Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EC2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Digital Electronics** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | | | **Course outcome** | **Marks** |
| **PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)** | | | | | | |
| 1. | Base 16 refers to which number system? | | | |  |  |
|  | a. binary coded decimal | b. decimal | c. octal | d. hexadecimal | CO1 | (1) |
| 2. | Convert the binary number (1011011)2 to octal. | | | |  |  |
|  | a. 134 | b. 132 | c. 133 | d. 131 | CO1 | (1) |
| 3. | Mention the number of independent digits in decimal number system. | | | |  |  |
|  | a. 16 | b. 8 | c. 10 | d. 9 | CO1 | (1) |
| 4. | What is the 10's complement of (2496)10? | | | |  |  |
|  | a. 7503 | b. 7502 | c. 7505 | d. 7504 | CO1 | (1) |
| 5. | Mention the code in which the consecutive numbers will have single bit change. | | | |  |  |
|  | a. Excess 3 code | b. Gray code | c. Binary code | d. Alphanumeric code | CO1 | (1) |
| 6. | Which of the following is the most widely used alphanumeric code for computer input and output? | | | |  |  |
|  | a. ASCII | b.parity | c.BCD | d.hexadecimal | CO1 | (1) |
| 7. | Using Boolean algebra write an equivalent expression for XYZ+XY'Z | | | |  |  |
|  | a. X | b.XZ | c.1 | d.0 | CO1 | (1) |
| 8. | From the truth table below, determine the standard SOP expression  E:\official\LMS\truthtable.png | | | |  |  |
|  | a. X= (A'.B.C')+(A.B.C)+(A'.B'.C') | b. X= (A'.B'.C)+(A'.B.C)+(A.B.C') | c. X=(A.B.C)' | d. X=A+B+C | CO2 | (1) |
| 9. | A + 0 = \_\_\_\_\_\_ | | | |  |  |
|  | a. 1 | b.2A | c.A | d.0 | CO1 | (1) |
| 10. | The simplest equation which implements the K-map shown below is  E:\official\LMS\kmap.jpg | | | |  |  |
|  | a. A+BC | b. AB+BC+CA | c. AC+B | d. BC+B | CO2 | (1) |
| 11. | An equivalent representation for the Boolean expression A' + 1 is | | | |  |  |
|  | a. 0 | b. A | c. 1 | d. A' | CO1 | (1) |
| 12. | Equivalent representation of NAND gate is | | | |  |  |
|  | a. AND invert | b. invert OR | c. invert AND | d. buffer invert | CO1 | (1) |
| 13. | In a Full Subtractor circuit, mention the Difference and Borrow when the inputs are 0,1,1. | | | |  |  |
|  | a. Difference =1  Borrow = 0 | b. Difference =1  Borrow = 1 | c. Difference =0  Borrow = 1 | d. Difference =0  Borrow = 0 | CO2 | (1) |
| 14. | A logic circuit which receives information from 2n input lines and transmits this information on a single output line is | | | |  |  |
|  | a. Encoder | b. Decoder | c. Multiplexer | d. Demultiplexer | CO2 | (1) |
| 15. | The basic building block of a combinational logic circuit is | | | |  |  |
|  | a. memory | b. flip flop | c. latches | d. Logic Gates | CO2 | (1) |
| 16. | BCD to excess code converter input is 0001, output= ------------------- | | | |  |  |
|  | a. 0010 | b.0110 | c.0111 | d.1000 | CO2 | (1) |
| 17. | For a 2 bit magnitude comparator A="10" and B="01",  outputs (A=B) = -----------, (A<B)= ---------------- and (A>B)= -------------- | | | |  |  |
|  | a. 1,0,0 | b.0,1,0 | c.0,0,1 | d.1,1,0 | CO2 | (1) |
| 18. | In positive logic, the logic one state corresponds to | | | |  |  |
|  | a. high voltage level | b. low voltage level | c. medium voltage level | d. negative voltage level | CO2 | (1) |
| 19. | A combinational circuit that converts binary information from from 2n input lines to n output lines is | | | |  |  |
|  | a. encoder | b. multiplexer | c. demultiplexer | d. decoder | CO2 | (1) |
| 20. | Mention the expression for carry propagate in a binary parallel adder when the inputs are Ai, Bi, Ci | | | |  |  |
|  | a. Ai AND Bi | b.Ai OR Bi | c.Ai XOR Bi | d.Ai NOR Bi | CO2 | (1) |

