PR XI (01) 16
PHYSICS (New)
Inter Part – I
(Fresh/Reappear)
Fic. No. _____
.(For Board's Office use only)

Roll Number

In Figures: _____ .

In Words: _____

Superintendent

Signature / Stamp:

_____

Fic. No. _____
(For Board's Office use only)

Time Allowed: 3 Hours

Marks: 85

Note: There are THREE sections in this paper i.e. Section **A, B** and **C.**
Attempt Section-A on the same paper and return it to the Superintendent within the given time.
No marks will be awarded for **Cutting, Erasing** or **Overwriting. Marks of Identification** will lead to UFM case, **Mobile Phone** etc are not allowed in the examination hall.

Time Allowed: 20 minutes

Marks: 18

Q-I   Write the correct option i.e. A, B, C or D in the empty box provided opposite to each part.

		A	B	C	D	
i.	The impulse has the same unit as	A. Force	B. Energy	C. Momentum	D. None of these	C
ii.	Frequency of a second's pendulum is	A. 2 Hz	B. 1 Hz	C. 0.2 Hz	D. None of these	D
iii.	Expression for critical velocity of a satellite is given by.......	A. $v = \sqrt{2gR}$	B. $v = \sqrt{gR}$	C. $v = \dfrac{gR}{2}$	D. None of these	B
iv.	If the tension in the string is doubled and its mass per unit length is reduced to half. Then the speed of transverse wave on it is	A. One fourth	B. Constant	C. Halved	D. Doubled	D
v.	Which one is a pair of SI base units?	A. Meter Newton	B. Kilogram Kelvin	C. Coulomb Second	D. Ampere Joule	B
vi.	With the increases of temperature viscosity	A. Decreases	B. Increases	C. Becomes double	D. Remains constant	A
vii.	Which of the given properties proves the transverse wave nature of light?	A. Polarization	B. Diffraction	C. Interference	D. Reflection	A
viii.	Triple point of water is	A. 273.16 °C	B. 372.16 K	C. 273.16 °F	D. None of these	D
ix.	The slope of displacement – time graph is called....	A. Distance	B. Velocity	C. Acceleration	D. None of these	B
x.	In an isolated system the total energy of vibrating mass and spring is........	A. Constant	B. High	C. Low	D. Variable	A
xi.	If the temperature of the heat source is increased, the efficiency of a Carnot's engine........	A. Increases	B. Decreases	C. Remains constant	D. First increases and then becomes constant	A
xii.	Efficiency of fluorescent lamp is	A. 20 %	B. 30 %	C. 40 %	D. 100 %	A
xiii.	The sum of magnitudes of two forces is 16. if the resultant force is 8 N and its direction is perpendicular to minimum force then the forces are	A. 2 N and 14 N	B. 4 N and 12 N	C. 8 N and 8 N	D. None of these	D
xiv.	Work is said to be negative when $\vec{F}$ and $\vec{d}$ are	A. Perpendicular	B. Parallel	C. Anti parallel	D. None of these	C
xv.	The plane angle and solid angle are purely......	A. Base quantities	B. Derived quantities	C. Non physical quantities	D. Geometrical quantities	D
xvi.	The increases in the speed of sound for each degree rise above 0°C is	A. 61 ms^{-1}	B. 6.1 ms^{-1}	C. 0.61 ms^{-1}	D. None of these	D
xvii.	Linear acceleration $a = r\alpha$, when "0" is	A. 90°	B. 360°	C. 180°	D. 0°	A
xviii	What is the angle between $\vec{A}$ and $\vec{B}$ for which $\left|\vec{A} \cdot \vec{B}\right| = \left|\vec{A} \times \vec{B}\right|$	A. 30°	B. 45°	C. 60°	D. 90°	B

PHYSICS (New)

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Note: Time allowed for Section – B and Section – C is 2 Hours and 40 minutes.

Section – B
Marks: 40

Q-II Attempt any TEN parts. Each part carries FOUR marks.

1. Differentiate between the light year and year.

2. Carry out the following conversion.

   Calculate a speed of 20 ms^{-1} in Kmh^{-1}.

3. Define vector. How a vector is represented? Explain.

4. Explain velocity time graph. Show that area under velocity time graph is distance.

5. What is projectile? Derive mathematical expressions for flight time and range of a simplest projectile.

6. Write a short note on inter conversion of Potential Energy and Kinetic Energy.

7. Differentiate between Real and Apparent Weights.

8. What is the moment of inertia of a 100 Kg sphere whose radius is 50 cm?

9. Briefly Explain any two applications of Bernoulli's equation.

10. Write a short note on the factors that affect the speed of sound in a gas.

11. Differentiate between progressive and stationary waves?

12. Explain polarization of light by reflection.

13. An inventor claims to have developed a heat engine, working between 27° C and 227° C having an efficiency of 45 %. Is the claim valid? Why?

Section – C
Marks: 27

Note : Attempt any THREE questions. All questions carry equal marks.

Q-III (a) Explain three Newton's Laws of motion.

(b) An object is traveling with a constant acceleration of 10 ms^{-2}. How much distance will it travel in 3rd second of its journey.

Q-IV (a) Define absolute potential energy. Prove that Absolute P.E = $\dfrac{GmM_e}{R_e}$.

(b) A man whose mass is 70 kg walks up to the third floor of a building which is 12 m above the ground in 20 S. Find his power in watts and in horse power.

Q-V (a) Define S.H.M. Show that motion of a mass attached with a spring executes S.H.M.

(b) Calculate the length of a second pendulum having time period 2 S at a place where g = 9.8 ms^{-2}.

Q-VI (a) Define the molar heat capacities C_p and C_v for a gas. Show that for a mole of an ideal gas $C_p - C_v = R$.

(b) Calculate the change in entropy when 10 kg of water is heated from 90° C to 100° C.

(Specific heat of water is 4180 JKg^{-1} K^{-1})