

22212

21718

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

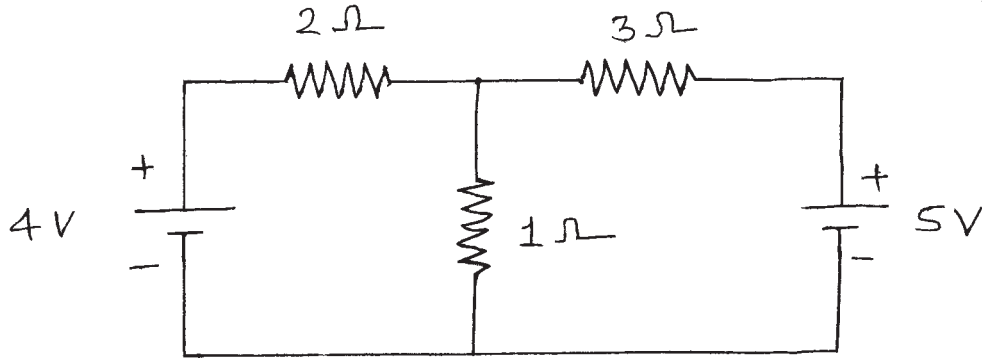
- 1. Attempt any FIVE of the following:** **10**
- Write any two differences between direct current and alternating current.
 - Define -
 - Node
 - Loop for a DC circuit
 - Define dielectric strength for a capacitor.
 - An iron ring of mean circumference 80 cm is uniformly wound with 500 turns of wire and carries 0.8 A. Find the magnetic field strength.
 - Define magnetic flux density. State its unit.
 - Define the term – statically induced emf.
 - A coil of 500 turns is linked with a flux of 25 mwb, when carries a current of 12.5A. Calculate the value of self inductance.

P.T.O.

2. Attempt any THREE of the following:

12

- List any four types of resistors. Give one application of each.
- Find current through 1Ω resistance of Figure No. 1 using Kirchoff's laws.

Fig. No. 1

- Draw a practical set-up to plot charging and discharging curves of a capacitor through a resistor. Draw the curves.
- When a voltage of 220 V is applied to a coil with resistance of 50Ω , produces 5 mwb of flux. If the coil has 1000 turns, find inductance of coil and energy stored in the magnetic field.

3. Attempt any THREE of the following:

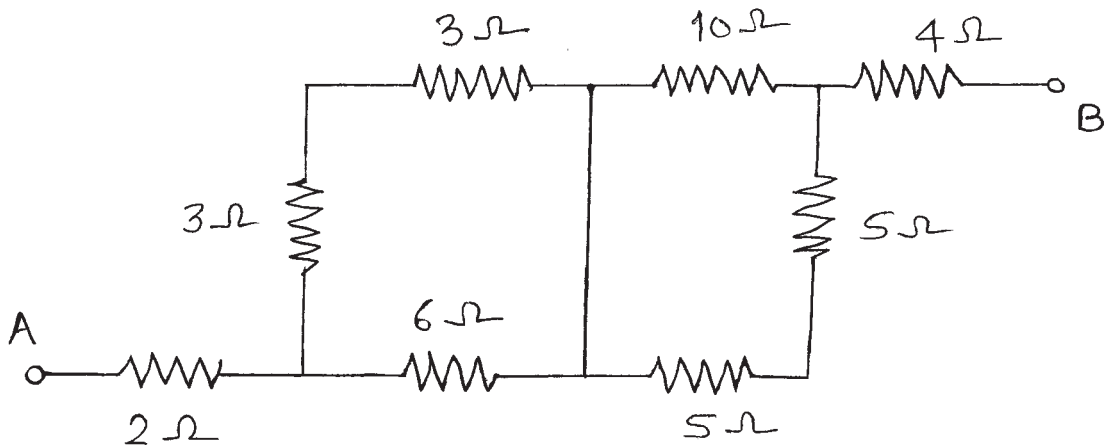
12

- A device stores 500 J and releases in the form of current of 40 A in the duration of 15 msec. Find the terminal voltage.
- List any two effects of electric current. Give one example of each.
- State and explain Ohm's law.
- Three capacitors $15\mu\text{f}$, $18\mu\text{f}$ and $12\mu\text{f}$ are connected in a circuit. Find equivalent capacitance when they are connected in -
 - series
 - parallel

4. Attempt any THREE of the following:

12

- a) Define – resistance and resistivity. State relation between them.
Give one material having high resistivity.
- b) Define following networks.
- Active
 - Passive
 - Unilateral
 - Bilateral
- c) Find resistance R_{AB} from Figure No. 2.

Fig. No. 2

- d) Derive the expression for energy stored in a capacitor with the help of neat diagram.
- e) List any three types of capacitor. Give one application of any one type.

5. Attempt any TWO of the following:**12**

- a) Draw a neat sketch of series magnetic circuit. State value of reluctance for both series and parallel magnetic circuit. Name each term used in them.
- 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.
- c) Define any three laws related to electromagnetic induction. Write use of each law.

6. Attempt any TWO of the following:**12**

- a) Draw hysteresis shapes for following materials-
 - (i) permanent magnet
 - (ii) steel alloy
 - (iii) plastic
 - b) Related to an inductor state
 - (i) any two types
 - (ii) any two applications
 - (iii) expression for self and mutual inductance
 - c) Two coils A of 1000 turns and B of 1200 turns are such that 60% of flux produced by A links with B. A current of 4A in coil A produces a flux of 0.05 wb and in coil B of 0.075 wb. Find –
 - (i) L_1
 - (ii) L_2
 - (iii) M
 - (iv) K
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