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Department of Computer Science and Engineering
Begum Rokeya University, Rangpur.

2nd Year 2nd Semester Final Examination-2012 (Session: 2010-2011)

Course Code: CSE- 2201

Course Title: Database Management System

Full Marks: 50

Time: 03.00 hrs

[Answer any five (5) Questions, Number of each question is indicated to the right.]

1. (a) Why do people prefer to use database system over traditional file system to store and manage data? 2.5
(b) With example show the levels of data abstraction. 2.5
(c) Define and classify data model. What are the key elements to represent various data models? 1+1+1
(d) Define "Entities" and "Attributes" in database with example. 2
2. (a) Define primary key, foreign key, and candidate key with example. 3
(b) Draw the E-R diagram for banking enterprise. 4
(c) Write short note for following terms: 3
(i) Derived attribute; (ii) Composite attribute; (iii) Recursive relationship.
3. (a) Explain the difference between strong and weak entity set with tabular representation. 2
(b) Define the concept of aggregation. Give two examples where this concept is useful. 3
(c) A university register's office maintains data about the following entities: 5

courses(course_number, title, credit, syllabus)
course_offerings(Course_number, year, semester, section_number, instructor, timing)
students(student-id, name, program)
Instructor(identification_number, name, department, title)

Construct an E-R diagram for the register's office.
4. (a) What is normalization? Why it necessary in database? 2
(b) Corroborate 1NF, 2NF, 3NF. 6
(c) What is the difference between multi valued dependencies and join dependencies normalization. 2
5. (a) How will you define SQL? Illustrate some popular commercial database system available today. 1.5
(b) Write down the basic structure of an SQL expression. Hence describe the operation of each clause. 3
(c) Describe the uses of wildcard in string operations. 2.5
(d) Consider the following database consisting of the following tables: .75×4=3

Department (dept id, dept name)
Student (rollno, name, gender, mark1, mark2, mar3, total, average, dept id)
Staff (staff id, name, designation, qualification, dept id)
Tutor (rollno, staff id)

 - i. Display the student details who come under the tutor ship of the given staff name 'X'.
 - ii. Display the student details who got greater than overall average marks of their department.
 - iii. How many students are there in CSE department?
 - iv. Write a trigger to display the message "Invalid marks" when marks are < 0 and > 100

6. (a) What do you mean by Referential integrity in SQL? How is it achieved? .6×5=
- (b) Create an employee table that contains five columns: Such as Employee Id, last name, First name, Phone number and Department number with the following constraints:
- The last name and first name should be not null.
 - Make a check constraint to check the department number is between 9 and 100.
 - Make a primary constraint on the employee ID column.
 - Make a foreign key on the department number column.
 - Use the "phone number" as a unique key.
- (c) Make a list of security concerns for a bank. For each item on your list state whether this concerns relates to physical security, human security, operating system security or database security. 2.5
- (d) How can a view play role in imposing security in data? Using the schema in question 4 create a view containing the account numbers and customers names (but not balances) for all accounts at Dhaph branch. 1.5+1.5
7. (a) Define Transaction in database. Hence, define the ACID properties of Transaction. 1+2
- (b) Describe the States of a Transaction. 3
- (c) Consider two Transactions T1 and T2. T1 transfers \$50 from account A to account B and T2 transfers 10 percent of the balance from account A to account B. 4

T1	T2
Read(A);	Read(A);
A:=A-50;	Temp:=A*.1;
Write(A);	A:=A-temp;
Read(B);	Write(A);
B:=B+50;	Read(B);
Write(B)	B:=B+temp;
	Write(B);

What will happen to these accounts if a serial schedule is maintained instead of concurrent schedule?

Department of Computer Science and Engineering
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2nd Year 2nd Semester Final Examination-2012 (Session: 2010-2011)

Course Title: Microprocessor & Assemble Language

Time: 03.00 hrs

Course Code: CSE- 2203

Full Marks: 50

[Answer any five (5) Questions, Number of each question is indicated to the right.]

