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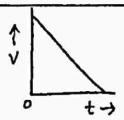
| Paper Code Number: 2477 | 2024 (1st-A) INTERMEDIATE PART-I (11th Class) | Roll No: |
|---|---|---|
| PHYSICS PAPER-I GROUP-I | | |
| TIME ALLOWED: 20 Minutes | OBJECTIVE | MAXIMUM MARKS: 17 |

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

| S.# | QUESTIONS | A | B | C | D |
|---|---|---|---|---|---|
| 1 | The resultant of two forces $\vec{F}_1$ and $\vec{F}_2$ making an angle of $90^o$ with each other is: | $(F_1 - F_2)^2$ | $F_1 + F_2$ | $(F_1 + F_2)^2$ | $\sqrt{F_1^2 + F_2^2}$ ● |
| 2 | The magnitude of $\hat{j} \cdot (\hat{k} \times \hat{i})$ is equal to: | 1 ● | $2\hat{j}$ | 0 | $-2\hat{j}$ |
| 3 | The velocity of a body changes with constant rate. The acceleration is: | Zero | Negative | Constant ● | Increases |
| 4 | The velocity time graph of a body is shown. It implies that:   | Force is positive | Force is negative ● | Force is zero | Force is constant |
| 5 | Gravity performs zero work when body accelerates: | Vertically upward | Vertically downward | Inclined plane | In a vertical loop ● |
| 6 | The acceleration of an object falling freely is: | $9.8ms^{-2}$ ● | $0ms^{-2}$ | $-9.8ms^{-2}$ | $5ms^{-2}$ |
| 7 | The rotational K.E of any ring of radius '$r$' is given by: | $\frac{1}{2}mr\omega^2$ | $\frac{1}{2}mr^2\omega^2$ ● | $\frac{1}{2}mr^2$ | $\frac{1}{4}mr^2\omega^2$ |
| 8 | The viscosity of water at $30^oC$ is: | $0.019Nm^{-2}s$ | $1000Nm^{-2}s$ | $1Nm^{-2}s$ | $0.801Nm^{-2}s$ ● |
| 9 | The time period of a simple pendulum, whose length is 980m is: | $2\pi$ sec | $2\pi\sqrt{0.1}$ sec | $20\pi$ sec ● | $\frac{2}{\pi}$ sec |
| 10 | The speed of sound wave is independent of: | Pressure ● | Medium | Source of sound | Temperature |
| 11 | A longitudinal sinusoidal wave has wavelength of 1cm with a time period of 2sec, its wave velocity is: | $50ms^{-1}$ | $0.005ms^{-1}$ ● | $0.5ms^{-1}$ | $2ms^{-1}$ |
| 12 | Which one of the given cannot be polarized? | Light waves | Radio waves | Microwaves | Sound waves ● |
| 13 | The minimum number of rays required by a lens to form an image are: | 2 ● | 3 | 4 | 5 |
| 14 | When heat is removed from the system, entropy is: | Remain same | Positive | Negative ● | Zero |
| 15 | For mono atomic gas $C_V = \frac{3}{2}R$, therefore gamma "$\gamma$" for gas is: | $\frac{3}{5}$ | $\frac{2}{5}$ | 2 | $\frac{5}{3}$ ● |
| 16 | How many colours are used by colour printing to produce the entire range of colours? | 3 | 4 ● | 5 | 6 |
| 17 | The dimensions of the relation $mc^2$ are equal to the dimensions of: | Force | Momentum | Heat ● | Velocity |



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**PHYSICS PAPER-I GROUP-I**

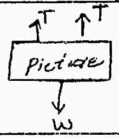
| TIME ALLOWED: 2.40 Hours | SUBJECTIVE | MAXIMUM MARKS: 68 |
|---|---|---|

**NOTE: Write same question number and its parts number on answer book, as given in the question paper.**

Multan Board-G-1-2024

## SECTION-I

**2. Attempt any eight parts.** **8 × 2 = 16**

| | |
|---|---|
| (i) | How do you check the correctness of an equation? |
| (ii) | How would a numerical data should be rounded off up to last significant figure? |
| (iii) | What do you understand about precise and accurate measurement? |
| (iv) | An old saying is that "A chain is only as strong as its weakest link" what analogous statement can you make regarding experimental data used in computation? |
| (v) | Two vectors have unequal magnitude. Can their sum be zero? Explain. |
| (vi) | What is the minimum value of tension in the string?   |
| (vii) | How do you subtract two vectors? |
| (viii) | An object is thrown vertically upward. Discuss the sign of acceleration due to gravity relative to velocity, while the object is in air. |
| (ix) | How a rocket is propelled in space? |
| (x) | When a moving car stops quickly, in what direction passengers fall and why? |
| (xi) | What is the method of fermentation? |
| (xii) | What sort of energy is in (a) compressed spring (b) moving car (c) water in a high dam? |

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**3. Attempt any eight parts.** **8 × 2 = 16**

| | |
|---|---|
| (i) | If a body of mass 10kg is allowed to fall freely what will be its weight? |
| (ii) | Show that orbital angular momentum, $L_o = mvr$. |
| (iii) | What is meant by moment of inertia? Explain its significance. |
| (iv) | Why does a diver change his body position before and after diving in the pool? |
| (v) | Explain the term viscosity. |
| (vi) | Why fog droplets appear to be suspended in air? |
| (vii) | What is second pendulum also write its length, time period and frequency? |
| (viii) | Can we realize an ideal simple pendulum? |
| (ix) | Describe some common phenomena in which resonance plays an important role? |
| (x) | A wave has speed 400 m/sec. Find wavelength of a wave if frequency is 2 kHz. |
| (xi) | Explain why sound travels faster in warm air than in cold air? |
| (xii) | What features do longitudinal waves have in common with transverse waves? |

**4. Attempt any six parts.** **6 × 2 = 12**

| | |
|---|---|
| (i) | How is the distance between interference fringes affected by the separation between the slits of Young's experiment? Can fringes disappear? |
| (ii) | How interference produced in their film? |
| (iii) | Could you obtain Newton's rings with transmitted light? If yes, would be pattern be different from that obtained with reflected light? |
| (iv) | What is Optical fibre? Write its types. |
| (v) | What is the function of turn table in the spectrometer? |
| (vi) | If a person was looking through a telescope at the full moon, how would the appearance of the moon be changed by covering half of the objective lens? |
| (vii) | State second law of thermodynamics in terms of entropy. |
| (viii) | Can the mechanical energy be converted into heat energy? If so give an example. |
| (ix) | A thermos flask containing milk as a system is shaken rapidly. Does the temperature of the milk rise? |

## SECTION-II

**NOTE: Attempt any three questions.** **3 × 8 = 24**

| | | |
|---|---|---|
| 5.(a) | Explain what is meant by projectile motion? Describe the expression for (i) Height of the projectile (ii) Time of flight | 5 |
| (b) | Find the projection of vector $\vec{A} = 2\hat{i} - 8\hat{j} + \hat{k}$ in the direction of vector $\vec{B} = 3\hat{i} - 4\hat{j} - 12\hat{k}$ | 3 |
| 6.(a) | How would you portray step by step guide for interconversion of PE and KE? | 5 |
| (b) | Find the temperature at which the velocity of sound in air is two times its velocity at $10^{\circ}C$. | 3 |
| 7.(a) | Define real and apparent weight and discuss when apparent weight increases, decreases and becomes zero during vertical motion. | 5 |
| (b) | An 8.0kg body executes S.H.M with amplitude 30cm. The restoring force is 60N. When the displacement is 30cm. Find (i) period (ii) speed when the displacement is 12cm | 3 |
| 8.(a) | Bernoulli's equation represents the conservation of energy in fluid dynamics. Discuss it. | 5 |
| (b) | Show that the ratio of the root mean square speeds of molecules of two different gases at a certain temperature is equal to the square root of the inverse ratio of their masses. | 3 |
| 9.(a) | Describe the experiment performed by Michelson to find the speed of light. Also discuss the speed of light reduced in other materials than vacuum. | 5 |
| (b) | Light of wavelength 450nm is incident on a diffraction grating, on which 5000 lines per centimeter have been ruled. How many orders of spectra can be observed on either side of the direct beam? | 3 |



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| Paper Code Number: 2478 | 2024 ($1^{st}$-A) INTERMEDIATE PART-I ($11^{th}$ Class) | Roll No: |
|---|---|---|
| PHYSICS PAPER-I GROUP-II | Multan Board-G-2-2024 | |
| TIME ALLOWED: 20 Minutes | OBJECTIVE | MAXIMUM MARKS: 17 |

