11TH PHYSICS

MCQS

ALL CHAPTERS

F.Sc. Physics (1st Year) Multiple Choice Questions

CHAPTER # 1: MEASUREMENTS

1. The branch of physics which deals with the ultimate particles of which the matter is composed is:

a) Plasma physics
b) Atomic physics
c) Nuclear physics
d) Particle physics

2. The branch of physics which deals with atomic nuclei is called

a) Acoustics
b) Thermodynamics
c) Magnetism
d) Nuclear physics

3. Silicon is abundantly obtained from:

a) Water
b) Metal
c) Sand
d) Stones

4. The number of base units are:

a) Three
b) Five
c) Seven
d) Nine

5. Which of the following is a derived quantity:

a) Force
b) Mass
c) Length
d) Time

6. Which of the following is SI base unit?

a) gram
b) slug
c) Newton
d) kilogram

7. Which one of the following is not a unit of length:

a) Angstrom
b) Micron
c) Radian
d) Light year

8. Which is not a base unit in SI units?

a) Kilogram
b) Joule
c) Ampere
d) Kelvin

9. An example of derived unit is

a) Candela
b) Ampere
c) Coulomb
d) Mole

10. Candela is the SI unit of

a) Charge
b) Luminous intensity
c) Power
d) Refractive index

11. An alternate unit to $kgms^{-1}$ is

a) Js
b) Ns
c) Nm
d) N

12. The SI units of pressure in terms of base units are

a) $kg\ m^{-1}\ s^{-2}$
b) $kg\ m^{-1}\ s^{-3}$
c) $kg\ m\ s^{-2}$
d) $kg\ m^{2}\ s^{-2}$

13. The SI unit of plane angle is

a) Steradian
b) Radian
c) Degree
d) Candela

14. Steradian is the angel which lies in:

a) One dimension
b) Two dimensions
c) Three dimensions
d) None

15. The SI unit of the solid angle is

a) Degree
b) Steradian
c) Revolution
d) Radian

16. The solid angle subtended at the center of sphere by an area of its surface equal to the square of radius of the sphere is called:

a) Degree
b) Radian
c) Minute
d) Steradian

17. SI unit of pressure is

a) $N\ m^{2}$
b) $N^{2}\ m$
c) $N\ m^{-2}$
d) $N^{-2}\ m$

18. Which is a derived unit:

a) Candela
b) Ampere
c) Kelvin
d) Newton

19. The unit of force is_____ and its symbol is _____ which is the correct pair?

a) Newton, n
b) Newton, N
c) newton, n
d) newton, N

20. Which one is the correct representation of the unit of pressure?

a) Newton/Meter^2
b) newton/meter^2
c) Newton/meter^2
d) Newton/Meter^2

21. Which of the following is least multiple:

a) Pico
b) Femto
c) Nano
d) Atto

22. Which one is the highest power multiple?

a) giga
b) mega
c) kilo
d) deca

23. The prefix pico is equal to

a) 10^{-6}
b) 10^{-12}
c) 10^{-18}
d) 10^{-11}

24. The SI unit of intensity of light is:

a) Mole
b) Kelvin
c) Candela
d) Ampere

25. 0.0023 can be expressed in scientific notation as:

a) 23×10^{-4}
b) 0.23×10^{-2}
c) 2.3×10^{-3}
d) None

26. 1024 can be written in scientific notation as

a) 1.024x 10^3
b) 2^{10}
c) 0.000976
d) 1/0300097

27. Error occurs due to negligence and inexperience of a person is:

a) Systematic Error
b) Random Error
c) Personal Error
d) None

28. Error in measurement may occur due to

a) Inexperience of a person
b) The faulty apparatus
c) Inappropriate method
d) Due to all reasons in a, b and c

29. In any measurement the significant figures are

a) All accurately known and all doubtful digits
b) Only accurately known digits
c) Only doubtful digits
d) All accurately know digits and the first doubtful digit

30. Number of significant figures in 0.0173 are:

a) Three
b) Four
c) Five
d) Two

31. A student added three figures 72.1, 3.32 and 0.003. The correct answer regarding the rules of the addition of the significant figures will be

a) 75.423
b) 75.42
c) 75.4
d) 75

32. If the reading is taken with measuring scale whose minimum division is 1mm, then the correct reading is:

a) 0.2145 m
b) 0.21 m
c) 0.214 m
d) None

33. 75.560 is round off as:

a) 75.6
b) 75.7
c) 76.00
d) None

34. Zero to the right of non-zero digits are:

a) Significant
b) Not significant
c) May or may not be significant
d) None

35. What is the number of significant figures in the measurement recorded as $8.70 \times 10^4\ kg$?

a) 1
b) 3
c) 4
d) 7

36. Zero is not significant only if it

a) Lies to the left of a significant digit
b) is between two digits
c) is to the right of a significant digit
d) is before the decimal point

37. Significant figures in 0.000846 are

a) Six
b) Four
c) Seven
d) Three

38. The sum of the three numbers, 2.7543, 4.10 and 1.273, up to correct decimal places is

a) 8.1
b) 8.13
c) 8.1273
d) 8.127

39. 73.650 rounded off up to one decimal is

a) 73.6
b) 73.7
c) 74.00
d) 73.65

40. Absolute uncertainties are added in following operations:

a) Multiplication
b) Division
c) Subtraction
d) None

41. An accurate measurement is one which has less

a) Precision
b) Absolute uncertainty
c) Fractional uncertainity
d) None

42. If $x_1 = 10.5 \pm 0.1\ cm$ and $x_2 = 26.8 \pm 0.1\ cm$, then $x = x_2 - x_1$ is given as:

a) $16.3 \pm 0.1\ cm$
b) $16.3 \pm 0.2\ cm$
c) $16.1 \pm 0\ cm$
d) $16.3 \pm 0\ cm$

43. Smaller is the least count of the instrument, more is the measurement:

a) Accurate
b) Precise
c) Accurate and precise
d) None of these

44. Which is a correct record for the diameter of wire when measured my a screw gauge of least count 0.001 cm:

a) 2.3 cm
b) 2.31 cm
c) 2.312 cm
d) 2.3124 cm

45. Which one of the following is not regarded as a fundamental quantity in Physics?

a) Length
b) Mass
c) Time
d) Weight

46. The dimensions of torque are:

a) $[ML^{-1}T]$
b) $[ML^2T^{-1}]$
c) $[ML^2T^{-2}]$
d) $[ML^{-2}T^2]$

47. Dimensions for acceleration due to gravity is

a) $[MLT^{-2}]$
b) $[MLT]$
c) $[LT^{+2}]$
d) $[M^0LT^{-2}]$

48. As $F_d = 6\pi\eta rv$, the dimension of coefficient of viscosity η is

a) $[ML^{-1}T^{-1}]$
b) $[MLT^{-1}]$
c) $[ML^{-2}T^{-1}]$
d) $[ML]$

49. $[M^0L^0T^{-1}]$ refers to quantity

a) Velocity
b) Time period
c) Frequency
d) Force

50. The dimension of the following pair is not the same

a) work & energy
b) work and torque
c) Momentum & impulse
d) Mass & moment of inertia

51. Unit of G is ?

a) $Nm^2 kg^2$
b) $N\ m^2\ kg$
c) $N\ m^2\ kg^{-2}$
d) None

52. The dimension of force is

a) MLT^{-1}
b) MLT^{-2}
c) $ML^{-1}T$
d) $ML^{-1}T^2$

53. $ML^{-1}T^{-2}$ is the dimension of

a) Force
b) Pressure
c) Momentum
d) Energy

54. A light year is a unit for

a) Time
b) Distance
c) Velocity
d) Time period

55. The dimensional formula for the quantity light year is:

a) $[LT^{-1}]$
b) $[T]$
c) $[ML^2T^{-2}]$
d) $[L]$

56. The dimensions of stain are

a) $[MLT^{-2}]$
b) $[ML^{-2}T]$
c) $[M^o\ L^o\ T^o]$
d) $[M^{-1}L^{-1}T^{-1}]$

57. How many years in one second?

a) 3.1×10^6 years
b) 3.1×10^{-7} years
c) 3.1×10^{-8} years
d) 3.1×10^{-9} years

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	d	**20**	b	**39**	a
2	d	**21**	d	**40**	c
3	c	**22**	a	**41**	c
4	c	**23**	b	**42**	b
5	a	**24**	c	**43**	b
6	d	**25**	c	**44**	c
7	c	**26**	a	**45**	d
8	b	**27**	c	**46**	c
9	c	**28**	d	**47**	d
10	b	**29**	d	**48**	a
11	b	**30**	a	**49**	c
12	a	**31**	c	**50**	d
13	b	**32**	c	**51**	c
14	c	**33**	a	**52**	b
15	b	**34**	a	**53**	b
16	d	**35**	b	**54**	b
17	c	**36**	a	**55**	d
18	d	**37**	d	**56**	c
19	d	**38**	b	**57**	c

CHAPTER # 2: VECTORS AND EQUILIBRIUM

1. Which one is a vector:

a) Length
b) Volume
c) Velocity
d) Work

2. An example of scalar quantity is

a) Displacement
b) Speed
c) Velocity
d) Torque

3. Name the quantity which is vector:

a) Density
b) Power
c) Charge
d) Moment of Force

4. Rectangular coordinate system is also called:

a) Polar coordinate system
b) Cartesian coordinate system
c) Cylindrical coordinate system
d) Space coordinate system

