light of yellow colour. The critical angle for green colour is

a. Less than 45 degree.
b. More than 45 degree.
c. Equal to 45 degree.
d. None of these.

Ans. A.

15. The refractive index of water is 4/3.The meaning of the statement is

a. The speed of light in air is 4/3 times the speed of light in water.
b. Speed of light in water is 4/3 the speed of light in vacuum.
c. Speed of light in air is 4/3 times less than the speed of light in water.
d. Both a and c.

Ans. A.

16. A ray of light is normally incident on one face of an equilateral prism. What will be the angle of incidence at the second face of the prism?

a. 30 degree.
b. 60 degree.
c. 90 degree.
d. 0 degree.

Ans. B.

17. Critical angle is that angle of incidence in ------medium for which the angle of refraction in -------medium is 90 degree

a. Rarer, denser.
b. Rarer, rarer.
c. Denser, rarer.
d. Denser, denser.

Ans. C

18. How is critical angle related to refractive index?

a. cosec C=1/refractive index.
b. sin C=1/refractive index.
c. Cosec C=refractive index.
d. both b and c.

Ans: D.

19. The apparent depth of an object lying in a denser medium is always --------- its real depth when viewed from any direction in the rarer medium.

a. Greater than

b. Less than

c. Equal to

d. None of these

Ans. B.

20. A student performs the experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He measures the angle of incidence i, angle of refraction r and angle of emergence e for all his observations. He would find that in all cases

a. i is more than r but nearly equal to e
b. i is less than r but nearly equal to e
c. i is more than e but nearly equal to r
d. i is less than e but nearly equal to r

Ans. A

Refraction through Lens.

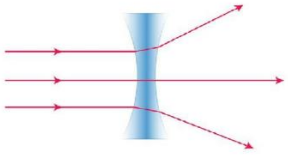
1. A lens is defined as 'a transparent refracting medium bounded
A. by either two spherical Surfaces.
B. Two plane Surfaces.
C. One spherical and one plane surface.
D. All the above:
Ans: A and C.

2 Which of the following will be the most accurate description of a convex lens?

A: A convex lens has a refracting surface.
B. A convex lens is a converging lens.
C. It is a diverging lens.
D. It is a reflecting surface.
Ans: C.

3 Which of the following will be the most accurate description of a concave lens?
A: A concave lens has a refracting surface.
B. A concave lens is a diverging lens.
C. It is a transparent medium.
D. It is a reflecting surface.
Ans: B.

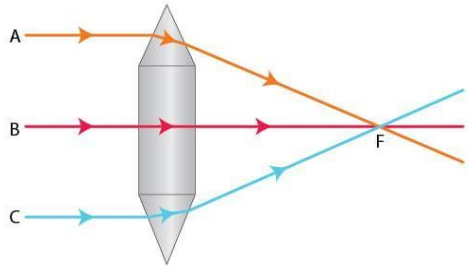
4. The lens seen here is a



A. Equiconcave lens.
B. Plano concave.
C. Convexo concave.
D. Convexo concave.
Ans: B.

concave

5. The lens seen here is a



A. Equiconvex lens.
B. Plano convex
C. Convexo concave.
D. Convexo concave.
Ans: A

convex lens

6. The ray of light passing through the optical center,
A. Deviates reasonably.
B. Passes undeviated.
C. Reflects backward.
D. Shows a negligible lateral displacement.
Ans: D.

7. The focus of a convex lens is

A. Real.
B. Virtual.
C. Plano.
D. Concurrent.
Ans: A.

8. The distance of focus from the optical centre of lens, is called
A. Its focal length.
B. Principle axis.
C. Radius.
D. Radius of curvature.
Ans: A.

9. A plane ..... To the principal axis, passing through the focus, is called the focal planeof a lens.
Ans: Parallel.
B. Normal.
C. Slanting.
D. At 60 degree
Ans: B.

10. A ray of light after refraction through a lens emerges parallel to the principal axis of the lens. The incident ray either passes through:
(a) Its optical centre
(b) Its first focus
(c) Its second focus
(d) Its centre of curvature of the first surface Solution:
Ans: B.

