*Total number of printed pages:* **03** **Diploma/2nd /DEE203**

**2022**

# FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

*Full Marks: 100*

Time: Three hours

***The figures in the margin indicate full marks for the questions.***

*Answer **any five** questions.*



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|---|---|---|---|
| 1. | a) | Write a note on intrinsic and extrinsic semiconductor. | 5 |
| | b) | Write down the distinction between p-type and n-type semiconductor. | 5 |
| | c) | What is a P-N junction? Write a note on formation of P-N junction. | 7 |
| | d) | Write down the applications of P-N junction diode. | 3 |
| 2. | a) | How does current flows in P-N junction diode in forward and reverse bias? Draw a I-V characteristic for it. | 10 |
| | b) | What is bipolar junction transistor (BJT). Make symbol of PNP and NPN BJT. | 5 |
| | c) | Write a note on construction of PNP and NPN bipolar junction transistor. | 5 |
| 3. | a) | Write a note on different types of biasing system of bipolar transistor. | 5 |
| | b) | Write down the Kirchoff's voltage law. | 5 |

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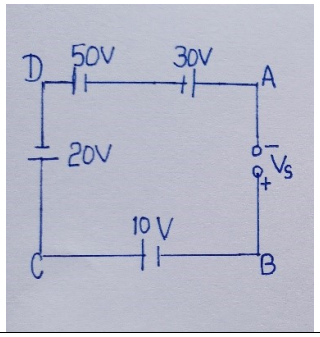
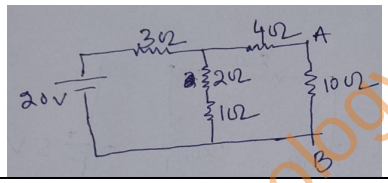
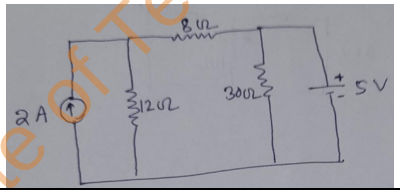
| | c) | Calculate the voltage $V_S$ across the open switch in the given circuit?<br>  | 10 |
| 4. | a) | Find the Thevenin equivalent circuit between the terminal A and B in the Figure shown below also find the load current.<br>  | 5 |
| | b) | Find the current across 8Ω register using superposition theorem in the circuit shown below<br>  | 5 |
| | c) | Explain different types of energy sources and Differentiate between conventional as well as non-conventional source of energy. | 10 |
| 5. | a) | A series AC circuit contains a resistor, an inductor of 220 mH, a capacitor of 4.70 μF4.70 μF, and a generator with $\Delta V_{max}$=240 V operating at 50.0 Hz. The maximum current in the circuit is 200 mA.<br>(i) Calculate the inductive reactance. (ii) Calculate the capacitive reactance.<br>(iii) Calculate the impedance. (iv) Calculate the phase angle between the current and the generator voltage. | 10 |

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| | b) | What is Full wave rectifier? Draw and explain the working principle of Full wave rectifier. | 5 |
| | c) | Write notes on Peak Inversion Voltage | 5 |
| 6. | a) | Describe the construction and working principle of Cathode ray tube (CRT) | 10 |
| | b) | Calculate the impedance in R-C parallel circuit by using Phasor Diagram | 5 |
| | c) | Explain the advantages of full wave rectifier over Half wave rectifier as well as compare their efficiencies. | 5 |