5. The direction of a vector in space is specified by:

a) One angle
b) Two angle
c) Three angle
d) No angle

6. If both components of a vector are negative, then resultant lies in:

a) 1st quadrant
b) 2nd quadrant
c) 3rd quadrant
d) 4th quadrant

7. In which quadrant the two rectangular components of a vector have same sign?

a) 1st
b) 2nd
c) both 1st and 3rd
d) 4th

8. If the x-component of a vector is positive and y-component is negative, then resultant vector lies in what quadrant:

a) 1st quadrant
b) 2nd quadrant
c) 3rd quadrant
d) 4th quadrant

9. If vector A lies in the third quadrant, its direction will be:

a) $180^0 - \phi$
b) $360^0 - \phi$
c) $180^0 + \phi$
d) $None$

10. A single vector having the same effect as all the original vectors taken together, is called

a) Resultant vector
b) Equal vector
c) Position vector
d) Unit vector

11. When two vectors are anti-parallel, the angle between them is:

a) Zero
b) 180°
c) 90°
d) 270°

12. The resultant of two forces 30 N and 40 N acting at an angle of 90° with each other is

a) 30 N
b) 40 N
c) 50 N
d) 70 N

13. The magnitude of the vector $\frac{2}{3}\hat{\imath} - \frac{1}{3}\hat{\jmath} + \frac{2}{3}\hat{k}$ is:

a) Zero
b) One
c) Three
d) $\frac{1}{9}$

14. If 6N force act at right angle to 8N force, then the magnitude of resultant will be:

a) 6N
b) 8N
c) 10N
d) 14N

15. If $\vec{A} + \vec{B} = \vec{B} + \vec{A}$, this shows that addition of vectors is

a) Associative
b) Commutative
c) Additive
d) Additive inverse

16. A body is in dynamic equilibrium only when it is

a) At rest
b) Moving with a variable velocity
c) Moving with uniform acceleration
d) Moving with uniform velocity

17. The unit vector along y-axis is

a) $\hat{\imath}$
b) $\hat{\jmath}$
c) $\hat{k}$
d) None

18. Mathematically, unit vector is described as:

a) $\hat{A} = A\,\vec{A}$
b) $\hat{A} = \frac{A}{\vec{A}}$
c) $\hat{A} = \frac{\vec{A}}{A}$
d) $\hat{A} = \vec{A}\,.\,\vec{A}$

19. A unit vector is obtained by dividing a vector with:

a) Its direction
b) Its magnitude
c) Its magnitude and direction
d) None

20. The unit vector in the direction of vector $\vec{A} = 2\hat{\imath} - 2\hat{\jmath} + \hat{k}$ is:

a) $2\hat{\imath} - 2\hat{\jmath} + \hat{k}$
b) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k}\,)/9$
c) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k}\,)/3$
d) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k}\,)/5$

21. The magnitude of a vector $\vec{A} = A_x\hat{\imath} - A_y\hat{\jmath}$
a) ${A_x}^2 + {A_y}^2$
b) ${A_x}^2 - {A_y}^2$
c) $\sqrt{{A_x}^2 + {A_y}^2}$
d) $\sqrt{{A_x}^2 - {A_y}^2}$

22. Vectors A is along y axis, its component along x axis is:
a) A
b) A/2
c) Zero
d) 2A

23. The angle between rectangular components of vector is:
a) 45°
b) 60°
c) 90°
d) 180°

24. A force of 10N is acting along x-axis, its component along y-axis is
a) 10N
b) 5N
c) 8.66N
d) Zero N

25. If vector $\vec{A}$ is acting along y-axis, its y-component is:
a) A
b) $A\cos\theta$
c) $A\sin\theta$
d) Zero

26. If $\mathbf{A} = 2\hat{\imath} - \hat{\jmath} + 3\hat{k}$, then the magnitude of vector A is:
a) 4
b) 14
c) $\sqrt{14}$
d) None

27. $\left|\hat{\imath} - \hat{\jmath} - 3\hat{k}\right| =$
a) $\sqrt{5}$
b) $\sqrt{7}$
c) $\sqrt{11}$
d) $\sqrt{13}$

28. If $\bar{A} = 2\hat{\imath} + \hat{\jmath} + 2\hat{k}$, then $|\bar{A}|$ is :
a) Zero
b) 3
c) 5
d) 9

29. Dot product of two non-zero vectors is zero, when angle between them is:
a) 0^0
b) 30^0
c) 45^0
d) 90^0

30. The cross product $\hat{\imath} \times \hat{\imath} = \hat{\jmath} \times \hat{\jmath} = \hat{k} \times \hat{k}$ is equal to
a) 1
b) -1
c) Zero
d) None

31. The scalar product of two vectors is maximum when they are:
a) Parallel
b) Perpendicular
c) Anti-parallel

32. Two vectors A and B are making angle θ with each other. The projection of vector B on vector A is written as.
a) $\vec{A}.\vec{B}/A$
b) $\vec{A}.\vec{B}/B$
c) cos θ
d) Both a and b are correct.

33. The projection of a vector $\vec{B}$ over $\vec{A}$ is:
a) $A\cos\theta$
b) $B\cos\theta$
c) $A\sin\theta$
d) $B\sin\theta$

34. If $\mathbf{A} = A_x\hat{\imath} + A_y\hat{\jmath} + A_z\hat{k}$ and $\mathbf{B} = B_x\hat{\imath} + B_y\hat{\jmath} + B_z\hat{k}$ then:
a) $\mathbf{A}.\mathbf{B} = A_xB_x + A_yB_y + A_zB_z$
b) $\mathbf{A}.\mathbf{B} = A_xB_y + A_yB_z + A_zB_x$
c) $\mathbf{A}.\mathbf{B} = A_yB_z + A_zB_y + A_zB_x$
d) $\mathbf{A}.\mathbf{B} = A_xB_z + A_yB_y + A_zB_x$

35. The magnitude of vector product is given by:
a) $AB\sin\theta\,\hat{n}$
b) $AB\sin\theta$
c) $AB\cos\theta$
d) $AB\tan\theta$

36. The direction of vector product is given by:
a) Head to tail rule
b) Right hand rule
c) Left hand rule
d) Triangular rule

37. The cross product $\hat{\imath} \times \hat{\jmath}$ is equal to
a) zero
b) one
c) $-\hat{k}$
d) $\hat{k}$

38. Torque has zero value, if the angle between $\bar{r}$ and $\bar{F}$ is
a) 0°
b) 90°
c) 270°
d) 180°

39. $\hat{\imath}.\left(\hat{\jmath} \times \hat{k}\right)$ is equal to
a) 1
b) 0
c) -1
d) $-k$

40. The cross product of vectors will be minimum when the angle between vectors is
a) 35^0
b) 90^0
c) 0^0
d) 45^0

41. The direction of torque is
a) Along position vector $\bar{r}$
b) Parallel to the plane containing $\bar{r}$ and $\bar{F}$
c) Along force $\bar{F}$
d) Perpendicular to the plane containing $\bar{r}$ and $\bar{F}$

42. $\vec{A} \times \vec{A}$ is
a) A
b) A^2
c) 2A
d) Zero

43. If the position $\bar{r}$ and force $\bar{F}$ are in same direction, then torque will be:
a) Maximum
b) Minimum
c) Same
d) Negative

44. The direction of torque can be found by:
a) Head to tail rule
b) Right hand rule
c) Left hand rule
d) Fleming rule

45. At what angle, the two vectors of the same magnitude have to oriented, if they were to be combined to give a resultant equal to a vector of same magnitude?
a) 45°
b) 90°
c) 120°
d) 180°

46. If the line of action of force passes through axis of rotation or the origin, then its torque is:
a) Maximum
b) Unity
c) Zero
d) None of these

47. The magnitude of a vector can never be:
a) Positive
b) Negative
c) Positive and negative
d) None of these

48. The minimum number of unequal forces whose resultant will be zero:
a) 2
b) 3
c) 4
d) 5

49. Torque is defined as.
a) Turning effect of force
b) Cross product of force and position vector
c) Product of force and moment arm
d) All a, b and c are correct

50. SI unit of torque is:
a) Nm^{-1}
b) Nm
c) Nm^{-2}
d) None

51. A body will be in complete equilibrium when it is satisfying:
a) 1st condition of equilibrium
b) 2nd condition of equilibrium
c) Both 1st and 2nd condition of equilibrium
d) Impossible

52. For a body to be in complete equilibrium,
a) $a = 0 \; and \; \alpha = 0$
b) $\sum F = 0$
c) $\sum \tau = 0$
d) None

53. If a body is at rest, then it will be in
a) Static equilibrium
b) Dynamic equilibrium
c) Translational equilibrium
d) Unstable equilibrium

54. The magnitudes of rectangular component are equal if its angle with x-axis is:
a) 45°
b) 90°
c) 30°
d) 0°

55. If $A_x = A_y$, then the angle between the vector A with x-axis will be:
a) 0^0
b) 30^0
c) 45^0
d) 90^0

56. The resultant of two forces of equal magnitudes is also equal to the magnitude of the forces. The angle between the two forces is.
a) 30^o
b) 60^o
c) 90^o
d) 120^o