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|--------|--|---------|
| 1. (a) | Show the different parts of a 8086 microprocessor using block diagram. | 4 |
| (b) | Describe its different parts in brief. | 6 |
| 2. (a) | Show the pin configuration of 8086. | 2 |
| (b) | What are the two modes of 8086? Indicate the pins for those modes. Explain the pins function those are common to both modes. | 1+2+5=8 |
| 3. (a) | Explain what are the advantages of the memory segmentation. | 2 |
| (b) | Explain the physical memory organization in 8086. | 5 |
| (c) | How does 8086 convert a logical address to physical address? Explain with example. | 2+1=3 |
| 4. (a) | What do you mean by instruction cycle and machine cycle for a processor? | 2 |
| (b) | With the help of neat timing diagram, explain bus activities during T ₁ and T ₂ states for writing operation of 8086. | 5 |
| (c) | How does 8086 manage read/write operations that require more than 4 states? | 3 |
| 5. (a) | What is assembly language? Give its advantages and disadvantages? | 1+2=3 |
| (b) | Mention the groups in which the instruction set of 8086 are categorized. | 4 |
| (c) | Show the allowed operands for the instruction ADD, ADC and INC. | 3 |
| 6. (a) | Mention the different types of data transfer instructions with proper examples. | 6 |
| (b) | Can the MOV instruction transfer data directly between a source and destination that both reside in external memory? | 1 |
| (c) | What is meant by a "string" and what are the characteristics of a string instruction? | 1+2=3 |
| 7. (a) | What is an interrupt? Show the sequence of actions 8086 take in response to an interrupt. | 1+3=4 |
| (b) | Draw the interrupt vector table for 8086 and explain how the address of the interrupt service routine is computed when 8086 receives an Interrupt. | 3 |
| (c) | Give the order of priority among all types of interrupts of 8086. | 3 |

Department of Computer Science and Engineering

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2nd Year 2nd Semester Final Examination-2012 (Session: 2010-2011)

Course Code: CSE- 2205

Course Title: Operating System & System Programming

Full Marks: 50

Time: 03.00 hrs

[Answer any five (5) Questions, Number of each question is indicated to the right.]

1. (a) Define Operating system. What are the services of operating system? 1+2=3
- (b) What is process control block (PCB)? Discuss the information that a PCB contains with a specific process. 1+3=4
- (c) What is context switch? What are the main advantages of multiprogramming? 1+2=3
2. (a) What are the difference between Unix system structure and MS-DOS layer structure? 3
- (b) Discuss actions taken by a kernel to context-switch between processes. 2
- (c) Describe the action taken by a thread library to context switch between user-level threads. 2
- (d) Why it is important for the scheduler to distinguish I/O bound programs from CPU-bound programs? 3
3. (a) What is CPU scheduling algorithm? What are the criteria for comparing CPU scheduling algorithm? 3
- (b) Describe the difference between Preemptive and non- preemptive scheduling? 2
- (c) Consider the following set of processes with the length of CPU burst time given in millisecond and quantum 10 ms. The process are assumed arrived in the order p1,p2,p3,p4 and p5 at time 0. 5

Process	Burst Time
P_1	9
P_2	12
P_3	4
P_4	13
P_5	7

Draw the grant chart and find out the waiting time and turnaround time for FCFS, SJF, and RR algorithm.

4. (a) What is deadlock? Discuss the condition to have a deadlock in a system. 3
- (b) Discuss the option to breaking deadlock. 2
- (c) What do you mean by safe state? Is there any relation between safe, unsafe and deadlock state? 3
- (d) What technique should you apply to prevent deadlock. If circular wait occurs? 2
5. (a) Compare the circular-wait scheme with the various deadlock avoidance schemes with 4

- (b) Explain the difference between internal and external fragmentation. 2
- (c) Why page size is always an integral multiple of 2? 3
- (d) How virtual memory does enhance the system performances? Discuss. 2
6. (a) What is virtual memory? Describe the procedure for handling page fault. 3
- (b) Consider the following page reference string: 3
- 1, 2, 3, 4, 2, 1, 6, 5, 1, 2, 1, 3, 7, 6, 3, 2, 1, 2, 3, 6
- How many page faults would occur for the following replacement algorithm assuming 3 frames?
- i) Optimal II) LRU
- (c) When we need hierarchical paging? Explain the address translation for two-level 32 bit paging architecture. 2
- (d) What are the five major activities of an operating system with regards to file management? 2
7. Write short on the following topics (any four): 2.5×4=10
- i) Time sharing System
 - ii) Swapping
 - iii) Demand paging
 - iv) Sequential access method
 - v) File system mounting

[Answer any five (5) Questions, Number of each question is indicated to the right.]

