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.

Q1.   12

1. The half life of cobalt is:

    (A) 40 years   (B) 50 years   (C) 20 years   (D) 30 years

2. The brain of any computer system is:

    (A) Control unit   (B) CPU   (C) Memory   (D) Monitor

3. The basic operations performed by a computer are:

    (A) Arithmetic operation   (B) Non arithmetic operation

    (C) Logical operation   (D) Both A and C

4. Types of waves are:

    (A) 4   (B) 3   (C) 2   (D) 1

5. The speed of sound at room temperature is:

    (A) 320 ms^{-1} (B) 330 ms^{-1} (C) 340 ms^{-1} (D) 350 ms^{-1}

6. The refractive index of ice is:

    (A) 1.52   (B) 1.31   (C) 2.45   (D) 1.33

7. Which one of the following quantity is not change during refraction of light.

    (A) Its Direction   (B) Its Speed   (C) Its frequency   (D) Its wavelength

8. The value of 'K' in Coulomb's law is:

    (A) $9 \times 10^{9} Nm^{2}C^{-2}$ (B) $9 \times 10^{11} Nm^{2}C^{-2}$ (C) $9 \times 10^{-9} Nm^{2}C^{-2}$ (D) $9 \times 10^{-11} Nm^{2}C^{-2}$

9. Electric potential and emf:

    (A) are same quantities   (B) two different quantities

    (C) have different units   (D) Both A and B

10. The combined resistance of two identical resistors connected in series is 8 ohm. Their combined resistance in a parallel arrangement will be:

    (A) 2Ω   (B) 4Ω   (C) 8Ω   (D) 12Ω

11. The presence of magnetic field can be detected by a:

    (A) small mass   (B) stationary positive charge

    (C) stationary negative charge   (D) magnetic compass

12. The particles emitted from a hot cathode surface are:

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

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 reflection of waves.

    (ii)   What are mechanical waves, write an example.

    (iii)   Differentiate noise and music.

    (iv)   Write down two uses of ultrasound.

    (v)   Define intensity of sound, write its unit.

    (vi)   Define potential difference and write its unit.

    (vii)   What is meant by electromotive force?

    (viii)   What is unit of resistance? Define it

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

    (i)   Define power of a lens and its unit.

    (ii)   Define the terms resolving power and magnifying power.

    (iii)   Define total internal reflection.

    (iv)   State Coulomb's Law.

    (v)   Define the unit of capacitance.

    (vi)   What is the role of computer in everyday life.

    (vii)   Differentiate between the primary memory and secondary memory.

    (viii)   What is Internet.

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

    (i)   What is meant by mutual induction?

    (ii)   What is meant by electric motor?

    (iii)   Define thermionic emission.

    (iv)   Write names of two parts of cathode ray oscilloscope.

    (v)   What is meant by truth tables?

    (vi)   Differentiate between atomic number and neutron number.

    (vii)   What is meant by nuclear fusion?

    (viii)   Write the causes of background radiations.

(PART - II)

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

Q5. (a)   Distinguish between longitudinal and transverse waves with suitable examples.   4

    (b)   An object 30 cm tall is located 10.5 cm from a concave mirror with focal length 16 cm.   5

        (a)   Where is the image located?   (b)   How high is it?

Q6. (a)   Write four characteristics of series combination of capacitors.   4

    (b)   A electric bulb is marked with 220 V, 100 W. Find the resistance of the filament of bulb. If the bulb is used 5 hours daily. Find the energy in kWh consumed by the bulb in one month (30 days)   5

Q7. (a)   What do you understand by the term word processing and data managing.   4

    (b)   Technetium 99 is a radioactive element, has half life of 6 hours if there is 200 mg of this technetium present, how much will be left in 36 hours.   5

Q1. 12

1. In a vacuum all electromagnetic waves have the same:

    (A) speed   (B) Frequency   (C) Amplitude   (D) Wavelength

2. SI unit of Intensity is:

    (A) $W\,m^{-1}$ (B) $W\,m^{-2}$ (C) $W\,m$ (D) $W\,m^{2}$

3. Snell's law is:

    (A) $n = \dfrac{\sin \hat{i}}{\sin \hat{r}}$ (B) $n = \dfrac{\sin \hat{r}}{\sin \hat{i}}$ (C) $n = \sin \hat{r}$ (D) $n = \sin \hat{i}$

4. The endoscope which is used to examine throat is called:

    (A) Gastroscope   (B) Cystoscope   (C) Bronchoscope   (D) None of these

5. Coulomb's Law is:

    (A) $F = K\dfrac{q_1 q_2}{r^3}$ (B) $F = K\dfrac{q_1 q_2}{r^2}$ (C) $F = Eq$ (D) $F = G\dfrac{m_1 m_2}{r^2}$

6. What is the power rating of a lamp connected to a 12 V source when it carries 2.5 A?

    (A) 4.8 W   (B) 14.5 W   (C) 30 W   (D) 60 W

7. Specific resistance of metal nichrome is:

    (A) $100 \times 10^{-8}\,\Omega m$ (B) $200 \times 10^{-8}\,\Omega m$ (C) $300 \times 10^{-8}\,\Omega m$ (D) $600 \times 10^{-8}\,\Omega m$

8. The step-up transformer:

    (A) Increase the input current   (B) Increase the input Voltage

    (C) Has more turns in primary   (D) Has less turns in secondary coil

9. The output of a NAND gate is '0' when:

    (A) Both of its input are '0'   (B) Both of its input are '1'

    (C) Any of its input is '0'   (D) Any of its input is '1'

10. Which of the following is not processing:

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

11. 1 megabyte is equal to:

    (A) 1024 kB   (B) 1034 kB   (C) 1044 kB   (D) 1054 kB

12. Isotopes are atoms of same element with different:

    (A) Atomic mass   (B) Atomic number   (C) Number of Protons   (D) Number of electrons

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 mechanical waves.

   (iii)   What is meant by noise pollution.

   (iv)   What is meant by Zero bel.

   (v)   Define Ultrasound.

   (vi)   Define the unit of resistance.

   (vii)   Define conventional current.

   (viii)   Define electric power.

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

   (i)   Define power of lens. Also write its formula.

   (ii)   Write down the function of Gastroscope.

   (iii)   Write laws of reflection.

   (iv)   How electric charge is Produced.

   (v)   Write two uses of capacitor.

   (vi)   What is meant by floppy disk and hard disk.

   (vii)   Write two advantages of E-mail.

   (viii)   Write names of two parts of computer.

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

   (i)   Write two factors effecting induced e.m.f.

   (ii)   State the Faraday's law of electromagnetic induction.

   (iii)   Differentiate between analogue and digital electronics.

   (iv)   Explain NOR gate.

   (v)   Define Cathode ray oscilloscope. (CRO)

   (vi)   Write two characteristics of beta particles.

   (vii)   Differentiate between atomic number and atomic mass number.

   (viii)   Define natural radio activity.

(PART - II)

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

Q5. (a) Explain the following properties of waves with reference to ripple tank experiment.   4

   (i) Refraction   (ii) Diffraction

   (b) An object is placed 6cm in front of a concave mirror that has focal length 10cm. Determine the location of the image.   5

Q6. (a) What is gold leaf electroscope? Explain its working principle with a diagram.   4

   (b) If the length of copper wire is 1m and its diameter is 2 mm then find its resistance.   5

Q7. (a) What is meant by Computer? What is role of computer in every day life?   4

   (b) Carbon-14 has a half life of 5730 years. How long will it take for the quantity of Carbon-14 in a sample to drop to one-eighth of the initial quantity?   5