57. The magnitude of dot and cross product of two vectors are $6\sqrt{3}$ and 6 respectively. The angle between them will be
a) 0°
b) 30°
c) 45°
d) 60°

58. The magnitude of cross-product and dot-product of two vectors are equal, the angle between them is
a) Zero
b) 45°
c) 90°
d) 180°

59. Two vectors to be combined have magnitudes 60 N and 35 N. The correct answer for the magnitude of their resultant will be:
a) 15 N
b) 20 N
c) 70 N
d) 100 N

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	c	21	c	41	d
2	b	22	c	42	d
3	d	23	c	43	b
4	b	24	d	44	b
5	c	25	a	45	c
6	c	26	c	46	c
7	c	27	c	47	c
8	d	28	b	48	b
9	c	29	d	49	d
10	a	30	c	50	b
11	b	31	a	51	c
12	c	32	a	52	a
13	b	33	b	53	a
14	c	34	a	54	a
15	b	35	b	55	c
16	d	36	b	56	d
17	b	37	d	57	b
18	c	38	a	58	b
19	b	39	a	59	c
20	c	40	c		

CHAPTER # 3: MOTION AND FORCE

1. A body covering equal displacement in equal interval of time possesses:
a) Variable velocity
b) Uniform acceleration
c) Uniform velocity
d) None of above

2. Instantaneous and average velocities become equal when body:
a) Has zero acceleration
b) Has uniform velocity
c) Has variable velocity
d) Moves in a circle

3. When velocity time graph is a straight line parallel to time axis then:
a) Acceleration is const
b) Acceleration is variable
c) Acceleration is zero
d) Velocity is zero

4. Slope of velocity time graph is:
a) Acceleration
b) Distance
c) Force
d) Momentum

5. The area between the velocity-time graph and the time axis is numerically equal to:
a) Velocity
b) Distance
c) Time
d) Acceleration

6. If the slop of velocity-time graph gradually decreases, then the body is said to be moving with:
a) Positive acceleration
b) Negative acceleration
c) Uniform velocity
d) Variable velocity

7. If the slop of velocity-time graph gradually increases, then the body is said to be moving with:
a) Positive acceleration
b) Negative acceleration
c) Uniform velocity
d) Variable velocity

8. What is the shape of velocity time graph for constant acceleration?
a) Straight line
b) Parabola
c) Inclined curve
d) Declined curve

9. When the object is moving towards earth, the value of "g" is taken as:
a) Positive
b) Negative
c) Zero
d) None

10. Change in momentum is called:
a) Force
b) Impulse
c) Acceleration
d) Torque

11. The time rate of change of momentum is called:
a) Force
b) Impulse
c) Acceleration
d) Torque

12. The property of a body due to which it opposes its state of rest or uniform motion is called:
a) Momentum
b) Inertia
c) Torque
d) Weight

13. Which law of motion is also called law of inertia?
a) 1st law
b) 2nd law
c) 3rd law
d) 4th law

14. Inertia of an object is quantitative measure of its:
a) Volume
b) Density
c) Mass
d) Temperature

15. Momentum depends upon.
a) Force act on the body
b) Mass of the body
c) Velocity of the body
d) Both mass and velocity of the body

16. An alternate unit to $kg\ ms^{-1}$ is:
a) Js
b) Ns
c) Nm
d) N

17. SI unit of impulse is:
a) $kg\ m\ s^{-2}$
b) $N\ s$
c) N
d) None of these

18. The dimension of acceleration is.
a) $[LT^{-1}]$
b) $[L^2T^{-2}]$
c) $[L^2T^2]$
d) $[L\,T^{-2}]$

19. The dimension of force is.
a) $[MLT^{-2}]$
b) $[ML^2T^{-2}]$
c) $[ML^2T^2]$
d) $[ML^{-2}T^{-2}]$

20. Which of the following pair has same direction always?
a) Force, displacement
b) Force, velocity
c) Force, acceleration
d) Force, momentum

21. A snooker ball moving with velocity v collides head on with another snooker ball of same mass at rest. If the collision is elastic, the velocity of the second snooker ball is:
a) Zero
b) Infinity
c) V
d) 2V

22. Taking off rocket can be explained by.
a) 1st law of motion
b) 2nd law of motion
c) Law of conservation of momentum
d) Law of conservation of energy

23. The trajectory (or path) of a projectile is.
a) Straight line
b) Parabola
c) Hyperbola
d) Circle

24. A football player will throw a football at maximum distance if the angle of projection is:
a) 30^0
b) 45^0
c) 60^0
d) 90^0

25. Range of a projectile on a horizontal plane is same for the following pair of angles:
a) 30^0 and 60^0
b) 20^0 and 80^0
c) 0^0 and 45^0
d) 10^0 and 90^0

26. The total time of flight of projectile is given by:
a) $v_i \sin\theta / g$
b) $2v_i \sin\theta / g$
c) $v_i \sin\theta / 2g$
d) $2v_i \sin^2\theta / g$

27. Horizontal range of the projectile is given by the expression $R = 2v_i^2 \sin 2\theta / g$. For what value of θ, range is maximum:
a) 0^0
b) 30^0
c) 45^0
d) 90^0

28. The velocity of projectile at its maximum height is:
a) $v_i \sin\theta$
b) $v_i \cos\theta$
c) Maximum
d) Zero

29. Motion of projectile is _____ dimensional.
a) One
b) Two
c) Three
d) Four

30. A projectile is thrown upward with initial velocity v_i making an angle θ with the horizontal. The maximum horizontal range is given by:
a) v_i^2/g
b) $v_i^2/2g$
c) $v_i^2 \sin 2\theta/g$
d) $v_i^2 \sin 2\theta/2g$

31. During projectile motion, the horizontal component of velocity:
a) Changes with time
b) Becomes zero
c) Remains constant
d) Increases with time

32. The range of projectile is same for angles of projection:
a) 30° and 45°
b) 45° and 60°
c) 50° and 45°
d) 30° and 60°

Q. No.	Ans.	Q. No.	Ans.
1	c	**17**	b
2	b	**18**	d
3	c	**19**	a
4	a	**20**	c
5	b	**21**	c
6	b	**22**	c
7	a	**23**	b
8	a	**24**	b
9	a	**25**	a
10	b	**26**	b
11	a	**27**	c
12	b	**28**	b
13	a	**29**	b
14	c	**30**	a
15	d	**31**	c
16	b	**32**	d

CHAPTER # 4: WORK AND ENERGY

1. Area under the curve of force-displacement graph is equal to:
a) Displacement
b) Work
c) Power
d) Energy

2. Slope of work time graph is equal to.
a) Displacement
b) Acceleration
c) Power
d) Energy

3. Work done will be maximum if the angle between the force F and displacement d is.
a) 45^o
b) 90^o
c) 180^o
d) 0^o

4. A field will be conservative when work done:
a) By centripetal force is zero
b) By a frictional force is negative
c) By force perpendicular to the displacement is zero
d) In a close path is zero

5. A field in which the work done in a moving a body along closed path is zero is called.
a) Electric field
b) Conservative field
c) Electromagnetic field
d) Maximum

6. When a force is parallel to the direction of motion of the body, then work done on the body is:
a) zero
b) minimum
c) infinity
d) Maximum

7. The work done is said to be negative when force and displacement are
a) Parallel
b) Anti-parallel
c) Perpendicular
d) None

8. Which of the following is not conservative force?
a) Friction
b) Electric
c) Gravitational
d) Magnetic

9. Which of the following types of force can do no work on the particle on which it acts?
a) Frictional force
b) Gravitational force
c) Elastic force
d) Centripetal force

10. Work has the dimension as that of same as that of.
a) Torque
b) Angular momentum
c) Linear momentum
d) Power

11. The average power and instantaneous power become equal if work is done at.
a) Any rate
b) At variable rate
c) At uniform rate
d) At high rate

12. The relation between horse power and watt is.
a) 1 hp = 546 watts
b) 1 hp = 746 watts
c) 1 hp = 1000 watts
d) 1 hp = 946 watts

13. If mass of a moving object is doubled, its K.E becomes:
a) 2 times
b) 4 times
c) 5 times
d) 16 times

14. Work done on the body equals to the
a) Change in its K.E always
b) Change in its P.E always
c) Change in it K.E and change in its P.E
d) Neither change in K.E nor change in its P.E

15. Work done by the force of friction is.
a) Always positive
b) Always negative
c) Positive only for small frictional force
d) Positive only for large frictional force

16. The consumption of energy by 60 watt bulb in 2 seconds is:
a) 20 J
b) 120 J
c) 30 J
d) 0.02 J

17. Power is also defined as dot product of
a) Force and displacement
b) Force and mass
c) Force and velocity
d) Force and time

18. One kilowatt hour of work is equal to
a) 0.36 MJ
b) 3.6 MJ
c) 36 MJ
d) 360 MJ

19. One mega watt hour is equal to.
a) 3.6×10^6 J
b) 3.6×10^{12} J
c) 3.6×10^9 J
d) 3.6×10^8 J

20. The escape velocity form the earth surface in km s^{-1} is.
a) 4.2 km s^{-1}
b) 7.5 km s^{-1}
c) 9.5 km s^{-1}
d) 11 km s^{-1}

