1st Year Physics Most Important MCQs

Note: For Better Preparation of MCQs, prepare all MCQs from any past paper or helping book

OBJECTIVE A +(-A)

1. The process of vector subtraction is similar to the process of

A) Multiplication of vectors (B) resolution of vectors (C) Addition of vectors (D) division of vectors

2. If R_x is negative and R_y is positive, then the resultant vector lies in:

(A) 2nd quadrant (B) 3rd quadrant (C) 4th quadrant (D) 1st quadrant

3. The relation results the

(A) Parallel vector (B) unit vector (C) null vector (D) position vector

4. Dot product of two non-zero vectors is zero if angle between them is:

(A) 30 (B) 60 (C) 45 (D) 90

5. The turning effect of Force is called:

(A) Work (B) Momentum (C) Power (D) Torque

6. The absolute uncertainty of screw gauge is

(A) 0.01 cm (B) 0.01 mm (C) 0.001 mm (D) 0.1 cm

7. Dimension of frequency is same that of

(A) Time period (B) angular velocity (C) angular acceleration (D) mass

8. The least count of meter rod is

(A) 0. 1 cm (B) 0.01 cm (C) cannot be zero (D) can be zero

9. Velocity of an object dropped from a building at any instant 't' is given by

(A) gt (B) $1/2gt^2$ (C) $v_it + 1/2\ gt^2$ (D) gt^2

10. Equations of motion hold only when there is

(A) Linear motion with constant velocity (B) linear motion with variable acceleration

(C) Linear motion with uniform acceleration (D) none of these **11. The velocity of freely falling body just before hitting the ground is 9.8 ms^{-1}. The height through which it falls is:**

(A) 9.8m (B) 4.9m (C) 19.6m (D) 196 m

12. Inertia of body is measured in terms of:

(A) its weight (B) its mass (C) its velocity (D) its force

13. The rate of change of momentum is equal to:

(A) Force (B) Impulse (C) Momentum (D) acceleration

14. A mass of fuel consumed by a typical rocket to overcome earth's gravity is

(A) 10000 kgs^{-1} (B) 1000kgs^{-1} (C) 100kgs^{-1} (D) 10kgs^{-1}

15. Which parameter changes during projectile motion?

(A) Vertical velocity (B) acceleration (C) horizontal velocity (D) both A and B

16. Single force does not exist, is the result of which law of motion

(A) 1st law (B) 2nd law (C) 3rd law (D) all of these

17. The area under the force-displacement graph represents:

(A) Work done (B) power (C) torque (D) momentum

18. The work done is half of max value if the angle between the force $\vec{F}$ and displacement $\vec{d}$ is:

(A) 180° (B) 90° (C) 45° (D) 60°

19. In conservative field the work done is independent of

(A) path followed by the body (B) direction (C) force (D) Angle

20. 9 joules of work is done in 3 seconds then power is:

(A) 6 watt (B) 3 watt (C) 18 watt (D) 2 watt

21. A body of mass 5 kg has P.E 100 J. Its height from the ground is

(A) 10m (B) 8 m (C) 5m (D) 2 m

22. The dimension of power is

(A) $[MLT^{-2}]$ (B) $[MLT^{-3}]$ (C) $[ML^{-1}T^{-2}]$ (D) $[ML^2T^{-3}]$

23. The energy stored in a dam is

(A) Elastic P.E (B) gravitational P.E (C) K.E (D) electric energy

24. The angle between angular velocity and angular acceleration when angular velocity decreases is

(A) 30^o (B) 45^o (C) 180^o (D) 90^o

25. A car of mass 1000kg traveling at 40 ms^{-1} rounds a curve of radius 100m. what is the F_C

(A) 100 N (B) 1.6 x 10^4N (C) 1.6 x 10^6N (D) 8x 10^4N

26. Moment of inertia is measured in

(A) $Kg.m^2$ (B) $Kg.m^{-2}$ (C) $rd\text{-}sec^{-1}$ (D) Joule. Sec

27. The ratio of rotational K.E of hoop to its translational K.E is

(A) 1:2 (B) 2:1 (C) 1:1 (D) 1:4

28. The weight of a man in an elevator moving down with an acceleration of 9.8 ms^{-2} will be

(A) Half (B) Double (C) Four times (D) Zero

29. A wheel of radius 50 cm having angular speed of 5 rad s^{-1} will have linear speed in ms^{-1}:

(A) 1.5 (B) 2.5 (C) 3.5 (D) 4.5

30. Equation of continuity gives the conservation of the:

(A) Mass (B) Energy (C) Speed (D) Volume

31. The velocity of liquid below which its flow is laminar is called

(A) Critical velocity (B) escape velocity (C) relative velocity (D) terminal velocity

32. If amplitude of a simple pendulum is increased by 4 times the time period will be:

(A) Four times (B) Half (C) Same (D) Two times

33. The wavelength of waves produced by microwave oven is:

(A) 0.12 cm (B) 1 cm (C) 6cm (D) 12 cm

34. In SHM the restoring force is directly proportional to

(A) Velocity (B) speed (C) acceleration (D) displacement

35. When a body is vibrating, the value of its distance from the mean position at any time is called

(A) SHM (B) distance (C) instantaneous displacement (D) Instantaneous amplitude

36. The number of vibration per unit time is called

(A) Time period (B) frequency (C) vibration (D) amplitude

37. If spring is cut into three pieces than spring constant of each spring becomes

(A) Double (B) half (C) remains same (D) none of these

38. The time period of simple pendulum is independent of its

(A) Length (B) mass (C) gravitational acceleration (D) all of these

39. By increasing the weights on an oscillatory spring, the period of oscillation would be

(A) Increases (B) decreased (C) remain same (D) may increase or decrease

40. The waves which do not require any medium for propagation is called

(A) Sound waves (B) water waves (C) electromagnetic waves (D) all of these **41. Bounce back of waves from the boundary of medium is known as**

(A) Reflection of waves (B) refraction of waves (C) interference of waves (D) none of these

42. The elasticity of glass is _____liquids

(A) smaller than (B) equal to (C) greater than (D) none of these

43. When the observer moves away from the stationary source the frequency

(A) Increases (B) become zero (C) remain same (D) decreases

44. If tension (or external force) generating stationary waves remain constant then speed of wave

(A) Will be greater (B) will be smaller (C) also remain constant (D) none of these

45. Electromagnetic waves transfer

(A) Mass (B) energy (C) both A and B (D) none

46. According to Laplace sound travels in air under

(A) Isothermal condition (B) adiabatic conditions

(C) Isobaric conditions (D) isochoric conditions

47. The periodic variations of sound between maximum and minimum loudness are called

(A) Beats (B) Interference (C) reflection (D) diffraction

48. Light waves are

(A) Longitudinal waves (B) Parallel to wave front (C) Opposite to wave front (D) Equal to wave front **49. Sodium chloride in a flame gives out pure:**

(A) Blue light (B) Yellow light (C) Wavelength (D) Displacement

50. In Young's double slit experiment, the fringe spacing is equal to

(A) $\frac{2\lambda}{D}$ (B) $\frac{\lambda L}{d}$ (C) $\frac{d}{\lambda D}$ (D) $\frac{\lambda d}{D}$

51. Such a surface on which all the points have the same phase of vibration is called

(A) Crest (B) trough (C) wavelength (D) wave front

52. In a compound microscope magnification produced by objective is 5 and that produced by eye piece is 50, the total magnification produced by the microscope is