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

| S.# | QUESTIONS | A | B | C | D |
|---|---|---|---|---|---|
| 1 | A fixed mass of an ideal gas in a cylinder is compressed isothermally. Which is true statement? | Heat is dissipated from the system ● | K.E. of the gas increases | P.E of the gas increases | No work is done on the gas |
| 2 | Number of significant zeroes in 3.50070 are: | 1 | 2 | 3 ● | No significant zero |
| 3 | If we add the numbers 2.7543, 4.10, 1.273, the rounded off answer will be: | 8.1273 | 8.127 | 8.2 | 8.13 ● |
| 4 | If vector $\vec{A}$ makes an angle $\theta$ with Y–axis, then its Y–component will be: | $A\sin\theta$ | $A\cos\theta$ ● | $A\tan\theta$ | $A$ |
| 5 | The magnitude of $\vec{A} = \cos\theta\,\hat{i} + \sin\theta\,\hat{j}$ is: | $\sqrt{\cos\theta + \sin\theta}$ | 2 | 1 ● | $\sqrt{1+\cos^2\theta}$ |
| 6 | A body moves in a circle of radius $r$. The displacement covered in one rotation is: | $2\pi r$ | $\pi r$ | $\frac{\pi}{2}r$ | Zero ● |
| 7 | A stone is dropped from the top of a tower. It takes 2s to reach the ground. The height of the tower is: | 19.6 m ● | 9.8 m | 40 m | 19 m |
| 8 | Two masses $M$ and $4M$ are moving with same K.E. The ratio of their linear momenta is: | 1 : 16 | 1 : 2 ● | $\sqrt{2}:1$ | 4 : 1 |
| 9 | Which is a correct relation? | $\vec{v} = \vec{r} \times \vec{w}$ | $\vec{w} = \vec{v} \times \vec{r}$ | $\vec{v} = \vec{w} \cdot \vec{r}$ | $\vec{v} = \vec{w} \times \vec{r}$ ● |
| 10 | A body of mass $m$ is moving in a vertical circle of radius $r$, tied with a string. The tension at the lowest point is: | $T = m\left(\frac{v^2}{r} - g\right)$ | $T = m\left(\frac{v^2}{r} + g\right)$ ● | $T = m(v^2 - gr)$ | $T = m(v^2 + gr)$ |
| 11 | 1 torr = _____ $N/m^2$ | 133.33 ● | 123.33 | 122.22 | 143.33 |
| 12 | What will be the displacement of a particle in SHM when its velocity is half the maximum velocity (amplitude = $x_o$): | $\frac{3}{\sqrt{2}}x_o$ | $\sqrt{2}x_o$ | $\frac{3}{4}x_o$ | $\frac{\sqrt{3}}{2}x_o$ ● |
| 13 | A physical system under going forced vibrations in known as: | Simple harmonic oscillator | Driven harmonic oscillator ● | Damped harmonic oscillator | Torsional oscillator |
| 14 | The frequency of sound emitted from a source in water is 600 Hz. If speed of sound in water and air is 1500 m/s and 300 m/s respectively, then frequency of sound heard above the water surface is: | 300 Hz | 750 Hz | 600 Hz ● | 120 Hz |
| 15 | Which monochromatic light will produce maximum orders of spectra using a diffraction grating? | Blue ● | Red | Green | Yellow |
| 16 | Multimode step index fibre is useful for short distance to carry white light due to: | Polarization effects | Diffraction effects | Interference effects | Dispersion effects ● |
| 17 | In PV graph of isothermal and adiabatic process, the adiabatic curve has _____ work under the curve, than isothermal curve,: | Greater | Smaller ● | Equal | Negative work |

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| TIME ALLOWED: 2.40 Hours | SUBJECTIVE | MAXIMUM MARKS: 68 |
|---|---|---|

**NOTE: Write same question number and its parts number on answer book, as given in the question paper.**

Multan Board-G-2-2024

## SECTION-I

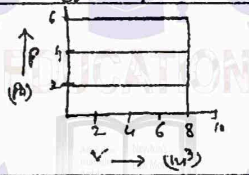
**2. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | Differentiate between random error and systematic error. |
| (ii) | What is principle of homogeneity? |
| (iii) | Name several repetitive phenomenon occurring in nature which could serve as reasonable time standards? |
| (iv) | Give the drawbacks to use the period of a pendulum as a time standard? |
| (v) | Why the cross product is not commutative? Explain briefly. |
| (vi) | The vector sum of three vectors gives a zero resultant. What can be the orientation of the vectors? |
| (vii) | If one of the rectangular components of a vector is not zero, can its magnitude be zero? Explain. |
| (viii) | Can the velocity of an object reverse direction when acceleration is constant? If so give an example. |
| (ix) | Calculate the force due to water when it flows out from a pipe at $3kgs^{-1}$ and its velocity changes from $5ms^{-1}$ to zero on striking the wall? |
| (x) | An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air? |
| (xi) | Derive a relation between power and velocity. |
| (xii) | A person holds a bag of groceries while standing still, talking to a friend. A car is standing still while its engine is running. From stand point of work, how are these two situations similar? |

**3. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | Show that orbital angular momentum $L_o = mvr$. |
| (ii) | What is meant by moment of inertia? Explain its significance. |
| (iii) | Prove that 1 radian $= 57.3^o$. |
| (iv) | Write down applications of communication satellites. |
| (v) | What are the factors upon which drag force acting upon a small sphere of radius "$r$" moving through a liquid, depend? |
| (vi) | A chimney works best when it is tall. Why? |
| (vii) | Does frequency depends on amplitude for harmonic oscillators? |
| (viii) | The equation for SHM of an object is given by $X = 0.25\cos\left(\frac{\pi}{8}\right)t$. What will be displacement after 2 seconds? |
| (ix) | What is Hook's law? Write its mathematical form. |
| (x) | Explain why sound travels faster in warm air than in cold air. |
| (xi) | How will you differentiate between longitudinal and transverse wave? |
| (xii) | What is period of 300 cycles per second of sound waves? |

**4. Attempt any six parts.** $6 \times 2 = 12$

| | |
|---|---|
| (i) | Why interference is necessary to produce diffraction pattern? Answer this question with the analytical approach. |
| (ii) | Explain the term "Optical rotation". |
| (iii) | Could you obtain Newton's rings with transmitted light? If yes, would the pattern be different from that obtained with reflected light? |
| (iv) | Explain how a convex lens is used as a magnifier? |
| (v) | Explain scattering and absorption as a loss of power? |
| (vi) | If a person was looking through a telescope at the full moon, how would the appearance of the moon be changed by covering half of the object lens? |
| (vii) | What happens to the temperature of room, when an air conditioner is left running on a table in the middle of the room? |
| (viii) | Is it possible to convert internal energy into mechanical energy? Explain with an example. |
| (ix) | Calculate the work done in the given diagram:  |



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## SECTION-II

**NOTE: Attempt any three questions.** $3 \times 8 = 24$

| | | |
|---|---|---|
| 5.(a) | What do you know about collision? How would two balls collides elastically in different cases? | 5 |
| (b) | The magnitude of dot and cross product of two vectors are $6\sqrt{3}$ and "6" respectively. Find the angle between vectors. | 3 |
| 6.(a) | Define absolute potential energy. Derive its mathematical expression $U = \frac{-GMm}{r}$ | 5 |
| (b) | An organ pipe has a length of 50cm. Find the frequency of its fundamental note when it is closed at one end. (Speed of sound = $350\,ms^{-1}$). | 3 |
| 7.(a) | How orbital radius of Geostationary orbits are calculated mathematically. Also calculate its value and its height from the earth surface. | 5 |
| (b) | A spring, whose spring constant is $80.0\,Nm^{-1}$ vertically supports a mass of 1.0 kg in the rest position. Find the distance by which the mass must be pulled down, so that on being released, it may pass the mean position with a velocity of $1.0\,ms^{-1}$. | 3 |
| 8.(a) | State and prove the Bernoulli's equation in dynamic fluid; that relates pressure to fluid speed and height. | 5 |
| (b) | $336J$ of energy is required to melt 1g of ice at $0^oC$. What is the change in entropy of 30g of water at $0^oC$ as it is changed to ice at $0^oC$ by a refrigerator. | 3 |
| 9.(a) | What is compound microscope? Describe its construction and working. Also calculate its magnifying power. | 5 |
| (b) | A light is incident normally on a grating which has 2500 lines per centimeter. Compute the wavelength of a spectral line for which the deviation in second order is $15.0^o$. | 3 |



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| Paper Code Number: 2471 | 2023 ($1^{st}$-A) INTERMEDIATE PART-I ($11^{th}$ Class) | Multan Board-2023 Roll No: _____ |
|---|---|---|

**PHYSICS PAPER-I GROUP-I**

| TIME ALLOWED: 20 Minutes | OBJECTIVE | MAXIMUM MARKS: 17 |
|---|---|---|

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

| S.# | QUESTIONS | A | B | C | D |
|---|---|---|---|---|---|
| 1 | The dimensions of centripetal force is: | $[ML^{-2}T^{2}]$ | $[MLT^{-2}]$ | $[ML^{-1}T^{-2}]$ | $[ML^{2}T^{-2}]$ |
| 2 | Absolute uncertainty in a measuring instrument is equal to: | Least count | Accuracy | Fractional uncertainty | Percentage uncertainty |
| 3 | $(\hat{i} \times \hat{j}) \cdot \hat{k} =$ | 0 | $-1$ | $\hat{k}$ | 1 |
| 4 | Angle between two vectors $3\hat{i} + 4\hat{j}$ and $4\hat{i} - 3\hat{j}$ is: | $30^{o}$ | $90^{o}$ | $60^{o}$ | $45^{o}$ |
| 5 | When the body moves with constant acceleration, the velocity time graph is: | Parabola | Hyperbola | Straight line | Curve |
| 6 | If a mass of a body is doubled, then acceleration becomes: | Half | Double | One fourth | Constant |
| 7 | Consumption of energy by a 60 watt electric bulb in 2 seconds is: | 0 | 30 J | 0.5 J | 120 J |
| 8 | The rate of change of angular momentum is equal to: | Force | Rotational K.E | Torque | Impulse |
| 9 | A wheel of radius 4 m turns through an angle of $114.6^{o}$. It lays out a tangential distance: | 4 m | 8 m | 458.4 m | 28 m |
| 10 | The property of a fluid having constant density is called: | Compressible fluid | Non-ideal fluid | Turbulent fluid | Incompressible fluid |
| 11 | The K.E of a simple pendulum at equilibrium position is: | Maximum | Minimum | Zero | Medium |
| 12 | The types of waves are particularly useful for under sea communication and detection systems: | Radio waves | Microwaves | Ultrasonic waves | Infrared waves |
| 13 | Frequency range of hearing of dog is: | 60 – 70,000 Hz | 15 – 50,000 Hz | 20 – 20,000 Hz | 150 – 150,000 Hz |
| 14 | When light enters glass its suffers a change in: | Frequency only | Wavelength only | Velocity only | Both B and C |
| 15 | When the final image is formed at infinity, the magnification formula of simple microscope will be: | $1 + \frac{d}{f}$ | $2 + \frac{d}{f}$ | $\frac{d}{f}$ | $\frac{f}{d}$ |
| 16 | At constant temperature the graph between $v$ and $\frac{1}{p}$ is: | Hyperbola | Straight line | Parabola | Semi circle |
| 17 | In irreversible process the entropy of system: | Increases | Decreases | Becomes zero | Remains constant |

