

**NOTE: Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink. Cutting or filling two or more circles will result in zero mark in that question.**

21.

12

1. **Waves transfer:**

- (A) Energy (B) Frequency (C) Wavelength (D) Velocity

2. **For a normal person, audible frequency range for sound wave lies between:**

- (A) 10Hz -- 10kHz (B) 20Hz -- 20kHz (C) 25Hz -- 25kHz (D) 30Hz -- 30kHz

3. **The index of refraction of Ice is:**

- (A) 1.52 (B) 1.31 (C) 1.00 (D) 2.42

4. **Image formed by a camera is:**

- (A) Real, inverted and Diminished (B) Virtual, Upright and Diminished  
(C) Virtual, Upright and Magnified (D) Real, Inverted and Magnified

5. **A positive electric charge:**

- (A) attracts other positive charge (B) repels other positive charge  
(C) attracts a neutral charge (D) repels a neutral charge

6. **The combined resistance of two identical resistors, connected in series is  $8\Omega$ . Their combined resistance in a parallel arrangement will be:**

- (A)  $2\Omega$  (B)  $4\Omega$  (C)  $8\Omega$  (D)  $12\Omega$

7. **The unit of electric power is:**

- (A) Watt (B) Ampere (C) Joule (D) Volt

8. **An example of mutual induction is:**

- (A) A.C. Generator (B) D.C. Motor (C) Transformer (D) Relay

9. **The particles emitted from a hot cathode surface are:**

- (A) Positive ions (B) Negative ions (C) Protons (D) Electrons

10. **The brain of any computer system is:**

- (A) Monitor (B) Memory (C) C.P.U (D) Control Unit

11. **Which of the following is not processing?**

- (A) Arranging (B) Manipulating (C) Calculating (D) Gathering

12. **When a heavy nucleus splits into two lighter nuclei, the process would:**

- (A) Release Nuclear Energy (B) Absorb Nuclear Energy  
(C) Release Chemical Energy (D) Absorb Chemical Energy

Roll No.(in Figures): ..... (in Words): .....

Maximum Marks: 48

**SUBJECTIVE TYPE**

Time Allowed :1.45 Hours

**(PART- I)**

**Q2. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) Define Amplitude.
- (ii) Define Restoring Force.
- (iii) What is meant by Silent Whistle?
- (iv) What is meant by Zero bel?
- (v) Calculate the frequency of a Sound Wave of speed  $340\text{ms}^{-1}$  and Wavelength is 0.5m.
- (vi) Define Ampere, the unit of current.
- (vii) State Joule's law.
- (viii) Define Unit of resistance.

**Q3. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) State Laws of Refraction.
- (ii) Define Power of Lens.
- (iii) What is variable Capacitor?
- (iv) Define Dielectric.
- (v) What are the Hazards of Static Electricity?
- (vi) What is meant by Cell Phone?
- (vii) What is Flash Drive?
- (viii) What is meant by Internet?

**Q4. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) Describe the method to find the direction of Magnetic Lines of Force produce by Current Carrying Solenoid.
- (ii) Write the factors on which the Magnitude of Induced emf depend.
- (iii) Name two factors which can enhance Thermionic Emission.
- (iv) Write the name of components of Cathode Ray Oscilloscope.
- (v) How can you compare the logic operation  $X = A.B$  with usual operation of Multiplication?
- (vi) Define Natural Radioactivity.
- (vii) Write any two properties of Beta Particles.
- (viii) What are two common Radiation Hazards? Describe the precautions that are taken against them.

**(PART - II)**

**Note: Attempt any TWO questions. (2×9=18)**

- Q5. (a) Define wave Motion. Explain with example "Waves as carriers of Energy". 4**
- (b) An object 30cm tall is located 10.5cm from a concave mirror with focal length 16cm. 5**
- i. Where is the image located?                      ii. How high is it?
- Q6. (a) What is gold leaf Electroscope? Discuss its working principle with a labelled diagram. 4**
- (b) If a current of 0.5A passes through a bulb connected across a battery of 6V for 20 Seconds, then find the rate of energy transferred to the bulb. Also find the resistance of the bulb. 5**
- Q7. (a) What is Computer? What is the role of Computer in everyday life? 4**
- (b) Cobalt - 60 is a Radioactive element with half life of 5.25 years. What fraction of the original sample will be left after 26 years? 5**

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Q1.

