C. U. SHAH UNIVERSITY
Summer Examination-2022

Subject Name : Analog and Digital Electronics

Subject Code : 4SC04ADE1   **Branch: B.Sc. (Chemistry, Mathematics)**

Semester: 4   **Date: 10/05/2022**   **Time: 11:00 To 02:00**   **Marks: 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat circuit diagrams and figures (if necessary) at whenever necessary.
(4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**
1. Define stabilization and give formula of stabilization factor.
2. What is CMRR in Op-AMP operation?
3. Define pinch-off voltage.
4. Define transconductance of amplifier.
5. List the name of transistor biasing methods.
6. Define bandwidth of transistor.
7. State applications of thermistor.
8. Draw the diagram for Op Amp when it is used as an adder
9. Define slew rate for OPAMP.
10. Convert $(4321)_{10}$ into binary number system.
11. Draw circuit of AND gate using NAND Gates
12. Write the truth table for NOR gate
13. Give the basic difference between Analog and Digital Signal
14. Give Barkhahusen's criterion for self-sustained oscillations.

Attempt any four questions from Q-2 to Q-8

Q-2	**Attempt all questions**	**(14)**
A	Explain in detail: Why class AB power amplifiers are preferred over Class B amplifiers?	**5**
B	Explain Binary Subtraction using 2's Complement Method by giving suitable example.	**5**
C	Discuss in detail: Transistor as an amplifier in CB configuration.	**4**
Q-3	**Attempt all questions**	**(14)**
A	Why negative feedback is utilized in amplifiers? How various parameters of an amplifier gets modified by negative feedback?	**5**
B	Explain input and output Characteristics of Common Emitter Amplifier using proper circuit diagram	**5**
C	Explain in brief about voltage divider biasing for transistors.	**4**

Q-4		**Attempt all questions**	**(14)**
	A	Compare the characteristics of ideal Op-Amps and practical Op-Amps.	7
	B	Explain Integrator and Zero Crossing Detector using Op-Amps.	7
Q-5		**Attempt all questions**	**(14)**
	A	Describe output Characteristics of JFET.	6
	B	Give difference between JFET and Bipolar Transistors.	5
	C	Explain construction of MOSFET with diagrams	3
Q-6		**Attempt all questions**	**(14)**
	A	Explain Karnaugh map of three variable using example.	5
	B	Explain in details Half adder and full adder circuits.	5
	C	Simplify the Boolean Expressions:	4

$$AB + \bar{A}C + BC$$

Q-7		**Attempt all questions**	**(14)**
	A	Why OP-AMP is not used in open loop for most of the applications?	5
	B	Give truth table of XOR and XNOR Gates	5
	C	Convert the following binary to decimals	4

    (a) $(11001)_2$
    (b) $(10101)_2$

Q-8		**Attempt all questions**	**(14)**
	A	Explain in details Barkhausen's criterion for self-sustained oscillations in details.	7
	B	Explain advantages and applications of UJT.	7