Total No. of printed pages = 8

Co-305/CAO/3rd Sem/2017/N

COMPUTER ARCHITECTURE AND ORGANISATION

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer *all* questions.

SECTION – A

Marks – 25

1 (a) State true or false : 1×5=5

(i) In computer subtraction is normally carried out by 2's complement

(ii) The circuit used to store one bit of information is known as Register

(iii) An n-bit microprocessor has n-bit instruction register

(iv) RAM is not suitable for permanent storage because it is volatile

(v) The operation executed on data stored in registers is called macro operation

[Turn over

(b) Fill up the blanks : $1 \times 5 = 5$

(i) _____ register keeps track of the instructions of a program stored in memory.

(ii) The operation executed on data stored in registers is called _____.

(iii) An address in main memory is called _____.

(iv) In _____ addressing mode the operand is given explicitly in the instruction.

(v) _____ holds the last instruction fetched.

(c) Each question below gives a multiple choice of answers. Choose the most appropriate one : $1 \times 10 = 10$

(i) _____ is generally used to increase the apparent size of physical memory.

(a) Secondary memory

(b) Virtual memory

(c) Hard-disk

(d) Disks

(ii) To reduce the memory access time we generally make use of ————.

(a) Heaps

(b) Higher capacity RAM's

(c) SDRAM's

(d) Cache's

(iii) The ALU makes use of ———— to store the intermediate results.

(a) Accumulators

(b) Registers

(c) Heap

(d) Stack

(iv) Which memory device is generally made of semi-conductors ?

(a) RAM

(b) Hard-disk

(c) Floppy disk

(d) CD disk

(v) A source program is usually in ——.

(a) Assembly language

(b) Machine level language

(c) High-level language

(d) Natural language

(vi) The ——— format is usually used to store data.

(a) BCD

(b) Decimal

(c) Hexadecimal

(d) Octal

(vii) During the execution of a program which gets initialized first ?

(a) MDR (b) IR

(c) PC (d) MAR

(viii) A CPU has one 16 bit program counter. This means that the CPU can address

(a) 16 K memory location

(b) 32 K memory locations

(c) 64 K memory location

(d) 256 K memory location

(ix) The immediate addressing mode of instruction provides the operand in the memory location

(a) Pointed by the PC

(b) Next to that of OP code

(c) Pointed by PC+1

(d) None of these

(x) On getting an interrupt, CPU

(a) finishes the current instruction and moves to interrupt service routine

(b) releases the control on I/O lines and memory lines

(c) makes the peripheral device, which requested the interrupt wait for fixed interval of time

(d) immediately moves to interrupt service routine without completing current instruction

(d) Match words and phrase in column X with the closest related / meaning word(s) in column Y. 1×5=5

X	Y
BCD code of decimal number 15	Secondary memory
Universal Logic Gate	Digital Signal Processor
Hard Disk Drive	Set of register
Implicit addressing mode	UART
Harvard architecture	0001 0101
	NAND
	PUSH and POP
	Address is inbuilt in instruction

SECTION – B

Marks – 45

2. (a) What is a cache memory? How is the performance of cache memory measured? 5

   (b) Show the step by step multiplication process using Booth Algorithm when (+15) is multiplied by (–13). Assume 5 bit register that hold signed numbers. 5

3. (a) Explain the hardwired control unit with suitable diagram. 6

   (b) What do you mean by RISC? Discuss the major characteristics of RISC. 4

4. (a) Differentiate between : 3×2=6

   (i) Microprocessor and Microprogram

   (ii) Encoder and Decoder

   (iii) RAM and ROM

   (b) Perform the subtraction using 2's complement 4

   (i) 1010100 – 1000011

   (ii) 11010 – 1101

5. Write short notes on any *three* : 5×3=15

(i) Von Neuman Architecture

(ii) Polling

(iii) BCD

(iv) Floating Point Representation

(v) Multiplexer

(vi) Truncation error.