21. The work done by the force of 10N applied parallel to direction of motion up to 20 m
a) 10 J
b) 20 J
c) 200 J
d) 2000 J

22. The SI unit of power is
a) Joule
b) Horsepower
c) kWh
d) Watt

23. The original source of tidal energy is:
a) Moon
b) Earth
c) Sun
d) Sea

24. The energy stored in the spring of a watch is:
a) K.E
b) Electrical Energy
c) Elastic P.E
d) Solar Energy

25. Work-energy equation can be expressed as:
a) $Fa = K.E_f - K.E_i$
b) $ma = (K.E_f)^2 - (K.E_i)^2$
c) $Fd = K.E_f - K.E_i$
d) $F.V = K.E_f - K.E_i$

26. The tides raise the mater in the sea roughly in a day:
a) Once
b) Twice
c) Four times
d) Eight times

27. The source of geothermal energy is.
a) Decay of radioactive element in the earth
b) Compression of material in the earth
c) Residual lost of the earth
d) All as said in a, b and c

Q. No.	Ans.	Q. No.	Ans.
1	b	**15**	b
2	c	**16**	b
3	d	**17**	c
4	d	**18**	b
5	b	**19**	c
6	d	**20**	d
7	b	**21**	c
8	a	**22**	d
9	d	**23**	a
10	a	**24**	c
11	c	**25**	c
12	b	**26**	b
13	b	**27**	d
14	a		

CHAPTER # 5: CIRCULAR MOTION

1. 1 revolution:
a) 57°
b) 90°
c) 180°
d) 360°

2. One radian is equal to.
a) 67.3^o
b) 57.3^o
c) 87.3^o
d) 60^o

3. The SI unit of angular momentum is Js. It can also be expressed as:
a) $kg\ m\ s^{-1}$
b) $kg\ m^2\ s^{-1}$
c) $kg\ m^2\ s^{-2}$
d) $kg\ m^{-2}\ s^{-1}$

4. The rate of change of angular displacement is called:
a) Angular displacement
b) Angular velocity
c) Angular acceleration
d) Torque

5. Revolution/minute is the unit for
a) Angular displacement
b) Angular acceleration
c) Angular velocity
d) Time

6. Time rate of change of angular velocity is called:
a) Angular momentum
b) Angular displacement
c) Angular acceleration
d) None of these

7. The angular acceleration is produced by:
a) Momentum
b) Torque
c) Pressure
d) Power

8. A particle is moving in a circle with constant speed. The direction of centripetal force will be:
a) Along the tangent
b) Along radius towards center
c) Along radius away from center
d) Changing with motion

9. Moment of inertia is equal to:
a) m^2r
b) m^2r^2
c) $m\,r$
d) $m\,r^2$

10. Moment of inertia is measured in:
a) $kg\ m^2$
b) $kg\ m^{-2}$
c) $N\ s$
d) rad/s

11. The angular momentum is given by:
a) $m\vec{\omega}$
b) $\vec{\omega} \times \vec{F}$
c) $\vec{r} \times \vec{F}$
d) $\vec{r} \times \vec{p}$

12. The period of a circular motion is given by.
a) T = rV
b) T = ωw
c) T = 2πω
d) T = 2π/ω

13. The direction of linear velocity of body moving in a circle is.
a) Along the axis of rotation
b) Along the tangent
c) Directed towards the center
d) Directed away from the center

14. The circumference subtends an angle.
a) Radian
b) 2π radian
c) π/2 radian
d) 4π radian

15. The relation between linear and angular acceleration is.
a) $\vec{\alpha} = \vec{a} \times \vec{r}$
b) $\vec{a} = \vec{r} \times \vec{\alpha}$
c) $\vec{a} = \vec{\alpha} \times \vec{r}$
d) $\vec{r} = \vec{\alpha} \times \vec{a}$

16. When a body is whirled in a horizontal circle by means of a string the centripetal force is supplied by.
a) Mass of a body
b) Velocity of body
c) Tension in the string
d) None of these

17. Centripetal force performs
a) Maximum work
b) Minimum work
c) Negative work
d) No work

18. When a body moves in a circle of radius 'r' with linear speed 'V', its centripetal force is.
a) mv / r^2
b) mv / r
c) mv^2 / r
d) mv^2 / r^2

19. The angular acceleration of a body is directed
a) Towards the center of the circle
b) Away from the center of the circle
c) Along the tangent to the circle
d) Along the axis of rotation

20. The magnitude of the centripetal force on a mass m moving with angular speed ω in a circle of radius r is
a) $mr^2\omega$
b) mr^2/ω
c) $mr\ \omega$
d) $mr\ \omega^2$

21. The dimension of angular acceleration is:
a) T^{-1}
b) T^{-2}
c) T^{-3}
d) LT^{-2}

22. A gymnast sitting on stool with his arms out stretched lowers his arms:
a) The angular speed decreases
b) The angular speed increases
c) Neither increases nor decrease
d) Both increases and decreases

23. When torque acting on a system is zero, which of the following will be constant:
a) Linear momentum
b) Force
c) Angular momentum
d) Impulse

24. The rotational K.E of any hoop of radius "r" is given by:
a) $\frac{1}{2}mr^2w^2$
b) $\frac{1}{2}r^2w^2$
c) $\frac{1}{2}r\ w^2$
d) None of these

25. Unit of angular velocity in SI unit is:
a) $Rad./s$
b) m/s
c) $degree/s$
d) $Revolution/s$

26. Angular speed of daily rotation of earth is:
a) $2\pi\ rad./s$
b) $\pi\ rad./s$
c) $4\pi\ rad./s$
d) $7.3 \times 10^{-5}\ rad./s$

27. The rotational K.E of a body is given by:
a) $\frac{1}{2}I\omega^3$
b) $\frac{1}{3}I\omega^2$
c) ω^2
d) $\frac{1}{2}I\omega^2$

28. The minimum velocity necessary to put a satellite into orbit is:
a) $7.1\ km\ s^{-1}$
b) $7.3\ km\ s^{-1}$
c) $7.9\ km\ s^{-1}$
d) $8.9\ km\ s^{-1}$

29. The apparent weight of a man in an ascending lift moving with acceleration "a":
a) Increases
b) Decreases
c) Remains constant
d) Becomes zero

30. The apparent weight of a man in a lift moving down with an acceleration of $9.8\ m\ s^{-2}$ is:
a) Zero
b) 9.8 N
c) 19.6 N
d) Infinity

31. Which electromagnetic wave are used as medium in satellite communication system:
a) Microwaves
b) Radio waves
c) Infrared waves
d) Ultraviolet waves

32. The minimum number of communication satellites required to cover the whole earth is:
a) 4
b) 3
c) 2
d) 5

33. The critical speed of an artificial satellite is.
a) 6 Kms^{-1}
b) 8.1 Kms^{-1}
c) 7.9 Kms^{-1}
d) 8 ms^{-1}

34. Geo-stationary satellite completes one rotation around earth in.
a) 3 hours
b) 6 hours
c) 12 hours
d) 24 hours

35. In case planets the necessary acceleration is provided by.
a) Gravitational force
b) Frictional force
c) Coulomb force
d) Centripetal force

36. The acceleration of a freely falling body is:
a) Zero
b) 9.8 ms^{-2}
c) 32 ms^{-2}
d) -9.8 ms^{-2}

37. A man of weight W is standing on an elevator which is ascending with an acceleration a. The apparent weight of the man is.
a) mg
b) mg – ma
c) mg + ma
d) mg – ma

38. If a body of mass 10 kg is allowed to fall freely, its weight becomes.
a) zero
b) 98N
c) 9.8N
d) 10N

39. Pull of earth on a mass of 20 kg on the surface of the earth is
a) 20 N
b) 196 N
c) 19.6 N
d) 1960 N

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	d	**14**	b	**27**	d
2	b	**15**	c	**28**	c
3	b	**16**	c	**29**	a
4	b	**17**	d	**30**	a
5	c	**18**	c	**31**	a
6	c	**19**	d	**32**	c
7	b	**20**	d	**33**	c
8	b	**21**	b	**34**	d
9	d	**22**	b	**35**	a
10	a	**23**	c	**36**	b
11	d	**24**	a	**37**	c
12	d	**25**	a	**38**	a
13	b	**26**	d	**39**	b

CHAPTER # 6: FLUID DYNAMICS

1. The study of properties of fluids in motion is called
a) Fluid
b) Fluid statics
c) Fluid dynamics
d) None

2. The dimensions of coefficient of viscosity are.
a) $ML^{1}T^{-1}$
b) $M^{2}L^{1}T^{1}$
c) $ML^{-1}T^{-1}$
d) $M^{2}L^{-1}T^{-1}$

3. η Is denoted for coefficient of:
a) Friction
b) Viscosity
c) Linear expansion
d) Gravitational customer

4. The SI unit of coefficient of viscosity is:
a) $kg\ m^{-1}\ s^{-1}$
b) $kg\ m^{-2}\ s^{-1}$
c) $kg\ m^{-2}s^{-2}$
d) $kg\ m^{2}\ s$

5. An object moving through a fluid experience a retarding force called
a) Drag force
b) Gravitational force
c) Terminating force
d) Frictional force

6. The maximum constant velocity of an object falling vertically downward is called:
a) Final velocity
b) Terminal velocity
c) Initial velocity
d) None of these

