



PRESIDENCY UNIVERSITY

BENGALURU

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End - Term Examinations – May/June 2026

Date: 18- 05-2026

Time: 09:30am – 12:30pm

School: SOCSE	Program: B.Tech-CSE & ISE	
Course Code : EEE1200	Course Name: Basics of Electrical and Electronics Engineering	
Semester : II	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	12	17	19	26	26

Instructions:

- Read all questions carefully and answer accordingly.
- Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

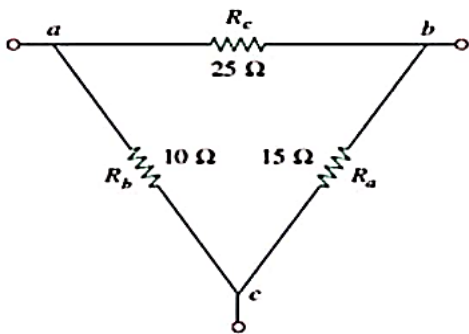
1.	If three identical lamps are connected in parallel and the combined resistance is $150\ \Omega$, find the resistance of one lamp.	2 Marks	L3	C01
2.	A capacitor has a reactance of 40 ohm, when operated on a 50 Hz supply. Determine the value of its capacitance.	2 Marks	L3	C02
3.	The synchronous speed of an induction motor is 1200 rpm and the rotor speed is 1140 rpm. Calculate the slip	2 Marks	L3	C03
4.	What is the maximum possible speed of an induction motor used in Indian power supply?	2 Marks	L1	C03
5.	A diode has reverse saturation current, $I_s = 4 \times 10^{-9}$ A. If it is reverse biased (before breakdown), compute the reverse current.	2 Marks	L3	C04
6.	List the applications of Zener diode	2 Marks	L1	C04
7.	Compare the ripple factor values of half wave rectifier and full wave rectifier.	2 Marks	L2	C04
8.	Find the value of CE configuration current gain (β) if the current gain of CB configuration (α) is 0.9	2 Marks	L3	C05

9.	List the different types of MOSFET.	2 Marks	L1	C05
10.	Name the three configurations of a BJT	2 Marks	L1	C05

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Apply delta to star conversion technique, calculate R_a , R_b , and R_c for the Fig.1	5 Marks	L3	C01
 Fig.1					
	b	Given four 1ohm resistors, state how they must be connected to give an overall resistance of (a) 0.25ohm (b) 1ohm (c)1.33ohm (d) 2.5ohm, all four resistors being connected in each case.	5 Marks	L3	C01
Or					
12.	a.	Three resistors, each of 3Ω , are connected in a delta (Δ) configuration. Convert this delta network into an equivalent star (Y) configuration and determine the resistance values of each resistor in the star network	5 Marks	L3	C01
	b	A 15Ω resistor is connected in series with 3 parallel resistors of 2Ω , 5Ω and 10Ω . If the current through the entire circuit is 8A, find current flowing through each resistor	5 Marks	L3	C01
13.	a.	A series circuit consists of a resistor of 20Ω and an inductor of 0.05 H connected across a 230 V, 50 Hz AC supply. Determine the current flowing through the circuit, the power factor, and the power consumed. Also, draw the phasor diagram showing the voltage and current relationship	10 Marks	L3	C02
Or					
14.	a.	A pure inductance of 1.273 mH is connected in series with a pure resistance of 30 ohm. If the frequency of the sinusoidal supply is 5 kHz and the potential drop. across the 30 ohm resistor is 6 V,	10 Marks	L3	C02

		determine the value of the supply voltage and the voltage across the 1.273 mH inductance. Draw the phasor diagram.			
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15.	a.	An induction motor has 8 poles and a synchronous speed of 750 rpm. If it runs at 700 rpm, Calculate the supply frequency and slip of the induction motor.	5 Marks	L3	C03
	b.	A 3phase, 6-pole, 50 Hz induction motor runs at 900 rpm. Find the synchronous speed and slip of the motor.	5 Marks	L3	C03

