

B. Tech. Sem –III (Electrical Engg.) 2014 COURSE) (CBCS) :
SUMMER - 2019

SUBJECT : LINEAR AND DIGITAL INTEGRATED CIRCUITS

Day: Monday
Date: 13/05/2019

Time: 02.30 PM TO 05.30 PM
Max. Marks:60

S-2019-2563

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagrams **WHEREVER** necessary.

Q.1 a) Draw neat diagram of instrumentation amplifier. Describe its operation and its applications. **(06)**

b) Define slew rate, PSRR. State its typical values. **(04)**

OR

Q.1 a) Draw circuit diagram of I to V converter and explain its operation **(06)**

b) Draw circuit diagram of adder for $V_1 = +1V$ and $V_2 = -0.5V$ and find output voltage. **(04)**

Q.2 a) Draw circuit diagram of triangular waveform generator and describe its operation with waveforms. **(06)**

b) What are clipping and clamping circuits? Describe by suitable waveforms. **(04)**

OR

Q.2 a) Draw neat diagram of differentiator and describe its operation with waveforms for square wave input. Write mathematical equation. **(06)**

b) Draw circuit diagram of zero crossing detector and explain. **(04)**

Q.3 Draw pin diagram and block diagram of IC 723. Describe its operation and state its specifications. Define line regulation and load regulation. **(10)**

OR

Q.3 Draw block diagram of IC 555 as monostable multivibrator. Describe its operation with all waveforms. Write down the equation of time delay provided. **(10)**

Q.4 a) Express the number $(-37)_{10}$ as an 8 bit number in sign magnitude. **(02)**

b) Reduce the following Boolean expressions using K- map. **(08)**

i) $f(A, B) = \overline{A}B + \overline{A}\overline{B} + AB$

ii) $f(A, B) = AB + \overline{A}\overline{B}$

iii) $f(A, B, C) = \overline{A}\overline{B}\overline{C} + \overline{A}B\overline{C} + \overline{A}B\overline{C} + \overline{A}\overline{B}C + \overline{A}BC$

iv) $f(X, Y, Z) = \overline{X}\overline{Y}Z + X\overline{Y}\overline{Z} + \overline{X}Y\overline{Z} + XY\overline{Z} + \overline{X}YZ$

OR

Q.4 a) Find the sum of the following using 2's complement. **(04)**

i) -1011 & -0101

ii) $+0111$ & -0011

b) List the various laws stated in Boolean Algebra. **(06)**

P.T.O.

- Q.5 a)** Explain the function of (n:1) multiplexer with block diagram and truth table. **(06)**
- b)** Implement the given function using 8:1 multiplexer **(04)**
 $F(A, B, C) = \Sigma M(0, 2, 3, 5)$

OR

- Q.5 a)** Implement 1:8 demultiplexer using two 1:4 demultiplexers. **(06)**
- b)** Implement the given function using 4:1 multiplexer **(04)**
 $f(A, B) = \pi M(1, 3, 4)$

- Q.6 a)** Design 3 bit asynchronous up counter with the help of JK flip flop and draw its logic diagram. Also show the timing waveforms. **(08)**

- b)** Draw the symbol and write truth table of SR & JK flip flop. **(02)**

OR

- Q.6 a)** Explain the working of 4 bit twisted ring counter with neat block diagram. **(06)**
- b)** What is master –slave JK flip flop? Explain its working with logic diagram & truth table. **(04)**

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