7. The drag force increases as the speed of the object
a) Increases
b) Decreases
c) Remain constant
d) None of these

8. The equation $F = 6\pi\eta rv$ is called:
a) Newton's law
b) Stoke's law
c) Ohm's law
d) Lenz's law

9. Stokes law is applicable if body has _____ shape.
a) Rough
b) Square
c) Circular
d) Spherical

10. The drag force F on a sphere of radius r moving slowly with speed v through a fluid of viscosity η is
a) $6\pi\eta\ r^{2}\ v$
b) $6\pi\eta\ r\ \ v$
c) $6\pi^{2}\eta\ r\ \ v$
d) $6\pi\eta\ r\ v^{2}$

11. Drag force is given by
a) Newton's law
b) Pascal's law
c) Gauss's law
d) Stoke's law

12. When weight of an object falling freely becomes equal to the drag force, then the body will move with
a) Increasing speed
b) Decreasing speed
c) Constant speed
d) None of them

13. When the body reaches its terminal velocity, the acceleration of the body becomes
a) Maximum speed
b) Minimum speed
c) Zero
d) Constant quantity

14. As the water falls from tap, its speed increases and cross sectional area:
a) Zero
b) Increases
c) Decreases
d) Remains constant

15. Terminal velocity is given by equation.
a) $V_t = 2gr^2\rho/9\eta$
b) $V_t = gr^2\rho/9\eta$
c) $V_t = gr^2\rho/9\eta$
d) $V_t = 9gr^2\rho/2\eta$

16. If radius of droplet becomes half then its terminal velocity will be
a) Half
b) Double
c) One forth
d) Four times

17. Turbulent flow is:

a) Unsteady and regular
b) Steady and regular
c) Unsteady and irregular
d) Steady and regular

18. The flow of ideal fluid is always:

a) Turbulent
b) Streamline
c) Irregular
d) Straight line

19. Irregular flow of fluid is called:

a) Streamline
b) Turbulent
c) Uniform
d) Laminar

20. According to equation of continuity, $A_1V_1 = A_2V_2$ = constant. The constant is equal to:

a) Flow rate
b) Volume of fluid
c) Mass of fluid
d) Density of fluid

21. Equation of continuity is obtained by applying law of conservation of
a) Mass
b) Energy
c) Momentum
d) All

22. If cross-sectional area of pipe decreases, the speed of fluid must increase according to:

a) Venturi relation
b) Bernoulli's equation
c) Equation of continuity
d) Torricelli's theorem

23. In equation of continuity, the units of Av is given as:

a) Cubic meter
b) Cubic meter per second
c) Square meter per second
d) Square meter

24. The law of conservation of mass gives:
a) Bernoulli's equation
b) Equation of continuity
c) Torricelli theorem
d) None of these

25. Bernoulli's theorem applies to:

a) Solids
b) Plasma state
c) Fluids
d) Liquids

26. Velocity of fluid increases where the pressure is:

a) Low
b) High
c) Constant
d) Changes continuously

27. Speed of efflux can be determined by applying:

a) Pressure-velocity relationship
b) Torricelli's theorem
c) Venture relation
d) All

28. Venturi meter is a device used to measure:
a) Pressure of the fluid
b) Speed of fluid
c) Density of fluid
d) Viscosity of the fluid

29. A man standing near a fast moving train may fall.
a) Away from the train
b) Towards the train
c) On himself
d) None of these

30. Bernoulli's equation is obtained by applying law of conservation of.
a) Mass
b) Energy
c) Momentum
d) Fluid

31. Ideal fluid is.
a) Non-viscous
b) Incompressible
c) Steady flow
d) Possess all properties

32. Velocity of efflux is measured by relation
a) $\sqrt{gh}$
b) $\sqrt{\frac{gh}{2}}$
c) $\sqrt{2gh}$
d) $\sqrt{\frac{4gh}{3}}$

33. The mathematical relation $v = \sqrt{2g(h_2 - h_1)}$ is known as:
a) Equation of continuity
b) Torricelli's theorem
c) Bernoulli's equation
d) Ventra relation

34. Swing is produced to:
a) Increase the speed of ball
b) Decrease the speed of ball
c) Deceive the player
d) Applying the force on the ball

35. The blood pressure in the vessels is always
a) Less than atmosphere
b) Greater than atmosphere
c) Equal to atmosphere
d) 133.3 $N\ m^2$

36. Instrument used to measure blood pressure is called
a) Venturi meter
b) Blood pressure
c) Sphygmomanometer
d) Sonometer

37. One Torr is expressed in Nm^{-2} as:
a) 133.3 Nm^{-2}
b) 13.33 Nm^{-2}
c) 1333 Nm^{-2}
d) 1.333 Nm^{-2}

38. Blood has density equal to that of:
a) Mercury
b) Sodium
c) Honey
d) Water

39. For which position, blood pressure in the body have the smallest value?
a) Standing straight
b) Sitting on chair
c) Sitting on ground
d) Lying horizontally

Q No.	Ans.	Q No.	Ans.	Q No.	Ans.
1	c	14	c	27	b
2	c	15	a	28	b
3	b	16	c	29	b
4	a	17	c	30	b
5	a	18	b	31	d
6	b	19	b	32	c
7	a	20	a	33	b
8	b	21	a	34	c
9	d	22	c	35	b
10	b	23	b	36	c
11	d	24	b	37	a
12	c	25	c	38	d
13	c	26	a	39	d

CHAPTER # 7: OSCILLATIONS

1. The S.I units of spring constant are:
   a) m^{-1}
   b) Nm^{-1}
   c) Nm^{-2}
   d) Nm^{2}

2. If $F = 0.08\ N$ and $x = 4\ cm$ then $k =$:
   a) $6\ Nm^{-1}$
   b) $4\ Nm^{-1}$
   c) $8\ Nm^{-1}$
   d) $2\ Nm^{-1}$

3. One complete round trip of a vibrating body is called
   a) Time period
   b) Frequency
   c) Vibration
   d) Amplitude

4. The time required to complete one vibration is called
   a) Time period
   b) Frequency
   c) Time period
   d) Velocity

5. The force which opposes the applied force producing the displacement in the spring is called
   a) Restoring force
   b) Periodic force
   c) Centripetal force
   d) Resistive force

6. The number of vibrations completed by a body in one second is called
   a) Time period
   b) Frequency
   c) Total vibrations
   d) Displacement

7. Simple harmonic motion is a type of:
   a) Rotational motion
   b) Circular motion
   c) Musical arrangement
   d) Vibratory motion

8. In SHM, the restoring force is directly proportional to
   a) Velocity
   b) Acceleration
   c) Displacement
   d) Time period

9. The expression for instantaneous displacement of particle executing SHM is:
   a) $a = -\omega^2 x$
   b) $x = x_0 \sin \omega t$
   c) $F = kx$
   d) All of above

10. Acceleration of a projection on the diameter for a particle moving along a circle is:
    a) w^2x
    b) wx^2
    c) $-w^2x$
    d) $-wx^2$

11. In equation of SHM, $a = -\omega^2 x$, the negative sign indicates the direction of motion of particle
    a) Away from mean position
    b) Perpendicular to mean position
    c) Towards mean position
    d) None of above

12. If f is the frequency of a body executing SHM, its angular frequency ω is:
    a) $4\pi f$
    b) $3\pi f$
    c) $2\pi f$
    d) None of these

13. The distance of vibrating body at any instant from its equilibrium position is called
    a) Displacement
    b) Frequency
    c) Amplitude
    d) Time period

14. SI unit of frequency is:
    a) Radian
    b) ms^{-1}
    c) Hertz
    d) Meter

15. The product of time period and frequency is:
    a) Zero
    b) 1
    c) π
    d) None of these

16. The phase angle $\theta = \omega t$ of the body performing SHM indicates:
    a) Only direction of motion
    b) Only magnitude of displacement
    c) Both magnitude of displacement and direction of motion
    d) None of these

17. In SHM, the velocity of the particle is maximum at:
    a) Mean position
    b) Extreme position
    c) In between mean and extreme position
    d) None

18. Angular velocity of vibrating body attached with horizontal mass spring system is given by:
    a) $\omega = \frac{k}{m}$
    b) $\omega = \frac{\sqrt{k}}{m}$
    c) $\omega = \sqrt{\frac{k}{m}}$
    d) $\omega = \frac{k}{\sqrt{m}}$

19. For a body executing S.H.M, its
    a) Momentum remains constant
    b) Potential energy remains constant
    c) Kinetic energy remains constant
    d) Total energy remains constant

20. If the displacement of a body executing S.H.M is plotted against time, then the curve is known
    a) Frequency of S.H.M
    b) Period of S.H.M
    c) Wave form
    d) None of them

21. The waveform of simple harmonic motion is:
    a) Sine wave
    b) Square wave
    c) Pulsed wave
    d) None of these

22. Frequency of the second pendulum is:
    a) 2.5 Hz
    b) 0.5 Hz
    c) 1.5 Hz
    d) 2 Hz

23. The time period of a second pendulum is-
    a) 4 seconds
    b) 3 seconds
    c) 2 seconds
    d) 6 seconds

24. The length of second pendulum is.
    a) 100 cm
    b) 99 cm
    c) 99.2 cm
    d) 98 cm

25. The restoring force acting on simple pendulum is given by.
    a) $mg \sin \theta$
    b) $-mg \sin \theta$
    c) $mg \cos \theta$
    d) $-mg \cos \theta$

