

Time Allowed: 3 Hrs

Marks: 65

Note: There are Three Sections in this paper i.e. A, B and C. Attempt Section A and return it to the Superintendent within the given time.

No marks will be awarded for Cutting, Erasing and Overwriting.

Mobile Phone is strictly prohibited in Examination Hall.

Time: 20 Minutes

SECTION "A"

Marks: 12

Q.1. Choose the correct option and shade one of (A, B, C, D) in the given Bubble Answer Sheet.

- i. The function of control grid in electron gun is to:
- (A) emit electrons (B) control intensity of electrons (C) focus electrons (D) accelerate electrons
- ii. The programmed instructions that tell your computer what to do is called;
- (A) hardware (B) software (C) human resource (D) transmission
- iii. The half-life of a substance is 4 hours. 25% of the substance will remain undecayed in:
- (A) 2 hours (B) 4 hours (C) 8 hours (D) 12 hours
- iv. Radioactive nuclei ${}_{90}\text{X}^{234}$ decays to ${}_{91}\text{Y}^{234}$. The type of particle being emitted is:
- (A) alpha (B) beta (C) gamma (D) both alpha & beta
- v. The time period of simple pendulum is T. If its length is increased four times its original length, the new time period will be:
- (A) 2T (B) 4T (C) 8T (D) 16T
- vi. The frequency of water waves travelling with a speed of 6ms^{-1} is 3Hz. The wavelength of the waves is:
- (A) 1m (B) 2m (C) 3m (D) 4m
- vii. If the intensity of a sound is 10 times the intensity of faintest audible sound, its intensity level in dB is:
- (A) 0 (B) 10 (C) 20 (D) 30
- viii. An object is placed at a distance of 20 cm from a concave mirror of focal length 15 cm. The image is formed at a distance of:
- (A) 15cm (B) 20cm (C) 30cm (D) 60cm
- ix. A ray of incident light is passing through focal point. After refraction through a convex lens, it will travel.
- (A) along focal point (B) parallel to principal axis (C) antiparallel to principal axis (D) perpendicular to principal axis
- x. If the voltage V across a capacitor is doubled, its capacitance C will be:
- (A) 2C (B) 4C (C) 8C (D) 1C
- xi. Two identical bulbs are connected in series across a voltage source. The addition of a third such bulb to the combination will.
- (A) Increase current (B) Decrease resistance (C) Increase voltage drop across each bulb (D) Increase resistance
- xii. A current carrying conductor placed in a magnetic field will experience no force when placed with respect to (w.r.t) the direction of magnetic field at an angle of:
- (A) 0° (B) 45° (C) 60° (D) 90°

ESKPX-XXVI (I)
SSC-(P-II)
PHYSICS – 10th

Time: 2 Hours 40 Minutes

SECTION "B"

Marks: 32

Note: Attempt any EIGHT (08) questions. All questions carry equal marks.

- Q.1.** Define the terms pitch and loudness. How is loudness of sound affected by amplitude of vibration and area of vibrating body? 1+1+1+1
- Q.2.** Calculate the speed of sound at a temperature of 40°C. 1+1+1+1
- Q.3.** What is refraction of light? State two conditions necessary for total internal reflection to take place. 2+1+1
- Q.4.** State Coulomb's law. What happens to the Coulomb force F , if the magnitudes of two charges is doubled and the distance between the two point charges is reduced to half? 2+2
- Q.5.** Describe the effect of temperature and cross-sectional area of a metallic conductor on its electrical resistance. 2+2
- Q.6.** 8×10^6 J of energy is used by a boiler in 30 minutes to boil water. Calculate the current passing through it if the applied voltage is 220 V. 1+1+1+1
- Q.7.** Why does a current carrying conductor placed in a magnetic field experience a force? What is the magnitude of this force? Under what condition is this force?
 a). maximum b). minimum 1+1+1+1
- Q.8.** Draw the truth table and circuit symbol for OR gate. Also write its Boolean equation. 2+1+1
- Q.9.** Define data, information, hardware and software. 1+1+1+1
- Q.10.** Describe beta radiation in terms of its nature, charge and relative penetration ability. Why does a nucleus emit beta particles? 1+1+1+1
- Q.11.** Explain nuclear fusion with an example. What is the source of large amount of energy released during nuclear fusion? 2+1+1

SECTION "C"

Marks: 21

Note: Attempt any THREE (03) questions. All questions carry equal marks.

- Q.12.** a) Show mathematically that the acceleration of a simple pendulum is directly proportional to the displacement and is directed towards the mean position for small angle. 1+1+1+1
 b) Calculate the time period of a simple pendulum of length 1m on planet mercury. 1+1+1
 ($g_{\text{mercury}} = 3.7 \text{ ms}^{-2}$)
- Q.13.** a) Define the angle of incidence and the angle of reflection. State the two laws of reflection by drawing a neat diagram. 1+1+1+1
 b) Light is incident from one medium of refractive index 1 at an angle of incidence 15° on a second medium. If the angle of refraction is 10° , calculate the refractive index of the second medium. 1+1+1
- Q.14.** a) Derive the formula for the equivalent capacitance of two capacitors of capacitance C_1 and C_2 connected in parallel across a battery of voltage V . 1+1+1+1
 b) Two capacitors of $4\mu\text{F}$ and $8\mu\text{F}$ are connected in series across a 30V battery. Calculate:
 a). equivalent capacitance of the combination 1+1+1
 b). charge stored on each capacitor
- Q.15.** a) What is D.C motor? State its working principle. Why is a split ring (commutator) used in D C motor? 1+1+2
 b) the use of transformer for efficient of electricity over long distance. 1+1+1