Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 40185

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Second Semester

Civil Engineering

BE 8251 – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Agriculture 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. What is meant by charge?

2. Define RMS value.

3. Mention the different parts of a DC generator.

4. What is the use of commutator?

5. Define power transistors.

6. What is the use of h - Parameters? Write the voltage and current equation for hybrid parameters.

7. What is meant by parity bit?

8. Find the complement of the functions $F_1 = x'yz' + x'y'z$ and $F_2 = x(y'z' + yz)$. By applying De Morgan's theorem as many times as necessary.

9. Determine the size of antenna working at frequency of 20 kHz and wave length of wave 1.5×10^6 m given that velocity of light to be 3×10^8 m/s.

10. What is the basic principle of communication satellites?

PART B — (5 × 13 = 65 marks)

11.   (a)   Use the superposition principle to compute voltage v6Ω in the circuit of Figure 1.   (13)
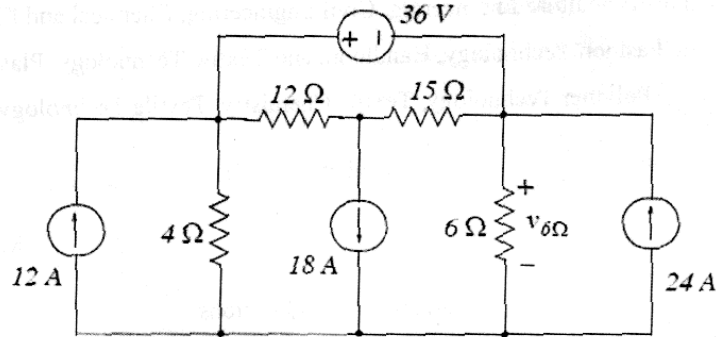

Figure 1

Or

(b)   Explain the construction and working of an energy meter.   (13)

12.   (a)   (i)   Describe various types self-excited of DC generator with their circuit layout.   (8)

(ii)   Explain the characteristics of dc shunt motor.   (5)

Or

(b)   Explain the working principle of various types of single phase induction motor with neat circuit diagram.   (13)

13.   (a)   Explain the working of Zener diode and mention its applications.   (13)

Or

(b)   Explain the working of CE configuration of a BJT and draw its input, output characteristics.   (13)

14.   (a)   List various types of logic gates with its logic symbols and truth table. List also universal gates.   (13)

Or

(b)   With necessary diagrams describe the operation of a 4-bit binary ripple counter and JK Flip-flop.   (13)

15. (a) (i) Explain the principle of amplitude modulation with relevant expressions. (6)

(ii) An audio frequency signal $10 \sin 2\pi \times 500t$ is used to amplitude modulate a carrier of $50 \sin 2\pi \times 10^5 t$. Calculate (7)

(1) Modulation index

(2) Sideband Frequencies

(3) Amplitude of each sideband frequencies

(4) Bandwidth required

(5) Total power delivered to the load of $600\,\Omega$

Or

(b) With the help of block diagrams describe the working of

(i) a typical TV transmitter (7)

(ii) a typical TV receiver. (6)

PART C — ($1 \times 15 = 15$ marks)

16. (a) Explain the operation of any one type of digital to analog converter with its schematic diagram. (15)

Or

(b) With a neat circuit diagram explain the working of binary ladder network for digital to analog conversion. (15)

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