

# SARDAR PATEL UNIVERSITY

M. Sc. I. T. (Integrated) Examination, 2<sup>nd</sup> Semester

Wednesday, 13<sup>th</sup> April, 2016

PS02EIT01: Digital Electronics

Time: 10:30 AM to 12:30 PM

Total Marks: 70

Note: Answer of all the questions (including Multiple Choice Questions) should be written in the provided answer book only

**Q:1 Give answers of following Multiple Choice Questions [10]**

- [01] De Morgan's first theorem says that a NOR gate is equivalent to a \_\_\_\_\_.
- (A) bubbled OR (B) bubbled NOR  
(C) bubbled AND (D) AND bubbled
- [02] A combinational circuit that performs the arithmetic addition of two bits is called \_\_\_\_\_.
- (A) Full Adder (B) Half Adder  
(C) Binary Adder (D) Decoder
- [03] Half adder consists of. \_\_\_\_\_ and \_\_\_\_\_ Gates
- (A) XNOR, AND (B) XNOR, OR  
(C) XOR, AND (D) XOR, OR
- [04] A 4 - to - 1 line multiplexer requires \_\_\_\_\_ data select line.
- (A) 1 (B) 2  
(C) 3 (D) 4
- [05] Which device has many input and one output?
- (A) Flip - Flop (B) Multiplexer  
(C) De-Multiplexer (D) Counter
- [06] In Comparator, \_\_\_\_\_ gate is use for comparing bits in word.
- (A) XOR (B) AND  
(C) NOR (D) XNOR
- [07] In k-map, quad eliminates \_\_\_\_\_ variable.
- (A) One (B) Two  
(C) Three (D) Four
- [08] The 4-variable Karnaugh Map (K-Map) has \_\_\_\_\_ rows and \_\_\_\_\_ columns
- (A) 2, 2 (B) 4, 4  
(C) 4, 2 (D) 2, 4
- [09] Which of the following is Universal flip-flop?
- (A) JK flip-flop (B) RS flip-flop  
(C) Master slave flip-flop (D) D flip-flop
- [10] Shift register move the stored bits \_\_\_\_\_ or \_\_\_\_\_.
- (A) Left or right (B) Left or left  
(C) Right or right (D) Up or down

- Q:2 Answer the following short questions (any Ten) [20]**
- [01] Explain De Morgan first theorem.
  - [02] Describe binary adder in short.
  - [03] Draw the circuit of encoder.
  - [04] Draw the circuit of Seven Segment Decoder.
  - [05] Draw the circuit of 4x1 line multiplexer.
  - [06] Draw the circuit of 4x1 line de-multiplexer.
  - [07] Define Karnaugh map in detail.
  - [08] Explain K-Map for 2 variable with example.
  - [09] Describe octet in k-map
  - [10] Draw circuit diagram of D flip-flop
  - [11] Define flip-flop.
  - [12] Explain shift left register in brief.
- Q:3 [A] Explain half adder in detail. [05]**  
**[B] Explain 8x3 line encoder in detail. [05]**
- OR**
- Q:3 [C] Explain binary adder-subtractor in detail. [05]**  
**[D] Explain 3x8 line decoder in detail. [05]**
- Q:4 [A] Explain 8x1 line multiplexer with circuit in detail. [05]**  
**[B] Write a short note on Comparator with circuit diagram. [05]**
- OR**
- Q:4 [C] Explain 8x1 line de-multiplexer with circuit in detail. [05]**  
**[D] Write a short note on Nibble Multiplexer with circuit. [05]**
- Q:5 [A] What is k-map? Explain pair and quad with example. [05]**  
**[B] Simplify this using k-map  $F(A,B,C,D)=\sum(1,3,5,6,8,11,15)$  [05]**
- OR**
- Q:5 [C] Write a short note on Don't Care Condition. [05]**  
**[D] Simplify this using k-map  $F(A,B,C,D)=\sum(1,2,5,6,8,12,14)$  [05]**
- Q:6 [A] Explain RS flip-flop in detail. [05]**  
**[B] Explain controlled buffer register in detail. [05]**
- OR**
- Q:6 [C] Explain JK flip-flop in detail. [05]**  
**[D] Explain ring counters in detail. [05]**

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 (2)