*Total number of printed pages: 02* **Programme(D)/2nd Semester/ DEE203**

**2023**

# Fundamental of Electrical & Electronics Engineering

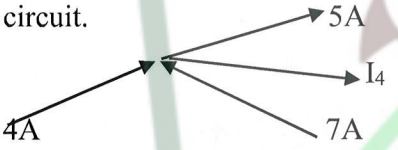
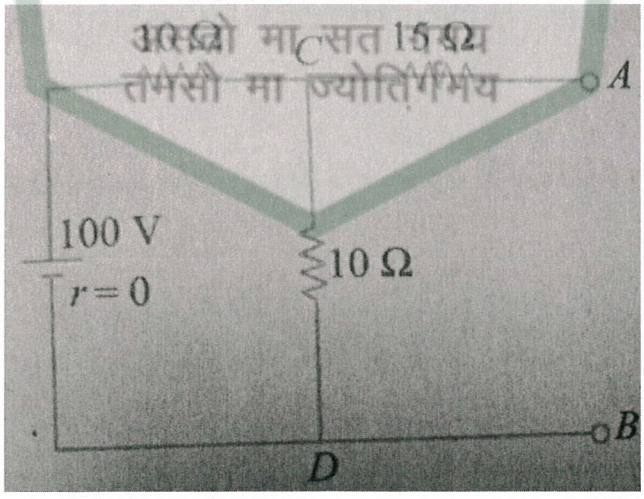
*Full Mark: 100*

Time: Three hours

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

*Answer **any five** questions.*



| | | | |
|---|---|---|---|
| 1. | a) | Differentiate between conventional and non-conventional sources of energy. | 10 |
| | b) | (i) What is the main source of energy in India?<br>(ii) Can any source of energy be pollution free?<br>(iii) What are advantages and disadvantages of the wind power? | 3+3+4 |
| 2 | a) | Using Kirchhoff's current law, find the value of $I_4$ in the following given circuit.<br>  | 5 |
| | b) | Using Norton's theorem, find the constant current equivalent of the circuit.<br>  | 15 |
| 3. | a) | A series RLC circuit contains the following components: R= 150 Ω, L=0.25 H, C=2 μF, and a source with 210 V operating at 50 Hz. Find the<br>(i) Inductive reactance in the circuit | 4×5 = 20 |

| | | | |
|---|---|---|---|
| | | (ii) Capacitive Reactance in the circuit<br>(iii) Impedance in the circuit<br>(iv) Maximum current in the circuit<br>(v) Phase angle between the current and source voltage | |
| 4. | a) | Write the difference between intrinsic and extrinsic semiconductor. | 5 |
| | b) | Write a short note on p-type and n-type semiconductor | 5 |
| | c) | Discuss the forward and reverse bias of the P-N junction diode and its V-I characteristics. | 10 |
| 5. | a) | Make the symbol of:<br>(i) p-n junction diode in forward and reverse bias<br>(ii) Zener diode<br>(iii) Varactor diode<br>(iv) Tunnel diode<br>(v) PIN diode | 2×5=10 |
| | b) | Write a short note on Tunnel diode and Zener diode | 5+5=10 |
| 6. | a) | What is a Bipolar junction transistor (BJT)? Discuss about the PNP and NPN BJT. | 10 |
| | b) | Write down the operation of PNP and NPN bipolar junction transistor. | 10 |
| 7. | a) | What is rectifier? Write down a short note on full wave rectifier and its working principle. | 10 |
| | b) | Discuss the construction and features of the cathode ray oscilloscope | 10 |