A device 'X' is connected to an ac source $V=V_0$ sin ωt . The variation of voltage, current and power in one cycle is shown in the following graph :



- (a) Identify the device 'X'.
- (b) Which of the curves A, B and C represent the voltage, current and the power consumed in the circuit? Justify your answer.
- (c) How does its impedance vary with frequency of the ac source ? Show graphically.
- (d) Obtain an expression for the current in the circuit and its phase relation with ac voltage.

OR

- (a) Draw a labelled diagram of an ac generator. Obtain the expression for the emf induced in the rotating coil of N turns each of cross-sectional area A, in the presence of a magnetic field B.
- (b) A horizontal conducting rod 10 m long extending from east to west is falling with a speed 5.0 ms⁻¹ at right angles to the horizontal component of the Earth's magnetic field, 0.3 × 10⁻⁴ Wb m⁻². Find the instantaneous value of the emf induced in the rod.
- 26. (a) तरंगाग्र की परिभाषा लिखिए । हाइगेन्स सिद्धान्त का उपयोग करके अपवर्तन के नियम सत्यापित कीजिए ।
 - (b) प्रकाश के प्रकीर्णन की प्रक्रिया द्वारा रैखिकत: ध्रुवित प्रकाश किस प्रकार प्राप्त किया जाता है ? जब काँच का अपवर्तनांक = 1.5 है, तो वायु – काँच अंतरापृष्ठ के लिए ब्रूस्टर कोण ज्ञात कीजिए ।

अथवा

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