Q1. 12

1. What does the term e-mail stand for?

   (A) Emergency mail   (B) Electronic mail   (C) Extra mail   (D) External mail

2. One isotope of uranium is $^{238}_{92}U$. The number of neutrons in this isotope is:

   (A) 92   (B) 238   (C) 146   (D) 330

3. A device which converts electrical energy into mechanical energy is called:

   (A) D.C. motor   (B) Generator   (C) Transformer   (D) All of these

4. Which is an example of a longitudinal wave?

   (A) Sound wave   (B) Light wave   (C) Radio wave   (D) Water wave

5. Speed of light in water is:

   (A) $3 \times 10^8 \ ms^{-1}$ (B) $2.3 \times 10^8 \ ms^{-1}$ (C) $2 \times 10^8 \ ms^{-1}$ (D) $1 \times 10^8 \ ms^{-1}$

6. One volt is equal to:

   (A) $1 \ JC$ (B) $1 \ JC^{-1}$ (C) $1 \ J/C^2$ (D) $1 \ NC^{-1}$

7. Mathematical form of Ohm's Law is:

   (A) $P = IV$ (B) $V = IR$ (C) $Q = It$ (D) $W = Q/V$

8. The process by which electrons are aemitted by a hot metal surface is known as:

   (A) Boiling   (B) Evaporation   (C) Conduction   (D) Thermionic emission

9. The relation between v, f and λ of a wave is:

   (A) $vf = \lambda$ (B) $f\lambda = v$ (C) $v = \dfrac{\lambda}{f}$ (D) $v\lambda = f$

10. When we double the voltage in a simple electric circuit, we double the:

    (A) Current   (B) Power   (C) Resistance   (D) both A & B

11. SI unit of charge is:

    (A) kg   (B) Newton   (C) Volt   (D) Coulomb

12. Index of refraction of diamond is:

    (A) 1.52   (B) 1.66   (C) 2.21   (D) 2.42

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)　　What is meant by time period?

    (ii)　　State joule's law.

    (iii)　　What is difference between musical sound and noise?

    (iv)　　What is audible frequency range?

    (v)　　Define intensity of sound.

    (vi)　　Define current and write its unit.

    (vii)　　Define unit "Ohm".

    (viii)　　What is the work of fuse?

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

    (i)　　If p = 6 cm, f = 10 cm mirror is concave find q?

    (ii)　　What is meant by critical angle?

    (iii)　　Write two uses of optical fibre.

    (iv)　　Define capacitance.

    (v)　　Define electrical potential.

    (vi)　　What is meant by telecommunication?

    (vii)　　What is meant by data management?

    (viii)　　Write two services of internet.

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

    (i)　　State Fleming's left hand rule.

    (ii)　　What is meant by step down transformer?

    (iii)　　Write the parts name of cathode ray oscilloscope.

    (iv)　　NAND is a universal gate, give its symbol and truth table.

    (v)　　Define thermionic emission.

    (vi)　　What is meant by half life of radio active element?

    (vii)　　Define carbon dating.

    (viii)　　Write two characteristics of β-particles.

(PART - II)

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

Q5. (a) What are mechanical waves? Describe its types with examples.　　4

    (b) An object 30 cm tall is located 10.5 cm from a concave mirror with focal length 16cm. Find the location and height of the image.　　5

Q6. (a) Explain one application and one hazard of static electricity.　　4

    (b) By applying a potential difference of 10 V across a conductor, a current of 1.5 A passes through it. How much energy would be obtained from the current in 2 minutes?　　5

Q7. (a) Explain in detail about compact disc and flash drive.　　4

    (b) Ashes from a campfire deep in a cave show carbon-14 activity of only one-eight the activity of fresh wood. How long ago was that campfire made?　　5

Q1.   **12**

1. The types of spherical mirrors are:

    (A) 2   (B) 4   (C) 6   (D) 8

2. What is the voltage across a 6 Ω resistor when 3 A of current passes through it?

    (A) 2V   (B) 9V   (C) 18V   (D) 36V

3. Capacitance is defined as:

    (A) VC   (B) Q/V   (C) QV   (D) V/Q

4. Unit of charge is:

    (A) Ohm   (B) Watt   (C) Coulomb   (D) Ampere

5. Which of the following quantity is not changed during refraction of light?

    (A) Its direction   (B) Its speed   (C) Its frequency   (D) Its wavelength

6. Which part of a D.C. motor reverses the direction of current through the coil every half cycle?

    (A) Armature   (B) Commutator   (C) Brushes   (D) Slip rings

7. In vacuum, all electromagnetic waves have the same:

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

8. One of the isotope of uranium is $^{238}_{92}U$. The number of neutrons in this isotope is:

    (A) 92   (B) 146   (C) 238   (D) 330

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

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

10. Which of the following is not processing?

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

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

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

12. Which is the most suitable means of reliable continuous communication between an orbiting satellite and earth?

    (A) Microwaves   (B) Radio-waves   (C) Sound-waves   (D) Any light wave

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)   How can you define the term wave?

   (ii)   What is meant by diffraction of wave?

   (iii)   Define pitch of sound. What is the relation between pitch and frequency of sound.

   (iv)   Calculate the frequency of a sound wave of speed 340 ms^{-1} and wavelength 0.5 m.

   (v)   What is the audible frequency range for human ear?

   (vi)   Define electric current and write its unit.

   (vii)   State Joule's law.

   (viii)   What is difference between musical sound and noise?

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

   (i)   Draw the ray diagram of refraction telescope.

   (ii)   How farsightedness defect can be corrected?

   (iii)   Define resolving power of an instrument.

   (iv)   Define electric field intensity and write its unit.

   (v)   Define dielectric.

   (vi)   Define Software.

   (vii)   What is meant by optical fibre?

   (viii)   Define "ICT" (in information technology).

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

   (i)   Define Fleming's left hand rule.

   (ii)   State Lenz's law.

   (iii)   Write different name of component of cathode ray oscilloscope.

   (iv)   Draw diagram of NAND gate and write its truth table.

   (v)   Define digital electronic.   (vi)   Define isotopes

   (vii)   Describe two uses of radio isotopes.   (viii)   Define nuclear fusion.

(PART - II)

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

Q5. (a) Prove that motion of a mass attached to a spring is simple harmonic motion.   4

   (b) A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens? Also find the magnification of lens. 5

Q6. (a) Explain Coulomb's Law.   4

   (b) A current of 3 mA is flowing through a wire for '1' minute. What is the charge flowing through the wire?   5

Q7. (a) Differentiate between hardware and software. Also write name of different hardwares and softwares.   4

   (b) Cobalt-60 is a radio active element with half life of 5.25 years. What fraction of the original sample will be left after 26 years?   5