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| INTERMEDIATE PART-I (11th Class) | 2023 (1st-A) | Roll No: |
|---|---|---|
| PHYSICS PAPER-I GROUP-I | | |
| TIME ALLOWED: 2.40 Hours | SUBJECTIVE | MAXIMUM MARKS: 68 |

**NOTE: Write same question number and its parts number on answer book, as given in the question paper.**

## SECTION-I

Multan Board-2023

**2. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | The wavelength $\lambda$ of a wave depends on the speed $v$ of the wave and its frequency $f$. Knowing that $[\lambda] = [L]$, $[v] = [LT^{-1}]$ and $[f] = [T^{-1}]$. Decide which of the following is correct, $f = v\lambda$ or $f = v/\lambda$ |
| (ii) | Give the drawbacks to use the period of pendulum as a time standard. |
| (iii) | What rules should be followed in rounding of data? |
| (iv) | Distinguish between Random error and Systematic error. |
| (v) | If one of the rectangular components of a vector is not zero, can its magnitude be zero? Explain. |
| (vi) | If all the components of the vectors, $A_1$ and $A_2$ were reversed, how would this alter $\vec{A}_1 \times \vec{A}_2$ ?s |
| (vii) | Distinguish between Translational and Rotational equilibrium. |
| (viii) | Explain the circumstances in which the velocity "$v$" and acceleration "$a$" of a car are: (i) Parallel (ii) Anti-parallel |
| (ix) | At what point or points in its path does a projectile have its minimum speed, its maximum speed? |
| (x) | What do you mean by Inertia? How it is important in Newton's first law of motion? |
| (xi) | What does the slope of velocity-time graph show? |
| (xii) | A person is standing near a fast moving train. Is there any danger that he will fall towards it? |

**3. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | When a rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from? |
| (ii) | Write the two names of conservative forces and non-conservative forces. |
| (iii) | A boy uses a catapult to throw a stone which accidentally smashes a green house window. List the possible energy changes. |
| (iv) | Write down the four uses of Geostationary satellites. |
| (v) | Describe what should be the minimum velocity, for a satellite, to orbit close to the Earth around it. |
| (vi) | On what factors the moment of inertia of a body depends? Explain. |
| (vii) | What is a simple harmonic oscillator? Give an example. |
| (viii) | If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop? |
| (ix) | What is the total distance travelled by an object moving with SHM in a time equal to its period, if its amplitude is $A$ ? |
| (x) | If the speed of sound is $332\,ms^{-1}$ in air at $0^\circ C$ then find its speed at $20^\circ C$. |
| (xi) | Explain the terms (i) Crest and (ii) Trough |
| (xii) | Is it possible for two identical waves travelling in the same direction along a string to give rise to a stationary wave? |

**4. Attempt any six parts.** $6 \times 2 = 12$

| | |
|---|---|
| (i) | Could you obtain Newton's rings with transmitted light? If yes, would the pattern be different from that obtained with reflected light? |
| (ii) | How would you manage to get more orders of spectra using a diffraction grating? |
| (iii) | Write two uses of Michelson's interferometer? |
| (iv) | How the light signal is transmitted through optical fibre? |
| (v) | Calculate the value of critical angle for glass by total internal reflection. |
| (vi) | What happens to the temperature of the room, when an airconditioner is left running on a table in the middle of the room? |
| (vii) | What is effect of pressure and density on speed of sound? |
| (viii) | Does entropy of a system increase or decrease due to friction? Explain. |
| (ix) | What will be the efficiency of an engine if it performs 100J of work and rejects 400J of heat energy to the cold reservoir? |

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## SECTION-II

**NOTE: Attempt any three questions.** $3 \times 8 = 24$

| | | |
|---|---|---|
| 5.(a) | Explain vector product with its characteristics and examples. | 5 |
| (b) | A force (Thrust) of 400N is required to overcome road friction and air resistance in propelling an automobile at $80\,kmh^{-1}$. What power (kW) must the engine develop? | 3 |
| 6.(a) | A projectile is thrown with initial velocity $v_i$ making an angle $\theta$ with the horizontal. Find its time of flight, range and maximum range. | 5 |
| (b) | A gramophone record turntable accelerates from rest to an angular velocity of $45.0\ rev\ min^{-1}$ in $1.60s$. What is its average angular acceleration? | 3 |
| 7.(a) | Define and explain molar specific heats of a gas. Also, derive their relation. | 5 |
| (b) | Water flows through a hose, whose internal diameter is 1cm at a speed of $1\,ms^{-1}$. What should be the diameter of the nozzle if the water is to emerge at $21\,ms^{-1}$? | 3 |
| 8.(a) | How various factors affect the speed of sound? Discuss. | 5 |
| (b) | What should be the length of simple pendulum whose period is 1.0 second at a place where $g = 9.8\,ms^{-2}$? What is the frequency of such a pendulum? | 3 |
| 9.(a) | Explain construction, ray diagram and magnification of an astronomical telescope. | 5 |
| (b) | In a double slit experiment the second order maximum occurs at $\theta = 0.25^\circ$. The wavelength is 650 nm. Determine the slit separation. | 3 |



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Multan Board-2023

| Paper Code Number: 2472 | 2023 (1st-A) INTERMEDIATE PART-I (11th Class) | Roll No: _____ |
|---|---|---|
| PHYSICS PAPER-I GROUP-II | | |
| TIME ALLOWED: 20 Minutes | OBJECTIVE | MAXIMUM MARKS: 17 |

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.

| S.# | QUESTIONS | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Dimensions of ratio of angular momentum to linear momentum is _____. | $[M^0LT^0]$ | $[MLT]$ | $[ML^2T]$ | $[M^{-1}L^{-1}T^{-1}]$ |
| 2 | Which of the following is a derived quantity? | Length | Mass | Time | Force |
| 3 | If a force of 5N is applied parallel to momentum arm of 5m, the torque is equal to: | Zero | 5Nm | 10Nm | 25Nm |
| 4 | $AB\sin\theta\hat{n} \times AB\sin\theta\hat{n}$ is: | $A^2B^2\sin^2\theta$ | $A^2B^2$ | $A^2B^2\hat{n}$ | $\vec{0}$ |
| 5 | Impulse has the same units as that of: | Linear momentum | Force | Energy | Mass |
| 6 | The angle of projection for which its maximum height and horizontal range are equal: | 46° | 56° | 66° | 76° |
| 7 | If velocity and mass of a moving object are doubled, then K.E. becomes: | Double | 4 times | 6 times | 8 times |
| 8 | The moment of inertia of thin rod is given by: | $12ML^2$ | $\frac{1}{12}ML^2$ | $\frac{2}{5}ML^2$ | $ML^2$ |
| 9 | The ratio of escape velocity to the critical orbital velocity is: | 2 | $\frac{1}{2}$ | $\frac{1}{\sqrt{2}}$ | $\sqrt{2}$ |
| 10 | The dimensions of $mgh$ is similar as that of: | K.E. | Pressure | Power | Volume |
| 11 | The dimensions of spring constant is: | $[MLT]$ | $[MLT^{-2}]$ | $[MLT^{-3}]$ | $[ML^0T^{-2}]$ |
| 12 | The value of '$\gamma$' for polyatomic gas is: | 1.67 | 1.69 | 1.40 | 1.29 |
| 13 | In sonar, we use: | Ultrasonic waves | Ultraviolet waves | Radio waves | Micro waves |
| 14 | Bending of light around the edges of an obstacle is called: | Refraction | Interference | Diffraction | Polarization |
| 15 | Refractive index is given by: | $\frac{c}{v}$ | $\frac{v}{c}$ | $\sqrt{\frac{c}{v}}$ | $\sqrt{\frac{v}{c}}$ |
| 16 | Absolute zero corresponds to: | $-360°F$ | $-460°F$ | $360°F$ | $373°F$ |
| 17 | Carnot cycle consists of: | Single step | Two steps | Three steps | Four steps |

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| INTERMEDIATE PART-I (11th Class) | 2023 (1st-A) | Roll No: |
|---|---|---|
| PHYSICS PAPER-I GROUP-II | Multan Board-2023 | |
| TIME ALLOWED: 2.40 Hours | SUBJECTIVE | MAXIMUM MARKS: 68 |

**NOTE: Write same question number and its parts number on answer book, as given in the question paper.**

## SECTION-I

**2. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | The wavelength '$\lambda$' of a wave depends on the speed '$v$' of the wave and its frequency $f$. Knowing that $[\lambda]=[L]$, $[V]=[LT^{-1}]$ and $[f]=[T^{-1}]$ Decide which of the following is correct $f = v\lambda$ or $f=\frac{v}{\lambda}$ |
| (ii) | The period of simple pendulum is measured by a stop watch. What type of errors are possible in the time period. |
| (iii) | What is the Absolute uncertainty? What is its actual value? |
| (iv) | Check the correctness of the relation $v=\sqrt{\frac{F\times\ell}{m}}$ where '$v$' is the speed of transverse wave on a stretched string of tension '$F$', length '$\ell$' and mass 'm'. |
| (v) | Name the three different conditions that could make $A_1 \times A_2 = 0$. |
| (vi) | Can a body rotate about its centre of gravity under the action of its weight? |
| (vii) | Write two conditions of Equilibrium. |
| (viii) | Can the velocity of an object reverse direction when acceleration is constant? If so, give an example. |
| (ix) | Define impulse and show that how it is related to linear momentum? |
| (x) | How is the Time of Flight? Calculated for Projectile. |
| (xi) | What is the Maximum Range? Write its mathematical formula. |
| (xii) | Two row boats moving parallel in the same direction are pulled towards each other. Explain. |