(A) 250 times (B) 10 times (C) 25 times (D) 100 times

53. The magnifying power of astronomical telescope is

(A) $\frac{f_0}{f_e}$ (B) $f_0 + f_e$ (C) $f_0 \lambda f_e$ (D) $f_0 - f_e$

54. An optical fiber carries data in the form of

(A) Light signals (B) sound signals (C) waves (D) particles

55. At some angle of incidence when the angle of refraction becomes 90°, this angle is called

(A) Phase angle (B) Incident angle (C) Refractive angle (D) Critical angel

56. For 1 mole of gas the relation P V=λ

(A) R Tλ (B) R Vλ (C) R Pλ (D) P Tλ

57. The amount of heat required to raise the temperature of one mole of substance through 1 Kelvin is called: (A) Specific heat (B) molar specific heat (C) Specific heat at constant volume (D) Heat capacity

58. In heat engine the heat is supplied through

(A) Hot reservoir (B) cold reservoir (C) sink (D) generator

59. An ideal heat engine can only be 100% efficient if its exhaust temperature is:

(A) 100°C (B) 0°C (C) 0 K (D) temperature of hot reservoir

60. If 1 mole of an ideal gas is heated at constant pressure then

(A) $Q_P = C_V \lambda T$ (B) $Q_P = C_P \lambda T$ (C) $Q_V = C_V \lambda T$ (D) $Q_V = C_P \lambda T$

