

B.Sc. (I. T.) Sem. - I (CBCS - 2015 Course) : SUMMER - 2019
SUBJECT: DIGITAL ELECTRONICS AND COMMUNICATIONS

Day: Wednesday
Date: 08/05/2019

S-2019-1270

Time: 02.30 p.m. to 05.30 p.m.
Max Marks. 60

N.B. :

- 1) Question 1 is **COMPULSORY**.
- 2) Attempt **ANY FOUR** of the remaining **SIX** Questions.
- 3) Figures of right indicate **FULL** marks.

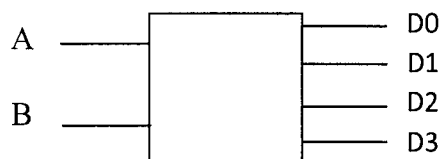
Q.1 Attempt **ANY TWO** of the following: **(20)**

- a) Briefly explain various types of guided media in communication systems.
- b) Differentiate between FDM and TDM.
- c) State advantages of FM over AM.
- d) Explain the purpose of Preset and Clear inputs in JK flip-flop.

Q.2 Explain the operation of a Parallel In Serial Out (PISO) shift register, with diagram. **(10)**

Q.3 Use Karnaugh maps (K-maps) to simplify the following function in sum of products form and draw the circuit to implement the function using NAND gates - **(10)**
 $(A, B, C, D) = \sum (0, 1, 4, 5, 12, 13)$

Q.4 Implement a 2 to 4 line decoder as shown in the figure below using basic gates - **(10)**



Q.5 Draw the block diagram of a typical Read/Write memory chip clearly showing all the inputs, outputs and control lines. **(10)**

Q.6 a) State Nyquist Sampling theorem. **(02)**
b) Voice channels band-limited to 4 kHz are converted to 8-bit PCM signals. 32 such channels are multiplexed using TDM. Determine the bit-rate on the channel. **(08)**

Q.7 A majority function is generated in a combinational circuit when the output is equal to 1, if the input variables have more 1's than 0's. The output is 0 otherwise. Design a 3-input majority function starting from the Truth table. **(10)**