Name:	
Enrolment No:	UPES UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

Course: Basic Electrical and Electronics Engg   **Semester: II**
Program: B. Tech (Food Technology / Bio Technology/Biomedical)   **Time : 03 hrs.**
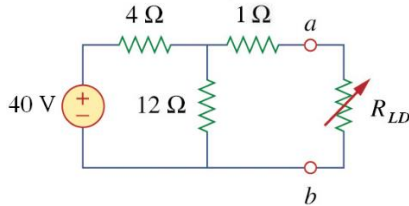**Course Code: ECEG1005**   **Max. Marks: 100**

Instructions: All Questions are compulsory

SECTION - A
(20 x 1.5 Marks)

Q	MCQs or fill in the blanks (1.5 marks each)	Marks	CO
1	While calculating Rth in Thevenin's theorem and Norton equivalent (A) All independent sources are made dead (B) Only current sources are made dead (C) Only voltage sources are made dead (D) All voltage and current sources are made dead	1.5	CO1
2	Which of the following is In-correct about direct current? a) Magnitude is constant b) Frequency is zero c) Can be transported to larger distances with less loss in power d) Flows in one direction	1.5	CO1
3	Which of the following according to KCL must be zero? a) Algebraic sum of currents in closed loop b) Algebraic sum of power in closed loop c) Algebraic sum of currents entering and leaving a junction d) Algebraic sum of voltages across the input and output	1.5	CO1
4	The algebraic sum of voltages around any closed path in a network is equal to _____ (A) Infinity (B) 1 (C) 0 (D) Negative polarity	1.5	CO1
5	Which basic law should be followed to analyze the circuit? (A)Newton's law (B) Faraday's law (C) Amperes law (D)Kirchhoff's law	1.5	CO1
6	An active element in a circuit is (A) Current source (B) Resistance (C) Inductance (D) Capacitance	1.5	CO1
7	What is the number of primary turns in a 200/1000 V transformer if the emf per turn is 10V? a) 5 b) 10 c) 20 d) 40	1.5	CO2
8	The superposition theorem is used when the circuit contains. (A) a single voltage source (B) active elements only (C) a number of voltage sources (D) passive elements only	1.5	CO1
9	A wire of 0.14 mm diameter and specific resistance 9.6 micro-ohm-cm is 440 cm long. The resistance of the wire will be (A) 9.6 ohm (B) 11.3 ohm (C) 13.7 ohm (D) 27.4 ohm.	1.5	CO1
10	What is responsible for the current to flow? a) Proton b) Electrons c) Nucleus d) Protons and Electrons	1.5	CO1

11	Which of the following type of circuits in electrical engineering cannot be analyzed using Ohm's law? a) Unilateral b) Bilateral c) Linear d) Conductors	1.5	CO3
12	The most used semiconductor element is a) Silicon b) Germanium c) Gallium d) Carbon	1.5	CO4
13	The reverse current in a diode is usually a) Very small b) Very large c) Zero d) In the breakdown region	1.5	CO4
14	The brush voltage drops in dc in / of the order of (A) 2 V (B) 10 V (C) 20 V (D) 40 V	1.5	CO2
15	The copper losses in a transformer at half load compared to those at full load will be (A) Same (B) Half (C) One-fourth (D) 2 times	1.5	CO2
16	Open circuit test on transformer measures (A) Impedance and insulation resistance (B) Voltage regulation (C) Eddy current loss (D) Core loss	1.5	CO2
17	The transformer ratings are usually expressed in terms of (A) KW (B) KVAR (C) KVA (D) Volts	1.5	CO2
18	Which winding in a transformer has more number of turns? (A) Secondary winding (B) primary winding (C) High voltage winding (D) Low voltage winding	1.5	CO2
19	The purpose of laminating a transformer core is (A) Difficulty of fabricating solid core (B) Laminated core provides high flux density (C) Avoid eddy current and hysteresis losses (D) Increase the main flux	1.5	CO2
20	Which of the following loss in a transformer is zero even at full load (A)Eddy current loss (B) Core loss (C) Copper loss (D)Friction loss	1.5	CO2
SECTION - B **(4 x 5 Marks)**		
Q1	Calculate the maximum power transfer to the load if $R_{LD} = R_{TH}$. 	5	CO1
Q2	A 500 KVA transformer has 2500 watts iron loss, and 7500 watts copper loss at full load. The power factor is 0.8 lagging. Calculate the Transformer efficiency at full load.	5	CO2
Q3	Explain the effects of Forward biasing and Reverse biasing of a P-N junction Diode	5	CO3
Q4	Illustrate the working of Bi-Polar transistor and explain V-I Characteristics of various applications of transistors.	5	CO4
SECTION - C **(2 x 15 marks)**		
Q1	Provide a detailed comparison of various kind of Transformers	15	CO2

Q2	Compare the Fermi Level in Intrinsic Semiconductors, P-type Semiconductors and N-Type Semiconductors.	15	CO3
SECTION- D **(2 x 10 marks)**			
Q1	Differentiate the Insulators, Semiconductors and Conductors based on band theory	10	CO3
Q2	Draw a diagram showing construction of FETs (J & MOS) and its characteristics.	10	CO4