23061

C23-EE–106

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BOARD DIPLOMA EXAMINATION, (C-23)

MARCH/APRIL—2026

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. State Ohm's Law.

2. Define *(i)* specific resistance and *(ii)* conductance.

3. Mention the effects of temperature on resistance in different materials.

4. Define Kirchhoff's current law and Kirchhoff's voltage law.

5. A lamp which is connected to 230 volts draws a current of 0.261 ampere. Calculate the energy consumed in Joules, if it runs for 10 minutes.

6. State Joule's law of heating.

7. Define thermal efficiency.

8. Define ideal voltage source and mention its characteristics.

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9. State the need for network theorems.

10. State maximum power transfer theorem.

PART—B

10×5=50

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

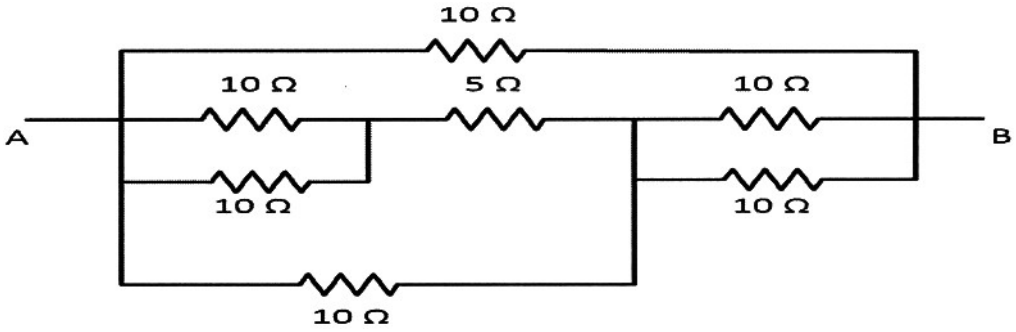
(2) Each question carries **ten** marks.

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

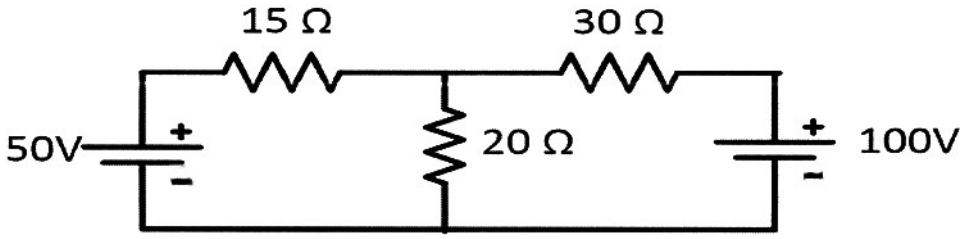
11. *(a)* Derive the relation $R = \rho \frac{l}{A}$. 5

(b) Determine the resistance of 100 m length of a wire having a uniform cross-section area of 0.1 mm^2. If the wire is madeup of manganin having a resistivity of 100×10^{-8} Ω-m. 5

12. Find the equivalent resistance between points A and B terminals for the circuit shown below : 10



13. Using Kirchhoff's laws, find the current through 20 Ω resistor in the circuit shown below : 10



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14. Calculate the monthly electricity bill of a household with the following loads for a month of 30 days :

(a) 4 incandescent lamps of 60 watt each working for 8 hours a day.

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

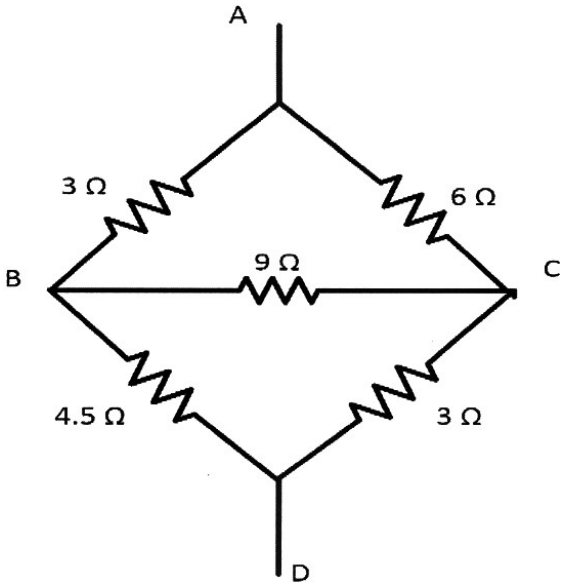
(c) 1 grinder of 500 watt working for 2 hours a day.

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

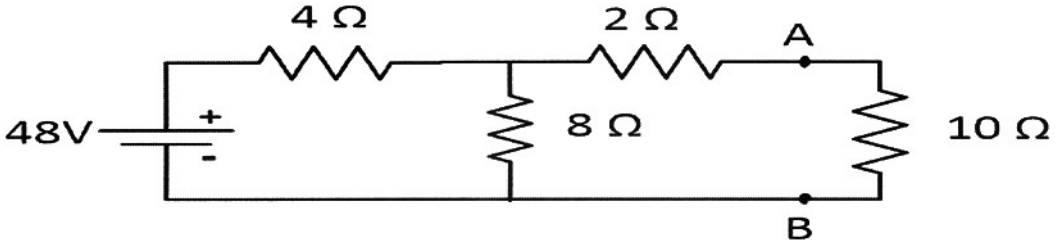
The tariff rate is ₹ 3.25 per unit. 10

15. Explain the construction and working of metal filament lamp with neat sketch. 10

16. Determine the equivalent resistance between terminals A and D of the circuit shown below by using Delta/Star transformation : 10

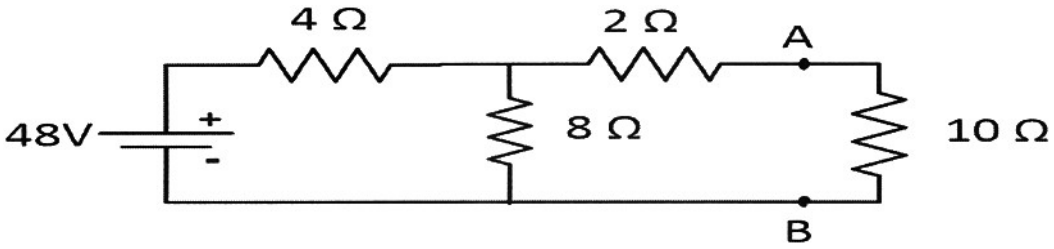


17. Find the current through 24 Ω resistor in the circuit shown below by using Thevenin's theorem : 10



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18. By using Norton's theorem find the current through 10 Ω resistor for the circuit shown below : 10



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