26. Which expression is correct for the time period of a simple pendulum:
    a) $T \propto L$
    b) $T \propto m$
    c) $T \propto \sqrt{L}$
    d) $T \propto \sqrt{m}$

27. An object undergoes S.H.M has maximum speed when its displacement from the mean position is
    a) Maximum speed
    b) Zero
    c) Half of the maximum value
    d) One third of the maximum value

28. An object undergoes S.H.M has maximum acceleration when its displacement form the mean position is
    a) Maximum
    b) Zero
    c) Half of the maximum value
    d) One third of the maximum value

29. In simple harmonic motion:
    a) P.E remains constant
    b) K.E remain constant
    c) Total energy remain constant
    d) Total momentum remain constant

30. The motion of simple pendulum is SHM only if:
    a) Amplitude is large
    b) Mass is small
    c) Amplitude is small
    d) Length is small

31. In S.H.M, the velocity of a particle is maximum at:
    a) Mean position
    b) Extreme position
    c) Middle between mean and extreme position on the right side
    d) Middle between mean and extreme position on the left side

32. The displacement of SHM is written as $X = X_o \sin\omega t$, If displacement is written by $X = X_o \cos\omega t$ then phase constant will be equal to:
    a) 0^o
    b) 45^o
    c) 90^o
    d) 180^o

33. The angle $\theta = \omega t$ which specifies the displacement as well as direction of motion of the point executing SHM is known as:
    a) Critical angle
    b) Phase angle
    c) Plane angle
    d) Solid angle

34. Phase of SHM describes.
    a) Displacement only
    b) Direction of motion only
    c) Both displacement and direction of motion
    d) Neither displacement nor direction of motion

35. Natural frequency of simple pendulum depends upon:
    a) Its mass
    b) Its length
    c) Square of its length
    d) Square root of its length

36. The process in which energy is dissipated in oscillating system is called:
    a) Resonance
    b) Damping
    c) Forced oscillation
    d) None of these

37. In damped harmonic oscillation, which one deceases?
    a) Amplitude of vibration
    b) Energy of vibration
    c) Both amplitude and energy
    d) Neither amplitude nor energy

38. A physical system undergoing forced vibrations is known as
    a) Driven harmonic oscillator
    b) Resonance
    c) Simple harmonic oscillator
    d) None of above

39. When θ is small, $\sin\theta$ is approximately equal to
    a) 2θ
    b) Zero
    c) θ
    d) $\frac{\theta}{2}$

40. At mean position, during SHM:
    a) P.E is maximum and K.E is minimum
    b) P.E is minimum and K.E is maximum
    c) Both K.E and P.E are maximum
    d) Both K.E and P.E are minimum

41. When the bob of simple pendulum is at extreme position, it has
    a) K.E
    b) P.E
    c) Both P.E and K.E
    d) None

42. Tuning of radio set is an example of
    a) Mechanical resonance
    b) Musical resonance
    c) Electrical resonance
    d) Free vibration

43. The frequency of waves produced in microwaves oven is:
    a) 1435 MHz
    b) 2450 MHz
    c) 1860 MHz
    d) 2850 MHz

44. Sharpness of resonance is.
    a) Directly proportional to damping force
    b) Inversely proportional to damping force
    c) Equal to square of damping force
    d) None of these

45. Which one does not work according to resonance?
    a) T.V
    b) Radio
    c) Microwave oven
    d) Bulb

46. The oscillations in which amplitude decreased steadily with time are called:
    a) Natural oscillations
    b) Free oscillation
    c) Damped oscillations
    d) Forced oscillations

47. Distance covered during one vibration of an oscillating body in term of amplitude A is:
    a) $A/2$
    b) A
    c) $2A$
    d) $4A$

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	b	**17**	a	**33**	b
2	d	**18**	c	**34**	c
3	c	**19**	d	**35**	d
4	a	**20**	c	**36**	b
5	a	**21**	a	**37**	c
6	b	**22**	b	**38**	a
7	d	**23**	c	**39**	c
8	c	**24**	c	**40**	b
9	b	**25**	b	**41**	b
10	c	**26**	c	**42**	c
11	c	**27**	b	**43**	b
12	c	**28**	a	**44**	b
13	a	**29**	c	**45**	d
14	c	**30**	c	**46**	c
15	b	**31**	a	**47**	d
16	c	**32**	c		

CHAPTER 8: WAVES

1. Waves transmit _____ from one place to another.

a) Energy
b) Mass
c) Both
d) None

2. The waves that require a material medium for their propagation are called

a) Matter waves
b) Electromagnetic waves
c) Carrier waves
d) Mechanical waves

3. The example of mechanical waves is:

a) Water and air waves
b) Radio waves
c) Infrared waves
d) Ultra violet waves

4. Sound waves cannot travel through:

a) Air
b) Water
c) Material medium
d) Vacuum

5. Sound waves do not travel in vacuum because

a) They are transverse waves
b) They are stationary waves
c) They require material medium for propagation
d) They do not have enough energy

6. The velocity of sound in vacuum is:

a) $332\ ms^{-1}$
b) $333\ ms^{-1}$
c) $280\ ms^{-1}$
d) $0\ ms^{-1}$

7. The speed of sound in air at $0°C$ is $332\ ms^{-1}$. the speed at $2°C$ will be:

a) $330\ ms^{-1}$
b) $333.2\ ms^{-1}$
c) $335\ ms^{-1}$
d) None of these

8. According to Laplace correction sound travel in air under the conditions of

a) Adiabatic
b) Isothermal
c) Isobaric
d) Isochoric

9. Laplace expression for speed of sound in a gase is:

a) $v = \sqrt{\frac{P}{\rho}}$
b) $v = \frac{P}{\rho}$
c) $v = \sqrt{\frac{\gamma P}{\rho}}$
d) $v = \sqrt{\frac{\gamma \rho}{P}}$

10. If the pressure of the gas is doubled, then the speed of sound:

a) Also doubled
b) Becomes half
c) Not affected
d) Increases four times

11. The speed of sound in air at $30°C$ is approximately equal to:

a) $332\ ms^{-1}$
b) $335\ ms^{-1}$
c) $340\ ms^{-1}$
d) $345\ ms^{-1}$
e) $350\ ms^{-1}$

12. Increase in velocity of sound in air for $1°C$ rise in temperature is:

a) $0.61\ ms^{-1}$
b) $61\ ms^{-1}$
c) $1.61\ ms^{-1}$
d) $2\ ms^{-1}$

13. The speed of sound is greater in solids than in gases due to high value of:

a) Density
b) Pressure
c) Elasticity
d) Temperature

14. The wave speed of a wave in terms of its wavelength λ and period T is:

a) $v = \lambda T$
b) $v = \lambda T^2$
c) $v = \lambda / T$
d) $v = T / \lambda$

15. The distance between any two consecutive crests or troughs is called
a) Frequency
b) Period
c) Wave length
d) Phase difference

16. In a transverse wave the distance between a crest and a trough is equal to:
a) $\lambda/2$
b) $\lambda/4$
c) λ
d) 2λ

17. When two identical waves moves in the same direction, they give rise to:
a) Standing waves
b) Interference
c) Beats
d) None of these

18. When path difference is an integral multiple of wavelengths, the effect is called:
a) Coherency
b) Destructive interference
c) Constructive interference
d) Phase lag

19. Periodic alteration of sound between maximum and minimum loudness are called
a) Interferece
b) Resonance
c) Doppler effect
d) Beats

20. Beats can be heard when the difference of frequency is not more than:
a) 8
b) 4
c) 10
d) 6

21. Beats are formed when two notes of frequencies f_1 and f_2 ($f_1 > f_2$) are sounded together. The beat frequency will be:
a) $f_1 + f_2$
b) $f_1 - f_2$
c) $\frac{f_1 + f_2}{2}$
d) $\frac{f_1 - f_2}{2}$

22. The number of beats produced per second is equal to
a) The sum of the frequencies of two tuning forks
b) The difference of the frequencies of two tuning forks
c) The ratio of the frequencies of two tuning forks
d) The frequency of either of the two tuning forks

23. When a wave is reflected on going from a rarer to a denser medium, then at the boundary the reflected wave will undergo a phase change of:
a) 0^o
b) 90^o
c) -90^o
d) 180^o

24. When a transverse wave is reflected on going from a denser to a rarer medium, then at the boundary the reflected wave undergoes a phase change of:
a) $0°$
b) $90°$
c) $-90°$
d) $180°$

25. When a transverse wave is reflected on going from a denser medium to a rare medium, then:
a) There is 180° phase shift
b) There is no change in phase
c) A crest is converted into trough
d) A trough is converted into crest

26. Phase differce of 180° is equivalent to a path difference of:
a) λ
b) $\frac{\lambda}{2}$
c) $\frac{\lambda}{4}$
d) $\frac{\lambda}{8}$

27. Two waves of equal frequency travelling in opposite direction produce:
a) Interference
b) Stationary waves
c) Beats
d) Doppler Effect

28. Two wave trains of the same amplitude and frequency travelling in opposite directions along the same path in the same medium produce:
a) Resonance
b) Beats
c) Standing waves
d) Musical notes

