



C09-EE-105

3037

BOARD DIPLOMA EXAMINATION, (C-09)

APRIL/MAY—2015

DEEE—FIRST YEAR EXAMINATION

BASIC ELECTRICAL ENGINEERING

Time : 3 hours]

[Total Marks : 80

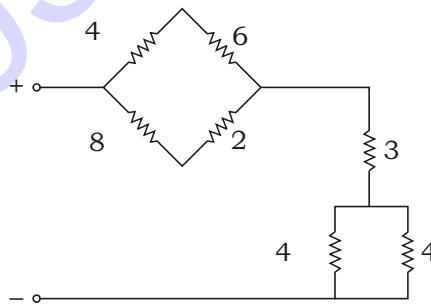
PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Derive the relation $R = \frac{l}{a}$.

2. Find the equivalent resistance of the circuit given below :



3. Distinguish between copper and aluminium in any three aspects.
4. Define the following :
- (a) Magnetic flux
 - (b) Reluctance
 - (c) Permeability of a magnetic field

- * 5. Explain dynamically induced e.m.f. and give its expression.
6. Two inductances of 16 H and 9 H are connected in series. The coefficient of coupling is 0.8. Find the mutual inductance between them. Find also the total inductance of the combination when the fluxes are (a) aiding and (b) opposing.
7. (a) State Gauss theorem. 2
 (b) Define capacitance and give its unit. 1
8. State any three factors which effect insulation resistance.
9. List three properties of fuse material.
10. Give any three differences between P-type semiconductors and N-type semiconductors.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) An aluminium resistor has a resistance of 45.6 ohms at 25 °C and 49.2 ohms at 50 °C. Calculate the temperature coefficient of resistance at 0 °C. 4
- (b) A house has the following loads :
- (i) 10 lamps of 60 W each working for 10 hr a day
 - (ii) 6 fans of 80 W each working for 15 hr a day
 - (iii) 1 electric iron of 750 W working for 1 hr a day
 - (iv) 1 heater of 1000 W working for ½ hr a day
 - (v) 1 refrigerator of 250 W working for 12 hr a day
- Calculate monthly bill, if the rate of charge per unit is ₹ 1.25 plus ₹ 20 as meter rent. 6
12. (a) State Joule's law and explain mechanical equivalent of heat. 4
- (b) An electric kettle is required to heat 0.6 litre of water from 10 °C to the boiling point in 5 min. The supply voltage is 240 V. The efficiency of the kettle is 78%. Calculate the (i) resistance of the heating element, (ii) kW power consumed and (iii) energy consumed in kWh. 6

- * **13.** (a) State work law. 2
- (b) Give the expression for the field strength on the axis of a solenoid. 2
- (c) A circular ring of iron is wound uniformly with 1000 turns of wire. Its mean diameter is 20 cm and its cross-section is 4 sq cm. Determine the current which will produce a flux of 20 -Wb. Assume the permeability to be 800. 6
- 14.** (a) Explain the statically induced e.m.f. 4
- (b) Two coils of 100 and 150 turns respectively are wound side by side on a closed iron circuit of section 125 cm² and mean length 200 cm. If the permeability of iron is 2000, calculate (i) self-inductance of each coil, (ii) mutual inductance between them and (iii) the e.m.f. induced in the second coil if current in the first coil changes from zero to 5 A in 0.02 sec. 6
- 15.** (a) Explain (i) dielectric strength and (ii) dielectric constant. 4
- (b) Two capacitors having capacitances 6 F and 4 F respectively are connected in series across 100 V DC supply. Calculate (i) potential difference across each capacitor, (ii) equivalent capacitance and (iii) energy stored in each capacitor. 6
- 16.** Mention the properties and applications of (a) mica and (b) asbestos. 5+5
- 17.** Draw CB configuration and CE configuration of (a) P-N-P transistor and (b) N-P-N transistor. 5+5
- * **18.** (a) Mention the properties, applications and advantages of ACSR conductors. 5
- (b) Explain galvanizing and its applications. 5