1 (a) (i). Define polar form of a complex number. Express $-5+5i$ in polar form. 3+3=6

(ii). Describe the following region geometrically:

$$|z-i| = |z+i|$$

(b). Define branch point. Prove that $f(z) = \log z$ has a branch point at $z=0$. 4

2 (a). State and prove sufficient condition for a function to be analytic. 5

(b). Prove that the function 5

$$f(z) = \frac{x^3(1+i) - y^3(1-i)}{x^2 + y^2}; \text{ when } z \neq 0$$

$$= 0 \quad \text{when } z = 0$$

is not analytic at origin although the Cauchy- Riemann equations are satisfied there.

3 (a). Define a harmonic function. Prove that the function $u = 2x(1-y)$ is harmonic. 5

Find its harmonic conjugate.

(b). If $f(z)$ is analytic inside and on the boundary C of a simply connected region R , 5

$$\text{prove that } f'(a) = \frac{1}{2\pi i} \oint_C \frac{f(z)}{(z-a)^2} dz.$$

4 (a). State and prove Taylor's theorem. 6

(b). Expand the function $z^3 - 3z^2 + 4z - 2$ about $z=2$. 4

5 (a) Obtain Fourier's series for the expansion of $f(x) = x \sin x$ in the interval 5

$$-\pi < x < \pi. \text{ Hence deduce that } \frac{\pi}{4} = \frac{1}{2} + \frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \dots$$

(b). Define even, odd and periodic function. Find the fourier series for the function 5

$$f(x) \text{ defined by } \begin{aligned} f(x) &= -\pi, & -\pi \leq x < 0 \\ &= x, & 0 \leq x < \pi \end{aligned}$$

- 6 (a). If $F\{f(x)\}$ and $F\{g(x)\}$ are the Fourier transform of the function $f(x)$ and $g(x)$ respectively then prove that the Fourier transform of the convolution of $f(x)$ and $g(x)$ is the product of their transform. 5

- (b). Use finite Fourier transforms to solve 5

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$$

$$u(0, t) = 0$$

$$u(4, t) = 0$$

$$u(x, 0) = 2x, \text{ when } 0 < x < 4, t > 0.$$

- 7 (a). Prove that the Laplace transform is linear . 4

- (b)(i). Find the Laplace transform of $\cos kx$. 3+3=6

(ii). Evaluate $L^{-1} \left\{ \frac{2s^2 - 4}{(s+1)(s-2)(s-3)} \right\}$

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2nd Year 2nd Semester Final Examination-2012 (Session: 2010-2011)

Course Code: CSE 2208

Course Title: Management

Full Marks: 50

Time: 03.00 hrs

[Answer any five (5) Questions, Number of each question is indicated to the right.]

1. (a) How would you like to define management? 2
 (b) Identify and elaborate the core functions of management process. 4
 (c) Do you agree with the view that a manager can not be successful without having necessary skills? If yes, how such skills can be acquired? 4

2. (a) Discuss the communication process. 4
 (b) What is information? 2
 (c) What are the characteristics of flow of information? 4

3. (a) What are the theories of leadership? 3
 (b) Discuss the trait theory of leadership. 4
 (c) Explain what type of skill specially need for the top level management. 3

4. (a) Define motivation. 2
 (b) What are the techniques of motivation? Explain. 4
 (c) What are the assumptions about people under theory X and theory Y? 4

5. (a) Mention the nature and purpose of strategies and policies. 2
 (b) Elaborately explain the strategic planning process with the help of figure. 6
 (c) Discuss the portfolio matrix. 2

6. (a) What is network diagram? Write the types of network diagram. 2
 (b) Activity, time estimate and immediate predecessor activity sequence of a project are given below: 8

Activity	Optimistic time (in days)	Most likely time (in days)	Pessimistic time (in days)	Immediate predecessor activity
A	10	22	22	-
B	20	20	20	-
C	4	10	16	-
D	2	14	32	A
E	8	8	20	BC
F	8	14	20	BC
G	4	4	4	BC
H	2	12	16	C
I	6	16	38	GH
J	2	8	14	DE

Required:

- i) Draw a network diagram.
- ii) Which path is critical one?
- iii) What is the probability of completing the project within 50 days?

7. Write short notes:

- a. Planning
- b. Committee
- c. PERT
- d. Time management.

2.5×4=10