For BE/BTech 2023 R
CA Test 2

24Z360

PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641 004
DEPARTMENT OF PHYSICS
CONTINUOUS ASSESSMENT TEST- 2 **Date: 7.1.2025**
B.E – CSE/ AI&ML
23Z/N102 – Basics of Electrical and Electronic Systems

Time: 1 Hour 30 minutes. **Maximum Marks: 50**

INSTRUCTIONS:

1. Answer **ALL** questions. Each Question carries 25 Marks.
2. In each question, subdivision **a** contains 1 question and the weightage of the question is 3 marks, subdivision **b(i)** and **b(ii)** carries 6 marks each and subdivision **c** carries 10 marks each.
3. Subdivisions (a) and (b) will be with no choice and Subdivision (c) may be with choice but not in more than 1 question.
4. Course Outcome Table :

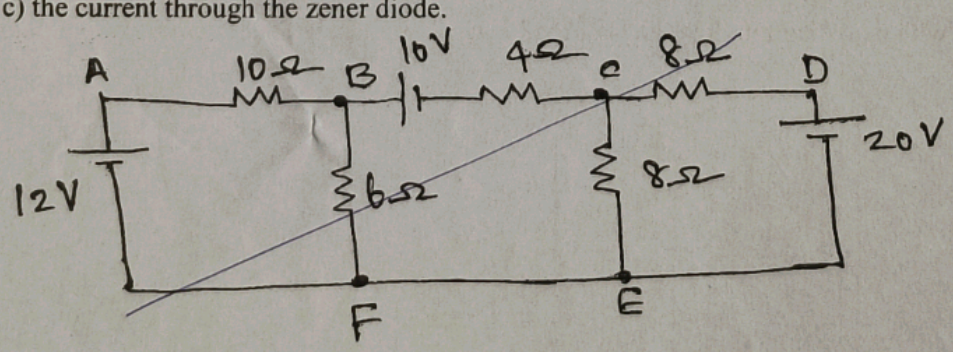
Qn. 1	CO. 4	Qn.2	CO 5

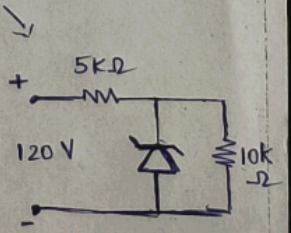
(1 x 3 mark =3 marks)

1. a) Explain the terms in the PN junction diode a)maximum forward current b) Peak inverse voltage c)maximum power rating. (L2)

(2x6 mark =12 marks)

b i) In the network shown find the a) output voltage b) the voltage drop across series resistance c) the current through the zener diode.





(L3)

ii) A crystal diode having internal resistance r_f = 20Ω is used for half wave rectification. If the applied voltage is v = 50sinωt and load resistance RL = 800Ω. Find a) I_m,I_{dc},I_{rms} b) ac power input and dc power output c) dc output voltage and d) efficiency of rectification. (L3)

(1x10 mark =10 marks)

c. i) Explain the construction and working of BJT. Draw the output characteristic curve for common base configuration. (L2)

(or)

ii) Explain how a full wave bridge rectifier converts an AC voltage into DC. Derive the expression for rectifier efficiency? (L2)

(1x3 mark =3 marks)

2.a) A differential amplifier has an open-circuit voltage gain of 100. This amplifier has a common input signal of 3.2V to both terminals. This results in an output signal of 26mV. Determine i) common-mode voltage gain ii) The CMRR in dB. (L3)

(2x6 mark =12 marks)

b i) Compare the effect of positive and negative feedback on overall gain of the operational amplifier. (L4)

ii) Draw the circuit diagram for inverting and non inverting amplifier and obtain the expression for gain. (L2)

(1x10 mark =10 marks)

c) Illustrate with neat diagrams how an OP-AMP is used as an adder, subtractor and integrator. (L3)