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C14–CM–302

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

DCME—THIRD SEMESTER EXAMINATION

BASIC ELECTRICAL AND ELECTRONICS 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 *(a)* current, *(b)* EMF and *(c)* specific resistance.

2. Find the value of R_1 and R_2 when connected in series, net resistance is 10   and when connected in parallel is 20   .

3. State Kirchhoff's laws.

4. Define *(a)* branch, *(b)* loop and *(c)* junction in a network.

5. State Fleming's right-hand rule.

6. Define PTC and NTC of thermistor.

7. Define the term biasing in the transistor.

8. Derive the relation between   and   .

9. Explain a valency band and a conduction band.

**10.** List different types of stabilizers and use of a stabilizer.

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)* Explain the laws of resistance. 4

(b) In the circuit given below, calculate the current in each resistor and total current : 6
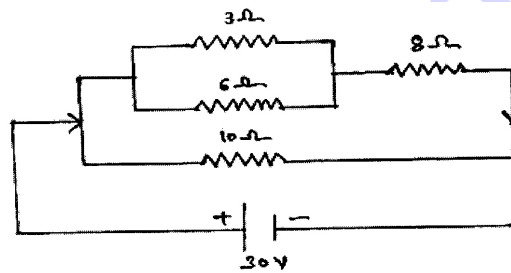
12. *(a)* Derive an equation for equivalent resistance when two resistors connected in parallel. 5

(b) Find the current in each resistance of the circuit given below : 5
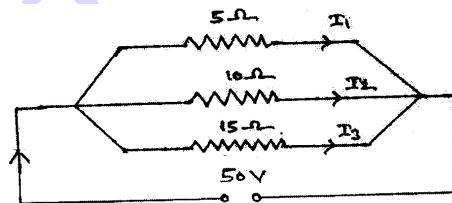
13. Determine the current through 30 resistor by applying star-delta transformation in the following circuit :
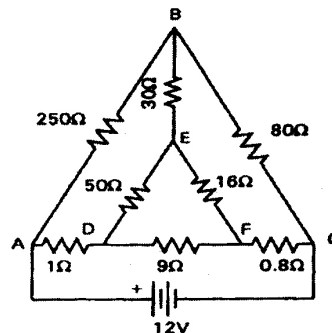
14. *(a)* State the limitations of Ohm's law. 4

(b) Define the terms *(i)* instantaneous value, *(ii)* maximum value and *(iii)* RMS value. 6

15. *(a)* State and explain Faraday's law of electromagnetic induction. 6

(b) An *R-L-C* series circuit with resistance 1 ohm, inductance 0·1 mH and capacitance 100 F is supplied with 220 volts. Calculate the resonant frequency. 4

16. *(a)* List the difference between rheostat and potentiometer. 4

(b) Explain how resistor value can be determined based on colour codes. Find the colour code for resistance of 0·1 1%. 6

17. Draw and explain the input and output characteristics of transistor in CE configuration. 10

18. *(a)* Explain the working principle of UPS with block diagram. 4

(b) Explain the formation of *P-N* junction diode. 6

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