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Question Paper Code: R2F05

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Second Semester

Computer Science and Design

R21UCD205- DIGITAL AND COMPUTER ORGANIZATION

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Convert $(1101.101)_2$ to decimal equivalent. CO2-App
2. Minimize the expression using the k-map method : CO2-App
 $F(A,B,C) = \sum m(1,2,3,5,7)$.
3. Implement 4X1 MUX using 2X1 MUX. CO2-App
4. Explain SR flip-flop. CO1- U
5. What are the registers generally contained in the processor? CO1- U
6. $A = 5$, $A = 3+A$ and $B = 4 \times A$ what hazard does the above two instructions create when executed concurrently CO2-App
7. What are the classifications of data hazards? CO1- U
8. Define Structural hazards. CO1- U
9. Define the term RELIABILITY. CO1- U
10. How the interrupt is handled during exception? CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Simplify the Boolean expression using K-map CO2-App (16)
 $F(A,B,C,D) = \sum m(0,2,3,8,10,11,12,14)$.
Or
(b) Consider the function CO2-App (16)
 $f(A, B, C, D) = \sum m(0,1,2,3,5,7,8,10,12,13,15)$ using Quine
Mccluskey Method.

12. (a) Explain the working of full adder with its logic symbol, logic circuit, truth table and logical expression. CO1- U (16)
- Or
- (b) Briefly explain about Multiplexer and Demultiplexer CO1- U (16)
13. (a) What do you mean by addressing modes? Explain various addressing modes with the help of examples. CO1- U (16)
- Or
- (b) Explain in detail the various components of computer system with neat diagram. CO1- U (16)
14. (a) Explain the various pipelining concepts in computer architecture. CO1- U (16)
- Or
- (b) Explain restoring and non-restoring division technique. CO1- U (16)
15. (a) Explain the need for cache memory and discuss the different types of mapping functions with necessary block diagram. CO1- U (16)
- Or
- (b) What is an interrupt? Explain the different types of interrupts and the different ways of handling interrupts. CO1- U (16)