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Department of Computer Science & Engineering
Begum Rokeya University, Rangpur
2nd Year 2nd Semester Final Examination – 2011 (Session: 2009–10)
Course Code: **CSE 2205**   Course Title: **Operating System & System Programming**
Full Marks: **50**   Time: **03:00 hrs**

(Answer any Five. Figures in the right margin indicate full marks.)

1	a.	What is an Operating System? Why it is required for a system function?	1+2=3
	b.	What are the difference between Multiprogramming and Time sharing?	3
	c.	Define Multi processor system, What are the advantageous of multi processor system?	4

2	a.	Define process. Mention the state related to process? What are the functionalities of each state?	1+1+3=5
	b.	With lucid depiction expatiate process control block.	3
	c.	What are the difference between short – tèrm scheduling and long – term scheduling?	2

3 a. What are the difference between Preemptive and non- preemptive scheduling?   2

   b. Consider the following set of processes with the length of CPU burst time   6
   given in millisecond. The process are assumed arrived in the order p1,p2.p3.

   i. Draw the grant chart illustrating the execution of these process using FCFS.
   SJF, and RR (time quantum =4) CPU scheduling algorithm.

   ii. Which of the algorithm in above question result the minimal average
   waiting time (over all process)?

Process	Burst Time
P_1	24
P_2	3
P_3	3

   c. What is Turnaround time and Response time?   2

5 a. Define Address Binding? Shortly Explain the steps for address binding with   4
   diagram?

   b. Define Swapping. Mention the strategies used to select a free hole from the set   1+2=3
   of available free hole?

   c. Consider a system consisting of four resources of the same type that are   3
   shared by three processes, each of which needs at most two resources. Show
   that the system is dead lock free?

6 a. What is virtual memory? Describe the procedure for handling page fault.   1+3=4

   b. How many page faults occur for LRU page replacement Algorithm for the   4
   following reference string, with three frame?
   7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

   c. If the page fault service time is 25 milliseconds and average access time is 100   2
   nanosecond, find the effective access time for page fault rate P=30% ?

4 a. Define deadlock? List and explain the four necessary conditions for deadlock   1+2=3
   to occur.

b. Consider the following snapshot of a system with 5 processes P_0 through P_4 5
and 3 resource types: A (10 instances), B (5instances), and C (7 instances).

Snapshot at time T_0:

	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

Answer the following question using the bankers algorithm
i. What the content of Need matrix?
ii. If a request from process p1 arrives for (1,0,2) can the system granted
immediately? Why

c. What are the difference between Deadlock prevention and Deadlock   2
avoidance?

7 a. Draw the MS-DOS layer structure and Unix system structure, also compare   4
between them.

b. What is File? What are the responsibilities of O/S in regards to file   4
management?

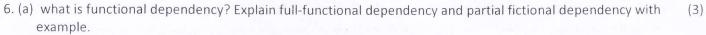c. Compare the Sequential and Direct access method of a file.   2

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(Answer any Five. Figures in the right margin indicate full marks)

1. (a) What do you mean by DBMS? List two significant differences between file processing system and DBMS. (1+2)

   (b) What is Data abstraction? Describe different levels of data abstraction.   (3)

   (c) What are the functions of DBA?   (2)

   (d) What do you mean by DDL and DML? Define their operations.   (2)

2. (a) What is Mapping cardinalities? Explain various mapping cardinalities.   (3)

   (b) Explain the concept of Specialization, Generalization and Aggregation.   (4)

   (c) Consider the following relational database where the primary keys are underlined. Give an expression in the (3)
      Relational algebra to express each of the following queries:

        Employee (*Employee-name*, street, city)
        Works (*employee-name*, company-name, salary)
        Company (*company-name*, city)
        Manages (*employee-name*, manager-name)

   (i). Find the employee named Mr. John.

   (ii). Find the Find the Name, address, cities of all employees who works for "Brack Bank" and earn more than
        30,0000 Tk.

   (iii). Find the names of all employee who earn more than every employee of "Brack Bank

3. (a) Show and discuss the basic structure of an SQL expression.   (2)

   (b) How many aggregate Functions are there in SQL? Give an Example of each.   (2)

   (c). Consider the following relational database where the primary keys are underlined. Construct the following
      SQL queries for this relational database: (1.5×4=6)

        Branch (*branch-name*, branch-city, assets)
        Customer (*customer-name*, customer-street, customer-city)
        Loan (*loan-number*, branch-name, amount)
        Borrower (*customer-name*, *loan-number*)
        Account (*account-number*, branch-name, balance)
        Depositor (*customer-name, account-number*)

   (i). Find all loan numbers for loans made at Rangpur branch with loan amounts greater than 1000 Tk.

