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Code No. : 11224 N/O

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD***Accredited by NAAC with A++ Grade***B.E. I-Semester Main & Backlog Examinations, Jan./Feb.-2024.****Introduction to Electronics Engineering**

(Common for CSE &amp; AIML)

Time: 3 hours

Max. Marks: 60

*Note: Answer all questions from Part-A and any FIVE from Part-B***Part-A (10 × 2 = 20 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	Explain the forward and reverse bias conditions of a p-n junction diode.	2	2	1	1
2.	What are transition and diffusion capacitances in pn junction diode?	2	1	1	1
3.	How transistor acts as an amplifier?	2	2	2	1
4.	State the difference between BJT and MOSFET.	2	1	2	1
5.	Explain briefly about the current-series and voltage-series feedback.	2	1	3	1
6.	List the differences between the feedback amplifier and oscillator.	2	1	3	1
7.	Define slew rate and common mode rejection ratio of operational amplifier.	2	1	4	1
8.	Construct the voltage subtractor using op-amp and explain it's working.	2	3	4	2
9.	What is a transducer?	2	1	5	1
10.	Write the applications of thermocouple?	2	1	5	1
<b>Part-B (5 × 8 = 40 Marks)</b>					
11. a)	Explain the working of full wave center tapped transformer rectifier and compare it's ripple factor and efficiency with bridge rectifier.	4	2	1	1
b)	A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 30 Ω. The transformer r.m.s secondary voltage from centre tap to each end of secondary is 45 V and load resistance is 900 Ω. Find i) $V_m$ ii) $I_m$ iii) $I_{dc}$ iv) $I_{rms}$ .	4	3	1	2
12. a)	Explain the working of N-channel metal oxide semiconductor FET of type depletion with transfer and drain characteristics.	4	2	2	1
b)	Construct the h-parameter equivalent models for common-emitter and common-collector configurations and write the definition of each parameter.	4	3	2	2
13. a)	Construct the RC phase oscillator circuit and explain it's working principle.	4	3	3	1
b)	Describe the advantages of negative feedback in amplifiers.	4	2	3	1

Contd... 2

14. a) Determine the output for the circuit of Fig. 3 with components  $R_f = 1 \text{ M}\Omega$ ,  $R_1 = 100\text{k}\Omega$ ,  $R_2 = 50\text{k}\Omega$ , and  $R_3 = 500 \text{ k}\Omega$ .

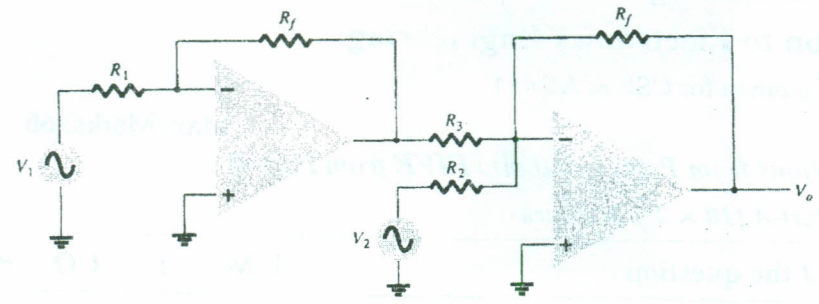


Fig. 3

- b) Derive the output expression of an active integrator and explain it's working principle. 4 4 4 1
- 15. a) Explain the working principle of Piezoelectric transducer. 4 2 5 1
- b) Illustrate the gas and humidity sensors with relevant applications. 4 2 5 1
- 16. a) Construct the Voltage regulator using Zener diode and explain the same. 4 3 1 1
- b) Explain the input and output characteristics of a common emitter amplifier with its working. 4 2 1 1
- 17. Answer any *two* of the following:
  - a) Construct the crystal oscillator using bipolar junction transistor and explain it's working. 4 3 3 1
  - b) What are the characteristics of an ideal op-amp. Explain the concept of virtual ground in op-amp. 4 1 4 1
  - c) Draw the functional diagram of C.R.O and describe its applications. 4 2 5 1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	22.5%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	37.5%

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