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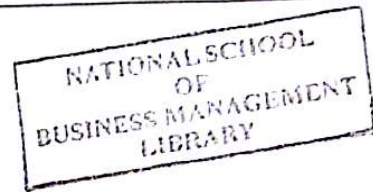
National School of Business Management
BSc in Management Information Systems (Special) Degree – 14.2
1st Year – 1st Semester Examination
Introduction to Computer Science
(BMIS 101)

NSBM

Answer All Questions.

Calculators are not allowed in this examination.

Time: 03Hrs
02 February 2014



1.

i. Convert the following Numbers to their Binary equivalents.

- a) 67_{10} b) 53_8 c) $C6A_{16}$

ii. Convert the following Numbers to their Decimal equivalents.

- a) 110011_2 b) 234_8 c) $3E3_{16}$

iii. Perform the following operations using 1's Complement method (use 8 bits).

- a) $15_{10} + (-12)_{10}$ b) $(-12)_{10} + 5_{10}$

iv. Perform the following operations using 2's Complement method (use 8 bits).

- a) $10_{10} + (-8)_{10}$ b) $(-8)_{10} - (+6)_{10}$

(12 marks)

2.

i. Convert -21.625_{10} to its binary equivalent. Then represent it in IEEE 32 bit floating point representation.

ii. Represent -523, +367 in:

- a) Zoned Decimal Representation method.
b) Packed Decimal Representation method.
c) Binary coded Decimal Representation method

(10 marks)

3. Draw a flow chart to that asks the user to enter two numbers, obtains them from the user and prints their sum, product, difference, quotient and remainder. (8 Marks)

4. Draw a flow chart to calculates and prints the average of several integers. Assume the last value read with the dummy Value 9999.

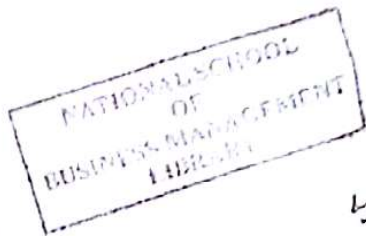
A typical input sequence might be 10 8 11 7 9 9999

(Indicating that the average of all the values preceding 9999 is to be calculated.)

(10 Marks)

5. The factorial function is used frequently in probability problems. The factorial of a positive integer n (written $n!$ and pronounced " n factorial") is equal to the product of the positive integers from 1 to n . Write a pseudo code to evaluates the factorials of the integers from 1 to 5. (10 Marks)

6. A palindrome is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a pseudo code to reads in a five-digit integer and determines whether or not it's a palindrome. [Hint: Use the division and remainder operators to separate the number into its individual digits.] (10 Marks)



7. Explain the following terms:

- i. High Level and Low Level Programming Languages
- ii. Hyper Threading Technology
- iii. Storage Mechanism of System RAM (Random Access Memory)
- iv. Storage Mechanism of CD-R
- v. Dual Core Technology of Processors

(10 marks)

8. a) Design files giving File Names, Field Names, Field Types and Field Sizes to store data about Item Details, Supplier Details, and Transaction Details in a Super Market

Assume that there are 10000 items supplied by 100 Suppliers and 100000 transactions per day.

b) Calculate the total file size at the end of 5 days.

(10 marks)

9. a) A disk file of 600,000 records is to be processed sequentially. The record size is 100 bytes and the sector size is 1024 bytes. The time taken to read a sector is 0.3 ms and the time taken to process the records in a sector is 0.1 ms.

- i. Calculate the number of records that can be stored in one sector.
- ii. Calculate the number of sectors required for the whole file.
- iii. Calculate the time taken to read and process all the records in the file.

b) A magnetic disk has 5 platters, 40,000 tracks on each surface and 80 sectors per track. The capacity of a sector is 1024 KB. Compute the capacity of a Track, Surface, Cylinder and Disk.

(8 Marks)

10.

- a) Describe briefly the function of each of the following registers:
- i. Instruction Register (IR)
 - ii. Program Counter (PC)

b) Describe the sequence of events carried out during the machine cycle when executing the following instructions. Clearly indicate the values in Accumulator after each execution

Address	Contents	Comments
800	LDA 2000	Load the value stored in memory location 2000 to Accumulator
801	MPY 2001	Multiply the value stored in 2001 with the value in Accumulator and store the result back in Accumulator
802	STO 2002	Store the content in Accumulator in Memory location 2002
803	JMP 3000	Change the PC Value to 3000
2000	6	
2001	10	

(Marks 12)

*****END*****