11. A ray of light incident on a lens parallel to its principal axis, after refraction passes through or appears to come from:
(a) Its first focus
(b) Its optical entre
(c) Its second focus
(d) The centre of curvature of its second surface.
Ans: C.

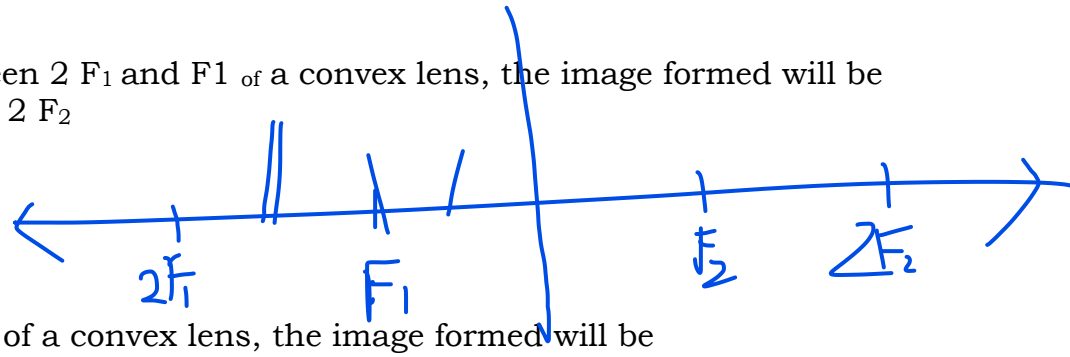
12. Where must a point source of light be placed in front of a convex lens so as to obtain a parallel beam of light?
A. The focal point on the left of the optical centre of the convex lens.
B. The focal point on the right of the optical centre of the convex lens.
C. The twice the focal point on the left of the optical centre of the convex lens.
D. The twice the focal point on the right of the optical centre of the convex lens.
Ans: A.

13. An object is placed beyond 2 F_1 of a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. At 2 F_2
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: C.

14. 13. An object is placed at 2 F_1 of a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. At 2 F_2
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: B.

15.. An object is placed beyond 2 F_1 of a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. At 2 F_2
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: C.

16. An object is placed between 2 F_1 and F1 of a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. Beyond 2 F_2
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: B.



17. An object is placed at F1 of a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. Beyond 2 F_2
C. Between 2 $F_1$and F_1.
D. At infinity
Ans: D.

18. An object is placed between F_1 and optical center a convex lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. On the same side as that of object.
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: B.

19. An object is placed between 2 F_1 and F1 of a concave lens, the image formed will be
A. Real, inverted and beyond 2 F_2
B. On the same side as that of object.
C. Between 2 $F_1$and F_1.
D. At the focus.
Ans: B.

20. Image formed by a convex lens is
A. Real.
B. Virtual.
C. Real or virtual depending upon the position of the object.
D. None.
Ans: C

21. Image formed by a concave lens is
A. Only Real.
B. Only Virtual.
C. real and erect.
D. Virtual and erect.
Ans: B.

22. Principal axis is defined as 'a line joining the
A. Foci.
B. Centers of curvature of the two surfaces of the lens.
C. Centre of curvature and focus of the lens.
D. Tangents of the two lenses.
Ans: B

23. An object is placed at a distance of more than 40 cm from a convex lens of focal Length 20 cm. The image formed is real, inverted and……
A: Enraged.
B. Diminished.
C. Of the same size as that of object.
D. None of the above.
Ans: B.

24. An object is placed at a distance 2f from a convex lens of focal length f. The image formed is……that of the object
A: Is equal to that of the object.
B. Diminished.
C. Enlarged.
D. None of the above.
Ans: A.