**3. Attempt any eight parts.** $8 \times 2 = 16$

| | |
|---|---|
| (i) | An object has 1J of potential energy. Explain what does it mean? |
| (ii) | When a rocket re-enters in the atmosphere, its nose cone becomes very hot. Where does this heat energy come from? |
| (iii) | A 70kg man runs up a long flight of stairs in 4.0s. The vertical height of the stairs is 4.5m. Calculate his power output in watts. |
| (iv) | When mud flies off the tyre of a moving bicycle, in what direction does it fly? Explain. |
| (v) | 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? |
| (vi) | A disc without slipping rolls down a hill of height 10.0m. If the disc starts from rest at the top of the hill, what is its speed at bottom? |
| (vii) | What happens to the period of a simple pendulum if its length is doubled? What happens if the suspended mass is doubled? |
| (viii) | Does the acceleration of a simple harmonic oscillator remain constant during its motion? Is the acceleration ever zero? Explain. |
| (ix) | Define Resonance. Give its types. |
| (x) | Why does sound travel faster in solids than in gases? |
| (xi) | How are beats useful in tuning musical instruments? |
| (xii) | Why did Newton fail to calculate the velocity of sound accurately? |

**4. Attempt any six parts.** $6 \times 2 = 12$

| | |
|---|---|
| (i) | How does one can obtain a plane wave? |
| (ii) | An oil film spreading over a wet footpath shows colours. Explain how does it happen? |
| (iii) | Why the polaroid sunglasses are better than ordinary sunglasses? |
| (iv) | How the power is lost in optical fibre through dispersion? Explain. |
| (v) | A telescope is made of an objective of focal length 20cm and an eye piece of focal length 5.0cm, both convex lenses. Find the angular magnification. |
| (vi) | Why the efficiency of a real heat engine is always less than one? |
| (vii) | For an Adiabatic Process, write down the form of first law of thermodynamics. |
| (viii) | A thermos flask containing milk as a system is shaken rapidly. Does the temperature of milk rise? |
| (ix) | Does entropy of a system increase or decrease due to friction? |

## SECTION-II

**NOTE: Attempt any three questions.** $3 \times 8 = 24$

| | | |
|---|---|---|
| 5.(a) | Define Gravitational Field. Prove that work done in the Earth's gravitational field is independent of path followed. | 5 |
| (b) | Find the angle between the two vectors, $A = 5\hat{i} + \hat{j}$ and $B = 2\hat{i} + 4\hat{j}$. | 3 |
| 6.(a) | Define Linear momentum and explain the Law of Conservation of Linear momentum. | 5 |
| (b) | A body of moment of inertia $I = 0.80\,kgm^2$ about a fixed axis, rotates with a constant angular velocity of 100 rad $s^{-1}$. Calculate its angular momentum L and the torque to sustain this motion. | 3 |
| 7.(a) | What is Carnot's engine? Explain its working and calculate its efficiency. Also state Carnot's theorem. | 5 |
| (b) | What gauge pressure is required in the city mains for a stream from a fire hose connected to the mains to reach a vertical height of 15.0m? | 3 |
| 8.(a) | What is Doppler effect? Find the change in frequency due to doppler effect when (i) Observer is moving towards the source at rest. (ii) Source is moving towards the observer at rest. | 5 |
| (b) | A block of mass 4.0 kg is dropped from a height of 0.80m on to a spring of spring constant $k = 1960\,Nm^{-1}$, find the maximum distance through which the spring will be compressed. | 3 |
| 9.(a) | Describe the diffraction of X-rays through crystals. Also verify Bragg's equation and describe its use. | 5 |
| (b) | An astronomical telescope having magnifying power of 5 consist of two thin lenses 24cm apart. Find the focal length's of these lenses. | 3 |

Paper Code Number: 2471

2021 (A)

Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

Multan Board-2021

**PHYSICS PAPER-I GROUP-I**

TIME ALLOWED: 20 Minutes

MAXIMUM MARKS: 17

## OBJECTIVE

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.**

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**Q.No.1**

(1) The dimensions of $\sqrt{\frac{m}{k}}$ is same as that of:

(A) Momentum (B) Time (C) Acceleration (D) Force

(2) The % uncertainty in the measurement of radius of a sphere is 2 %. The % uncertainty in the volume of sphere is: (A) 6 % (B) 2 % (C) 4 % (D) 8 %

(3) If $\left|\vec{A}\times\vec{B}\right| = \left|\vec{A}\cdot\vec{B}\right|$ then angle between vectors $\vec{A}$ and $\vec{B}$ is:

(A) $60^o$ (B) $90^o$ (C) $45^o$ (D) $30^o$

(4) Projection of $\vec{A}$ on $\vec{B}$ is:

(A) $B\cos\theta$ (B) $A\sin\theta$ (C) $\vec{B}\cdot\hat{A}$ (D) $\vec{A}\cdot\hat{B}$

(5) The horizontal acceleration of projectile is:

(A) Equal to "g" (B) Positive (C) Negative (D) Zero

(6) In a typical rocket, the fuel burns at the rate of:

(A) 4000 kg/s (B) 1000 kg/s (C) 10,000 kg/s (D) 40,000 kg/s

(7) The rotational $K.E$ of solid sphere is:

(A) $\frac{2}{5}mr^2\omega^2$ (B) $\frac{1}{5}mr^2\omega^2$ (C) $\frac{2}{3}mr^2\omega^2$ (D) $\frac{1}{5}I\omega^2$

(8) The ratio of orbital velocity to the escape velocity is:

(A) $\sqrt{\frac{1}{2}}$ (B) $\frac{1}{2}$ (C) 1 (D) $\sqrt{2}$

(9) The wavelength of waves produced in microwave oven is:

(A) 12 cm (B) 20 cm (C) 24 cm (D) 10 cm

(10) The speed of sound in air at $30^oC$ is approximately equal to:

(A) 332 m/s (B) 350 m/s (C) 340 m/s (D) 335 m/s

(11) The distance between 1st node and 4th antinode is:

(A) $\frac{5}{4}\lambda$ (B) $\frac{13}{4}\lambda$ (C) $\frac{7}{4}\lambda$ (D) $\frac{11}{4}\lambda$

(12) Escape velocity of object depends upon:

(A) Mass of object (B) Size of object (C) Shape of object (D) Radius of planet

(13) A carnot engine operating between the temperatures has greatest efficiency:

(A) 40k and 20k (B) 60k and 40k (C) 80k and 60k (D) 100k and 80k

(14) Which one is true for isothermal process?

(A) $Q = 0$ (B) $Q = W$ (C) $W = 0$ (D) $Q = \Delta\mu$

(15) The term $\frac{1}{2}\rho v^2$ in Bernoulli's equation represents:

(A) K.E of fluid (B) Pressure energy (C) K.E per unit volume (D) P.E of fluid

(16) The phase difference between two points on the same wave front is:

(A) $\frac{\pi}{2}$ (B) $\pi$ (C) $\frac{\pi}{4}$ (D) 0

(17) Final image formed by compound microscope is:

(A)Real; Inverted; Magnified (B) Virtual; Erect; Magnified

(C) Real; Erect; Diminished (D) Virtual; Inverted; Diminished



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Multan Board-2021

2021 (A) Roll No: _____

**INTERMEDIATE PART-I (11th CLASS)**

**PHYSICS PAPER-I GROUP-I** TIME ALLOWED: 2.40 Hours

**SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

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**2. Write short answers to any eight parts.** **8 × 2 = 16**

(i) Show that the expression $v_f = v_i + at$ is dimensionally correct where $v_i$ is the velocity at $t = 0$, $a$ is the acceleration and $v_f$ is the velocity at time $t$.

(ii) Write the dimensions of (i) Pressure (ii) Density

(iii) Define Precision and Accuracy.

(iv) Find the dimensions and hence the S.I units of coefficient of viscosity $\eta$ in relation of stokes law for the drag force $F$ for a spherical object of radius $r$ moving with velocity $v$ given as $F = 6\pi\eta rv$

(v) Define position vector and write its general formula in three dimension.

(vi) Prove that $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{A}$

(vii) If all the components of the vectors $\overrightarrow{A_1}$ and $\overrightarrow{A_2}$ were reversed, how would this alter $\overrightarrow{A_1} \times \overrightarrow{A_2}$.

(viii) Water flows out from a pipe at $3kgs^{-1}$ and its velocity changes from $5ms^{-1}$ to zero on striking the wall, then find the force due to flow of this water.

(ix) Derive the formula for the vertical distance covered by the projectile when it is thrown from a certain height $h$.

(x) Define the range of projectile and show that the range of projectile is maximum when projectile is thrown at an angle of 45° with the horizontal.

(xi) A 100 $g$ golf ball is moving to the right with a velocity of $20ms^{-1}$. It makes a head on collision with a 8 $kg$ steel ball initially at rest. Compute velocities of the balls after collision.

(xii) Define Torricelli's theorem and write the formula for the speed of efflux.

**3. Write short answers to any eight parts.** **8 × 2 = 16**

(i) Prove that $P = \vec{F} \cdot \vec{V}$

(ii) Calculate the work done in kilo joules in lifting a mass of 10kg (at a steady velocity) through a vertical height of 10m.

(iii) Differentiate between conservative and non conservative force.

(iv) Show that 1 rad = $57 \cdot 3^o$

(v) Why does a diver change his body position before and after diving in the pool?

(vi) What do you mean by orbital velocity? Write down its formula.

(vii) What happens to the period of simple pendulum if its length is doubled? What happens if the suspended mass is doubled?

(viii) Why soldiers are advised to break their steps when marching on bridge?

(ix) What is driven harmonic oscillator? Give example.

(x) Define beats and explain with one example.

(xi) Explain why sound travel faster in warm air than in cold air.

(xii) Speed of sound in air at $0^oC$ is $332ms^{-1}$. Find its speed at $20^oC$.

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Multan Board-2021

**4.** **Write short answers to any six parts.** **6 × 2 = 12**

(i) Under what conditions, two or more sources of light behave as coherent sources?

(ii) Could you obtain Newton's rings with transmitted light if yes, would the pattern be different from that obtained with reflected light?

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(iii) What is meant by fringe spacing?

