UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	COMPUTER ARCHITECTURE
COURSE CODE	:	BIT 2033
PROGRAMME	:	BACHELOR OF INFORMATION TECHNOLOGY
EXAMINATION DATE	:	JUNE 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS.

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

PART A

Instruction: Answer **ALL** questions.

Q1 The process of adding and comparing of data occur in _____.

A. hard disk
B. floppy disk
C. CPU chip
D. memory chip

Q2 Which of the following register is used to keep track of address of the memory location where the next instruction is located?

A. Memory Address Register
B. Memory Data Register
C. Instruction Register
D. Program Register

Q3 A complete microcomputer system consists of _____.

A. microprocessor
B. memory
C. peripheral equipment
D. all of above

Q4 CPU does not perform _____.

A. data transfer
B. logic operation
C. arithmetic operation
D. all of above

Q5 Pipelining processors of all computers, whether micro, mini or mainframe must have _____.

A. ALU.
B. primary storage
C. Control Unit
D. all of above

Q6 A stack is _____.

A. an 8-bit register in the microprocessor
B. a 16-bit register in the microprocessor
C. a set of memory locations in R/WM reserved for storing information temporarily during the execution of computer
D. a 16-bit memory address stored in the program counter

Q7 A stack pointer is _____.

A. a 16-bit register in the microprocessor that indicate the beginning of the stack memory.
B. a register that decodes and executes 16-bit arithmetic expression.
C. the first memory location where a subroutine address is stored.
D. a register in which flag bits are stored

Q8 The branch logic that provides decision making capabilities in the control unit is known as _____.

A. controlled transfer
B. conditional transfer
C. unconditional transfer
D. none of above

Q9 Interrupts which are initiated by an instruction are _____.

A. internal
B. external
C. hardware
D. software

Q10 A time sharing system implies _____.

A. more than one processor in the system
B. more than one program in memory
C. more than one memory in the system
D. none of above

(10 marks)

PART B

Instruction: Answer **ALL** questions.

Q11 Let A = 00100101 and B = 11111011 be 2's complement integers. A fixed width of 8 bits is assumed. Compute the following (show your work):

(a) A + B

(2 marks)

(b) A OR B

(2 marks)

(c) A AND B

(2 marks)

Q12 Explain the following types of interrupt:

(a) External Interrupt

(2 marks)

(b) Internal Interrupt

(2 marks)

(c) Software Interrupt

(2 marks)

Q13 Calculate the following expression by using 8-bit 2's complement:

(a) - 35 + (-11)

(6 marks)

(b) 19 - (- 4)

(6 marks)

Q14 Discuss **TWO (2)** different techniques used for interfacing I/O units with the processor.

(6 marks)

Q15 Given the following scenario:

A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers and an address part.

(a) Calculate how many bits are there in the operation code, the register code part and the address part.

(6 marks)

(b) Draw the instruction word format and indicate the number of bits in each part.

(6 marks)

(c) Calculate how many bits are there in the data and address inputs of the memory.

(4 marks)

Q16 Differentiate between 1's complement subtraction and 2's complement subtraction of binary numbers.

(4 marks)

PART C

Instruction: Answer **ALL** questions.

Q17 Show the truth table's for the following functions:

(a) $f(w, x, y, z) = w + x + y + z$

(5 marks)

(b) $f(w, x, y, z) = wx + xz + y$

(5 marks)

Q18 (a) Describe why page-table is required in a virtual memory system.

(4 marks)

(b) Justify why page-table is required in a virtual memory system.

(2 marks)

(c) Explain **TWO (2)** different ways of organizing a page table.

(4 marks)

Q19 (a) Explain how an interrupt is recognized.

(5 marks)

(b) Explain the interrupt cycle.

(5 marks)

Q20 (a) Discuss the differences of horizontal microcode with vertical microcode.

(6 marks)

(b) State **TWO (2)** advantages of micro programmed control unit.

(4 marks)