25. An object is placed at a distance 5 cm from a convex lens of focal length 10 cm. The image formed is
A: Virtual, upright and magnified.
B. Virtual, upright and diminished.
C. Real, upright and magnified.
D. Virtual, and magnified.
Ans: A

26. Unit of power of lens is
A. watt.
B. diopter.
C. newton.
D. pascal.
Ans: B.

27. How does the power of a lens change if its focal length is doubled?
A. It becomes double.
B. It becomes half.
C. It does not change.

D. It is reduced depending upon colour of light.
Ans: B.

28. If the magnification produced by a lens is - 0.5, the correct statement is :
(a) The lens is concave
(b) The image is virtual
(c) The image is magnified
(d) The images is real and diminished formed by a convex.
Ans: D.

29. The correct lens formula is
(a) 1 / u + 1 / v = 1 / f
(b) 1 / u – 1 / v = 1 / f
(c) 1 / v – 1 / u = 1 / f
(d) f = (u + v) / uv
Ans: C.

30. On reducing the focal length of a lens, its power:
(a) Decreases
(b) Increases
(c) Does not change
(d) First increases then decreases.
Ans: B.

31. The lens of power + 1.0 D is:
(a) Convex of focal length 1.0 cm
(b) Convex of focal length 1.0 m
(c) Concave of focal length 1.0 cm
(d) Concave of focal length 1.0 m.
Ans: B

Chapter 6 Spectrum. MCQ Questions

1. The colour of light rays is due to its _____.
    a. Frequency
    b. Wavelength
    c. Velocity
    d. None of the above

Ans: b

2. Which colour ray suffer the maximum refraction in spectrum obtain by dispersion of white light by a prism?
    a. Violet
    b. Red
    c. Yellow

d. Green

Ans: a

3. A deviation in the path of a ray of light can be produced _____.
   a. By a glass prism but not by a rectangular glass slab
   b. By a rectangular glass slab but not by a glass prism
   c. By a glass prism as well as by a rectangular glass slab
   d. Neither by a glass prism nor by a rectangular glass slab.

Ans: c

4. Whenever a monochromatic light wave enters a glass prism from air then _____does not change.
   a. Frequency
   b. Wavelength
   c. Amplitude
   d. Velocity

Ans: a

5. How many colours make up white light?
   a. 5
   b. 6
   c. 7
   d. 8

Ans: c

6. Which of the following natural phenomena show dispersion of light?
   a. A rainbow in the sky
   b. A mirage in a dessert
   c. Emission of light by moon
   d. Shinning of dew drops.

Ans: a

7. Through which of the following objects can we observe dispersion of light?
   a. Rectangular glass slab
   b. Mirror
   c. Glass prism
   d. Lens

Ans: c

8. Which principle is involved in phenomenon of rainbow?
   a. Reflection
   b. Refraction

c. Dispersion and refraction.
d. Dispersion, total internal reflection and refraction

Ans: c

9. Which of the following disperses the light of the sun to form a rainbow?
   a. Dew drop
   b. Lens of the eye
   c. Film of thin air
   d. Water droplets of rain.

Ans: d

10. Which colour of light bends the most in a glass prism?
   a. Red
   b. Yellow
   c. Green
   d. Violet

Ans: d

11. Which of the following colour has the least wavelength?
   a. Blue
   b. Violet
   c. Red
   d. Orange

Ans: b

12. State whether the following statement is true or false:
You can see a rainbow only if you are facing the sun.
   a. True
   b. False.
   c. May be.
   d. It does not depend upon the position of the sun.

Ans: b

13. Dispersion of light is _____
   a. The splitting of light into its constituent colours.
   b. Splitting of light into multiple beams of the same colour
   c. Distribution of light in all directions.
   d. Deviation of reflected light from the normal

Ans: a

14. The splitting of light into its constituent colours by a prism is called _____
   a. Deviation
   b. Dispersion

c. Refraction
d. Coloration

Ans: b

15. Colour light, having the minimum velocity in the prism is _____.
a. Yellow
b. Indigo
c. Red
d. Violet

Ans: d

16. Which of the following represents the seven colours of the white light spectrum?
a. VIGBYOR
b. VIBGYOR
c. YORVIBG
d. YORVIGB

