

Code No. : 21266

Sub. Code : SAC  
SACB.Sc. (CBCS) DEGREE EXAMINATION  
APRIL 2018.

Second Semester

Computer Science/Software Engineering — All

**DIGITAL DESIGN**

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum (100)

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is the decimal value of binary 1011101101101101

(a) 11.00 (b) 11.75

(c) 11.25 (d) 11.01

2. What is the output state of an AND gate if both inputs are 0 and 1?

(a) 0 (b) 1

(c) 3 (d) 2

A karnaugh map with 4 variable has \_\_\_\_\_.

(a) 2 cells (b) 4 cells

(c) 8 cells (d) 16 cells

(i) Boolean laws  $A + B = B + A$  is the \_\_\_\_\_ law.

(a) commutative (b) associative

(c) distributive (d) identify

(i) \_\_\_\_\_ is a logic circuit with many inputs and one outputs.

(a) encoder (b) demultiplexer

(c) multiplexer (d) decoder

(i) Half adder has \_\_\_\_\_.

(a) 2 inputs and 2 outputs

(b) 3 inputs and 3 outputs

(c) 4 inputs and 3 outputs

(d) 3 inputs and 2 outputs

(i) D counter is a counter \_\_\_\_\_.

(a) mod 5 (b) mod 7

(c) mod 10 (d) mod 6

8. The \_\_\_\_\_ flip flop used to synchro-  
nize the state change during a clock pulse transition.
- RS flip-flop
  - Edge-triggered flip-flop
  - J/K flip-flop
  - T flip-flop

9. MRI stands for \_\_\_\_\_.
- Memory Reference Instruction
  - Memory Register Instruction
  - Memory Reference Integration
  - Memory Register Intrusion

10. Ripple counter is \_\_\_\_\_ counter.
- synchronous
  - asynchronous
  - serial
  - parallel

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Do the following
- Convert  $(0.6875)_{10}$  to binary
  - Convert  $(0.513)_{10}$  to octal.

Or

- (b) What are universal gates? Explain.

- (a) Simplify  $Y = A\bar{B}C + AB\bar{C}$ .

Or

- (b) Simplify the following expressions using boolean algebra.

(i)  $AB + A(CD + CD')$

(ii)  $(BC' + A'D)(AB' + CD')$

- (c) Give the logic diagram of a 4-bit adder-subtractor and explain its working.

Or

- (a) Write a note on binary multiplexer.

- (b) Write about RS flip-flop.

Or

- (a) Discussing in detail, 2's complement arithmetic with example.

- (b) What are the types of register? Explain.

Or

- (a) Write about serial in-parallel out shift registers.

Answer ALL questions, choosing either (a) or (b) of each question.

Each answer should not exceed 600 words.

16. (a) What are basic logic gates? Describe any two.

Or

(b) Explain how the boolean expression  $Y = AB + CD$  can be drawn using

(i) AND-OR circuit

(ii) NAND NAND circuit

(iii) AND-OR Invert circuit

17. (a) Simplify  $Y = \overline{A}B\overline{C}D + \overline{A}BC\overline{D} + A\overline{B}C\overline{D} + A\overline{B}C\overline{D}$

Or

(b) Simplify the boolean function  $F(A, B, C, D, E) = \sum (0, 1, 4, 5, 10, 11, 12, 13)$

18. (a) Briefly discuss how to implement a 4-variable boolean function using multiplexers.

Or

(b) How multiplication of binary numbers is performed using the binary multiplier.

- (a) Describe the working of D-flipflop with the help of a state table, state diagram and analyze it.

Or

- (b) Explain Master-slave flip flop.  
(a) Describe about universal shift register.

Or

- (b) Write parallel in parallel out register.
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