61. The sum of all forms of molecular energy present in a thermodynamic system is called its

(A) Environmental energy (B) Temperature (C) Heat (D) Internal energy

62. First law of thermodynamics for an adiabatic process is

(A) $W U = -\lambda$ (B) $Q = \lambda U + W$ (C) Q =W (D) $Q = \lambda U$

63. For an isothermal process, first law of thermodynamics becomes

(A) $Q=W$ (B) $Q= \Delta U + W$ (C) $W = -\Delta U$ (D) $W=0$

64. Light year is a unit of

(A) time (B) speed (C) distance (D) light

65. Which SI unit written correctly

(A) Newton (B) Pascal (C) kelvin (D) watt

66. Electric charge in terms of base units is expressed as

(A) ampere (B) second (C) ampere x second (D) coulomb x second

67. The vector which describe the location of a point w.r.t the origin is called

(A) parallel vector (B) unit vector (C) null vector (D) position vector

68. The relation A +(-A) results the

(A) Parallel vector (B) unit vector (C) null vector (D) position vector

69. Graphically the direction of vector in a plane is denoted by

(A) Point (B) line (C) arrow head (D) an angle

70. The a_y component of a vector "a " of magnitude 90N making an angle of 30^0 with x-axis is

(A) 45N (B) 1N (C) 5N (D) 10N

71. A vector which has the same effect as all the original vectors taken together is called:

(A) Position vector (B) null vector (C) equal vector (D) resultant vector

72. If a car moves with uniform speed of 2m/s in a circle of radius 0.4 m. It's angular speed is

(A) 4 rad/s (B) 5 rad/s (C) 6 rad/s (D) 7 rad/s

73. When the axis of rotation is fixed then all the angular vectors have

(A) same direction (B) directionless (C) different direction (D) none of these

74. The linear velocity in circular path is also called

(A) Tangential velocity (B) instantaneous velocity

(C) Relative velocity (D) angular velocity

75. The direction of motion changes continuously in

(A) Rectilinear motion (B) circular motion (C) linear motion (D) none of these

76. Centripetal force performs.

(A) Maximum work (B) minimum work (C) negative work (D) no work

77. The unit of co-efficient of viscosity is

(A) kgm^{-1} (B) $kg^{-1}ms^{-1}$ (C) $Nm^{-2}s$ (D) $Nm^{-2}S^{-2}$

78. The dimension of co-efficient of viscosity is

(A) $[MLT^{-1}]$ (B) $[M^{-1}T]$ (C) $[ML^{-1}T^{-1}]$ (D) $[MT^{-1}]$

79. The maximum constant velocity of an object moving through the fluid is called

(A) Escape velocity (B) drag velocity (C) terminal velocity (D) fluid velocity

80. Two fog droplets have radius 2:3 their terminal velocities are in ratio of

(A) 4:6 (B) 4:9 (C) 2:3 (D) 4:3

81. light is a form of

(A) Matter (B) velocity (C) energy (D) acceleration

82. Electromagnetic wave travel in free space with the velocity of

(A) 332 ms^{-1} (B) $3x10^6$ ms^{-1} (C) $3x10^8$ ms^{-1} (D) 330 ms^{-1}

83. When crest of one wave falls on the trough of other wave this phenomenon is called

(A) Diffraction (B) Polarization

(C) Constructive Interference (D) Destructive Interference

84. In young's experiment if white light is used then

(A) No fringe will be seen (B) bright fringe will be seen

(C) Few coloured fringes will be seen (D) dark fringe will be seen

85. Power losses in optical fiber are due to

(A) Reflection and rarefaction (B) scattering and absorption

(C) Interference and diffraction (D) all of these

86. If an object is placed away from 2F from a converging lens, the image is located behind the lens

(A) at 2F (B) between F and 2F (C) at infinity (D) at the focus

87. The magnifying power of a simple microscope is

(A) $M = +\frac{1}{f}$ (C) $M =$ (B) $M = +1\frac{d}{f} + \frac{1}{1}$ (D) $M = +1\, df\, df$

88. Watch makers uses

(A) convex lens (B) concave lens (C) plano-concave lens (D) mirror

89. Which of the following relation holds for $C_P - C_V = R$

(A) $C_V = C_P$ (B) $C_V \square C_P$ (C) $C_V \square C_P$ (D) $C_V + C_P$

90. The K.E of the molecules of an ideal gas at absolute zero will be

(A) zero (B) low (C) high (D) remain same

91. The relation PV = RT hold good for

(A) one kilogram of gas (B) one meter cubic volume of gas

(C) one mole of gas (D) one gram of gas

92. The relationship between heat and other form of energy is called

(A) thermal equilibrium (B) thermodynamics (C) thermal energy (D) none of these

93. Equations of motion hold only when there is

(A) linear motion with constant velocity (B) linear motion with variable acceleration

(C) linear motion with uniform acceleration (D) none of these

94. Velocity of an object dropped from a building at any instant 't' is given by

(A) gt (B) $1/2gt^2$ (C) $v_it + 1/2\ gt^2$ (D) gt^2

95. Acceleration due to gravity near the surface of the earth is

(A) $0ms^{-2}$ (B) $9.8ms^{-2}$ (C) 1.6 m/s^2 (D) 11.2 m/s^2

96. Distance covered by a free falling body during 1st second of its motion is

(A) 4.9m (B) 9.8m (C) 14.7m (D) 19.6m

97. Force of gravity varies as the _____ square of distance from the Earth's center.

(A) direct (B) inverse (C) reverse (D) none of these

98. Which of the following is non-conservative force

(A) friction (B) air resistance (C) tension in string (D) all of them

99. A force of 10N acts on the body and body moves 10m distance perpendicular to it. Work done by the force onthe body is

(A) 10J (B) 100J (C) zero (D) infinite

100. A field in which work done in moving a body in a closed path is zero is called

(A) gravitational field (B) electric field (C) conservative field (D) ideal field

Compiled By: Mirza Umar

HOD Physics

Composed By: Sir Bilal Zulfiqar (Software Engineer) Contact: 0308-4848597/0307-0499768

Physics Part 1 Important Short Questions & Long Questions

Chapter 1:

Exercise Short Questions::

Q # 1 Does the dimensional analysis gives any information on constant of proportionality that may appear in an algebraic expression. Explain?
Q # 2 Write the dimensions of (i) Pressure (ii) Density?
Q # 3 The wavelength of a wave depends on the speed of the wave and its frequency. Decide which of the following is correct,
V = f□ or V/□ = f

Additional Short Questions:

Q 1: Differentiate between precise measurement (Precision) and accurate measurement (Accuracy)?
Q 2: Define absolute uncertainty?
Q 3: What is dimension? Write down two uses of dimensional analysis?
Q 4: Write dimension of Mass, Length, Time/Time period, Velocity, Acceleration, Force, Work, Power, Torque, Frequency, Momentum, Impulse, Viscosity, Angular velocity, Angular acceleration? Q 5: Example: 2,3,4,6
Q 6: Numerical: 4,5,6,7,9