Ans: b

17. Which colours in the visible spectrum has wavelength more than the wavelength corresponding to yellow colour?
a. Violet
b. Blue
c. Green
d. Orange

Ans: d

18. Which unit is used to express the wavelength of light?
a. metre
b. centimeter
c. Angstrom
d. hertz

Ans: c

19. White light.....
a. Consists of one wave only.
b. Consists of a very large number of waves.
c. is known as monochromatic light
d. is not monochromatic

Ans: d

20. Which of the following options correctly describes the relation between wavelength and frequency of light?
a. Greater the frequency of light, greater is its wavelength.

b. Greater the frequency of light, smaller is its wavelength.
c. The frequency of light remains constant irrespective of the change in wavelength of light.
d. There is no relation between the wavelength and frequency of light

Ans: b

21. Which of the following options correctly gives the value of one angstrom?
a. 1 Å = 10^{-10} m
b. 1 Å = 10^{-4} m
c. 1 Å = 10 m
d. 1 Å = 10^{-8} m

Ans: a

22. The colours which the human eye can detect fall in the _____region of electromagnetic spectrum.
a. Ultraviolet
b. Infrared
c. Visible
d. Both visible and infrared

Ans: c

23. Which of the following waves is used for propagating information through television?
a. Radio waves of shorter wavelength
b. Infra-red rays
c. Ultra-violet rays
d. Micro waves

Ans: a

24. If V_g, V_x and V_m are the velocities of ϒ- rays, X-rays and microwaves respectively in space, then their order would be….
a. $V_g < V_x < V_m$
b. $V_g > V_x > V_m$
c. $V_g > V_x < V_m$
d. $V_g = V_x = V_m$

Ans: d

25. Name the radiation, causing heating effect in the sunlight refers to_____
a. Ultraviolet
b. Infrared
c. Visible light
d. Laser rays

Ans: b

26. Assertion (A): The electromagnetic wave is transverse in nature.
Reason (R): The waves propagate in straight line.

a. Both (A) and (R) are true and (R) is the correct explanation of (A).
b. Both (A) and (R) are true and (R) is not the correct explanation of (A).
c. (A) is true, but (R) is false.
d. (A) is false, but (R) is true.

Ans: b

27. X-rays travel in space with the velocity of _____.

a. Ultraviolet rays
b. Light ways
c. (a) and (B) both
d. None of the above

Ans: c

28. Which of the following statements is true?

a. The wavelength of gamma rays is more than the radio waves.
b. The wavelength of X-rays is more than the visible light.
c. The frequency of gamma rays is less than the radio waves.
d. The frequency of X-rays is more than the visible light.

Ans: d

29. The instrument used to measure the temperature of a source from its thermal radiations is _____

a. Thermometer
b. Thermopile
c. Pyrometer
d. Barometer

Ans: b

30. Which range indicates the visible light?

a. 4000 Å - 8000 Å
b. 100 Å - 4000 Å
c. 8000 Å - 10000 Å
d. None of the above

Ans: a

31. _____radiations are detected by their large penetrating power.

a. Microwaves
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: d

32. Name the radiation detected by the mercury rises rapidly when a thermometer with a blackened bulb is kept in these radiations.
    a. Infrared radiation
    b. Ultraviolet waves
    c. X-rays
    d. Gamma rays

Ans: a

33. Name the radiation detected by aerials of radio and TV receiver.
    a. Microwaves
    b. Ultraviolet waves
    c. Radio waves
    d. Microwaves

Ans: c

34. Name the radiations used to kill cancer cells and in industry to check welding.
    a. Microwaves
    b. Ultraviolet waves
    c. X-rays
    d. Gamma rays

Ans: d

35. Name the radiation used to detect concealed precious metals.
    a. Microwaves
    b. Ultraviolet waves
    c. X-rays
    d. Gamma rays

Ans: d

36. Name the radiation that is chemically more active than the visible light.
    a. Microwaves
    b. Ultraviolet waves
    c. X-rays
    d. Gamma rays