(iv) What do you understand by linear magnification and angular magnification?

(v) What is the length of the telescope in state of normal adjustment?

(vi) Why is the average velocity of the molecules in a gas zero but the average of square of velocities is not zero?

(vii) What is meant by reversible process? Give its example.

(viii) Find the average speed of oxygen molecule in the air at STP.

(ix) Why does the pressure of gas in a car tyre increase when it is driven through some distance?

## SECTION-II

**NOTE:** **Attempt any three questions.** **3 × 8 = 24**

5.(a) Define and explain vector product of two vectors. Also write down the four characteristics of vector product of two vectors. 5

(b) A ball is thrown horizontally from a height of 10m with velocity of $21 ms^{-1}$. How far off it hit the ground? 3

6.(a) What is Gravitational field? Show that gravitational field is a conservative field. 5

(b) The frequency of the note emitted by a stretched string is 300 Hz. What will be the frequency of this note when the tension is increased by one-third without changing the length of the wire? 3

7.(a) Define centripetal force. Derive its relation. 5

(b) A tiny water droplet of radius 0.01 cm descends through air from high building. Calculate its terminal velocity. Given that $\eta$ for air is $19 \times 10^{-6} kg\, m^{-1} s^{-1}$ and density of water is $\rho = 1000 kgm^{-3}$. 3

8.(a) Define and explain the phenomenon of resonance with an example. 1 + 3 + 1 = 5

(b) A mechanical engineer develops an engine working between $327^{o}C$ and $27^{o}C$ and claims to have an efficiency of 52% . Does he claim correctly? Explain. 3

9.(a) What is diffraction grating? Calculate the wavelength of light used by diffraction grating. 5

(b) A telescope is made of an objective of focal length 20 cm and an eye piece of 5.0 cm. Both are convex lenses. Find the angular magnification. 3



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Paper Code Number: 2476

2021 (A)

Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

Multan Board-2021

**PHYSICS PAPER-I GROUP-II**

TIME ALLOWED: 20 Minutes

**OBJECTIVE**

MAXIMUM MARKS: 17

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.**

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**Q.No.1**

(1) If velocity and mass of a moving object are doubled then K.E becomes:

(A) Double (B) 4 times (C) 6 times (D) 8 times

(2) If a body is moving counter clockwise, then angular displacement is:

(A) Minimum (B) Zero (C) Negative (D) Positive

(3) The direction of angular momentum $\vec{L} = \vec{r} \times \vec{p}$ is:

(A) Along the direction of $\vec{p}$ (B) Along the direction of $\vec{r}$

(C) Parallel to the plane containing $\vec{r}$ and $\vec{p}$ (D) Perpendicular to the plane containing $\vec{r}$ and $\vec{p}$

(4) Venturi relation is given by:

(A) $P_1 + P_2 = \frac{1}{2}\rho v_2^2$ (B) $P_1 - P_2 = \frac{1}{2}\rho v_2^2$ (C) $P_1 + P_2 = \frac{1}{2}\rho v_2$ (D) $P_1 - P_2 = \frac{1}{2}\rho^2 v_2$

(5) The frequency of the first pendulum is:

(A) 2.0 $Hz$ (B) 1.5 $Hz$ (C) 1.0 $Hz$ (D) 0.5 $Hz$

(6) Speed of sound in air at S.T.P is:

(A) 280 $m/s$ (B) 330 $m/s$ (C) 331 $m/s$ (D) 332 $m/s$

(7) When the stretched string is plucked from one quarter of length, then stretched string will vibrate in:

(A) One loop (B) Two loops (C) Three loops (D) Four loops

(8) The regular array of atoms in a crystal forms a natural diffraction grating with spacing of the order of:

(A) $10^{-8} m$ (B) $10^{-9} m$ (C) $10^{-10} m$ (D) $10^{-11} m$

(9) Compound microscope consist of:

(A) Two convex lens (B) Two concave lens

(C) Convex lens and concave mirror (D) Concave lens and convex mirror

(10) If one mole of an ideal gas is heated at constant pressure; then:

(A) $Q_p = C_p \Delta T$ (B) $\Delta U = C_p \Delta T$ (C) $\Delta U = C_V \Delta T$ (D) $Q_p = C_V \Delta T$

(11) In carnot engine, each process is:

(A) Reversible (B) Perfectly reversible (C) Irreversible (D) Perfectly irreversible

(12) The appropriate precision on addition of following masses 0.089, 2.189, 5.32, 11.8 in kg is:

(A) 19.398 kg (B) 19.39 kg (C) 19.4 kg (D) 19.41 kg

(13) Dimension of coefficient of viscosity are:

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

(14) The resultant magnitude of two forces 6N and 8N acting at right angle to each other is:

(A) 10N (B) 8N (C) 6N (D) 4N

(15) The angle between the vectors $\hat{i} + 3\hat{j} - 2\hat{k}$ and $\hat{i} - \hat{j} - \hat{k}$ is:

(A) $0^o$ (B) $45^o$ (C) $90^o$ (D) $180^o$

(16) When a shell explodes in mid-air, the total momentum of its fragments:

(A) Becomes zero (B) Decreases (C) Increases (D) Remains constant

(17) An Un-powered and unguided missile is:

(A) Remote control (B) Long range (C) Powered (D) Ballistic

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Multan Board-2021

2021 (A) Roll No: _____

**INTERMEDIATE PART-I (11th CLASS)**

**PHYSICS PAPER-I GROUP-II** TIME ALLOWED: 2.40 Hours

**SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

**2. Write short answers to any eight parts.** **8 × 2 = 16**

(i) Show that $T = 2\pi\sqrt{\frac{\ell}{g}}$ is dimensionally correct.

(ii) Describe the principle homogeneity of dimensional analysis.

(iii) Write the dimensions of (i) Pressure (ii) Density

(iv) What are dimensions and units of $G$ in the formula $F = G\frac{m_1 m_2}{r^2}$?

(v) Can you add zero to null vector.

(vi) Define Torque, give its units and dimensions.

(vii) What is method to find the direction of cross product of two vectors, describe it.

(viii) Define horizontal range and time of flight of projectile.

(ix) Define impulse and show that how it is related to linear momentum.

(x) What is isolated system, state law of conservation of linear momentum?

(xi) Write down three equations of motion.

(xii) State Bernoulli's theorem. Give its mathematical form.

**3. Write short answers to any eight parts.** **8 × 2 = 16**

(i) Derive the relation of power in term of $P = \vec{F} \cdot \vec{V}$.

(ii) A person holds a bag of groceries while standing still, talking to a friend. A car is stationary with its engine running. From the stand point of work, how are these two situations similar?

(iii) A girl drops a cup from a certain height, which breaks into pieces. What energy changes are involved?

(iv) What do you understand by real and apparent weight? Explain.

(v) What is meant by angular momentum? Show angular momentum in mathematical form.

(vi) A disc and a hopp start moving down from the top of an inclined plane at the same time. Which one will be moving faster on reaching the bottom?

(vii) What should be the frequency of a simple pendulum whose period is one second at a place where $g = 9.8\,ms^{-2}$?

(viii) If a mass-spring system is hung vertically and set into oscillations, why does the motion eventually stops.

(ix) What is meant by phase angle? Does it define angle between maximum displacement and the driving force?

(x) How much greater is the speed of sound in hydrogen to that of oxygen? Explain.

(xi) What do you mean by quantization of frequency for stationary waves?

(xii) How are beats useful in tuning musical instruments?

**4. Write short answers to any six parts.** **6 × 2 = 12**

(i) What is meant by diffraction of light? Explain with an example.

(ii) Explain whether the Young's experiment is an experiment for studying interference or diffraction effects of light.

(iii) Could you obtain Newton's rings with transmitted light? If yes, would the pattern be different from that obtained with reflected light?

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(iv) Define magnifying power and resolving power of optical instruments.

(v) A telescope is made of an objective of focal length 20 cm and an eye piece of 5 cm, both convex lenses. Find the angular magnification.

(vi) Can the mechanical energy be converted completely into heat energy? If so give an example.

(vii) A mechanical engineer develops an engine, working between 600k and 300k claims to have efficiency of 52%. Does he claim correctly? Explain.

(viii) Define molar specific heats of a gas at constant pressure and constant volume.

(ix) Why is the average velocity of the molecules in a gas zero but the average of the square of velocities is not zero?

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## SECTION-II

**NOTE: Attempt any three questions.** **3 × 8 = 24**

5.(a) Differentiate between Elastic and Inelastic Collision. Derive the expressions for the velocities of two spherical bodies $m_1$ and $m_2$ after elastic collision in one dimension. 5

(b) Given that $\vec{A} = \hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{B} = 3\hat{i} - 4\hat{k}$, find the projection of $\vec{A}$ on $\vec{B}$. 3

6.(a) Define gravitational field. Show that work done in gravitational field is independent of path followed. 5

(b) Find the temperature at which the velocity of sound in air is two times its velocity at $10^oC$. 3

7.(a) Define centripetal force and derive its relation for an object travelling with uniform speed $V$ in a circle of radius $r$. 1 + 4

(b) What gauge pressure is required in the city mains for a stream from a fire hose connected to the mains to reach a vertical height of 15.0m. 3

8.(a) What is Carnot engine? Calculate the efficiency of Carnot engine. 5

(b) A block of mass 4.0kg is dropped from a height of 0.80m, on to a spring of spring constant $k = 1960\,Nm^{-1}$. Find the maximum distance through which the spring will be compressed. 3

9.(a) Define pressure of gas. Derive relation of pressure of gas. Show that $P \propto < K.E >$ of gas molecules. 5

(b) An astronomical telescope having magnifying power 5. Consistants of two thin lenses, 20cm apart. Find the focal lengths of the lenses. 3



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Paper Code Number: 2471

2019 (A)

Roll No._____

INTERMEDIATE PART-I (11th CLASS)

Multan Board-2019

PHYSICS PAPER-I GROUP-I (NEW SCHEME)

TIME ALLOWED: 20 Minutes **OBJECTIVE** MAXIMUM MARKS: 17

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.**

Q.No.1

(1) Which is the base quantity?