Chapter 2:

Exercise Short Questions::

1) Define the terms (i) Unit Vector (ii) Position Vector (iii) Component of a Vector.
2) The vector sum of three vectors gives a zero resultant. What can be the orientation of the vectors?
3) Is it possible to add a vector quantity to a scalar quantity? Explain.
4) Can you add zero to a null vector?
5) Show that the sum and difference of two perpendicular vectors of equal lengths are also perpendicular and of the same length?
6) Suppose the sides of a closed polygon represent vector-arranged head to tail. What is the sum of these vectors?
7) If all the components of the vectors A1 and A2 were reversed, how would this alter A1 × □2?

Additional Short Questions:

Q 1: Define null and equal vectors.
Q 2: Define Resultant vector and rectangular component of a vector?
Q 3: Define scalar product with two examples?
Q 4: Define torque (moment of force)? Write its unit and dimension?
Q 5: Define moment arm?
Q 6: Define Coordinate axes and rectangular coordinate system?
Q 7: Define vector product with two examples?
Q 8: State right hand rule?
Q 9: Write down two properties of scalar product? OR
Under what condition scalar product will be maximum and zero?
Q 10: Write down two properties of vector product? OR Under what condition vector product will be maximum and zero?
Q 11: Scalar product is a commutative property. Justify?
Q 12: Vector product is a non-commutative property. Justify?

Composed By: Sir Bilal Zulfiqar (Software Engineer) Contact: 0308-4848597/0307-0499768

Long Questions:

Example: 2,3,5,6
Numerical: 3,5,6,9,10,11,14
Long question:
(1).vector addition by rectangular components
(2). Scalar product with its characteristics
(3).vector product with its characteristics
(4). Torque

Chapter 3:

Exercise Short Questions::

1. Define impulse and show that how it is related to linear momentum.
2. State the law of conservation of linear momentum?
3. Explain the difference between elastic and inelastic collisions.
4. At what point or points in its path does a projectile have its minimum speed, its maximum speed?

Additional Short Questions:

Q # 1 Define the term impulse? Also write its unit and dimension? Does a moving body have impulses?
Q # 2 Find out the expression of force on a wall due to water flow
Q # 3 What do you know about projectile motion? Write down the expression of horizontal and vertical distance at any instant of time?
Q # 4 Derive the expressions for Height of projectile?
Q # 5 Derive the expressions for Time of Flight.
Q # 6 Derive the expressions for Range and maximum range of Projectile
Q # 7 Define ballistics flight and ballistic trajectory.

Long Questions:

Example: 2,3,5,6,7
Numerical: 3,8,9,10,11,13
Long questions:
(1). Law of conservation of momentum
(2). Elastic collision in one dimension with its cases
(4). Rocket propulsion
(5). Projectile motion complete

Chapter 4:

Exercise Short Questions:

1. A person hold a bag of groceries while standing still, talking to a friend. A car is stationary with its engine running. From the standpoint of work, how are these two situations similar?
2. Calculate the work done in kilo joules in lifting a mass of 10 kg (at a steady velocity) through a vertical height of10 m.
3. In which case is more work done? When a 50 kg bag of books is lifted through 50 cm, or when a 50 kg crate is pushed through 2 m across the floor with a force of 50 N?
4. An object has 1 J of potential energy. Explain what it means?
5. When a rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy comefrom?
6. A girl drops a cup from a certain height, which breaks into pieces. What energy changes are involved?

Additional Short Questions:

Q # 1 Define the term work. Give its SI unit and dimension?

Q # 2 What four conclusion can you draw from the definition of work?