Ans: b

37. Name the radiation that is obtained by passing the radiations through a quartz prism in place of a glass prism.
    a. Microwaves
    b. Ultraviolet waves

c. X-rays
d. Gamma rays

Ans: b

38. Name the radiation cause skin cancer if human body is exposed to it.
a. Microwaves
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: b

39. Source of vitamin D is_____
a. Microwaves
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: b

40. The spectrum of _____ radiations is obtained by using a rock salt prism.
a. Infrared radiation
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: a

41. The radiations used for night photography
a. Infrared radiation
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: a

42. The most energetic electromagnetic radiations are:
a. Microwaves
b. Ultraviolet waves
c. X-rays
d. Gamma rays

Ans: d

SOUND

1. The waves which require material medium to transfer energy are called
A. Mechanical waves.
B. Longitudinal waves.
C. Electromagnetic waves.
D. Seismic waves.
Ans: A.

2. Which of the following is not a characteristic of a waves,
(a) Amplitude
(b) Frequency
(c) Wavelength and
(d) Time
Ans: D.

3. A wave passes from one medium to another medium which of the property of does not change
A. Speed.
B. Frequency.
C. Wavelength.
D. All the above.
Ans: B.

4. In order to hear the distict echo, a person will have to stand from the cliff at least at,
A. 12 m away.
B. 34 m away.
C. 17 m away.
D. The distance does not matter.
Ans: C.

5. Sound ranging is the process of
A. Detecting obstacles with the help of echo.
B. Calculating the speed of sound.
C. To shatter the kidney stones.
C. None of the above.
Ans: A.

6. These ultrasonic waves have a frequency
A. More than 20 Hz.
B. More than 20000 Hz.
C. 20000 Hz.
d. Less than 10 Hz.
Ans: B.

7. The range of audibility of human ear is
A. More than 20000 Hz.
B. Less than 20 Hz.
C. 20 Hz to 20,000 Hz.
D. 10 to 10000 Hz.
Ans: C.

8. To detect the obstacles in their path, bats produce:
A. Infrasonic waves
B. Ultrasonic waves
C. Electromagnetic waves
D. Radio waves.
Ans: B.

9. Calculate the minimum distance in air required between the source of sound andthe obstacle to hear an echo. Take the speed of sound in air = 350m s^{-1}

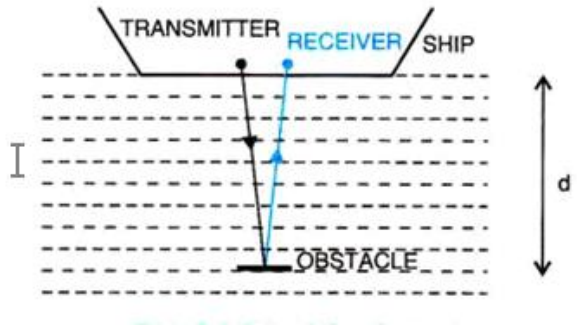
A. 17 m.
B. 17.5 m.
C. 16.5 m.
D. 17 cm.
Ans: B.

10. What should be the minimum distance between the source and reflector in water so that echo is heard distinctly? (The speed of sound in water = 1400m/s)
Ans: 17 m.
B. 70 m.
C. 74 m.
D. 700 m.
Ans: B.

11. A RADAR sends a signal to an aeroplane at a distance 300 km away, with a speed of3 × 10^{8} m s^{-1}. After how much time is the signal received back after reflecting from the aero plane?
A: 0. 0002 s
B. 0. 2 s.
C. 0.002 s
d. 2 s.
Ans: C.

12. A man standing 96 m away from a wall fires a gun. Calculate the time after which an echo is heard. (The speed of sound in air is 340m/s^{-1}).
A: 0. 3 s
B: 0.56 s.
C. 0. 44 s.
D. None of the above.
Ans: B.

13.



