Reg. No.: .....

Name: .....

W6713

University of Kerala

Third Semester FYUGP Degree Examination, November 2025

Discipline Specific Core Course

PHYSICS

UK3DSCPHY200 - Basic Electronics

Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.) **Max. Marks: 42**

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark Each.Answer all questions

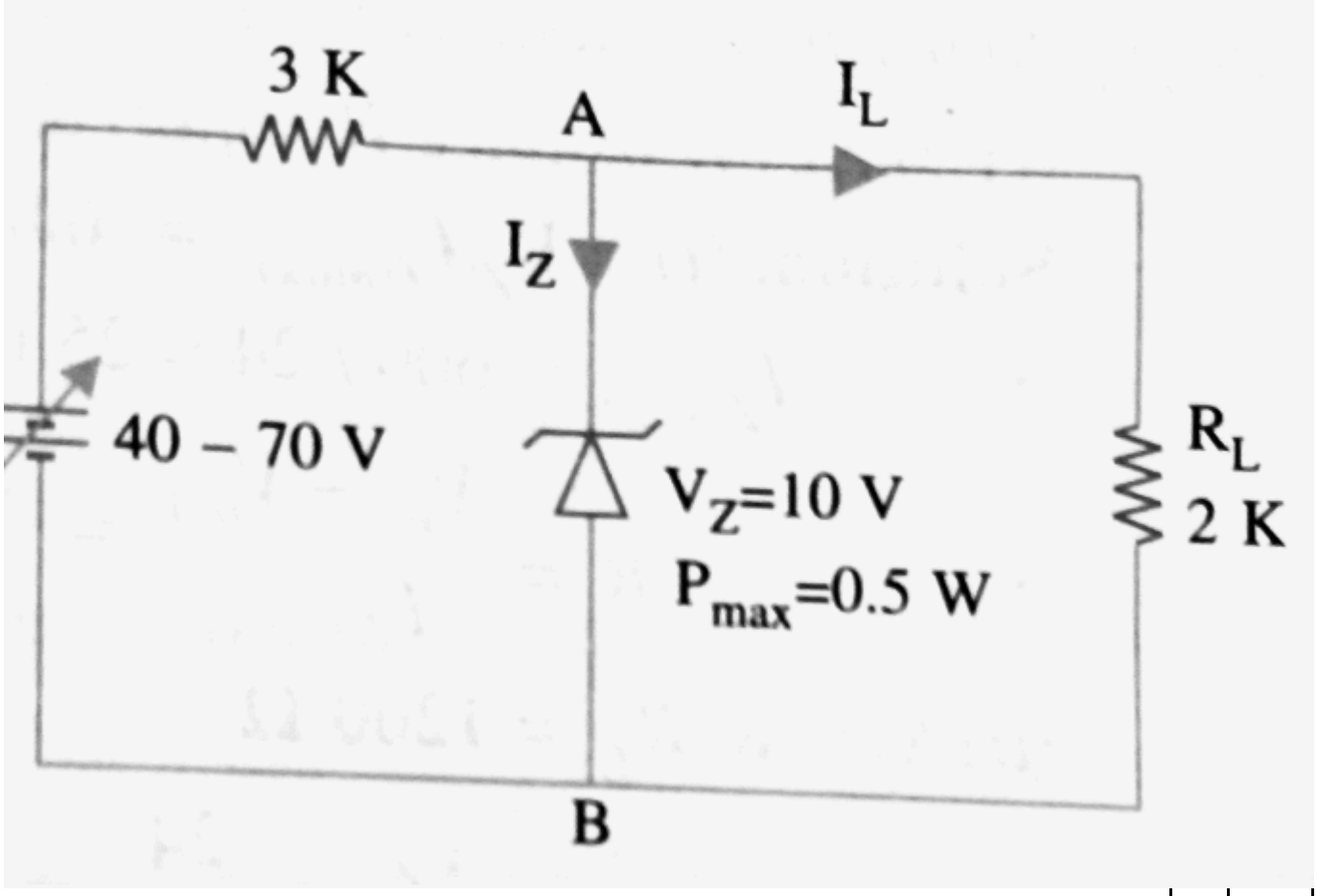
Qn No.	Question	CL	CO
1	Draw the schematic symbol of OP-Amp.	RE	4
2	State the Peak Inverse Voltage (PIV) of a diode.	RE	1
3	Construct the truth table for AND gate with 2 inputs.	UN	4
4	Explain why the emitter region of a transistor is heavily doped	UN	2
5	Explain β for a transistor.	UN	2
6	Explain operating point of an amplifier.	UN	3