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| 21. | Edge triggered single bit storage device is called as | | | | | | |  |  |
|  | a. flip flop | b. latch | | c. register | | d. RAM | | CO2 | (1) |
| 22. | D flip flop is a single input version of | | | | | | |  |  |
|  | a. JK flip flop | b.SR flip flop | | c. delay flip flop | | d. set flip flop | | CO2 | (1) |
| 23. | Mention the input condition for RS flipflop to be in set mode. | | | | | | |  |  |
|  | a. R=1,S=1 | b. R=1,S=0 | | c. R=0,S=0 | | d. R=0,S=1 | | CO2 | (1) |
| 24. | Mention the table that lists the inputs of a flip flop for a known condition of its states | | | | | | |  |  |
|  | a. Truth table | b. State table | | c. Excitation table | | d. Clock table | | CO2 | (1) |
| 25. | The terminal count of a modulus-10 binary counter is \_\_\_\_\_\_\_\_. | | | | | | |  |  |
|  | a. 1001 | b. 1011 | | c. 1100 | | d. 1010 | | CO2 | (1) |
| 26. | What is the condition for JK flip flop to toggle? | | | | | | |  |  |
|  | a.J=0 and K=0 | b. J=1 and K=0 | | c. J=0 and K=1 | | d.J=1 and K=1 | | CO2 | (1) |
| 27. | The JK flipflop is in its reset mode when input J = \_\_\_\_\_ and input K = \_\_\_\_\_. | | | | | | |  |  |
|  | a. 1 and 1 | b.0 and 1 | | c.1 and 0 | | d.0 and 0 | | CO2 | (1) |
| 28. | What is the input condition for RS flipflop to remain in ansame state? | | | | | | |  |  |
|  | a. R=0,S=0 | b.R=1,S=0 | | c.R=1,S=1 | | d.R=0,S=1 | | CO2 | (1) |
| 29. | A 4 bit up/down binary counter is in the UP mode and in the 1001 state. To what state does the counter go on the next clock pulse? | | | | | | |  |  |
|  | a. 1010 | b.1011 | | c.0111 | | d.1110 | | CO2 | (1) |
| 30. | A counter counts the \_\_\_\_\_\_\_\_\_\_\_ | | | | | | |  |  |
|  | a. number of clock pulses | b. number of flipflops | | c. number of outputs | | d. number of inputs | | CO2 | (1) |
| 31. | How many flip-flops are required to make a MOD-16 binary counter? | | | | | | |  |  |
|  | a. 5 | b. 6 | | c. 16 | | d. 4 | | CO2 | (1) |
| 32. | How many clock pulses are required to get the output of a 4 bit SISO shift register? | | | | | | |  |  |
|  | a. 4 | b. 5 | | c. 1 | | d. 8 | | CO2 | (1) |
| 33. | Write equation for the following PAL Implementation. | | | | | | |  |  |
|  | a. w=(ab)'+abc'+a' | | b. w=(a+b)(a'+b'+c)(a) | | c. w=ab+abc+a | | d. w=a'b+a'b'c | CO3 | (1) |
| 34. | Write the expression for the following PLA structure | | | | | | |  |  |
|  | a. w=(a+b)(a'+b'+c) | b. w=ab+abc | | c. w=a'b+a'b'c | | d. w=(ab)'+abc' | | CO3 | (1) |
| 35. | Which of the following is the non saturated logic? | | | | | | |  |  |
|  | a. TTL | b. CMOS | | c. Schottky TTL | | d.ECL | | CO3 | (1) |
| 36. | -------------- is the amount of noise that a circuit could withstand without compromising the operation of circuit. | | | | | | |  |  |
|  | a. Noise margin | b. Fan out | | c. power dissipation | | d.propagation delay | | CO3 | (1) |
| 37. | In ---------------- PLD structure both arrays are programmable. | | | | | | |  |  |
|  | a.PROM | b. PLA | | c. PAL | | d. EPROM | | CO3 | (1) |
| 38. | The time required for the gate or inverter to change its state is called--------------- | | | | | | |  |  |
|  | a. Noise margin | b. Fan out | | c. power dissipation | | d.propagation delay | | CO3 | (1) |
| 39. | The number of standard loads that the output of the gate can drive without impairment of its normal operation is called---------------------- | | | | | | |  |  |
|  | a. Noise margin | b.Fan out | | c. power dissipation | | d.propagation delay | | CO3 | (1) |
| 40. | In PROM -----------------array fixed and ----------------------- array programmable. | | | | | | |  |  |
|  | a. AND and OR | b. both AND and OR programmable | | c. OR and AND | | d. both AND and OR fixed | | CO3 | (1) |

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| **PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)** | | | |
| 41. | Draw circuit diagram and write truth table for the following expression  Q=AB+AC' | CO1 | (5) |
| 42. | Simplify the following using Kmap  f(a,b,c)=m(1,2,4)+d(0,3) | CO1 | (5) |
| 43. | Draw 4 bit parallel adder diagram. | CO2 | (5) |
| 44. | Derive excitation table for JK flip flop | CO2 | (5) |
| 45. | Design one bit comparator | CO2 | (5) |
| 46. | Implement the following expression using NAND gate  AB+C | CO1 | (5) |
| 47. | Design 2X4 decoder. | CO2 | (5) |
| 48. | Draw Johnson counter diagram and write the sequence table | CO2 | (5) |
| 49. | Design MOD-3 counter using T flip flop | CO2 | (5) |
| 50. | Implement the following function using PROM  f(A,B,C,D)=Ʃm(0,1,3,5,7,9,12,14) | CO3 | (5) |
| **PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)** | | | |
| 51. | Covert the following in to canonical form and write truth table.   1. Y=ABC+ACD'+A'B 2. Q=AB+AC'D | CO1 | (10) |
| 52. | Draw and Explain NAND,NOT and NOR gate CMOS representation. | CO3 | (10) |
| 53. | Implement the following circuit using T flip flop.  E:\official\LMS\moore.png | CO2 | (10) |

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