Enrollment No: _____   Exam Seat No:_____

C.U.SHAH UNIVERSITY
Summer Examination-2022

Subject Name :Analog and Digital Electronics
Subject Code : 5SC01ADE1   **Branch: M.Sc. (Physics)**
Semester: 1   **Date: 26/04/2022**   **Time: 11:00 To 02:00**   **Marks: 70**

Instructions:
  (1) Use of a Programmable calculator and any other electronic instrument is prohibited.
  (2) Instructions written in the main answer book are strict to be obeyed.
  (3) Draw neat diagrams and figures (if necessary) inthe right places.
  (4) Assume suitable data if needed.

SECTION – I

Q-1	**Attempt the following questions**	**07**
a.	What is an Op-Amp? Give its symbol.	**(01)**
b.	What is a photodiode? Identify its main parts giving its symbol.	**(01)**
c.	What is a phototransistor? Draw its symbol and identify its main parts.	**(01)**
d.	Differentiate UTP and LTP giving their full forms.	**(01)**
e.	What do you mean by the term "Reverse Recovery Time" of a Diode?	**(01)**
f.	Mention any two characteristics of an ideal op-amp.	**(02)**

Q-2	**Attempt all questions**	**14**
(A)	What is an LED? Give its Full form. Summarize the Principle, Construction, and Working of LEDs with a suitable symbol, figure and diagram.	**(07)**
(B)	What is an LDR? Give its full form. Write its constructional characteristics. How is an LDR used as an overlight detector?	**(07)**

OR

Q-2	Define the terms Clippers and Clampers. Narrate any one of them in detail.	**14**

Q-3	**Attempt all questions**	**14**
(A)	Differentiate the Basic Comparator versus Schmitt-Trigger. Write a brief note on Schmitt-Trigger made using an op-amp.	**(07)**
(B)	What is an optocoupler? Elucidate optocoupler with necessary circuit diagram.	**(07)**

OR

Q-3	Differentiate Astable, Monostable and BistableMultivibrators. Discuss in detail any one of them.	**14**

SECTION – II

Q-4	**Attempt the following questions.**	**07**
a.	Classify the power amplifiers according to the mode of operation.	**(01)**
b.	Define encoder and decoder.	**(01)**
c.	Define RAM and ROM	**(01)**
d.	Define tuned amplifiers.	**(01)**
e.	Give full forms of DAC and ADC.	**(01)**
f.	Draw the logic diagram of Master-Slave JK Flip-flop.	**(02)**

Q-5	Describe the operation of Half adder and Full adder with a suitable logic diagram, circuit diagram and truth table. Also, explain is the parallel adder?	**14**

OR

Q-5	What are the Class-A and Class-B PushPulllpower amplifiers? Describe any one of them with a circuit diagram, operation, power distribution and necessary expression. Highlight the advantages and disadvantages.	**14**

Q-6	**Attempt all questions**	**14**
(A)	Explain the shift register mode of serial input-serial output with the logic diagram.	**(07)**
(B)	Write a short note on Multiplexers and Demultiplexers.	**(07)**

OR

Q-6	Explain basic logic gates with the symbol, truth tables and circuit diagram for each. Also, discuss the universal gates. What are the major applications of the logic gates?	**14**