   (ii) Update the database to accommodate the change that all branches located at Dhaka will now
       be shifted to Rangpur.

   (iii) Find all customers name, loan-number, amount who have a loan from bank.

   (iv) Delete all account tuples in the Rangpur branch.

4. (a) What is Referential Integrity?   (2)

   (b) Define Triggers. Discuss it's necessity with example.   (3)

   (c) Discuss the following strategies of storing database into files: (2+2)
       (i). Fixed length representation
       (ii) Variable length representation.

5. (a) What is a *transaction*? Mention the ACID properties of a transaction?   (1+3)

   (b) Show and explain the state diagram of a transaction.   3

   (c) What is Recoverable Schedule? Why recoverability of schedule is desirable?   3

6. (a) what is functional dependency? Explain full-functional dependency and partial fictional dependency with example. (3)

(b Why is it important to normalize a database?. Summarize the definitions of various Normal forms. (3)

(c) Normalize the following database into 1NF, 2NF and 3NF: (4)

      Employee(employee-id, employee-name, branch, department, phone-no, item-no, item details, price)

7. (a) What is indexing in database? Why it is used? Show the B-tree structure of index and specify the levels of nodes. (3)

(b) Classify indexing in database. (3)

(c) Consider the following *dense primary* index file corresponding to the sequential file *Account* sorted on the attribute *branch_name*. Make necessary modifications to the index file after consecutive deletion of the records A-5 and A-2. (2+2 = 4)

Index File

Branch name	Pointer
Adabor	
Cox's Bazar	
Dhap	
Mirpur	
Motijheel	

Account no	Branch name	Balance
A-9	Adabor	1230
A-1	Adabor	500
A-5	Cox's Bazar	560
A-8	Dhap	5200
A-3	Dhap	4000
A-2	Mirpur	5000
A-4	Mirpur	520
A-10	Mirpur	1200
A-6	Motiiheel	600
A-7	Motiiheel	200

Department of Computer Science & Engineering
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2nd Year 2nd Semester Final Examination – 2011 (Session: 2009–10)

Course Code: **CSE 2203**   Course Title: **Microprocessor & Assembly Language**

Full Marks: **50**   Time: **03:00 hrs**

(Answer any Five. Figures in the right margin indicate full marks.)

1. (a) What is assembly language? Give a relative comparison between assembly language and high-level language. `1+2=3`

   (b) What is the basic difference between assemble and a high level languages? Why would you choose one over the other? `2+2=4`

   (c) What are the advantages of subroutines? . `1+2=3`

2. (a) What are the data definition pseudo-ops available in 8086 assembly language? Give the valid combinations of operands for the MOV and XCHG instructions. `1+2=3`

   (b) How many types of flags are there in the FLAGS register? What purpose are they used for by 8086? `1+1=2`

   (c) Mention the status of all the status flags after the following instruction is executed? `2`

   INC BX (BX contains FFFFh)

   (d) Translate the following C code fragment into assembly language code. `3`

   ```
   #define msg "Type Your Name"        printf(msg);
   #define Roll 00900000               gets(Name);
   char Name[100] = "X";               printf("%s\n%s", Name, Roll);
   ```

3. (a) How many types of jump instructions are there in 8086 assembly language? What is the range of conditional jump? How can this range limitation be overcome? Explain with an example. `1+1+2=4`

   (b) Which type of jump instructions is executed faster – conditional or unconditional? Why `1+1=2`

   (c) Suppose you have four byte variables containing four signed numbers taken from the keyboard. Write an assembly language program to form two words – one by concatenating the lower nibbles and the other by concatenating the upper nibbles and then print the numbers. `2`

   (d) What's wrong with the instruction MOV [SI], 1? How can you correct it? `1+1=2`

4 (a) What are the different addressing modes available in 8086? Mention what addressing mode is used in the source operand for each of the following instructions. Also give the value that is moved to destination. `1+3=4`

   i) MOV BX, 100h (BX = FFEEh)
   ii) XCHG SI, A[BP] (offset of variable A is 12EEh, BP=SI=0011h, SS=EF00h, DS=2F00, addresses 302FF and F02FF contain BC00h and AB00h respectively)
   iii) MOV AL, BX[DI+3] (BX=1234h, DI=00A1h, offset 12D5h is the start of an word array containing the digits 1, 511, 2, 200, 500)

