Reg. No															

B.Tech. DEGREE EXAMINATION, JUNE 2023

First / Second Semester

18EES101J - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40 minutes.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

Part - A (20 × 1 Marks = 20 Marks)

Answer **All** Questions

		Marks	BL	CO
1.	A circuit consists of three identical resistors connected in series. When one resistor is removed the circuit current will (A) Decrease by half (B) Increase by one third (C) Decrease by one third (D) Remains the same	1	2	1
2.	A circuit with pure inductance has (A) Real power is zero (B) Reactive power is zero (C) Apparent power is zero (D) Complex power is zero	1	1	1
3.	A wound coil passes 10 A and dissipates 1000 W when connected with a supply of 250 V, 25 Hz. The inductive reactance of the circuit is (A) 21.9128 Ω (B) 22.9128 Ω (C) 23.9128 Ω (D) 24.9128 Ω	1	3	2
4.	The number of circuits required for solving superposition theorem is same as that of (A) Nodes (B) Sources (C) Sources and Nodes (D) Mesh, Sources and Nodes	1	1	1
5.	The average value of sine wave with the peak value of 400 V is _____V (A) 1127.4 (B) 254.6 (C) 1282.8 (D) 1200	1	3	2
6.	A wave completes one cycle in 10 m sec, its frequency will be _____ Khz (A) 1 (B) 50 (C) 100 (D) 10	1	2	2
7.	To prevent saturation in a magnetic circuit _____ can be usually inserted. (A) air gap (B) magnetic motive force (C) magnetic field (D) flux density	1	1	2
8.	The function of commutator in dc generators is (A) To convert the ac to unidirectional current (B) To convert the dc to ac current (C) To amplify current (D) To amplify voltage	1	1	2
9.	The diode is used in (A) Uncontrolled rectifiers (B) transformers (C) AC Machines (D) DC Machines	1	2	3
10.	The number of 2-way switches used in staircase wiring (A) 1 (B) 2 (C) 3 (D) 4	1	2	3

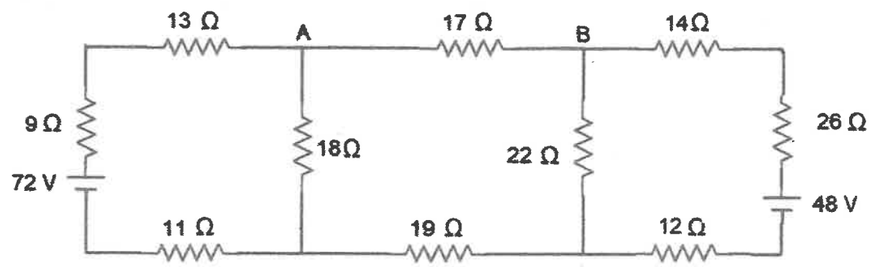
11.	An instrument which is used only for the direct current supply will be (A) Hotwire type (B) Moving iron attraction type (C) Permanent magnet type (D) Moving Iron repulsion type	1	1	3
12.	If the damping force is more than the operating force in the instrument, it will read (A) Oscillating (B) Dead (C) Slow (D) Fast and sensitive	1	2	3
13.	Choose the correct abbreviation of LVDT (A) Linear variable differential transducer (B) Linear variable different transformer (C) Line variable differential transducer (D) Line variable differential transformer	1	1	4
14.	The increase in resistance in stain gauge is due to (A) Increase in length and cross-sectional area of wire (B) Increase in length and decrease of its cross-sectional area of wire (C) Decrease in length and increase of its cross-sectional area of wire (D) Decrease in length and cross-sectional area of wire	1	2	4
15.	See back effect is used as a working principle of which transducer? (A) Phototransistor (B) Thermocouple (C) Thermistor (D) Strain Gauge	1	1	4
16.	Most widely used material for solar cell fabrication is (A) Germanium (B) Silicon (C) Silver (D) Aluminium	1	1	4
17.	In Frequency Modulation the Amplitude Carrier Wave will be (A) Constant (B) Varies with respect to time (C) Linearly Varies with respect to current (D) Linearly Varies with respect to voltage	1	2	5
18.	The application of phase modulation is (A) Wi-Fi (B) Amplifiers (C) Radio (D) TV	1	1	5
19.	The equation for EX-NOR gate is (A) A'B+AB' (B) A'B'+AB (C) AB+AB (D) AB'+AB	1	2	5
20.	A+A'B= (A) A (B) A+A' (C) A' (D) A+B	1	2	5

Part - B (5 × 4 Marks = 20 Marks)
Answer **any 5** Questions

		Marks	BL	CO
21.	State and explain Kirchoff's current law.	4	2	1
22.	State and explain Maximum Power Transfer Theorem for RL load.	4	2	1
23.	Derive the RMS value for a pure sine wave form.	4	2	2
24.	Explain PN junction diode forward and reverse bias.	4	1	3
25.	Explain negative Clippers with neat sketch.	4	1	3
26.	Write short notes on Transducer requirements.	4	2	4
27.	Minimize the following Boolean Expression. Y=ABCD'+ A'BC+CD'+A'B'C'+1	4	3	5

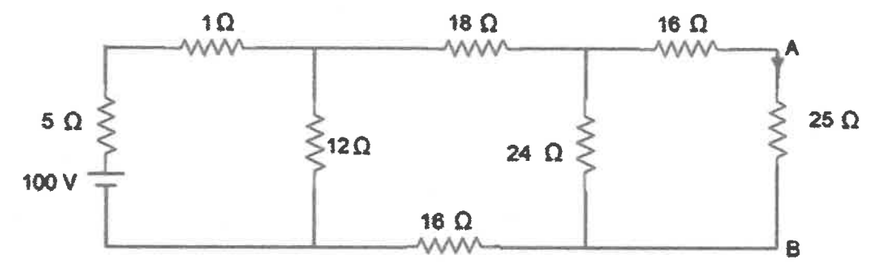
Part - C (5 × 12 Marks = 60 Marks)
Answer **All** Questions

		Marks	BL	CO
28.	a. Using Superposition theorem, calculate the current through the 17 Ω resistor.	12	3	1



(OR)

b. Using Thevenin's theorem, calculate the current through the 25 Ω resistor.



29.	a. Explain the construction and working of single phase transformer. (OR) b. A resistance of 50 Ω, an inductance of 0.1 H, and a capacitance of 30 mf are connected in series across a 230 V, 50 Hz supply. Calculate (i) the value of impedance (ii) current flowing (iii) power factor; (iv) power consumed.	12	3	2
30.	a. Explain the mechanism of avalanche breakdown and Zener breakdown. With the help of V-I characteristics show how a Zener diode is used as voltage regulator. (OR) b. Explain various types of earthing with relevant diagrams.	12	3	3
31.	a. With neat sketch, explain LVDT. Also mentions its applications, advantages and disadvantages. (OR) b. Explain the following: (i) LED (ii) LCD (iii) Photo diode	12	2	4
32.	a. Simplify the following Boolean expression using K- map and implement using logic Gates. $Y(A,B,C) = \sum m(3,4,6,7)$ (OR) b. Discuss the concept of Amplitude modulation and phase modulation Technique in detail.	12	3	5

* * * * *