Q # 3 Differentiate between conservative and non-conservative field? Give examples?
Q # 4 Define the term power? Give its SI unit and dimension?
Q # 5 Differentiate between Average Power and Instantaneous Power?
Q # 6 Prove that power □P = □F . □V ?
Q # 7 Define: 1) joule 2) watt
Q # 8 Define kilowatt-hour? Show that 1 kWh = 3.6 MJ ?
Q # 9 Define the term energy? Differentiate among kinetic energy and potential energy?
Q # 10 Differentiate between gravitational P.E and elastic P.E?
Q # 11 State work energy relation and write down its equation?
Q # 12 Define escape velocity and also give its equation and value?
Q # 13 Define absolute potential energy and also give its equation?
Q # 14 State law of conservation of energy.

Long Questions:

Example: 1,2,3
Numerical: 1,2,3,4,5,6,7,8
Long questions:
(1). Work done by variable force
(2). Work done by gravitational field
(3). Absolute potential energy
(4). Interconversion of P.E and k.E
(5). Work energy principle

Chapter 5:

Exercise Short Questions:

1. Explain the difference between tangential velocity and the angular velocity. If one of these is given for a wheel of known radius, how will you find the other?
2. Explain what is meant by centripetal force and why it must be furnished to an object if the object is to follow a circular path.
3. What is meant by moment of inertia? Explain the significance.
4. What is meant by angular momentum? Explain the law of conservation of angular momentum.
5. Show that orbital angular momentum Lo = mvr.
6. State the direction of the following vectors in simple situations; angular momentum and angular velocity.
7. When mud flies off the tyre of a moving bicycle, in what direction does it fly? Explain.
8. A disc and a hoop start moving down from the top of an inclined plane at the same time. Which one will be moving faster on reaching the bottom? Disc will be moving faster on reaching the ground?
9. Why does a diver change his body positions before diving in the pool?

Additional Short Questions: Q # 1

Define the term angular displacement? Also write its SI unit and dimension?
Q # 2 Derive the relationship between and radian and degrees?
Q # 3 Define: Angular Velocity, Average Angular Velocity, Instantaneous Angular Velocity? Also write its SI unit and dimension?
Q # 4 Define the following terms corresponding to the circular motion: Angular Acceleration? Also write its SI unit and dimension?
Q # 5
Derive the relationship between the angular displacement and linear displacement?

Derive the relationship between the angular velocity and linear velocity?
Derive the relationship between the angular acceleration and linear acceleration?
Q # 6 What is centripetal acceleration?
Q # 7 Write equation of Moment of inertia for thin rod , thin ring , solid disc and sphere ?

Q # 8 What do you know about the angular momentum? Also give its unit and importance?
Q # 9 Differentiate between spin and orbital angular momentum?
Q # 10 What do you know about the rotational kinetic energy?
Q # 11 What is meant by orbital velocity?
Q # 12 Distinguish among the real weight and apparent weight.

Long Questions:

Example: 1,2,5,6
Numerical: 1,2,3,5,6,7
Long questions:
(1). Centripetal force
(2). Moment of inertia
(3). Rotational K.E (disc and hoop)
(4). Cases of Apparent weight in lift
(5). Law of conservation of angular momentum

Chapter 6:

Exercise Short Questions:

Q.1 Explain what do you understand by the term viscosity?
Q.2 What is meant by drag force? What are the factors upon which drag force acting upon a small sphere of radius r, moving down through liquid, depend?
Q.3 Why fog droplets appear to be suspended in air?
Q.4 Explain the difference between laminar flow and turbulent flow.
Q.5 Two row boats moving parallel in the same direction are pulled towards each other. Explain.
Q.6 Explain how the swing is produced in a fast moving cricket ball.
Q.7 Explain the working of a carburetor of a motor car using Bernoulli's principle.

Additional Short Questions:

Q # 1 Define the term terminal velocity?
Q # 2 White down the properties of an ideal fluid?
Q # 3 What is meant by Torricelli theorem?
Q # 4 Define Venturi relation?

