23061

C23-EE–106

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BOARD DIPLOMA EXAMINATION, (C-23)

MARCH/APRIL—2025

DEEE – FIRST YEAR EXAMINATION

BASIC ELECTRICAL TECHNOLOGY

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 electric current and electric potential.

2. List any five limitations of Ohm's law.

3. Define temperature coefficient of resistance.

4. Write about junction and loop in electrical network.

5. Define electrical power and give its unit.

6. State Joule's law of electric heating.

7. Find resistance and current drawn by a 60 W incandescent lamp from 230 V source.

8. What is an ideal current source?

9. State the need for network theorems.

10. Write the statement of maximum power transfer theorem.

PART—B

10×5=50

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

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

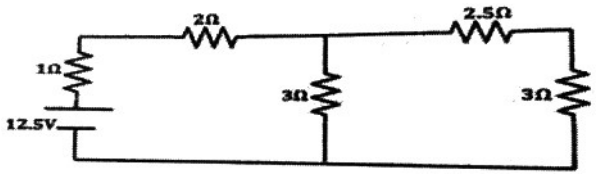
11. *(a)* State the laws of resistance and derive the formula for resistance. 6

(b) A heater element is made up of nichrome wire having resistivity of $45 \times 10^{-6}\ \Omega$-m. The diameter of the wire is 0·13 m. Calculate the length of the wire required to get a resistance of 3·4 Ω. 4

12. *(a)* Compare series circuits and parallel circuits in any six aspects. 6

(b) When two resistors 10 Ω and 20 Ω are connected in series across a 200 V supply. Determine the current flowing in each resistor and voltage drop across each resistor. 4

13. Find the current flowing through all resistors in the following circuit by using Kirchhoff's voltage law (KVL). 10



14. Calculate the monthly bill for a 30 day month for a household with the following loads. 10

(a) 4 lamps of 60 W each for 8 hours a day.

(b) 2 fans of 80 W each for 5 hours a day.

(c) 1 mixer grinder of 500 W each for 2 hours a day.

(d) 1 H.P water pump with an efficiency of 80% for 2 hours a day.

The tariff rate is ₹ 3·25 per unit for the first 100 units and ₹ 5·00 for remaining units.

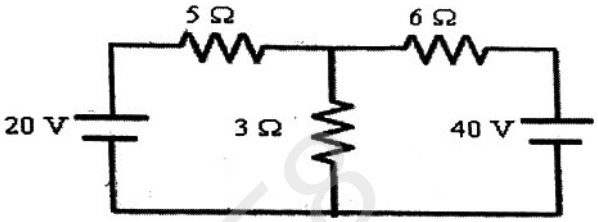
15. *(a)* How does an electric cooker produce heat? Explain with diagram. 6

(b) Find the amount of heat energy required in calories and joules to rise the temperature of 1 litre of water from room temperature to 50 °C. Assume that specific heat of water as 1. 4

16. Obtain the delta equivalent resistor network from Star equivalent resistor network. 10

17. State and explain Thevenin's theorem. 10

18. By using super position theorem, find the current flowing through 3 ohm's resistor in the below circuit. 10



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