Question Paper Code : X10139

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021

Second Semester

BE 8251 – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Agriculture Engineering/Civil Engineering/Environmental Engineering/Chemical and Electrochemical Engineering/Fashion Technology/ Handloom and Textile Technology/Plastic Technology/Polymer Technology/Textile Chemistry/Textile Technology)

(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. State Ohm's Law.

2. Distinguish Loop and Mesh Analysis.

3. List any two applications of following DC motors (i) DCSc MsMotor (ii) DCShunt Motor.

4. State Fleming's Right Hand rule.

5. What is meant by Semiconductor ? Also explain (i) n-type Semiconductor (ii) p-type Semiconductor.

6. Define Knee voltage or junction barrier voltage for PN-Junction.

7. Define duality property.

8. Represent binary number 1101-101 in 2^n form and find its decimal equivalent.

9. What do you understand by modulation ?

10. What is super heterodyne radio receiver ?

PART – B   (5×13=65 Marks)

11. a) Use mesh analysis to compute the voltage 10Ω in figure 1.   (13)

Figure. 1

(OR)

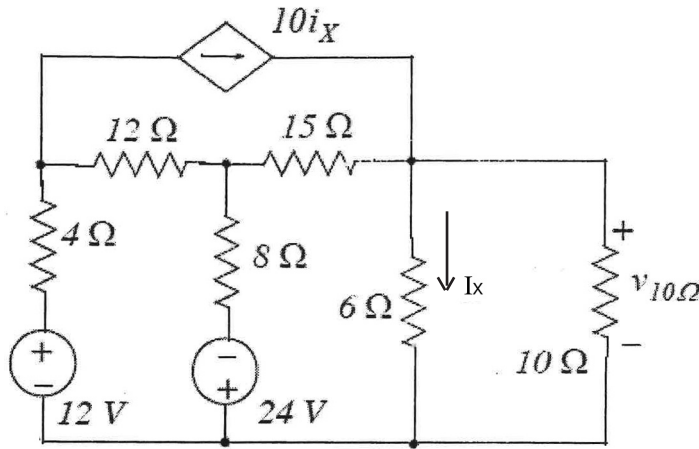b) i) Describe the working of single phase energy meter with necessary diagram.   (8)

   ii) Examine and formulate (a) The form factor (b) The peak factor for full wave rectified sine wave.   (5)

12. a) With a neat diagram explain the construction and working principle of a dc generator and derive the emf equation.   (13)

(OR)

b) Explain the tests on single phase transformer and develop an equivalent circuit from the above tests.   (13)

13. a) Draw the circuit diagram for full wave bridge rectifier and explain its working. And also obtain the expression for (i) Peak Current (ii) Output current (iii) DC output current (iv) RMS Value of Current (v) RMS value of Output Voltage (vi) Rectification Efficiency (vii) Ripple Factor (viii) Regulation.   (13)

(OR)

b) Explain the working of CE & CC configuration of NPN transistor. And also obtain the input characteristics and Output characteristics.   (13)

14. a) Using Boolean algebra simplify the following function.

    i) Y = ABC'D' + A'BC'D + A'BCD' + ABCD' **(5)**

    ii) Y = AB + A (B + C) + B (B + C) **(5)**

    iii) Y = AB + A'C + BC **(3)**

(OR)

b) i) Draw the logic diagram of clocked master – slave JK Flip flop and explain its working. **(6)**

    ii) Show how a full adder can be implemented using NAND gate. **(7)**

15. a) i) Explain in detail the method of producing amplitude modulated signal. **(6)**

    ii) A modulating signal $m(t) = 10 \cos (2\pi \times 103t)$ is amplitude modulated with a carrier signal $c(t) = 50 \cos (2\pi \times 105t)$. Find the modulation index, the carrier power and the power required for transmitting AM wave. **(7)**

(OR)

b) Draw the block diagram and explain the fiber optic communication. Mention its applications. **(13)**

PART – C   **(1×15=15 Marks)**

16. a) Explain the operation of 4-bit synchronous counter with necessary diagrams. **(15)**

(OR)

b) Explain the operation of 4-bit binary ring counter with necessary diagrams. **(15)**

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