Roll No. ....

Total No. of Questions : 09]

[Total No. of Pages : 02

Paper ID [EC204]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 4th)

DIGITAL ELECTRONICS (EC-204)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Four** questions from Section - B.

3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

$(10 \times 2 = 20)$

a) Convert decimal 225.225 to binary, octal and hexadecimal bases.

b) Give the truth-table for each flip-flop type: (a) J-K; (b) D; and (c) T.

c) Find two's complement of the numbers (i) 01001110; (ii) 01100100.

d) List applications of a direct coupled amplifier.

e) Explain why there may be a race condition in a shift register?

f) In a function of six variables the total maximum number of terms which the expression can have will be ....

g) Comment on the parameters which serve to describe the quality of performance of a D/A converter.

h) What is a ripple counter?

i) Differentiate between static and dynamic shift registers.

j) Determine the resolution of the output from a DAC that has a 12-bit input.

Section - B

$(4 \times 5 = 20)$

Q2) A four-variable function is given as $f(A,B,C,D) = \Pi M (0,3,4,5,6,7,11,13,14,15)$. Use a K-map to minimize the function.

Q3) Define a demultiplexer. Show how to convert a decoder into a demultiplexer. Indicate how to add a strobe to this system.

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Q4) Draw the logic symbols for T and RST flip-flops. Explain the function of each type of flip-flop.

Q5) Give an order of magnitude which is applicable to various logic families for (a) fan-out; (b) power dissipation per gate; (c) propagation delay per gate; (d) clock rate.

Q6) Represent the decimal numbers (a) 27, (b) 396 and (c) 4096 in binary form in (i) ASCII code, (ii) Gray code, and (iii) Excess 3 code.

Section - C

$(2 \times 10 = 20)$

Q7) Draw and explain the basic block diagram of (i) voltage of frequency conversion and (ii) voltage of time conversion

Q8) (a) Draw the basic block diagram of a voltage of frequency conversion. Sketch the system waveforms and explain its operation.

(b) An A/D converter has the following characteristics: resolution = 12 bits; relative accuracy = 0.03 per cent full scale; and full scale output = +5V.
   (i)   What is the quantization error in volts?
   (ii) What is the possible error in volts?

Q9) Write short notes on the following:

(a) Counter design with state equation and state diagrams.

(b) Classification and characteristics of memories.

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