



C16-EE-106

6040

BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2018

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. Define the terms (a) resistance, and (b) specific resistance.

$1\frac{1}{2}+1\frac{1}{2}=3$

2. State and explain Ohm's law.

3. Define electric power and electrical energy and give their SI units

$1\frac{1}{2}+1\frac{1}{2}=3$

4. State Joule's law of heating.

5. State Fleming's left-hand rule.

6. Plot the field patterns due to—

(a) straight current carrying conductor;

(b) solenoid;

(c) toroid.

$1+1+1=3$

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* 7. State Lenz's law.

8. Classify various types of induced e.m.f.

9. Define capacitance and state its units. 2+1=3

10. Determine the capacitance of parallel-plate capacitor having an area of 625 cm^2 separated by a glass dielectric of 0.5 cm thickness with relative permittivity as 6.

PART - B

10×5=50

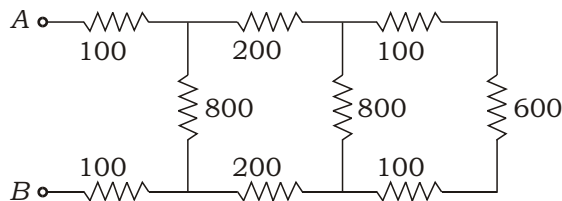
Instructions : (1) Answer *any five* questions.

(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) Derive an expression for equivalent resistance, when three resistances are connected in parallel. 5

(b) Find the equivalent resistance between the terminals A and B in the given network : 5



12. If the three resistances 2 , 4 , 6 respectively are connected in series across 60 V supply, find the—

(a) total resistance;

(b) current drawn from supply;

(c) potential drop across each resistance;

(d) power consumed by each resistance;

(e) total power delivered by the supply. 10

- * **13.** A house has the following loads :
- (a) 5 lamps of 60 W each, working for 10 hours/day
 - (b) 1 electric iron of 100 W each, working for 1 hour/day
 - (c) 5 fans of 80 W each, working for 8 hours/day
 - (d) 2 heaters of 1500 W each, working for 6 hours/day
 - (e) 1 electric motor of 1.5 HP, working for 4 hours/day at an efficiency of 85%

Calculate the monthly electricity bill for the month of September, if rate of charge per unit is ₹ 2 and add ₹ 25 as meter rent per month.

10

- 14.** (a) Explain the operation of an electric kettle with a neat sketch. 5
- (b) An electric kettle rated at 1.5 kW, 230 V takes 5 minutes to bring 1 kg of water to boiling point from 15 °C. Find the efficiency of a kettle. 5

- 15.** Compare the magnetic circuit with electric circuit in all aspects. 10

- 16.** (a) Derive an expression for magnitude of dynamically induced e.m.f. 5
- (b) A coil of 1000 turns is wound on a toroidal magnetic core having a reluctance of 10^4 A-t/Wb. When the coil current is increasing at the rate of 5 A/s, determine the e.m.f. induced in the coil. 5

- 17.** (a) Derive an expression for lifting power of a magnet. 5
- (b) Determine the force required in kg to separate two magnetic forces with contact area of 100 cm^2 , if the flux density across the surface is 0.1 tesla. 5

- * **18.** (a) Derive an expression for equivalent capacitance, when three capacitors are connected in parallel. 5
- (b) A parallel-plate air capacitor of area 25 cm^2 and plates being separated by 1 mm apart is charged to a potential of 100 volts. Calculate the energy stored in it. 5