Or

16.	a.	The maximum flux density in the core of a 250 / 3000 Volt, 50 Hz single phase transformer is 1.2 wb/m ² . If the emf per turn is 8volt, determine: (a). Primary and Secondary turns, (b). Area of the core.	5 Marks	L2	C03
	b.	A stepper motor is selected for a precise positioning system. Describe its construction briefly and explain how its structural features support accurate step-by-step motion. Also, identify suitable real-world applications where such a motor would be effectively used.	5 Marks	L2	C03

17.	a.	A delta connected load is energized by a three-phase supply. Draw the circuit diagram for this connection and write the relationship between phase and line voltages, as well as phase and line currents, in the system.	5 Marks	L3	C02
	b.	A single-phase transformer has a primary winding of 500 turns and secondary winding of 100 turns. If the primary voltage is 230 V, Find: (1) The secondary voltage and (2) The transformation ratio.	5 Marks	L3	C03
	c.	A silicon diode has: $I_s = 2 \times 10^{-12} A$, $\eta = 1$ and $V_T = 26mV$. If the applied voltage is 0.65 V, calculate the diode current using the Shockley equation.	5 Marks	L3	C04

Or

18.	a.	A 60 Hz, voltage of 115V (rms) is impressed on a 100 Ω resistance. Determine i) Maximum voltage, ii) Maximum current, and iii) <i>Angular velocity</i> (ω).	5 Marks	L3	C02
	b.	Compare core type transformer and shell type transformer	5 Marks	L2	C03
	c.	A battery-powered sensor circuit uses a PN junction diode for polarity protection. Illustrate the circuit with a neat diagram and explain how the diode's forward-bias operation allow current to	5 Marks	L2	C04

		flow only in the correct direction when the battery is connected properly.			
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19.	a.	A full-wave rectifier has a transformer secondary voltage of 15 V (rms). The load resistance is 500 Ω . Find: (1) Peak voltage, (2) Average DC output voltage, (3) DC load current and (4) Rectification Efficiency.	10 Marks	L3	C04
	b.	A 10 V supply is connected in series with a silicon diode (0.7 V drop) and a 2 k Ω resistor. Find (a) Current in the circuit and (b) Voltage across the resistor.	5 Marks	L3	C04

Or

20.	a.	A 9 V stabilized power supply is required from a 18 V DC input source. The maximum power rating P_Z of the Zener diode is 1.5 W. Using the Zener regulator circuit, calculate 1) The maximum Zener current (2) The minimum value of series resistor R_S , (3) The load current I_L if a 1.8 k Ω load resistor is connected across the Zener diode and (4) The Zener current I_Z at full load.	10 Marks	L3	C04
	b.	Compare half wave and full wave rectifier circuit.	5 Marks	L2	C04

21.	a.	(i). A MOSFET has a gate-to-source voltage of 6 V and a threshold voltage of 2 V. If the drain-to-source voltage is 2 V, determine the operating region of the MOSFET. (ii). A MOSFET operates with a gate-to-source voltage of 5 V and a threshold voltage of 2 V. If the drain-to-source voltage is 4 V, identify the region of operation of the MOSFET.	10 Marks	L3	C05
	b.	Explain the drain and transfer characteristics of MOSFET.	10 Marks	L2	C05

Or

22.	a.	(i). Determine the value of I_E for which $\beta = 50$ and $I_B = 20\mu A$. (ii). In a common base connection, $I_E = 1mA$, $I_C = 0.95mA$. Calculate the value of I_B .	10 Marks	L3	C05
	b.	Given a BJT used as an amplifier in a sensor-conditioning circuit, analyze how the input and output characteristics of a CE configuration influence the amplifier's performance, and sketch the corresponding characteristic curves.	10 Marks	L2	C05