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Roll No._____ To be filled in by the candidate.

Inter. (Part-I)-A- 2018

Rwp-11-18

Paper Code	2	4	7	7

Sessions;2015-2017,2016-2018 & 2017-2019

Physics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. If the period of wavemotion is 0.01Sec and wave speed is $100mS^{-1}$ then frequency of wave is:
(A) 0.5 Hz **(B)** 1 Hz **(C)** 10 Hz **(D)** 100 Hz

2. A bat finding its correct location by sending.
(A) Matter waves **(B)** Ultrasonic waves **(C)** Infrasonic waves **(D)** Electromagnetic waves

3. Which one of the following cannot be polarized:
(A) Radio waves **(B)** light waves **(C)** X-rays **(D)** Sound waves

4. The first person who attempted to measure the speed of light was:
(A) Michelson **(B)** Huygen **(C)** Galileo **(D)** Newton

5. In thermodynamics process, the equation $w = -\Delta u$ represents.
(A) Isothermal expansion **(B)** Isothermal compression **(C)** Adiabatic expansion **(D)** Adiabatic compression

6. The potential energy to the molecules of an ideal gas is considered to be:
(A) 100J **(B)** 212J **(C)** 273J **(D)** Zero J

7. In colour printing the whole range of colours can be obtained by mixing.
(A) three colours **(B)** four colours **(C)** five colours **(D)** seven colours

8. Minimum number of unequal forces whose vector sum can be zero are:
(A) 5 **(B)** 4 **(C)** 3 **(D)** 2

9. Change in momentum is equivalent to:
(A) Force **(B)** Energy **(C)** Impulse **(D)** Weight

10. Before the launch of a rocket the mass of the fuel of the rocket approximately consists of:
(A) 20% of rocket mass **(B)** 40% of rocket mass **(C)** 60% of rocket mass **(D)** 80% of rocket mass

11. Identify the non-conservative force among the following:
(A) Air resistance **(B)** Gravitational force **(C)** Elastic spring force **(D)** Electric force

12. If a body is moving in the counter clockwise direction then the direction of angular velocity will be:
(A) Towards the centre **(B)** Away form the centre
(C) Along the linear velocity **(D)** Prependicular to both radius and linear velocity

13. The moment of inertia of 10kg hoop about the axis of rotation perpendicular to its plane having radius 5m is:
(A) 50 Kgm^2 **(B)** 100 Kgm^2 **(C)** 150 Kgm^2 **(D)** 250 Kgm^2

14. The apparent weight of a pilot diving down with an acceleration $9.8mS^{-2}$ will become:
(A) Half **(B)** Zero **(C)** Double **(D)** Increases to four times

15. The S.I units of flow rate of fluid is:
(A) mS^{-1} **(B)** m^2S^{-2} **(C)** m^3S^{-1} **(D)** m^3S^{-2}

16. When three-fourth of the cycle of a vibrating body completed then the phase of vibration is:
(A) $\frac{\pi}{4}$ *radian* **(B)** $\frac{\pi}{2}$ *radian* **(C)** $\frac{3\pi}{2}$ *radian* **(D)** π *radian*

17. Waves produced in organ pipes are:
(A) transverse stationary waves **(B)** longitudinal stationary waves
(C) Electromagnetic waves **(D)** Matter waves

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Rwp-11-18

Sessions;2015-2017,2016-2018 & 2017-2019

Physics (Essay Type)

Time: 2:40 Hours **Marks: 68**

Section - I

2- Write short answers of any eight parts from the following. **2 x 8 =16** **2x22=44**

i. Under what conditions zeros are not significant?
ii. Give the drawbacks to use period of a pendulum as time standard.
iii. Distinguish between precision and accuracy.
iv. Define radian and ste-radian. Are they basic units of S.I?
v. Can a body rotate about its centre of gravity under the action of its weight?
vi. What is the unit vector in the direction of vector, $\vec{A} = 4\hat{i} + 3\hat{j}$.
vii. You are standing on the edge. What should you do to avoid falling?
viii Can the velocity of an object reverse direction when acceleration is constant? If so give an example.
ix. Explain the circumstances in which (a). $\vec{V}$ is zero but $\vec{a}$ is not zero (b). $\vec{a}$ is zero but $\vec{V}$ is not zero.
x. Which will be more effective in knocking down a bear and why? (a).A rubber bullet.(b).a lead bullet of same momentum.
xi. When a massive body collides elastically with light stationary body, what will be their final velocities?
xii. Why should chimney be tall for its better working?

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. A boy uses a catapult to throw a stone which accidentally smashes a green house window, list possible energy changes.
ii. Explain briefly how the energy is obtained from the fermentation of biomass.
iii. Differentiate between renewable and non-renewable energy sources with examples.
iv. What is critical velocity for a satellite which is orbiting at nearest height to earth? Derive this value.
v. Why does a diver change his body position before and after diving in the pool?
vi. A hoop and disc start moving down on an inclined plane at the same time, which one will be moving faster on reaching the ground?
vii. What is a phase angle?
viii. Define SHM and angular frequency.
ix Write any two applications of Dopplers effect.
x. How are beats useful in tuning a musical instrument?
xi. Describe some common phenomenon in which resonance plays an important role
xii. What happens when a jet plane like a concorde flies faster than speed of sound

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Can visible light produce interference fringes? Explain.
ii. Define wave fronts also write its types.
iii. The center of Newton's ring is dark. Why?
iv. Why would it be advantageous to use blue light with a compound microscope?
v. Define critical angle and total internal reflection.
vi. Is it possible to construct a heat engine that will not expel heat into the atmosphere?
vii. Can the mechanical energy be converted completely into heat energy? if so give an example.
viii. Define molar specific heat of a gas at constant volume and molar specifc heat at constant pressure.
ix. Does the entropy of system increase or decrease due to friction?

Section - II

NOTE: Answer any three questions from the following. **8x3=24**

5. (a) Describe elastic collision in one dimension. Show that relative velocity before collision=Relative velocity after collision. **05**
(b) A load of 10N 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. **03**

6. (a) What is meant by rotational Kinetic energy? Find rotational Kinetic energy for a disc and hoop. **05**
(b) $100m^3$ of water is pumped from a reservoir into a tank 10m higher than the reservoir in 20 minutes. If density of water is $1000kgm^{-3}$, find the power delivered by the pump. **03**

7. (a) Define and explain Molar specific heat of a gas at constant pressure and at constant volume and also derive relation between them. **05**
(b) A tiny water droplet of radius 0.01cm descends through air from a height. Calculate its terminal velocity. Given that for air $\eta=19\times10^{-6}kgm^{-1}S^{-1}$ and density of water $\rho=1000kgm^{-3}$. **03**

8. (a) What is simple pendulum? Show that its motion is SHM. Derive a formula for its time period. **05**
(b) A train is approaching a station at $90Kmh^{-1}$ sounding a whistle of frequency 1000 Hz. What will be the apparent frequency of the whistle heard by a listner sitting on the platform. Speed of sound $v=340mS^{-1}$. **03**

9. (a) What is astronomical telescope? Using ray diagram, calculate magnification power of astronomical telescope. **05**
(b) X-ray of wavelength 0.150nm are observed to undergo a first order reflection at a Bragg angle of 13.3° from the quartz crystal. What is the interplaner spacing of the reflecting planes in the crystal? **03**