   (b) Write an assembly language program to take two strings of the same length from the keyboard and then print "Equal" if the strings are equal and "Not Equal" if they are different. `3`

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Course Code : CSE-2207   Course Title: Complex variable, Laplace Transform and Fourier Analysis

Full Marks: 50   Time 3.00 hours

(Answer any Five. Figures in the right margin indicate full marks)

1. (a) Define Fourier series. Evaluate the coefficient of Fourier series on the interval $(-\pi, \pi)$.   (5)

   (b) Expand in Fourier series over the period $-\pi < x < \pi$ of the function   (5)

   $f(x) = x + x^2$. Hence show that , $\dfrac{\pi^2}{6} = 1 + \dfrac{1}{2^2} + \dfrac{1}{3^2} + \dfrac{1}{4^2} + \ldots\ldots\ldots\ldots\ldots\ldots\ldots$

2. (a) Find the Fourier transform of $F(x) = \begin{cases} 1 - x^2 : when |x| < 1 \\ 0 : when |x| > 1 \end{cases}$ (5)

   Find the reciprocal relation and also show that $\dfrac{3\pi}{16} = \int\limits_0^\infty \dfrac{\sin x - x\cos x}{x^3} \cos\dfrac{x}{2} dx$.

   (b) Use finite Fourier transform to solve   (5)

   $\dfrac{\partial U}{\partial t} = 3\dfrac{\partial^2 U}{\partial x^2}$

   $U(0,t) = U(2,t) = 0, t > 0$

   $U(x,0) = x, 0 < x < 2$.

3. (a) State and prove the convolution theorem for Laplace transformation.   (5)

   (b) Using Laplace transformation find the solution of the equation   (5)
   $X''(t) + 4X'(t) + 4X(t) = 4e^{-2t}$ with boundary conditions $X(0) = -1$ and $X'(0) = 4$.

4. (a) Define modulus of a complex number. Prove the modulus of sum or difference of two complex numbers   (5)
   is always less than or equal to the sum of their moduli.

   (b) Define amplitude of a complex number. If $z_1 = x_1 + iy_1$ and $z_2 = x_2 + iy_2$ then   (5)

   prove that $amp(\dfrac{z_1}{z_2}) = amp(z_1) - amp(z_2)$.

5. (a) State and prove the Taylor's theorem.   (5)

   (b) Expand $f(z) = \dfrac{z}{(z-1)(2-z)}$ in a Laurent series valid for $|z| < 1$.   (5)

6. (a) Define simple closed curve and simply connected domain. If f(z) is analytic inside and on a region R bounded (5)

by a simple closed curve C and $f'(z)$ is continuous there , prove $\oint_C f(z)dz = 0$.

(b) Prove the Cauchy theorem for the case of a triangle. (5)

7. (a) Evaluate , $\oint_C \dfrac{z+1}{(z-1)(z-4)(z-5)} dz$, where C is $|z| = 4$. (5)

(b). Evaluate $\dfrac{1}{2\pi i} \oint_{|z|=4} \dfrac{e^z}{(z^2+1)^2} dz$. (5)

Course Code: CSE-2208

Course Title: Management

Full Marks: 50

Time 3.00 hours

(Answer any Five. Figures in the right margin indicate full marks)

1. (a) Define Management.   2
   (b) Briefly discuss the basic functions of management.   4
   (c) What types of skills are needed at different levels of management and why   4

2. (a) What is organization?   2
   (b) Discuss the characteristics of good organization.   4
   (c) How would you distinguish between formal and informal organization?   4

3. (a) What is meant by motivation?   2
   (b) Describe the motivation process.   2
   (c) Explain the Maslow's need hierarchy Theory   6

4. (a) What is controlling?   2
   (b) Describe the nature of controlling.   3
   (c) Describe the various steps of controlling process.   5

5. (a) What are the principles of effective communication?   5
   (b) Explain the process of communication.   5

6. (a) What is time management? Discuss the importance of time management.   5
   (b) What is meant by consultative direction? Give your opinion on its applicability in Bangladesh.   5

7. Write Short notes on: 2.5×4
   (a) Unity of Command.
   (b) Social responsibilities of management.
   (c) Virtual organization.
   (d) Decentralization.