

SECTION-A

Note:

- 1) Attempting all MCQs is compulsory. This paper along with the OMR sheet must be returned to the superintendent after due time.
- 2) Fill the circle (A)(B)(C)(D), which one is correct with blue or black ball in separate OMR Sheet like ●
- 3) If more than one circle in the OMR sheet is filled then no credit will be given to such answer.

I.i. The Boolean equation for OR gate is _____.

- (A) $X=AB$ (B) $X=A+B$ (C) $X=\overline{AB}$ (D) $X=\overline{A+B}$

ii. Telephone communication is the example of transmission of Signals through _____.

- (A) Electric Wire (B) Optical fibres (C) Electromagnetic waves (D) All of these

iii. The SI unit of magnetic field B is _____.

- (A) N/m (B) J/C (C) Watt (D) Tesla

iv. A transformer is used for _____.

- (A) Both DC and AC (B) AC voltage (C) DC voltage (D) Farming

v. The value of Coulomb's constant K depends on _____.

- (A) Value of charge (B) Distance (C) Material medium (D) All of these

vi. Instrument used for the detection and testing of electric charge is called _____.

- (A) Electroscope (B) Electrostatic (C) Capacitor (D) Voltmeter

vii. 1 KWh= _____.

- (A) 3600 W (B) 1000 J (C) 3.6×10^6 J (D) 3 J

viii. Which one of the following material will refract light more.

- (A) Water (B) Glass (C) Air (D) Diamond

ix. The relation between focal length and radius of curvature is _____.

- (A) $f=2R$ (B) $R=f$ (C) $f=\frac{1}{2}R$ (D) $f=R^2$

x. Minimum echo distance is reduced in _____.

- (A) Summer (B) Winter (C) Spring (D) Space

xi. An average human ear can detect sounds with an intensity as low as _____.

- (A) 1 w/m (B) 10^{-12} w/m² (C) 12 w/m (D) 10^{12} w/m²

xii. A wave transports _____.

- (A) Energy (B) Matter (C) Air (D) Both A and B

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 32

II. Attempt any EIGHT Parts out of the following. Each Part carries equal marks.

- i. A thin rope hangs from high tower so that its upper end is not visible. How can the length of the rope be determined?
- ii. Define intensity of sound what is the unit of intensity.
- iii. Calculate the wave length of sound at the extremes of the audible range 20HZ and 20KHZ at normal room temperature 20°C.
- iv. State and explain Snell's law.
- v. What is Capacitor? Define Capacitance of a capacitor.
- vi. What is resistance and what is the unit of resistance.
- vii. If the unit of electricity cost 8.11 Rs/Kwh. What is cost of running 160w two fans and four 100w light bulbs for 6 hours.
- viii. How can a magnetic field be used to generate electric current?
- ix. What is the difference between analogue and digital electronics?
- x. What is isotopes write the isotopes of carbon and show the numbers of protons, electrons and neutrons.
- xi. Compare coulomb's law and newton's law of universal gravitation.

SECTION "C"

Marks: 21

Note: Attempt any THREE questions of the following. Each question carries equal Marks.

- III. (a) Differentiate between Transverse waves and Longitudinal waves. 4
(b) A positive test charge of $30\mu\text{C}$ is placed in an electric field. Force on it is 0.600N. What is the magnitude of electric field at the location of test charge? 3
- IV. (a) Derive thin lens Equation. 4
(b) Nimra is viewing a flea using magnifier with $f=3\text{cm}$ if her point is at $N=25\text{cm}$. Then calculate the maximum magnification she can get. 3
- V. (a) What is parallel combination of resistors? How we can determine equivalent resistance for different resistors connecting in Parallel? 4
(b) A 30volt battery is connected to a 10-Ohm resistor. Find the amount of current in the circuit. 3
- VI. (a) Explain the force on a current carrying conductor in a magnetic field. 4
(b) $^{220}_{86}\text{Rn}$ decays via alpha 86 decay identify the daughter nuclide. 3