F.Y. B.Sc [CS] Sem-I

25/03/19

Paper / Subject Code: 82101 / Computer Organization & Design.

(2 ½ Hours) [Total Marks: 75]

N.B: (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Illustrations, in-depth answers and diagrams will be appreciated.
(4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All (Each of 5 marks) (15M)

A) Multiple Choice Questions (5M)

i) **In decimal number system base is ____.**
a) 8 b) 2 c) 10 d) 16

ii) **RISC stands for _____.**
a) Reduced instruction set computer.
b) Reduced instruction set component.
c) Reference instruction set computer.
d) Reduced in set computer.

iii) **If one of the input to an OR gate is high its output will be ___.**
a) Medium b) High c) Low d) Moderate

iv) **A _____ used in microcomputers to temporarily store data being transmitted to or from a peripheral device.**
a) Data register b) MBR c) Index Register d) MDR

v) **Assembly is called a _____ programming language.**
a) low-level b) high level c) binary d) decimal

B) Fill in the blanks (5M)

(false ,true, adder ,peripheral devices, half adder ,mnemonic, memory buffer register , memory bus register)

i) The output of AND gate is _____ only when all the inputs are true.
ii) An _____ is a device that can add two binary digits.
iii) Assembly language uses a _____ to represent each low-level machine instruction or opcode.
iv) MBR stands for _____.
v) Input or output devices that are connected to computer are called _____.

C) Short Answers (5M)

i) Define fan-in.
ii) What is read and write operation?
iii) Define stack.
iv) Find the equivalent decimal number for octal number 143.
v) What are ALU and CU?

Q. 2 Attempt the following (Any THREE) (Each of 5 Marks) (15M)

a) Design full adder circuit.
b) Explain the concept of universal gate.
c) With suitable example explain Octal number system.
d) Compare multiplexer and De-Multiplexer.
e) With the help of neat diagram explain Shift Register.
f) Convert the binary number to decimal number.
i) 100101 ii) 10001110 iii) 10110101

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Q. 3 **Attempt the following (Any THREE) (Each of 5 Marks)** (15M)

a) Compare machine language and assembly language.
b) Explain following assembler directives:-
   a) INCLUDE b) ELSE c) RESET d)EQU e)ORG.
c) Explain characteristics of RISC instruction set.
d) With the help of neat diagram explain hardware implementation of Stack.
e) Explain Big-Endian and Little-Endian Assignments.
f) What is function call? Explain its use in ISA.

Q. 4 **Attempt the following (Any THREE) (Each of 5 Marks)** (15M)

a) How data movement & manipulation operations performed using Data Path?
b) List and explain different types of peripheral devices.
c) What is an interrupt? Give example.
d) List and explain with neat diagram main hardware components of Processor.
e) Explain arithmetic, logic & Load instructions with example.
f) Explain Direct Memory Access.

Q. 5 **Attempt the following (Any THREE) (Each of 5 Marks)** (15M)

a) Explain NOR, Exclusive OR, Exclusive NOR gate with truth tables.
b) Convert decimal number 106 to binary & octal form.
c) List and explain different types of Registers.
d) With the help of neat diagram explain Stack frame.
e) Explain S-R Flip Flop.

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