29. Which property of wave motion distinguish a travelling wave from a stationary wave:
a) amplitude
b) frequency of vibration
c) propogation of energy
d) direction of vibration

30. If a string vibrates in n loops, the wavelength of stationary waves will be:
a) $\frac{2l}{n}$
b) $\frac{nl}{2}$
c) $\frac{2n}{l}$
d) $\frac{l}{2n}$

31. Stationary waves are generated on a string of length "l", its fundamental frequency is given by:
a) $f_1 = v \times l$
b) $f_1 = \frac{v}{2l}$
c) $f_1 = 2(v \times l)$
d) $f_1 = \frac{2l}{v}$

32. The fixed ends of a vibrating string are
a) antinodes
b) nodes
c) overtones
d) neither nodes nor anti-nodes

33. At the open end of an organ pipe:
a) Nodes are formed
b) Antinodes are formed
c) Either nodes or antinodes may form
d) Neither nodes nor antinodes may form

34. A set of frequencies, which is multiple of fundamental frequency is called:
a) Beat frequency
b) Harmonics
c) Doppler frequencies
d) Nodal frequencies

35. The points of maximum displacement on a stationary wave is called
a) Anti-node
b) Node
c) Trough
d) Crest

36. In vibrating cord the points where the amplitude is zero, are called.
a) Antinodes
b) Nodes
c) Troughs
d) Crests

37. A distance between two consecutive nodes is:
a) λ
b) $\frac{\lambda}{2}$
c) $\frac{\lambda}{4}$
d) $\frac{\lambda}{8}$

38. Radar system is an application of:
a) Interferece
b) Beats
c) Stationary waves
d) Doppler effect

39. Stars moving towards the earth show:
a) Blue shift
b) Red shift
c) No shift
d) Longer wavelength

40. Which of the following does not have any effect on the speed of sound in gases?
a) Temperature
b) Density
c) Pressure
d) None of these

41. In a stationary wave, the particle velocity at the node is:
a) Maximum
b) Minimum
c) Zero
d) Constant

42. Doppler Effect applies to
a) Sound wave only
b) Light wave only
c) Both sound and light wave
d) Neither sound nor light wave

43. When the source of sound moves away from a stationary listener, then _____occurs:
a) An apparent increase in frequency
b) An apparent decrease in frequency
c) An apparent decrease in wavelength
d) An apparent change in frequency

44. A simple pendulum has a bob of mass 'm' and its frequency is 'f'. If we replaced the bob with a heavier one, say of '2m', then what will be its new frequency?
a) 1/4f
b) 1/2f
c) f
d) 2f

45. The distance between a node and anti-node is
a) λ
b) $\frac{\lambda}{2}$
c) $\frac{\lambda}{4}$
d) $\frac{\lambda}{8}$

46. The distance between two consecutive antinodes is:
a) $\frac{\lambda}{2}$
b) $\frac{\lambda}{4}$
c) λ
d) $\frac{\lambda}{8}$

47. In open organ pipe
a) Only even harmonics are present
b) Only odd harmonic are present
c) Both even and odd harmonics are present
d) Selected harmonics are present

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1	a	**17**	b	**33**	b
2	d	**18**	c	**34**	b
3	a	**19**	d	**35**	a
4	d	**20**	c	**36**	b
5	c	**21**	b	**37**	b
6	d	**22**	b	**38**	d
7	b	**23**	d	**39**	a
8	a	**24**	a	**40**	c
9	c	**25**	b	**41**	c
10	c	**26**	b	**42**	c
11	e	**27**	b	**43**	b
12	a	**28**	c	**44**	c
13	c	**29**	c	**45**	c
14	c	**30**	a	**46**	a
15	c	**31**	b	**47**	c
16	a	**32**	b		

CHAPTER 9: PHYSICAL OPTICS

1. The locus of all points in a medium having the same phase of vibration is called
a) Crest
b) Trough
c) Wavelength
d) Wave front

2. The distance between two consecutive wave fronts is called:
a) Time period
b) Frequency
c) Wavelength
d) Displacement

3. Which one of the following is nearly monochromatic light?
a) Light form fluorescent tube
b) Light form sodium lamp
c) Light form neon lamp
d) Light form simple lamp

4. Two sources of light are coherent if they emit rays of
a) Same wavelength
b) Same amplitude of vibration
c) Same wave length with constant phase difference
d) Same amplitude and wavelength

5. Sodium chloride in a flame gives out pure:
a) Blue light
b) Yellow light
c) Red light
d) White light

6. When crest of one wave falls over the trough of the other wave, this phenomenon is known as
a) Polarization
b) Constructive interference
c) Destructive interference
d) Diffraction

7. The condition for constructive interference of two coherent beams is that the path difference should be
a) Integral multiple of λ/2
b) Integral multiple of λ
c) Odd Integral multiple of λ/2
d) Even integral multiple of λ

8. The condition for destructive interference of two coherent beams is that the path difference should be
a) Integral multiple of λ/2
b) Integral multiple of λ
c) Odd Integral multiple of λ/2
d) Even integral multiple of λ

9. In Young's double slit experiment, the distance between two adjacent bright fringes, Δy is:
a) $\frac{2\lambda L}{d}$
b) $\frac{3\lambda L}{d}$
c) $\frac{\lambda L}{2d}$
d) $\frac{\lambda L}{d}$

10. In Young double slit experiment, if white light is used
a) Alternate dark and bright fringes will be seen
b) Colored fringes will be seen
c) No interference fringes will be seen
d) Impossible to predict

11. The center of Newton's rings is_____ due to destructive interference:
a) Bright
b) Dark
c) Colorless
d) Red

12. When the Newton's rings are observed with reflected light, the central spot is:
a) Red
b) Blue
c) Dark
d) Bright

13. When the Newton's rings are observed with transmitted light, the central spot is:
a) Red
b) Blue
c) Dark
d) Bright

14. The appearance of Color in thin films is due to
a) Diffraction
b) Dispersion
c) Interference
d) Polarization

15. Soap film exhibit brilliant colors in sun light due to:
a) Dispersion of light
b) Interference of light
c) Diffraction of light
d) Scattering of light

16. A light ray traveling form rarer to denser medium suffers a phase change of:
a) $60°$
b) $90°$
c) $180°$
d) $45°$

17. A light ray traveling form denser to rarer medium suffers a phase change of:
a) $0°$
b) $90°$
c) $180°$
d) $45°$

18. One angstrom is equal to:
a) $10^{-9}\ m$
b) $10^{-8}\ m$
c) $10^{-10}\ m$
d) $10^{-11}\ m$

19. $2d \sin\theta = m\lambda$ is called:
a) Laplace's equaiton
b) Reflection equation
c) Refraction equaion
d) Bragg's equation

20. $d \sin\theta = m\lambda$ is called:
a) Laplace's equaiton
b) Slit Diffraction Condition
c) Refraction equaion
d) Bragg's equation

21. Bending of light around the edges of an obstacle is known as:
a) Refraction
b) Polarization
c) Diffraction
d) Interference

22. The bending of a beam of light when it passes from one medium to another is known as:
a) Refraction
b) Reflection
c) Diffraction
d) Dispersion

23. The effective path difference between two reflected beams, in x-ray diffraction by crystal is:
a) $d \sin\theta$
b) $2d \sin\theta$
c) $d \sin\frac{\theta}{2}$
d) $d \sin 2\theta$

24. The equation of Michelson's interferometer is:
a) $L = \frac{m\lambda}{2}$
b) $L = \frac{m\lambda}{4}$
c) $L = m\lambda$
d) $L = 2m\lambda$

Q. No.	Ans.	Q. No.	Ans.
1	d	**13**	d
2	c	**14**	c
3	b	**15**	b
4	c	**16**	c
5	b	**17**	a
6	b	**18**	c
7	b	**19**	d
8	c	**20**	b
9	d	**21**	c
10	c	**22**	a
11	b	**23**	b
12	c	**24**	a

CHAPTER 10: OPTICAL INSTRUMENTS

1. The least distance of distict vision for a normal eye is:
a) 15 cm
b) 25 cm
c) 30 cm
d) 40 cm

2. A point where the incident parallel rays of light converge or appear to diverge after passing through a lens is called
a) Center of curvature
b) Focus
c) Optical centre
d) Aperture

3. A lens which converges a beam of parallel rays to a point is called:
a) Diverging (or concave) lens
b) Converging (or convex) lens
c) Plano concave lens
d) Plano convex lens

4. A real object placed inside the focus of a convex lens gives:
a) Real image but diminished
b) Real image but enlarge
c) Virtual image but diminished
d) Virtual image but enlarge

5. The power of the lens is measured in:
a) Watt
b) Joule
c) Diopter
d) Minutes

6. If a single convex lens is placed close to the eye, it can be used as a
a) Telescope
b) Simple microscope
c) Compound microscope
d) Refracting telescope

7. The magnifying power of a simple microscope is:
a) $1+\frac{d}{f}$
b) $1-\frac{d}{f}$
c) $1+\frac{f}{d}$
d) $1-\frac{f}{d}$

8. The magnifying power of a compound microscope is given by
a) $\frac{p}{q}\left(1+\frac{f_e}{d}\right)$
b) $\frac{q}{p}\left(1+\frac{d}{f_e}\right)$
c) $\frac{q}{p}\left(1+\frac{f_e}{d}\right)$
d) $\frac{p}{q}\left(1+\frac{d}{f_e}\right)$

