****

**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

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

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **09IT204/12IT206** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Digital Principles and System Design** | **Max. marks :** | **100** |

**Answer ALL Questions**

|  |  |  |
| --- | --- | --- |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Convert decimal 72 to binary. | (1) |
| 2. | State absorption theorem. | (1) |
| 3. | A \_\_\_\_\_\_\_\_\_ is a combinational circuit that performs the subtraction of three input bits. | (1) |
| 4. | Define parity. | (1) |
| 5. | Mention some applications of demultiplexer. | (1) |
| 6. | What are the types of arrays in RAM? | (1) |
| 7. | Define state equation. | (1) |
| 8. | Name the circuit that can maintain a binary state indefinitely until directed by an input signal to switch states. | (1) |
| 9. | Enumerate the types of hazards. | (1) |
| 10. | Define moore machine. | (1) |

|  |  |  |
| --- | --- | --- |
| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | Express the Boolean function xy + x’z in a product of maxterm. | (3) |
| 12 | Design a two bit even parity generator circuit. | (3) |
| 13 | Compare combinational and sequential circuit. | (3) |
| 14 | Define ROM. Highlight the importance of it. | (3) |
| 15 | Why do hazards matter? | (3) |

|  |  |  |  |
| --- | --- | --- | --- |
| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | Simplify f *=* ∑ (0, 1, 2, 3, 5, 8, 10, 11, 13, 15) using tabulation method. | (15) |
| (OR) | | | |
| 17. | a. | Explain Karnaugh map simplification method. | (5) |
| b. | Simplify the f(w,x,y,z) = Σm(0,2,4,5,8,14,15), d(w,x,y,z) = Σm(7,10,13) using Karnaugh map method. | (10) |
| 18. | a. | Design a combinational circuit which can add three bits. | (10) |
| b. | List the steps involved in design of a combinational circuit. | (5) |
| (OR) | | | |
| 19. |  | Design and implement a combinational circuit to convert BCD code to Excess-3 code. | (15) |
| 20. | a. | Define decoder. With suitable diagrams explain 2-4 decoder. | (10) |
| b. | Mention some applications of decoder. | (5) |
| (OR) | | | |
| 21. |  | Design a combinational circuit that compares two numbers and determines their relative magnitudes. Implement the same using logic gates. | (15) |
| 22. |  | Define shift register. With suitable diagram explain bidirectional shift register. | (15) |
| (OR) | | | |
| 23. |  | Design a counter with the following binary sequence: 0, 1, 2, 3, 5, 6 and repeat. Use JK flip-flops. | (15) |
| 24. |  | What is the reason for race condition? Illustrate various types of race conditions. | (15) |
| (OR) | | | |
| 25. |  | Explain the types of hazards with suitable examples. | (15) |