

Roll No. of Candidate: \_\_\_\_\_

Physics (New Scheme)  
Time: 20 Minutes

(INTERMEDIATE PART-I) 319-(II) Group: I  
OBJECTIVE

Paper: I  
Marks: 17

Code: 6473

**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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave other blank.

1. The magnifying power of convex lens of focal length 10cm is:  
A) 7                      B) 9.6                      C) 3.5                      D) 11
2. If  $AB \sin \theta = AB \cos \theta$  then the angle between  $\vec{A}$  and  $\vec{B}$  is:  
A)  $30^\circ$                       B)  $45^\circ$                       C)  $60^\circ$                       D)  $180^\circ$
3. As the speed of object moving through a fluid increases then the drag force experienced by it:  
A) increases                      B) decreases                      C) remains constant                      D) becomes zero
4. In a Michelson Interferometer by moving the mirror through a distance of  $\frac{\lambda}{4}$ , the path difference changes by:  
A)  $\frac{\lambda}{4}$                       B)  $\frac{\lambda}{2}$                       C)  $\lambda$                       D)  $2\lambda$
5. The ratio of moment of inertia of disc and hoop is:  
A)  $\frac{1}{4}$                       B)  $\frac{1}{2}$                       C)  $\frac{3}{4}$                       D)  $\frac{3}{2}$
6. \_\_\_\_\_ has the same dimensions.  
A) work and power                      B) momentum and energy  
C) work and torque                      D) power and pressure
7. The louder the sound, the greater will be its:  
A) wavelength                      B) amplitude                      C) speed                      D) frequency
8. If the resultant of two vectors each of magnitude 'F' is also of magnitude 'F' then the angle between them will be:  
A)  $30^\circ$                       B)  $60^\circ$                       C)  $90^\circ$                       D)  $120^\circ$
9. \_\_\_\_\_ is derived unit.  
A) candela                      B) ampere                      C) kelvin                      D) newton
10. At constant temperature, if pressure is halved then its volume is:  
A) constant                      B) halved                      C) four times                      D) doubled
11. \_\_\_\_\_ is non-conservative force.  
A) electric force                      B) magnetic force                      C) gravitational force                      D) frictional force
12. Change in entropy of reversible process is:  
A) positive                      B) negative                      C) zero                      D) maximum
13. The total energy of mass-spring system is independent of:  
A) mass of the body                      B) amplitude  
C) spring constant                      D) nature of material of spring
14. Pull of earth on a mass of 10 Kg on the surface of the earth is:  
A) 95 N                      B) 96 N                      C) 97 N                      D) 98 N
15. One radian is equal to:  
A)  $77.3^\circ$                       B)  $67.3^\circ$                       C)  $57.3^\circ$                       D)  $47.3^\circ$
16. Pascal is the unit of:  
A) pressure                      B) force                      C) tension                      D) weight
17. Distance between two adjacent crests and troughs is:  
A)  $\lambda$                       B)  $\frac{\lambda}{2}$                       C)  $\frac{\lambda}{4}$                       D)  $2\lambda$

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Physics (New Scheme)

(INTERMEDIATE PART-I) 319 Group: I

Paper: I

Time: 2:40 Hours

SUBJECTIVE

Marks: 68

Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

(SECTION - I)

2. Write short answers to any EIGHT questions.

(2 × 8 = 16)

- i. How many nanoseconds are there in one year?
- ii. Give the drawbacks to use the period of a pendulum as a time standard.
- iii. State right hand rule for the cross product of two vectors.
- iv. If  $\vec{A} = \hat{i} - 2\hat{j} + 3\hat{k}$  and  $\vec{B} = 2\hat{i} - \hat{j} + \hat{k}$ , then find  $\vec{A} \cdot \vec{B}$
- v. Can a body rotate about its centre of gravity under the action of its weight?
- vi. What is the biomass? Write the names of two methods to obtain energy from biomass.
- vii. What is Aquifer?
- viii. State Bernoulli's relation for a liquid in motion and describe some of its applications.
- ix. A person is standing near a fast moving train. Is there any danger that he will fall towards it?
- x. Define free oscillations and forced oscillations.
- xi. Can we realize an ideal simple pendulum? Explain briefly.
- xii. Does frequency depends on amplitude for harmonic oscillators?

3. Write short answers to any EIGHT questions.

(2 × 8 = 16)

- i. An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.
- ii. Motion with constant velocity is a special case of motion with constant acceleration. Is this statement true? Discuss.
- iii. Which quantity remains same at all points on the trajectory of a projectile; either velocity or acceleration? Explain.
- iv. Define impulse. Does a moving object having uniform velocity has impulse?
- v. Explain how many minimum number of geo-stationary satellites are required for global coverage of T.V transmission?
- vi. Why does a diver change his body positions before and after diving in the pool?
- vii. A disc without slipping rolls down a hill of height 10.0 m. If the disc starts from rest at the top of hill, what is its speed at the bottom?
- viii. Define angular acceleration. Write its unit.
- ix. Why does sound travel faster in solids than in gases?
- x. As a result of a distant explosion, an observer senses a ground tremor and then hears the explosion. Explain the time difference.
- xi. What do you mean by harmonic series?
- xii. What is the effect of density on speed of sound in a gas?

4. Write short answers to any SIX questions.

(2 × 6 = 12)

- i. Explain whether the Young's experiment is an experiment for studying interferences or diffraction effect of light.
- ii. What is the function of collimator in a spectrometer?
- iii. Why central spot of Newton's ring is dark?
- iv. Could you obtain Newton's ring with transmitted light? If yes, would the pattern be different from that obtained with reflected light?
- v. How the light signal is transmitted through the optical fibre?
- vi. Give an example of natural process that involves an increase in entropy.
- vii. A thermo flask containing milk as a system is shaken rapidly. Does the temperature of milk rise?
- viii. Is it possible to convert internal energy into mechanical energy? Explain with an example.
- ix. Define triple point, what is triple point of water?

(Turn Over)

Guj - 11 - G1 - 19

(SECTION - II)

5. (a) Differentiate between precision and accuracy with example. 5  
(b) Find the average speed of Nitrogen molecules in air under standard conditions of pressure and temperature. 3
6. (a) What are rectangular components, explain. How a vector is obtained from its rectangular components. 5  
(b) A truck weighing 2500 Kg and moving with velocity of  $21 \text{ ms}^{-1}$  collides with a stationary car weighing 1000 Kg. The truck and the car move together after the impact. Calculate their common velocity. 3
7. (a) Define standing waves. Find the relations for frequencies of these waves in different air columns. 5  
(b) A force (thrust) of 400 N is required to overcome road friction and air resistance propelling an automobile at  $80 \text{ Km h}^{-1}$ . What power must the engine develop? 3
8. (a) Derive the relation for Artificial Gravity. 5  
(b) What should be the length of a simple Pendulum whose period is 1.0 second at a place where  $g = 9.8 \text{ ms}^{-2}$ ? What is the frequency of such a pendulum? 3
9. (a) What is a bandwidth? Discuss the fibre optic principles? 1+4  
(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 a second order is  $15.0^\circ$ ? 3

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