For finding the depth of the sea bed, the principle of _____ is used.
A. Echo.
B. SONAR.
C. Echocardiography.
D. Reverberations.
Ans: B

14. A person standing at a distance x in front of a cliff fires a gun. Another person B standing behind the person A at a distance y from the cliff hears two sounds of the fired shots after 2s and 3s respectively. Calculate x and y (take speed of sound 320 ms-1)
A. 160 m.
B.320 m.
C. 540 m.
D. 120 m.
Ans: A.

x=160 and y=800

15. Distance between the resting position and the maximum displacement of the wave is known as
A. Frequency.
B. Amplitude.
C. Wavelength.
D. Wave velocity.
Ans: B.

16. Number of waves passing by a specific point per second is called
A. Frequency.
B. Amplitude.
C. Wavelength.
D. Wave velocity.
Ans: A.

17. In one time period of vibration of the particle of the medium, the distance travelled by a wave is called
A. Frequency.
B. Amplitude.
C. Wavelength.
D. Wave velocity.
Ans: C.

18. The distance travelled in one second by the wave is called its
A. Wave velocity.
B. Frequency.
C. Amplitude.
D. Wavelength.

Ans: A.

19. Which of the statement is correct.
A: Light waves are electromagnetic waves, Sound waves are the mechanical waves.
B. Sound waves are electromagnetic waves, Light waves are the mechanical waves.
C. Both are Mechanical waves.
D. Both are electromagnetic waves.
Ans: A.

20. Which of the following statement is correct?
A. Sound can travel in vacuum whereas light waves require a material medium for propagation. They cannot travel in vacuum.
B. Light can travel in vacuum whereas sound waves require a material medium for propagation. They cannot travel in vacuum.
C. Both light and sound waves travel through vacuum.
D. Both sound and light need material medium to travel.
Ans: B.

21. Which of the condition for the reflection of a sound wave is not necessary?
A: There must be a reflecting surface.
B. The only condition for reflection of sound wave is that the size of the reflecting surface must be bigger than the wavelength of the sound wave.
C. The sound should be loud enough.
D. None of the following.
Ans: D.

22. A man standing 48 m away from a wall fires a gun. Calculate the time after which an echo is heard. (The speed of sound in air is 320m/s-1).
A: 3 s.
B. 0,3 s. 0.3s
C. 30 s.
D. 3 m.
And: B.

23. A ship on the surface of water sends a signal and receives it back from the submarine inside water after 4s. Calculate the distance of submarine from the ship. (The speed of sound in water is 1450 m s-1).
A: 2900 m.
B: 2. 9 m.
C. 2900 km. 2.9km
D. 2. 999 m.
A: A.

24. A pendulum has a frequency of 5 vibrations per second. An observer starts the pendulum and fires a gun simultaneously. He hears an echo from the cliff after 8 vibrations of the pendulum. If the velocity of sound in air is 340m s-1, find the distance between the cliff and the observer.
A: 172 mm.
B. 172 m.
C. 172 km.
D. 172 cm.

Q.30 272m

A: B.

25. Sound is a form of
A. Energy.
B. A wave.
C. Force.
D. Both A and B.
A: D.

26. Sound is produced when
A. We produce it.
B. When an object is set into vibration,
C. Hearer is there.
D. When a medium is present.
Ans: B.

27. Bats can fly in darkness because,
A. they have sharp eye sight.
B. They can see in darkness.
C. They use echo.
D. All the above.
Ans: D.

28. Which of the following is correct about sound waves.
A. They require a material medium for propagation.
B. They cannot travel in vacuum.
C. They are mechanical waves.
D. All the above.
Ans: D.

29. Sound is used in medical filed for the imaging of human organs such as . Identify the wrong statement.
A. Liver.
B. Gall bladder,
C. uterus.
D. Lungs.
Ans: D.

30. A pendulum has a frequency of 5 vibrations per second. An observer starts the pendulum and fires a gun simultaneously. He hears an echo from the cliff after 8 vibrations of the pendulum. If the velocity of sound in air is 340m s-1, find the distance between the cliff and the observer.
A: 270 m.
B. 272 m.
C. 274 m.
D. 275 m.
Ans: B.