

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.

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|-------|---|---------|
| 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.

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| 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.
b) Calculate the time period of a simple pendulum of length 1m on planet mercury.
($g_{\text{mercury}} = 3.7 \text{ ms}^{-2}$) | 1+1+1+1
1+1+1 |
| Q.13. | a) Define the angle of incidence and the angle of reflection. State the two laws of reflection by drawing a neat diagram.
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+1
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.
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
b). charge stored on each capacitor | 1+1+1+1
1+1+1 |
| Q.15. | a) What is D.C motor? State its working principle. Why is a split ring (commutator) used in D.C motor?
b) Describe the use of transformer for efficient transmission of electricity over long distance. | 1+1+2
1+1+1 |