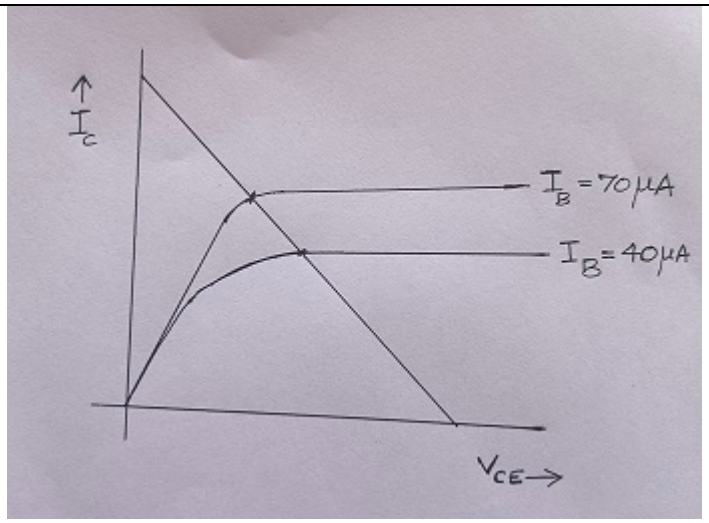
Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the concept of Zener breakdown voltage in a Zener diode. Discuss the factors affecting the value of Zener breakdown voltage.	UN	1
8	Describe different terminals in a transistor	UN	2
9	Illustrate the need for transistor biasing.	AP	3
10	Using Boolean algebra, verify the identity: AC + ABC = AC	AP	4

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) Apply your understanding of transistor characteristics to set up and conduct an experiment to study the behavior of a transistor in the common-base (CB) configuration. Sketch and label the input and output characteristic curves, and analyze the relationship between input current, output current, and applied voltages. OR B)	AP	2, 2

Qn No.	Question	CL	CO
	Using your understanding of transistor operation, Explain the input and output characteristics of a transistor in the common-emitter (CE) configuration.		
12	A) Discuss the importance of the series resistor in the voltage regulator circuit constructed using a Zener diode. Analyze the given circuit and calculate the battery current I.  OR B) Interpret the VI characteristics curve of a PN junction diode and explain the behavior in different biasing conditions	AN	1, 1
13	A) The figure given below shows the DC load line and output characteristics of a transistor. By applying your understanding of transistor biasing and amplifier operation, evaluate which of the two zero-signal collector currents (Q-points) is more suitable for designing a common-emitter (CE) transistor amplifier. Justify your choice	EV	3, 3

Qn No.	Question	CL	CO
	 OR B) A transistor uses potential divider method of biasing. R_1 = 50kΩ, R_2 = 10kΩ and R_E = 1kΩ. If V_{cc} = 12V, Evaluate (i) The value of I_c ; given V_{BE} = 0.1V (ii) The value of I_c ; given V_{BE} = 0.3V		
14	A) Create logic circuit for Boolean Function F=x'y'z+x'yz+xy'+xz and obtain its truth table. Simplify this function using boolean identities and develop the logic circuit for the same. OR B) Design and construct opamp inverting amplifier circuit and derive the expression for its voltage gain.	CR	4, 4