Long Questions:

Example: 1,2,3
Numerical: 1,2,4,5,9
Long question:
(1). Terminal velocity
(2). Equation of continuity
(3). Bernoullis equation
(4). Applications of Bernoullis equation

Chapter 7:

Exercise Short Questions:

Composed By: Sir Bilal Zulfiqar (Software Engineer) Contact: 0308-4848597/0307-0499768

Q.1 What is the total distance traveled by an object moving with SHM in a time equal to its period, if its amplitude is A?
Q.2 What happens to the period of a simple pendulum if its length is doubled? What happens if the suspended mass is doubled?
Q.3 Does the acceleration of a simple harmonic oscillator remain constant during its motion? Is the acceleration ever zero? Explain.
Q.4 What is meant by phase angle? Does it define angle between maximum displacement and the driving force?
Q.5 Under what conditions does the addition of two simple harmonic motions produce a resultant, which is also simple harmonic?
Q.6 Explain the relation between total energy, kinetic energy and potential energy for a body oscillating the SHM?
Q.7 Describe some common phenomena in which resonance plays an important role.
Q.8 If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?

Additional Short Questions:

Q1: Define SHM. (simple harmonic motion)?
Q2: Write down the expressions for angular frequency, time period, displacement and velocity for the case of horizontal mass spring system.
Q3: What is simple pendulum? Which restoring force acts in simple pendulum?
Q4: Explain free and forced oscillations.
Q5: Define resonance. Write its examples.
Q6: Differentiate between mechanical resonance and electrical resonance?
Q7: Give advantages and disadvantages of resonance?
Q8: Briefly give two phenomena in which resonance plays an important role.
Q9. What do you understand by sharpness in resonance?

Long Questions:

Example: 1,2,3
Numerical: 1,2,4,5
Long questions:
(1). Horizontal mass spring system
(2). Simple pendulum
(3). Energy conservation in SHM
(4). Resonance and its advantages and disadvantages

Chapter 8:

Exercise Short Questions:

1. Is it possible for two identical waves travelling in the same direction along a string to give rise to a stationarywave? No. It is not possible.
2. Why does sound travel faster in solids than in gases?
3. How are beats useful in tuning musical instruments?
4. Explain why travels sound faster in warm air than in cold air.

Additional Short Questions:

Q1. Define the term wave.
Q2: Define mechanical and electromagnetic waves. Give examples of each wave?
Q3: Differentiate between longitudinal and transverse waves.
Q4: What is progressive or travelling wave. Give the names of two progressive waves.
Q5: What is effect of pressure on speed of sound in gases Q6:
Describe the effect of density on the speed of sound in gases.
Q7: What is effect of temperature on the speed of sound in gases.

Composed By: Sir Bilal Zulfiqar (Software Engineer) Contact: 0308-4848597/0307-0499768

Q8: State the principle of superposition. Also write the applications of Superposition Principle Q9: Explain the term Beats, Interference.
Q10: Differentiate between constructive and destructive interference.
Q11. Describe the two conditions of reflection of waves.
Q12: How stationary waves are produced in a medium.
Q13: Define node and antinode?

Long Questions:

Example: 1,2,3,4
Numerical: 1,3,5,6,7

Long questions:
(1). Speed of sound in air
(2). Effect of temperature on speed of sound
(3). Beats

(4). Stationary waves in a stretched string
(5). Stationary wave in air columns

Chapter 9:

Exercise Short Questions:

1. Under what conditions two or more sources of light behave as coherent sources?
2. How is the distance between interference fringes affected by the separation between the slits of Young's experiment? Can fringes disappear?
3 Can visible light produce interference fringes? Explain.
4. In the Young's experiment, one of the slits is covered with blue filter and other with red filter. What would be the pattern of light intensity on the screen?
5 Explain whether the Young's experiment is an experiment for studying interference or diffraction effects of light.
6. Could you obtain Newton's rings with transmitted light? If yeas, would the pattern be different from that obtained with reflected light?
7. How would you manage to get more orders of spectra using a diffraction grating?

