22232

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

(a) Define electric current. **2**

(b) State the meaning of active and passive circuit. **2**

(c) State the meaning of the term dielectric strength. **2**

(d) Define Magneto Motive Force. **2**

(e) Define Magnetic Hysterisis. **2**

(f) Define Co-efficient of coupling. **2**

(g) State the formula to calculate the energy stored in a magnetic field. **2**

2. Attempt any THREE of the following : **12**

(a) State the effects of electric current. Explain any one effect with a suitable example. **4**

(b) Compare resistances in series and parallel. **4**

(c) With suitable diagram explain the action of capacitor. **4**

(d) State and explain statically and dynamically induced emfs. **4**

3. Attempt any THREE of the following : **12**

(a) State and explain ideal voltage source and current source. **4**

(b) An electric kettle is required to heat 0.6 litre of water from 10 °C to the boiling point in 5 minutes. Calculate the resistance of the heating element, if the supply voltage is 240 V. **4**

(c) State and explain Kirchoff's Voltage Law. **4**

(d) Enlist the types of capacitor. Explain the construction of any one. **4**

4. Attempt any THREE of the following : **12**

(a) Compare direct current and alternating current. **4**

(b) Calculate the resistance between the points B & D, for the Fig. 4.1. **4**

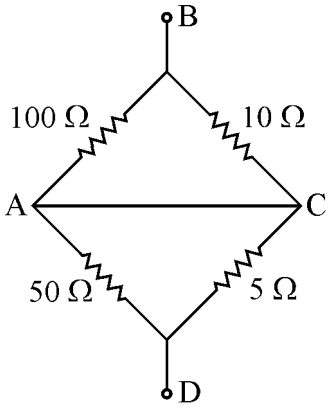

FIG. 4.1

(c) Applying Kirchoff's voltage law, find the current flowing through the resistance 6 Ω & for the circuit shown in Fig. 4.2 **4**

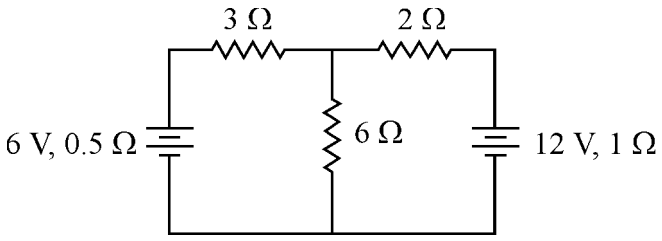

FIG. 4.2

(d) Derive the equation for energy stored in a capacitor. **4**

(e) Three capacitors A, B and C have capacitances 10, 50, 25 μF each are connected in parallel to a 250 V supply. Calculate

(i) Total capacitance

(ii) Charge across each capacitor. **4**

5. Attempt any TWO of the following : 12

(a) Draw the experimental setup to plot the 'B-H Curve' of a magnetic material. Explain the procedure and draw the curve. **6**

(b) An iron ring of mean length 50 cm has an air gap of 1 mm and a winding of 200 turns. If the permeability of iron is 400, calculate the fuel density when a current of 2 A flows through the coil. **6**

(c) (i) State Faraday's Laws of Electro Magnetic Induction.

(ii) Draw and explain the experimental setup to demonstrate the generation of statically induced emf. **6**

6. Attempt any TWO of the following : 12

(a) Compare electric and magnetic circuit. **6**

(b) Two coils having 50 and 400 turns respectively are wound side by side on a closed iron ring of area of cross-section 100 cm^2 and mean length 200 cm. Calculate

(i) Mutual inductance between the coils, if the relative permeability of iron is 2000.

(ii) emf induced in the second coil, when a zero ampere current grows to 10 A in a time of 0.02 sec in the first coil. **6**

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(c) If a coil of 1000 turns is linked with a flux of 0.02 weber, when carrying a current of 10 A, calculate

(i) Inductance of the coil.

(ii) Induced emf, if the current is uniformly reversed in the coil in 0.01 seconds. **6**