(A) Area (B) Volume (C) Length (D) Density

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(2) If least count is $10kg$, then $8.00 \times 10^3 kg$ has significant figures:

(A) 1 (B) 2 (C) 3 (D) 4

(3) If the initial velocity of a projectile becomes doubled. The time of flight will become:-

(A) Double (B) Same (C) 3 times (D) 4 times

(4) Unit vector of a given vector $\vec{A} = 4\hat{i} + 3\hat{j}$ is:

(A) $\frac{4\hat{i} + 3\hat{j}}{25}$ (B) 1 (C) $\frac{4\hat{i} + 3\hat{j}}{5}$ (D) $\sqrt{\frac{4\hat{i} + 3\hat{j}}{5}}$

(5) Time of flight of a projectile is:

(A) $\frac{Vi \sin\theta}{g}$ (B) $\frac{Vi \sin\theta}{2g}$ (C) $\frac{Vi^2 \sin\theta}{g}$ (D) $\frac{2Vi \sin\theta}{g}$

(6) Tidal energy is due to the gravitational pull of:

(A) Sun (B) Moon (C) Earth (D) Mars

(7) Moment of inertia for a particle is given by:

(A) $m^2r^2$ (B) $mr^2$ (C) $m^2r$ (D) $mr^{-2}$

(8) S.I unit of angular momentum is:

(A) $Kg\,m^2s^{-1}$ (B) $Kg\,m^{-2}s^{-1}$ (C) $Kg\,m^{-1}s$ (D) $Kg\,m^2s^{-2}$

(9) Fluid dynamics is the study of the behaviour of:

(A) Fluid at rest (B) Liquids at rest (C) Liquids in motion (D) Liquids and gasses in motion

(10) Blood has density equal to that of:

(A) Oil (B) Honey (C) Thick Tar (D) Water

(11) Acceleration in S.H.M is proportional to the:

(A) Velocity (B) Displacement (C) Time period (D) Frequency

(12) If speed of sound in air at a given pressure is "$V$" and now if pressure is doubled then new speed will be:

(A) $2V$ (B) $V/2$ (C) $V$ (D) $4V$

(13) Stars moving away from Earth show:

(A) Red shift (B) Blue shift (C) Green shift (D) Yellow shift

(14) In case of point source, shape of the wavefront is:

(A) Plane (B) Spherical (C) Circular (D) Ellipitical

(15) Magnifying power of telescope is:

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

(16) In case of adiabatic process, the 1st law of thermodynamic is written as:

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

(17) If temperature of sink is decreased, the efficiency of Carnot engine.

(A) Decreases (B) Increases (C) Remain same (D) First increases then decreases



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Multan Board-2019

2019 (A) Roll No: _____

# INTERMEDIATE PART-I (11th CLASS)

**PHYSICS PAPER-I GROUP-I (NEW SCHEME)**

TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

**2.** **Attempt any eight parts.** $8 \times 2 = 16$

(i) What is the cause of random error and how can it be reduce?

(ii) If a precise measurement is also an accurate measurement. Explain your answer.

(iii) Is it possible to add 5 in $2\hat{i}$ ? Explain.

(iv) Can the magnitude of a vector ever be negative? Explain.

(v) If a vector lies in $x - y$ plane. Is it possible, one of its rectangular components is zero? Explain.

(vi) Define conservative force. Give at least its two examples.

(vii) Explain Geyser and Aquifer.

(viii) Why a fog droplet appear to be suspended in air?

(ix) Derive the relation between speed and pressure of the fluid.

(x) What is damping and give its one application.

(xi) How does resonance play role in heating and cooking food?

(xii) If mass of a simple pendulum is doubled, what is the effect on its period? Explain.

**3.** **Attempt any eight parts.** $8 \times 2 = 16$

(i) What are two differences between uniform and variable velocity?

(ii) Can the velocity of an object reverse the direction when acceleration is constant? If so, give an example.

(iii) Explain the two differences between Elastic and in-elastic collision.

(iv) How would you find the distravelled by velocity-time graph?

(v) Show that: $S = r\theta$ (where $\theta$ is in radian)

(vi) Show that velocity of hoop rolling down on an inclined plane is, $v = \sqrt{gh}$

(vii) What is meant by moment of inertia? Explain.

(viii) Why does a diver change his body positions before and after diving in the pool?

(ix) Write down two differences between Transverse and Longitudinal waves.

(x) Explain the terms Crest and Trough

(xi) Why does sound travel faster in solids than in gases?

(xii) How are beats useful in tuning musical instruments? Explain.

**4.** **Attempt any six parts.** $6 \times 2 = 12$

(i) How is the distance between interference fringes affected by the separation between the slits of Young's experiment? Can fringes disappear?

(ii) An oil film spreading over a wet footpath shows colours. Explain how does it happen?

(iii) Write two differences between interference and diffraction phenomena of light waves.

(iv) Describe two causes of power losses in optical fibre during transmission of light signals.

(v) Why would it be advantageous to use blue light with a compound microscope?

(vi) Specific heat of a gas at constant pressure is greater than specific heat at constant volume. Why?

(vii) Does entropy of a system increase or decrease due to friction? Explain.

(viii) Give an example of a natural process that involves an increase in entropy.

(ix) Define triple point of water and write its equation.

## SECTION-II

**NOTE: - Attempt any three questions.** $3 \times 8 = 24$

5.(a) What is the difference between Petrol Engine and Diesel engine? Explain the four stroke of Petrol Engine. 5

(b) Derive a relation for the time period of a simple pendulum by using Dimensional analysis. 3

6.(a) What is Torque? Derive an expression for torque due to force acting on a rigid body. 5

(b) A bomber dropped a bomb at a height of 490m when its velocity along the horizontal was 300 $Kmh^{-1}$. How long was it in air? 3

7.(a) Explain work done in gravitational field. Also define conservative field. 5

(b) A stationary wave is established in a string which is 120cm long and fixed at both ends. The string vibrates in four segments, at a frequency of 120 $Hz$. Determine its wavelength and the fundamental frequency. 3

8.(a) Define simple harmonic motion. Prove that the projection of a particle moving along a circular path performs simple harmonic motion. 5

(b) What is the least speed at which an aeroplane can execute a vertical loop of 1km radius so that there will be no tendency for the pilot to fall down at the highest point? 3

9.(a) Discuss the Young's double slit experiment and determine the position where the dark and bright fringes will be observed. 5

(b) A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least 39°. What is the minimum angle for total internal reflection if pipe is in water? (Refractive index of water = 1.33) 3



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Multan Board-2019

2019 (A)

Roll No._____

Paper Code Number: 2472

# INTERMEDIATE PART-I (11th CLASS)

## PHYSICS PAPER-I GROUP-II (NEW SCHEME)

OBJECTIVE

TIME ALLOWED: 20 Minutes

MAXIMUM MARKS: 17

**Note:** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

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Q.No.1

(1) There are four readings of a micrometer to measure the diameter of a wire in mm are 1.21, 1.23, 1.25, 1.23. The mean of deviations is:

(A) 0.02 mm (B) 0.01 mm (C) 0.10 mm (D) 0.20 mm

(2) The correct answer of $\frac{5.348 \times 10^{-2} \times 3.64 \times 10^{4}}{1.336}$ is:

(A) $1.46 \times 10^{3}$ (B) $1.451 \times 10^{3}$ (C) $1.457 \times 10^{3}$ (D) $1.5 \times 10^{3}$

(3) $\vec{B} . \hat{B}$ is equal to:

(A) $B^2$ (B) 1 (C) Zero (D) $B$

(4) Two forces of magnitude 10N each. Their resultant is equal to 20N. Then angle between them is:

(A) $180^o$ (B) $30^o$ (C) $90^o$ (D) $0^o$

(5) The velocity of a body changes with constant rate. Then acceleration is:

(A) Zero (B) Constant (C) Negative (D) Positive

(6) The dimensions of the ratio of power to work are:

(A) $[ML^2T^{-2}]$ (B) $[M^0LT^{-1}]$ (C) $[M^0L^0T^{-2}]$ (D) $[ML^0T^{-1}]$

(7) 2.0 radian is equal to:

(A) 57.3° (B) 57.6° (C) 114.6° (D) 115.6°

(8) Artificial gravity like earth is obtained, if space ship rotate with frequency:

(A) $\frac{1}{2\pi}\sqrt{gR}$ (B) $\frac{1}{2\pi}\sqrt{2gR}$ (C) $\frac{1}{4\pi}\sqrt{gR}$ (D) $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$

(9) The relation $v_2 = \sqrt{2g(h_1 - h_2)}$ is called:

(A) Torricelli's theorem (B) Ventusi relation (C) Stoke's law (D) Equation of continuity

(10) Viscosity of air at 30°C is:

(A) 6.29 $Nsm^{-1}$ (B) 0.019 $Nsm^{-2}$ (C) 1.00 $Nsm^{-2}$ (D) 0.510 $Nsm^{-2}$

(11) The velocity of spring-mass vibrating system at mean position is:

(A) Zero (B) $\sqrt{\frac{k}{m}}$ (C) $x_0\sqrt{\frac{k}{m}}$ (D) $w\sqrt{\frac{k}{m}}$

(12) If a stationary wave is established along a stretched string of length $\ell$ and it vibrate in one loop, the wave length is equal to: (A) $\ell$ (B) $\frac{\ell}{2}$ (C) $\frac{\ell}{3}$ (D) $2\ell$

(13) The value of "γ" for polyatomic gas is:

(A) 1.40 (B) 1.29 (C) 1.67 (D) 1.19

(14) The property of the substances by which their concentration in solutions can be found is:

(A) Optical rotation (B) Interference (C) Diffraction (D) Reflection

(15) The ratio $\frac{c}{v}$ is equal to:

(A) Critical angle (B) Total reflection (C) Refractive index (D) Angle of refraction

(16) Human metabolism is the example of: (A) First law of thermodynamics

(B) Entropy (C) Second law of thermodynamics (D) Adiabatic process

(17) In which process entropy of the system remains constant?

