* K C - 8 0 6 3 *

KC-8063

B. E. II (Sem. III) (Computer) Examination

November/December – 2012

Computer Organization & Architecture

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. II (Sem. III) (Computer)**

Name of the Subject :

☛ **Computer Organization & Architecture**

☛ Subject Code No. : **8 0 6 3** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Figures to extreme right indicate maximum marks.

(3) Make necessary assumptions and clearly mention them if required

(4) Support your answers with block diagram or neat sketches, if required.

SECTION – I

1 (a) Answer the following questions : **10**

(i) A control unit whose binary control variables are stored in memory is called _____. **1**

(ii) Which instructions can set and clear IEN flip-flop ? **1**

(iii) When FGO is set or clear ? **1**

(iv) Define following terms : **3**

(a) microinstruction

(b) microoperation

(c) Effective Address

(v) Define Three State Buffer **2**

(vi) State the use of sequencer. **2**

(b) Answer the following questions : **10**

(i) Draw and explain hardware implementation for common bus using multiplexers. **6**

(ii) Explain in brief types of computer instruction formats. **4**

2 (a) Discuss the implementation of branch logic in a microprogrammed control unit with diagram. **5**

(b) (1) Draw and explain flowchart for first pass of assembler. **6**

(2) The 8-bit registers AR, BR, CR and DR initially have the following values : **4**

AR = 11110010

BR = 11111111

CR = 10111001

DR = 11101010

Determine the 8-bit values in each register after the execution of the following sequence of micro operations.

AR ← AR + BR	Add BR to AR
CR ← CR ^ DR, BR ← BR + 1	AND DR to CR, increment BR
AR ← AR – CR	Subtract CR from AR

OR

(b) What is interrupt ? Draw flowchart for instruction cycle with interrupt cycle and explain in detail. **10**

3 (a) Answer the following : (any three) **15**

(i) Differentiate following

- Direct and indirect address instruction
- Hardwire and microprogrammed control unit

(ii) Draw and explain 4-bit binary addere-subtractor

(iii) Explain input-output configuration

(iv) Write an assembly language program to Add Two Numbers

SECTION – II

4 (a) Answer the following questions. Each question carried one mark. **10**

(i) Define Relative Addressing Mode.

(ii) Define Internal Interrupts.

(iii) When the CPU is executing a program that is part of the operating system, it is said to be in the _____ mode.

(iv) Convert the following into reverse polish notation.

A+B* [C*D+E* (F+G)]

(v) Define Zero-Address Instructions.

(vi) Name the addressing mode in which data is directly available as an operand.

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

(viii) Define Pipeline conflict.

(ix) Interrupts which are initiated by an instruction are software interrupts. (True/False)

(x) An instruction pipeline can be implemented by means of FIFO buffer. (True/False)

(b) Answer the following : (any two) **10**

(i) Explain and differentiate between RISC and CISC.

(ii) Explain Overlapped Register Windows

(iii) Draw the space time diagram for six segment pipeline showing the time it takes to process 8 tasks.

5 Attempt the following :

(a) Write the program to logically OR the two numbers without using "OR" instruction. **7**

(b) Explain the Instruction Pipelining with example. 8

OR

(b) Explain the working of a pipelined processor, which is having four pipeline stages, with proper space time diagrams. Under which conditions this computer's speed up can be 4 ? Explain mathematically how it is so. 8

6 Attempt the follwing :

(a) Explain various types of interrupts. **7**

OR

(a) Explain the Booth's algorithm with the help of flowchart. **7**

(b) Explain the procedure for addition and subtraction with signed-magnitude data with the help of flowchart. 8