PHYSICS 10 Class 2018

Time: 2 ½ Hours **Max. Marks: 66**

SECTION "B" (SHORT ANSWER QUESTIONS)(40)

PART 'A'

NOTE: Answer 5 questions from this part.

2. Define: (i) Doping (ii) Mechanics (iii) Friction (iv) Personal error
3. Give scientific reason:
   (i) It is dangerous to jump from a fast moving vehicle
   (ii) Aquatic animals survive in frozen seas.
4. State Newton's 2nd Law of Motion and derive F = ma.
5. How is a Galvanometer converted into an Ammeter and a Voltmeter? Also draw relevant diagrams.
6. State Coulomb;s Law. Write down its equation. Mention the value of K in S.I. units.
7. State two differences between:
   (i) mass and weight
   (ii) fission reaction and fusion reaction.
8. Write the name of the law, which states "When a pressure is applied to a liquid it is transmitted equally in all directions." Describe any one application of this law.
9. What is Radar? Write down its three uses.

PART 'A'

NOTE: Answer 5 questions from this part.

10. The radius of a Hydrogen atom is 0.53×10^{-10} m. Convert it is kilometer, millimeter, micrometer and nanometer.
11. A ball is dropped from a height of 122.5 m. How much time will it take to reach the ground?
12. What is the pressure of 200 moles of a gas in a $50m^3$ cylinder at 27°C?
13. Two resistances of 4Ω and 6 Ω are connected in parallel and then joined to a source having an e.m.f of 12 V. Find the value of equivalent resistance of the circuit and the total current flowing it the circuit.
14. An object of weight 50N is raised 2m above the ground using an inclined plane of length 10m. Calculate the effort applied parallel to the inclined plane. Also, find the mechanical advantage of the inclined plane.
15. Two bodies of masses 5 Kg and 4 Kg are attached to the ends of a string that passes over a pulley such that the two bodies hang vertically. Find the acceleration of the bodies and tension in the string.
16. The focal length of a convex lens is 18cm. An object 5cm high is placed at a distance of 12cm from the lens. Determine the position, nature and the height of the image.
17. A piece of paper completes 600 vibrations in 60 seconds when some waves pass through the surface of water. Find the time period and the frequency of the piece of paper. Calculate the wave length if the velocity of the waves is 2.5m/s.

SECTION 'C' (DETAILED ANSWER QUESTIONS)

Note: Answer any Two questions from this Section.

18.(a) Define K.E. and P.E. Derive the equation $K.E = \frac{1}{2} mv^2$.

(b) Define resolution of a vector. Explain the method to resolve a vector into its rectangular components.

19.(a) Define Co-efficient of linear expansion and derive the relation $L_2 = L_1 [1 + a\Delta T]$

(b) Define simple harmonic motion and prove that the motion of a simple pendulum is simple harmonic motion.

20.(a) With the help of a ray diagram derive the mirror equation

$$\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$$

(b) State the Law of Universal Gravitation. Prove that

$$M_e = \frac{gR_e^2}{G}$$