(A) Isothermal (B) Isochoric (C) Irreversible (D) Adiabatic

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# INTERMEDIATE PART-I (11th CLASS) Multan Board-2019

## PHYSICS PAPER-I GROUP-II (NEW SCHEME)

TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: - Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

**2. Attempt any eight parts.** **8 × 2 = 16**

(i) What is Radian? Explain with diagram.

(ii) Calculate the 1 light year in metres.

(iii) How does the direction of a vector specified in three dimensions? Explain with diagram.

(iv) Show that: $\hat{i} \cdot \hat{j} = \hat{j} \cdot \hat{k} = \hat{k} \cdot \hat{i} = 0$

(v) Is it possible to add a vector quantity to a scalar quantity? Explain.

(vi) Write two differences between conservative and non-conservative forces.

(vii) Calculate the work done in kilo joules in lifting a mass of 10kg (at steady velocity) through a vertical height of 10m.

(viii) What is Stoke's Law? Explain briefly.

(ix) State Torricelli's theorem? Write mathematical form.

(x) What is Hook's law? Define spring constant.

(xi) On what factors does the velocity of mass-spring system depends?

(xii) If a mass-spring is hung vertically and set into oscillations, why does the motion eventually stop?

**3. Attempt any eight parts.** **8 × 2 = 16**

(i) Discuss the case in velocity time graph, when the car moves with constant acceleration.

(ii) What is the difference between uniform velocity and uniform acceleration?

(iii) Write down the impact on the bodies when a lighter body collides with a massive body at Rest. Explain by the Mathematical relation.

(iv) Discuss the case in velocity time graph, when the accceleration is increasing.

(v) What is meant by moment of inertia? Explain its significance.

(vi) Convert two Radian in degree.

(vii) 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? Explain.

(viii) Define Angular Momentum and Law of Conservation of Angular Momentum.

(ix) Describe the relation between pressure and density.

(x) What is the difference between open and closed organ pipe?

(xi) What are the conditions for a path difference in constructive and destructive interference?

(xii) Why did Newton fail to calculate the velocity of sound accurately?

**4. Attempt any six parts.** **6 × 2 = 12**

(i) How would you manage to get more orders of spectra using a diffraction grating?

(ii) Write the equations of conditions for constructive and destructive interference.

(iii) Why the Polaroid sunglasses are better than ordinary sunglasses?

(iv) One can buy a cheap microscope for use of children. The images seen in such a microscope have coloured edges. Why is this so?

(v) A magnifying glass gives a five times enlarged image at a distance of 25cm from the lens. Find, by ray diagram, the focal length of the lens.



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(vi) Explain that the average velocity of the molecules in a gas is zero but the average of the square of velocities is not zero

(vii) Give an example of a process in which no heat is transferred to or from the system but the temperature of the system changes.

(viii) Can the mechanical energy be converted into heat energy? If so give an example

(ix) Write the names of four processes involved in a cyclic process of petrol engine.

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## SECTION-II

**NOTE: - Attempt any three questions.** $3 \times 8 = 24$

5.(a) Describe the relation for pressure of a gas enclosed in a vessel by applying kinetic theory of gases. 5

(b) How many metres are in on light year? If speed of light is $3 \times 10^8 ms^{-1}$. 3

6.(a) Discuss elastic collision in one dimension and prove that speed of approach is equal to the speed of separation. 5

(b) The magnitude of dot and cross products of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between the vectors. 3

7.(a) Prove that for a body of mass 'm' at a height 'h' above the surface of Earth when released and falls its:
Loss in P.E = Gain in K.E. 5

(b) The wavelength of the signals from a radio transmitter is 1500m and the frequency is 200 kHz. What is the wavelength for a transmitter operating at 1000 kHz and with what speed the radio waves travel? 3

8.(a) What do you mean by geostationary orbits? Find the expression for the orbital radius of geostationary satellite. 5

(b) A block of mass 4kg is dropped from a height of 0.8m on to a spring of spring constant $K = 1980\, Nm^{-1}$. Find the maximum distance through which spring will be compressed. 3

9.(a) Describe the Michelson's experiment to calculate the speed of light? 5

(b) A light is incident normally on a grating which has 2500 lines per centimetre. Compute the wavelength of a spectral line for which the deviation in second order is $15.0°$. 3



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Paper Code Number: 2477

2018 (A) Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

Multan Board-2018

## PHYSICS PAPER-I GROUP-I (NEW SCHEME)

TIME ALLOWED: 20 Minutes **OBJECTIVE** MAXIMUM MARKS: 17

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.**

**Q.No.1**

(1) If the initial velocity of a projectile becomes doubled. The time of flight will become:-

(A) Double (B) Same (C) 3 times (D) 4 times

(2) For freely falling body, in the presence of force of friction the:-

(A) Loss in P.E. = gain in K.E. (B) Loss in P.E. < gain in K.E.
(C) Loss in P.E. > gain in K.E. (D) Loss in P.E. = 0

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(3) The ratio of moment of inertia of hoop to the moment of inertia of disc (if their masses and radii are same) is equal to:- (A) 2 (B) $\frac{1}{2}$ (C) 4 (D) $\frac{1}{4}$

(4) Einstein's theory gives us a physical picture of how the:- (A) Body moves
(B) Gravity works (C) Moment of inertia produced (D) Weightlessness creates

(5) The dimensions of $\rho gh$ has same as that of:-

(A) Work (B) Energy (C) Pressure (D) Mass

(6) Time period of simple pendulum only depends on its:-

(A) Mass (B) Amplitude (C) Density (D) Length

(7) When an observer is moving away from the source with velocity $U_0$ from a stationary source then relative velocity of the waves and the observer is:-

(A) $V + U_0$ (B) $V - U_0$ (C) $\frac{V + U_0}{2}$ (D) Zero

(8) _____ is correct relation:

(A) $\frac{v_t}{v_0} = \frac{\rho_0}{\rho_t}$ (B) $\frac{v_t}{v_0} = \frac{\rho_t}{\rho_0}$ (C) $\frac{v_t}{v_0} = \sqrt{\frac{\rho_t}{\rho_0}}$ (D) $\frac{v_t}{v_0} = \sqrt{\frac{\rho_0}{\rho_t}}$

(9) A ray of light shows the direction of propagation of light. It is a line which is:-

(A) Normal to the wave front (B) Parallel to wave front
(C) Opposite to wave front (D) Equal to wave front

(10) Light waves are:-

(A) Longitudinal waves (B) Transverse waves (C) Stationary waves (D) Mechanical waves

(11) The magnification of a convex lens of focal length 5 cm is equal to:- (A) $\frac{1}{5}$ (B) 5 (C) 6 (D) 25

(12) In adiabatic process the first law of thermodynamics becomes:-

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

(13) The change in entropy $\Delta s$ is equal to:-

(A) $\frac{\Delta Q}{\Delta T}$ (B) $\frac{\Delta Q}{T}$ (C) $\frac{\Delta T}{\Delta Q}$ (D) $\frac{T}{\Delta Q}$

(14) In the light of Einstein's famous equation $E = mc^2$, the energy for mass of 2 kg is equal to:-

(A) $3 \times 10^8$ *joule* (B) $9 \times 10^{16}$ *joule* (C) $4 \times 10^{16}$ *joule* (D) $18 \times 10^{16}$ *joule*

(15) The number of significant figures in 0.00232 are:- (A) 6 (B) 5 (C) 3 (D) 4

(16) If both components $R_x$ and $R_y$ of resultant vector $\vec{R}$ are negative then angle "$\theta$" of $\vec{R}$ along $x-$axis will be:-

(A) $\theta = 270^o$ (B) $180^o < \theta < 270^o$ (C) $180^o > \theta > 270^o$ (D) $\theta \leq 270^o$

(17) The magnitude of $\hat{A}$ will be:- (A) Zero (B) $A^2$ (C) 1 (D) $A$



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Multan Board-2018

2018 (A) Roll No: _____

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# INTERMEDIATE PART-I (11th CLASS)

## PHYSICS PAPER-I GROUP-I (NEW SCHEME)

TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: - Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

**2. Attempt any eight parts.** **8 × 2 = 16**

(i) How many nanoseconds are there in 1 year?

(ii) Name several repetitive phenomenon occurring in nature which could serve as reasonable time standards.

(iii) Define Precision and Accuracy.

(iv) Write the dimensions of (i) Work (ii) Torque

(v) Is it possible to add a vector quantity to a scalar quantity? Explain

(vi) Suppose the sides of a closed polygon represent vector arranged head to tail. What is the sum of these vectors?

(vii) If one of the rectangular components of a vector is not zero, can its magnitude be zero? Explain.

(viii) Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Explain.

(ix) An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.

(x) Explain the circumstances in which the velocity $\vec{v}$ and acceleration $\vec{a}$ of a car are (i) Parallel (ii) Anti-parallel

(xi) Explain the term viscosity.

(xii) A person is standing near a fast moving train. Is there any danger that he will fall towards it?

**3. Attempt any eight parts.** **8 × 2 = 16**

(i) Calculate the work done in kilo joules in lifting a mass of 10 kg (at a steady velocity) through a vertical height of 10 m.

(ii) Define "Joule".

(iii) Write the formula for escape velocity. (Do not derive it). Calculate the value of escape velocity on earth.

(iv) Prove that $S = r\theta$

(v) Explain why an object, orbiting the Earth is said to be freely falling. Use your explanation to point out why objects appear weightless under certain circumstances.

(vi) 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?

(vii) What is Sharpness of Resonance?

(viii) If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?

(ix) Explain the relation between total energy, potential energy and kinetic energy for a body oscillating with SHM.

(x) Explain effect of density of air on the speed of sound.

(xi) What is the Principle of Super Position of Waves?