9. The magnifying power of an astronomical telescope is:
a) f_0+f_e
b) f_0-f_e
c) $f_0 f_e$
d) $\frac{f_0}{f_e}$

10. For normal adjustment, the length of astronomical telescope is:
a) f_0+f_e
b) f_0-f_e
c) $f_0 f_e$
d) $\frac{f_0}{f_e}$

11. For the phenominon of total internal reflection, the angle of incidance should be:
a) Equal to critical angle
b) Smaller than critical angle
c) Greater than critical angle
d) Zero

12. Referactive index is given by:
a) $\frac{c}{v}$
b) $\frac{v}{c}$
c) $\sqrt{\frac{c}{v}}$
d) $\sqrt{\frac{v}{c}}$

13. The value of critical angle for glass-air boundry is:
a) $41.8°$
b) $41.5°$
c) $42.8°$
d) $42°$

14. In michelson's experiment, the equation used to find te speed of light is:
a) $c = 16\, fd$
b) $c = 16\, \frac{f}{d}$
c) $c = 16\, \frac{d}{f}$
d) $c = \frac{1}{16\, fd}$

15. The instrument which is used to measure speed of light was developed by
a) Newton
b) Galileo
c) Michelson
d) Graham Bell
e) Huygen

16. In going form a denser to rarer medium a array of light is
a) Un-deviated
b) Bent away from the normal
c) Bent towards the normal
d) Polarized

17. At some angle of incidence, when angle of refraction becomes 90°, this angle is called:
a) Phase angle
b) Incident angle
c) Refractive angle
d) Critical angle

18. In multimode step index fibre the refractive index of core and cladding is
a) Same
b) Different
c) Zero
d) Different with refractive index of core higher than cladding

19. Dispersion effect may produced error in light signals. This type of error is minimum in:
a) Single mode step index fiber
b) Multimode step index fiber
c) Multimode graded index fiber
d) Monomode step index fiber

20. Light signals passes through multimode graded fiber due to:
a) Continuous refraction
b) Total internal reflection
c) Both continuous refraction and total internal reflection
d) Diffraction

21. Critical angle is that incident angle in denser medium for which angle of refraction is.
a) 0^o
b) 45^o
c) 90^o
d) 180^o

22. The electrical signals change into light signals for transmission through optical fiber. A light pulse represents.
a) Zero (0)
b) One (1)
c) Both zero (0) and one (1)
d) Neither zero (0) nor one (1)

23. The optical fiber in which the central core has higher refractive index and its density gradually decreases towards its periphery is called:
a) Single mode index fiber
b) Multi mode index fiber
c) Multi mode graded index fiber
d) None of these

24. Which of the phenomenon of light is used in propagation of light through optical fibers?
a) Total internal reflection
b) Polarization
c) Interference
d) Diffraction

Q. No.	Ans.	Q. No.	Ans.
1	b	**13**	a
2	b	**14**	a
3	b	**15**	c
4	d	**16**	b
5	c	**17**	d
6	b	**18**	d
7	a	**19**	c
8	b	**20**	a
9	d	**21**	c
10	a	**22**	b
11	c	**23**	c
12	a	**24**	a

CHAPTER 11

1. Heat is the form of:
a) Power
b) Work
c) Energy
d) Motion

2. Pressure of the gas depends upon:
a) Only on molecular speed
b) Only on mass of molecule
c) Only on number of molecules in a unit volume
d) Number of molecules in a unit volume, mass and speed of molecule

3. In the isothermal process, one of the following is constant:
a) Pressure
b) Volume
c) Temperature
d) Heat energy
e) Specific heat

4. A process in which no heat enters or leaves the system is called:
a) Isothermal process
b) Adiabatic process
c) Isochoric process
d) Isobaric process

5. For a gas obeying Boyle's law, if the pressure is doubled, the volume becomes:
a) Double
b) One half
c) Four times
d) One fourth

6. Gas law $PV^{\gamma} = \text{constant}$ is for:
a) Isothermal process
b) Adiabatic process
c) Isobaric process
d) Isochoric process

7. Cloud formation in the atmosphere is example of:
a) Adiabatic process
b) Isothermal process
c) Isochoric process
d) Isobaric process

8. Boyle's law holds for ideal gases in.
a) Isochoric processes
b) Isobaric processes
c) Isothermal processes
d) Adiabatic processes

9. Which one is true for internal energy?
a) It is sum of all forms of energies associated with molecules of a system.
b) It is a state function of a system
c) It is proportional to transnational K.E of the molecules
d) All are correct

10. The internal energy of an ideal gas is directly proportional to:
a) Potential energy
b) Translational kinetic energy
c) Vibrational kinetic energy
d) None of these

11. Which one is correct relation?
a) $C_P + C_V = \gamma$
b) $C_P = 1 + R/C_V$
c) $\gamma = C_P/C_V$
d) $C_P = 1 - R/C_V$

12. Specific heats of a gas at constant pressure and at constant volume are respectively C_p and C_v:
a) $C_p < C_v$
b) $C_p > C_v$
c) $C_p = C_v$
d) none of these

13. Numerical value of Boltzmann's constant is.
a) $1.38 \times 10^{-31} JK^{-1}$
b) $3.18 \times 10^{-31} JK^{-1}$
c) $3.18 \times 10^{-23} JK^{-1}$
d) $1.38 \times 10^{-23} JK^{-1}$

14. The first law of thermodynamics is an expression of:
a) The conservation of energy
b) Conservation of mass
c) Heat death of the universe
d) Degradation of energy

15. The amount of heat required raising the temperature of 1 kg of a substance through 1 K is called
a) Specific heat
b) Heat capacity
c) Calorie
d) Joule

16. The expression for isothermal process is:
a) $Q = U$
b) $Q = W$
c) $U = W$
d) $U = -W$

17. In adiabatic expansion, first law of thermodynamics becomes:
a) $\Delta Q = \Delta W$
b) $\Delta Q = \Delta U$
c) $\Delta W = \Delta U$
d) None of these

18. The Celsius scale starts from:
a) $32°F$
b) $273\ K$
c) $0°C$
d) $373\ K$

19. Unit of thermodynamic scale of temperature is:
a) Kelvin
b) Centigrade
c) Fahrenheit
d) Celsius

20. Normal human body temperature 98.6°F corresponds to.
a) 37°C
b) 42 °C
c) 55 °C
d) 410 °C

21. Triple point of water is.
a) $373.16\ K$
b) $284.16\ K$
c) $300.16\ K$
d) $273.16\ K$

22. If the temperature of the sink is decreased, the efficiency of Carnot engine:
a) Decreases
b) Increases
c) Remains the same
d) First increases and then decreases

23. The area enclosed by the curve ABCDA for a Carnot heat engine represents the work done by Carnot engine.
a) At any instant
b) Averagely
c) During its operation
d) During one cycle

24. Carnot cycle is:
a) Reversible
b) Irreversible
c) Both
d) None of these

25. The efficiency of diesel engine is about:
a) $50\%\ to\ 60\%$
b) $25\%\ to\ 30\%$
c) $35\%\ to\ 40\%$
d) $40\%\ to\ 50\%$

26. The efficiency of petrol engine is about:
a) $30\%\ to\ 35\%$
b) $25\%\ to\ 30\%$
c) $35\%\ to\ 40\%$
d) None of these

27. The efficiency of a Carnot engine between HTR at T_1 and LTR at T_2 is given by:
a) $1-\frac{T_1}{T_2}$
b) $\frac{T_2-T_1}{T_1}$
c) $\frac{T_1-T_2}{T_1}$
d) $\frac{T_1}{T_1-T_2}$

28. Working cycle of a typical petrol engine consists of:
a) Two strokes
b) Four strokes
c) Six strokes
d) Eight strokes

29. The unit of entropy is:
a) JK
b) $\frac{K}{J}$
c) $\frac{J}{K}$
d) $\frac{J}{K^2}$

30. Mathematically, entropy is represented by:
a) $\Delta Q = \frac{\Delta S}{T}$
b) $\Delta S = \frac{\Delta Q}{T}$
c) $\Delta S = \Delta Q.T$
d) $\Delta S = \frac{\Delta T}{Q}$

31. The increase in the entropy means the increase in:
a) Disorder
b) Unavailability of energy
c) Randomness
d) All of these

32. The property of a system that remains constant during an adiabatic process is called:
a) Internal energy
b) Entropy
c) Temperature
d) Pressure

33. In which process entropy remains constant.
a) Isobaric
b) Isochoric
c) Adiabatic
d) Isothermal

34. When heat is added to the system, the entropy change is:
a) Positive
b) Negative
c) Zero
d) None

Q. No.	Ans.	Q. No.	Ans.
1	c	**18**	c
2	d	**19**	a
3	c	**20**	a
4	b	**21**	d
5	d	**22**	b
6	b	**23**	d
7	a	**24**	a
8	c	**25**	c
9	d	**26**	b
10	b	**27**	c
11	c	**28**	b
12	b	**29**	c
13	d	**30**	b
14	a	**31**	d
15	a	**32**	b
16	b	**33**	c
17	c	**34**	a


Good
Luck!