



22212

12223

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) 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 resistance and state its unit.	2
(b) State KCL and KVL.	2
(c) Define dielectric strength for a capacitor and give its unit.	2
(d) Define flux and flux density.	2
(e) State Lenz law.	2
(f) A coil of 500 turns is linked with a flux of 25 mWb, when carrying a current of 12.5 A. Calculate the value of self inductance.	2
(g) Define co-efficient of self inductance.	2
2. Attempt any THREE of the following :	12
(a) Compare resistance in series and resistance in parallel.	4
(b) State four applications of heating effect.	4
(c) Define resistance and resistivity. State the relation between them.	4
(d) Draw a practical set-up to plot charging and discharging curves of a capacitor through a resistor. Draw the curves.	4



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

(a) Describe the effect of temperature on resistance. 4

(b) State and explain Ohm's law. 4

(c) Define the following terms as related to electric circuits :

(i) Node

(ii) Branch

(iii) Loop

(iv) Mesh 4

(d) Three capacitors $16 \mu\text{F}$, $18 \mu\text{F}$ and $13 \mu\text{F}$ are connected in a circuit. Find equivalent capacitance when they are connected in (i) series, (ii) parallel. 4

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

(a) State the various effects of electric current and explain any one of them. 4

(b) Using Kirchoff's law, calculate the current flowing through 10Ω . 4

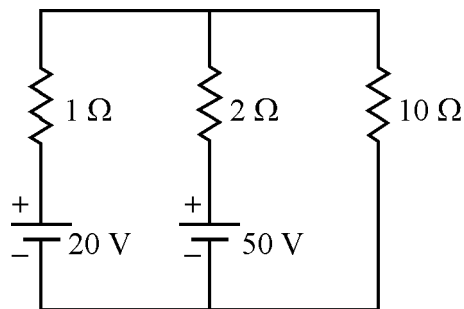


Fig. (a)

(c) Derive the expression for energy stored in a capacitor with the help of neat diagram. 4

(d) Three capacitors A, B, C have capacitance 10 F , 50 F and 25 F respectively. Calculate :

(i) Charge on each when connected in parallel to a 250 V supply.

(ii) Total capacitance 4

(e) State and explain Faraday's law of electromagnetic induction. 4

- 5. Attempt any TWO of the following :** **12**
- (a) Explain Hysteresis loop of magnetic material with neat labelled diagram. **6**
- (b) A coil consisting of 120 turns is placed in the magnetic field of 0.8 mWb. Calculate the average emf induced in the coil when it is moved in 0.08 seconds from the given field to 0.3 mWb. If the resistance of coil is 200 Ω , find the induced current in the coil. **6**
- (c) (i) State the various types of inductor. **6**
- (ii) Derive an expression for energy stored in magnetic field. **6**
- 6. Attempt any TWO of the following :** **12**
- (a) Compare electric circuit and magnetic circuit on any six points. **6**
- (b) An iron ring of mean circumference 0.8 m is uniformly wound with 400 turns of wire. It carries 1.6 A and produces a flux density of 1.1 T. Find permeability of the material. **6**
- (c) State the types of induced emf and explain the dynamically induced emf. **6**
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