Additional Short Questions:

Q1: Define wave fronts. Also give its types.
Q2: Define a ray of light.
Q3: State two postulates of Huygen's principle
Q4: What is difference between interference and diffraction fringes?
Q5: What are conditions for detectable interference of light?
Q6: What are Newton's Rings.
Q7: The center of Newton's ring is dark. Why?
Q8: What do you know about Michelson's Interferometer?
Q9: What is diffraction grating, write equation.
Q10: What is meant by diffraction of light.
Q11: Define the term Grating Element.
Q12: Why the diffraction effects of X-rays are not observed by ordinary diffraction gratings.

Long Questions:

Example: 1,2
Numerical: 3,4,5,6,7
Long questions:
(1). Young's double slit experiment
(2). Newton rings
(3). Diffraction grating
(4). Diffraction of r rays by crystal
(5). Michelson interferometer

Chapter 10:

Exercise Short Questions:

1. What do you understand by linear magnification and angular magnification? Explain how a convex lens is used as a magnifier?
2. Explain the difference between angular magnification and resolving power of an optical instrument. What limits the magnification of an optical instrument?
3. Why would it be advantageous to use blue light with a compound microscope?

4. One can buy a cheap microscope for use by the children. The image seen in such a microscope have coloredges. Why is this so?
5. If a person were looking through a telescope at the full moon, how would the appearance of the moon bechanged by covering half of the objective lens?

Additional Short Questions:

1. Define least distance of distinct vision?
2. Define resolution power?
3. What is spectrometer? Write down the name of components of spectrometer?
4. Differentiate between total internal reflection and continuous refraction?
5. What is optical fibre? Give its uses?
6. What is meant by critical angle?

Long Questions:

Example: 1,2
Numerical: 1,2,3,4,6,8,9
Long question:
(1). Simple microscope
(2). Compound microscope
(3). Optical fibre and its principle
(4). Astronomical telescope
(5). Spectrometer
(6) Measurement of speed of light

Chapter 11:

Exercise Short Questions:

1. Why is the average velocity of the molecules in a gas zero but the average of the square of velocities is not zero?
2 Why does the pressure of a gas in a car tyre increase when it is driven through some distance?
3. Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?
4 Give an example of a process in which no heat is transferred to or from the system but the temperature of the system changes.
5. Is it possible to convert internal energy into mechanical energy? Explain with example.
6 Is it possible to construct a heat engine that will not expel heat into the atmosphere?
7. Can the mechanical energy be converted completely into heat energy? If so give an example.

Additional Short Questions:

Q 1. Write the four postulates of kinetic theory of gases.
Q 2. What is meant by pressure of gases? Give its mathematical form?
Q 3. Derive Boyle's law from kinetic theory of gases.
Q 4. Derive Charles' law from kinetic theory of gases.
Q 5. What is average translational kinetic energy of the molecules in a gas at 28 ^{0}C.
Q 6. Define the term internal energy. Discuss in what form it is in an ideal gas.
Q 7. State First law of thermodynamics? How it is applicable on human body.
Q 8. What is the difference between isothermal and adiabatic process.
Q 9. What is meant by heat and work and when it said to be positive and negative?
Q 10. Define molar specific heat of gases and □ ?
Q 11. Define : molar specific heat of gases C_P and molar specific heat of gases C_v.
Q 12. Define the term cycle? Define reversible and irreversible processes. Give example.
Q 13. Draw the diagram of heat engine and refrigerator?
Q 14. Define heat engine. What is its components and working?

Q 15. State second law of thermodynamics? OR State second law of thermodynamics in term of entropy? Q 16. State Carnot's theorem.

Composed By: Sir Bilal Zulfiqar (Software Engineer)

Contact: 0308-4848597/0307-0499768

Long Questions:

Example: 1,2,3,4
Numerical: 1,2,3
4,5,7,8,11 Long questions:
(1). Pressure of a gas
(2). Postulates of KMT
(3). Interpretation of temperature & derivation of gas law
(4). First law of thermodynamics
(5). Isothermal and adiabatic process
(6). Cp-Cv=R prove it
(7). Carnot engine and theorem