(xii) A wave is produced along a stretched string but some of its particles permanently show zero

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Multan Board-2018

4. **Attempt any six parts.** $6 \times 2 = 12$

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(i) State two parts of Huygen's principle. $1 + 1 = 2$

(ii) How the distance between interference fringes will be affected if the distance between the slits in Young's experiment is doubled?

(iii) How would you distinguish between un-polarized and plane-polarized lights?

(iv) Why adiabate is steeper than isotherm? $1 + 1 = 2$

(v) Draw the ray diagram of compound microscope.

(vi) Differentiate between Multimode Step Index Fibre and Multimode Graded Index Fibre.

(vii) Write any two assumptions of Kinetic Theory of Gases.

(viii) Derive Boyle's Law from Kinetic Theory of Gases.

(ix) Explain bicycle pump as an example of first law of thermodynamics.

## SECTION-II

**NOTE: - Attempt any three questions.** $3 \times 8 = 24$

5.(a) Explain the addition of two vectors by rectangular components method. 5

(b) A football is thrown upward with an angle of $30^{\circ}$ with respect to the horizontal. To throw a 40 m pass what must be the initial speed of the ball? 3

6.(a) Define Gravitational Field. Show that gravitational field is conservative field. 5

(b) Calculate the angular momentum of a star of mass $2.0 \times 10^{30}\ kg$ and radius $7.0 \times 10^{5}\ km$. If it makes one complete rotation about its axis once in 20 days. 3

7.(a) Prove that the product of cross sectional area of the pipe and the fluid speed at any point along the pipe is a constant. 5

(b) 336 J of energy is required to melt 1 g of ice at $0^{\circ}C$. What is the change in entropy of 30 g of water at $0^{\circ}C$ as it is changed to ice at $0^{\circ}C$ by a refrigerator? 3

8.(a) Discuss the Law of Conservation of Energy in Oscillating Mass Spring System along with the graphical representation. 5

(b) A Church organ consists of pipes, each open at one end, of different lengths. The minimum length is 30 mm and the longest is 4 m. Find the range of frequencies of sound produced, if speed of sound $v = 340\ m/s$. 3

9.(a) What is astronomical telescope? Draw ray diagram and derive an expression for its magnification. 5

(b) In a double slit experiment the $2^{nd}$ order maximum occurs at $\theta = 0.25^{\circ}$. The wavelength is 650 nm. Find the slit separation. 3

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Paper Code Number: 2478

2018 (A) Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

Multan Board-2018

## PHYSICS PAPER-I GROUP-II (NEW SCHEME)

TIME ALLOWED: 20 Minutes **OBJECTIVE** MAXIMUM MARKS: 17

**Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.**

**Q.No.1**

(1) A force of 10 N makes an angle of 30° with $y-$axis. The magnitude of $x-$component will be:-

(A) 5 N (B) 8.66 N (C) 10 N (D) Zero

(2) A force of 10 N acts on a body of mass 5 kg for one second. The change in its momentum will be:-

(A) $10\,kgms^{-1}$ (B) $50\,kgms^{-1}$ (C) $2\,kgms^{-1}$ (D) $20\,kgms^{-1}$

(3) _____ is the biofuel.

(A) Water (B) Petrol (C) Ethanol (D) Oil

(4) When a body is in circular motion, the angle between linear and angular velocity is:-

(A) 180° (B) 90° (C) 45° (D) 0°

(5) The linear velocity of a disc when it reaches the bottom of an inclined plane of height 'h' is:-

(A) $\sqrt{gh}$ (B) $\sqrt{\frac{4}{3}gh}$ (C) $\sqrt{\frac{2}{3}gh}$ (D) $\sqrt{\frac{1}{3}gh}$

(6) The term $\frac{1}{2}\rho v^2$ in Bernoulli's equation has the same unit as:-

(A) Work (B) Volume (C) Pressure (D) Force

(7) If 30 waves per second pass through a medium at a speed of $30\,ms^{-1}$, then the wavelength is:-

(A) 30 m (B) 15 m (C) 1 m (D) 28 m

(8) Radar system is an application of:-

(A) Interference (B) Beats (C) Stationary waves (D) Doppler's effect

(9) The example of mechanical waves is:-

(A) Water waves (B) Radio waves (C) Infrared waves (D) Ultraviolet waves

(10) Light entering from air to glass does not give change in its:-

(A) Frequency (B) Wavelength (C) Velocity (D) Direction

(11) The final image formed by a simple microscope is:-

(A) Virtual and inverted (B) Virtual and erect (C) Real and erect (D) Real and inverted

(12) _____ will travel faster than others through an optical fibre.

(A) Ultraviolet light (B) Visible light (C) Infrared light (D) White light

(13) The unit of entropy is:-

(A) $JK$ (B) $K/J$ (C) $J/K^2$ (D) $J/K$

(14) A heat engine operates between the temperatures 1000 k and 400 k. Its efficiency can be equal to:-

(A) 50 % (B) 60 % (C) 70 % (D) 100 %

(15) One light year is equal to:-

(A) $9.5\times10^{15}\,m$ (B) $9.6\times10^{15}\,m$ (C) $9.5\times10^{-15}\,m$ (D) $9.6\times10^{-16}\,m$

(16) The sum of three numbers, 2.7543, 4.10 and 1.273 up to the correct decimal place is:-

(A) 8.12 (B) 8.13 (C) 8.1273 (D) 8.127

(17) The cross product of a vector $\vec{A}$ with itself results:-

(A) $\vec{A}$ (B) $A^2$ (C) Zero (D) Null vector

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# INTERMEDIATE PART-I (11th CLASS) Multan Board-2018

## PHYSICS PAPER-I GROUP-II (NEW SCHEME)

TIME ALLOWED: 2.40 Hours **SUBJECTIVE** MAXIMUM MARKS: 68

**NOTE: - Write same question number and its part number on answer book, as given in the question paper.**

## SECTION-I

**2. Attempt any eight parts.** $8 \times 2 = 16$

(i) Check the correctness of the relation $V = \sqrt{\frac{F \times \ell}{m}}$, where $V$ is the speed of transverse wave on a stretched string of tension $F$, length $\ell$ and mass $m$.

(ii) Find the dimensions and hence, the SI unit of Coefficient of viscosity $\eta$ in the relation of Stoke's Law $F = 6\pi\eta rV$.

(iii) The period of simple pendulum is measured by stop watch. What type of errors are possible in the time period?

(iv) How many nanoseconds are there in one year?

(v) If $\vec{A} + \vec{B} = 0$, what can you say about the components of the two vectors?

(vi) Suppose the sides of a closed polygon represent vector arranged head to tail. What is the sum of these vectors?

(vii) What are Coplanar and Concurrent Forces?

(viii) Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Discuss.

(ix) Differentiate between Distance and Displacement.

(x) Explain, how the swing is produced in a fast moving cricket ball?

(xi) Explain, what do you understand by the term Viscosity?

(xii) What is Velocity-Time Graph? What does its slope represent?

**3. Attempt any eight parts.** $8 \times 2 = 16$

(i) How energy can be obtained from waste products?

(ii) When a rocket re-enters the atmosphere, its nose cone becomes very hot. Where does this heat energy come from?

(iii) A 70 kg man runs up a long flight of stairs in 9.8 sec. The vertical height of the stairs is 5 m. Calculate his power in kW.

(iv) Why does a diver change his body position before diving in the pool?

(v) What is meant by moment of inertia? Explain its significance.

(vi) Define and explain Orbital Velocity?

(vii) Does frequency depend on amplitude for harmonic oscillators?

(viii) How the resonance is useful for cooking of food?

(ix) If a mass spring system is hung vertically and set into oscillations, why does the motion eventually stop?

(x) What is the difference between Constructive and destructive interference?

(xi) Explain the terms Crest and Trough.

(xii) How should a sound source move with respect to an observer so that the frequency of its sound does not change?

**4. Attempt any six parts.** $6 \times 2 = 12$

(i) What is the usual way to obtain plane wave front from a point source?

(ii) Write two uses of $X$ – rays diffraction by crystal.

(iii) Can visible light produce interference fringes? Explain.

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(iv) A convex lens of shorter focal length is preferred in simple microscope. Why?

(v) Why would it be advantageous to use blue light with a compound microscope?

(vi) Why is the average velocity of the molecules in a gas zero but the average of the square of velocities is not zero?

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(vii) A thermos flask containing milk as a system is shaken rapidly. Does the temperature of milk rise?

(viii) What would be the heat lost if internal energy decreases by 10 J and 20 J of work is done on the system simultaneously?

(ix) What is triple point of water? Define Kelvin (the unit of temperature) in terms of triple point of water.

## SECTION-II

**NOTE: - Attempt any three questions.** **3 × 8 = 24**

5.(a) What is a Projectile Motion? Derive the following equations for projectile:- 5
(i) Time of flight (ii) Range of the projectile

(b) A load of 10 N is suspended from a clothes line. This distorts the line so that it makes an angle of 15° with the horizontal at each end. Find the tension in the clothes line. 3

6.(a) What are Geo stationary Satellites? Derive an expression for the radius of Geo stationary Satellites. 5

(b) How large a force is required to accelerate an electron of mass $9.1 \times 10^{-31} kg$ from rest to a speed of $2 \times 10^{7} m/s$ through a distance of 5 cm? 3

7.(a) Derive an expression for terminal velocity of a spherical droplet of water falling freely through air. 5

(b) Estimate the average speed of nitrogen molecules in air under standard conditions of pressure and temperature. 3

8.(a) What is the drawback of Newton's formula for the speed of sound and how this was corrected by Laplace? Derive the Laplace's expression for the speed of sound and also find the value of speed of sound by using this expression. 1 + 3 + 1 = 5

(b) What should be the length of a simple pendulum whose period is 2 seconds at a place where $g = 9.8 ms^{-2}$? What is the frequency of such a pendulum? 3

9.(a) How compound microscope is formed? Derive an expression for its total magnification. 5

(b) In a double slit experiment the second order maximum occurs at $\theta = 0.25°$. The wavelength is 650 nm. Determine the slit separation. 3

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