Code: AC58/AT58/AC106/AT106   Subject: COMPUTER ORGANIZATION

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours   **JUNE 2016**   Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   **Choose the correct or the best alternative in the following:**   **(2×10)**

a.   During the execution of a program, which register gets initialized first?
   (A) MDR   **(B)** 1R
   (C) PC   **(D)** MAR

b.   When the CPU detects an interrupt, it than saves its
   (A) previous state   **(B)** next state
   (C) current state   **(D)** both **(A)** & **(B)**

c.   When we perform subtraction on -7 and +1, the answer in 2's complement form is
   (A) 1010   **(B)** 1110
   (C) 0110   **(D)** 1000

d.   To overcome the conflict over the possession of the BUS we use
   (A) optimizers   **(B)** BUS arbitrators
   (C) multiple bus structure   **(D)** none of these

e.   The DMA transfer is initiated by
   (A) processor   **(B)** running process
   (C) I/O device   **(D)** OS

f.   The alternate way of writing the instruction ADD #5, R1 is
   (A) ADD [5], [R1]   **(B)** ADDI 5, RI
   (C) ADDIME 5, [RI]   **(D)** No alternative

g.   Which directive is used to specify and assign the memory required for the block of code?
   (A) Allocate   **(B)** Assign
   (C) Set   **(D)** Reserve

h.   When dealing with the branching code the assembler

   (A) Replaces the target with its address.
   (B) Does not replace until the test condition is satisfied.
   (C) Finds the branch offset and replaces the branch target with it.
   (D) Replace the target with the value specified by the dataword directive.

i.   The data transfer in UART is done in
     (A) Synchronous format   **(B)** Asynchronous format
     (C) ISO synchronous format   **(D)** None of these

j.   The centralized bus arbitration is similar to _____ interrupt circuit.
     (A) priority   **(B)** parallel
     (C) single   **(D)** daisy chain

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Solve the following using 2's complement method
         (i) $(+4)+(-6)$ (ii) $(-5)+(-2)$
         (iii) $(+6)-(+3)$ (iv) $(-7)-(-5)$ **(4)**

         b. Explain branching with example.   **(8)**

         c. Explain Big-endian and little-endian assignments.   **(4)**

Q.3 a. Explain the following addressing modes with an example
         (i)   Register   (ii) Indirect
         (iii) Absolute   (iv) Immediate   **(4)**

         b. Explain how subroutine is linked using link register.   **(8)**

         c. Explain with example different rotate instructions.   **(4)**

Q.4 a. Write an assembly language program that reads one line from the keyboard,
             stores it in memory buffer and echoes it back to the display.   **(6)**

         b. List out the sequence of operations involved in handling an interrupt request
             from a single device.   **(6)**

         c. Explain daisy chain scheme.   **(4)**

Q.5 a. Explain with neat diagram serial interface.   **(10)**

         b. Mention the functions of any 6 data transfer signals used on the PCI bus. **(6)**

Q.6 a. Explain the working of Synchronous DRAMs. Give the relevant block
             diagram. Define double data rate DRAM.   **(4+3+3)**

         b. Explain performance considerations for the following:-   **(2 x 3 = 6)**
             (i) Inerleaving   (ii) Hit rate and miss penalty

Q.7 a. Explain virtual memory organization.   **(4)**

         b. Define the following with respect to secondary storage:-   **(3 x 2 = 6)**
             (i)   Access time   (ii) Data buffer   (iii) Disk controller

         c. Explain 4-bit carry lookahead adder.   **(6)**

Q.8 a. Write the block diagram of sequential circuit binary multiplier and show how
             no's 13 and 11 are multiplied.   **(12)**

         b. Write IEEE standard floating point formats for single precision and double
             precision.   **(4)**

Q.9 a. With neat diagram explain single bus organization of the data path inside a
             processor.   **(8)**

         b. Explain the working of hard-wired control.   **(4)**

         c. Explain the working of microprogrammed control unit.   **(4)**