12

1. **In a vacuum, all electromagnetic waves have the same:**  
(A) Speed (B) Frequency (C) Amplitude (D) Wavelength
2. **Which type of image is formed by a convex lens on a screen?**  
(A) Inverted and Real (B) Inverted and virtual  
(C) Upright and Real (D) Upright and Virtual
3. **Wave theory of light is formulated by:**  
(A) Newton (B) Faraday (C) Maxwell (D) Bell
4. **For a normal person, audible frequency range for sound wave lies between.**  
(A) 10Hz – 10kHz (B) 20Hz – 20kHz (C) 25Hz – 25kHz (D) 30Hz – 30kHz
5. **Two small charged spheres are separated by 2 mm. Which of the following would produce the greatest attractive force?**  
(A) +1q and +4q (B) -1q and -4q (C) +2q and +2q (D) +2q and -2q
6. **If the current in a wire which is placed perpendicular to a magnetic field increases, the force on the wire:**  
(A) Increases (B) Decreases (C) Remains the Same (D) Will be zero
7. **What happens to the intensity or the brightness of the lamps connected in series as more and more lamps are added?**  
(A) Increases (B) Decreases (C) Remains the Same (D) Can not be predicted
8. **Electric power (P) is equal to:**  
(A)  $PV$  (B)  $IV^2$  (C)  $I^2R$  (D)  $IR^2$
9. **The particles emitted from a hot cathode surface are:**  
(A) Positive ions (B) Negative ions (C) Protons (D) Electrons
10. **One of the Isotopes of uranium is  $^{238}_{92}\text{U}$ . The number of neutrons in this isotope is:**  
(A) 92 (B) 146 (C) 238 (D) 330
11. **The basic operations performed by a computer are:**  
(A) Arithmetic Operation (B) Non Arithmetic Operation  
(C) Logic Operation (D) Both A and C
12. **Which of the following is not a storage device:**  
(A) Hard Disk (B) Flash Drive (C) Keyboard (D) Cassettes

Roll No.(in Figures): ..... (in Words): .....

Maximum Marks: 48 **SUBJECTIVE TYPE** Time Allowed :1.45 Hours**(PART - I)****Q2. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) Define Mechanical Wave.
- (ii) A Wave moves on a Slinky with frequency of 4Hz and Wavelength of 0.4m. What is the speed of the wave?
- (iii) What is Pitch? Give its an example.
- (iv) Write down two advantages of SONAR.
- (v) What are the necessary conditions for the production of Sound?
- (vi) Define Conventional Current.
- (vii) Define Resistance and write its unit.
- (viii) State Joule's Law.

**Q3. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) Define Principle Axis and Focal Length.
- (ii) What is meant by Total Internal Reflection?
- (iii) What is Endoscope?
- (iv) Write two uses of Capacitors.
- (v) What is the Unit of Capacitance? Define it.;
- (vi) What is meant by information and Communication Technology?
- (vii) Write name of two essential parts of any Communication system.
- (viii) What is Super Computer?

**Q4. Write short answers to any FIVE (5) questions. (5×2=10)**

- (i) Define Electromagnetic Induction.
- (ii) Differentiate between Generator and a Motor.
- (iii) Write the name of the components of CRO.
- (iv) Define Boolean Algebra.
- (v) What is meant by Thermionic Emission?
- (vi) Define Background Radiation.
- (vii) Differentiate between Atomic Number and Atomic Mass Number.
- (viii) Write two characteristics of Gamma Rays.

**(PART - II)****Note: Attempt any TWO questions. (2×9=18)**

- Q5. (a) Prove that Motion of a Simple Pendulum is Simple Harmonic Motion. 4**  
**(b) An object 10.0 cm in front of a Convex Mirror forms an image 5.0cm behind the mirror. What is the Focal Length of the Mirror. 5**
- Q6. (a) What is Gold Leaf Electroscope? Discuss its working principle with a labelled diagram. 4**  
**(b) If two resistors of 6kΩ and 4kΩ are connected in series across a 10V battery. Then find the given quantities: 5**  
**(i) Equivalent Resistance of the Series Combination**  
**(ii) The current flowing through each of the Resistance**
- Q7. (a) What is meant by Nuclear Fission Reaction? Explain it in detail. 4**  
**(b) Write a detail note on Compact Disc and Flash Drive. 5**