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06AL51

Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Management and Entrepreneurship

Time: 3 hrs.

Max. Marks:100

Note : 1. Answer any FIVE full questions taking at least two from each part.
2. All questions carry equal marks.

PART - A

- 1 a. Define "Management" and bring out its nature and Characteristics. (05 Marks)
b. Briefly explain the functional areas of management. (10 Marks)
c. List out the levels of management and also list the roles of management. (05 Marks)
- 2 a. Define planning and discuss its importance. (04 Marks)
b. Briefly explain the steps in decision making. (08 Marks)
c. Discuss the various steps in planning. (08 Marks)
- 3 a. Define an organization and distinguish between Formal and informal organization. (04 Marks)
b. Discuss any two types of organization structures with a chart highlighting their merits and demerits. (10 Marks)
c. Distinguish between;
i) Centralization and Decentralization.
ii) Selection and Recruitment. (06 Marks)
- 4 a. Define "Directing" and list out the principles of Direction. (04 Marks)
b. What is motivation? Explain the characteristics. (10 Marks)
c. Discuss the essentials of a sound control system. (06 Marks)

PART - B

- 5 a. List out the characteristics and qualities of an entrepreneur. (04 Marks)
b. Bring out a broad classification of entrepreneur. (10 Marks)
c. Explain the stages in entrepreneur process. (06 Marks)
- 6 a. List out the characteristics of Small Scale Industries (SSIs). (06 Marks)
b. Discuss the impact of Liberalization, Privatization and Globalization on SSIs. (06 Marks)
c. List out the supporting agencies of government for SSIs and explain any two of them. (08 Marks)
- 7 a. Classify and List out the institutions that assist SSIs. (06 Marks)
b. Explain any two institutions that assist SSIs. (08 Marks)
c. Briefly list out the objectives of KSFC. (06 Marks)
- 8 a. Briefly out line the contents of a project report. (06 Marks)
b. Explain the process of project Appraisal. (08 Marks)
c. What is Social feasibility? Explain. (06 Marks)

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06CS52

Fifth Semester B.E. Degree Examination, Dec.08/Jan.09

System Software

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Bring out the differences between Application software and System software. (04 Marks)
- b. Explain SIC/XE machine instruction formats and all addressing modes by clearly indicating the setting of different flag bits. (10 Marks)
- c. Write a subroutine in SIC/XE to read a 100-byte record from a device 'F5' into BUFFER. Use immediate and register-to-register instructions. (06 Marks)

- 2 a. Write and explain the algorithm of PASS-1 of two-pass assembler. (10 Marks)
- b. Generate the complete object program for the following assembly level program.

```

SUM          START          0
FIRST        CLEAR          X
              LDA            #0
              +LDB           #TOTAL
              BASE           TOTAL
LOOP         ADD             TABLE, X
              TIX            COUNT
              JLT            LOOP
              STA            TOTAL
COUNT      RESW             1
TABLE       RESW             2000
TOTAL       RESW             1
              END            FIRST
  
```

Assume below opcodes (all in hexadecimal)

```

CLEAR – B4    LDA – 00    LDB – 68    ADD – 18
TIX – 2C      JLT – 38    STA – 0C
  
```

(10 Marks)

- 3 a. Distinguish between literal and immediate operands. How does the assembler handle the literal operand? (04 Marks)
- b. Compare a two-pass assembler with a one-pass assembler. How forward references are handled in one-pass assemblers? (10 Marks)
- c. Write a note on MASM assembler. (06 Marks)
- 4 a. Give and explain the algorithm or source program for a simple Bootstrap loader. (08 Marks)
- b. Distinguish between linking loader and linkage editors. (04 Marks)
- c. Explain dynamic linking with suitable diagrams. (08 Marks)

PART – B

- 5 a. Explain the structure of a text editor with a neat diagram. (10 Marks)
- b. Explain the functions and capabilities of an interactive debugging system. (06 Marks)
- c. Write a note on the aspect of user-interface criteria. (04 Marks)
- 6 a. What are the basic functions of macroprocessor? Explain the various data structures used in the implementation of a one-pass macroprocessor. (10 Marks)

b. Using the following definition, expand the following macro calls, called in sequence.

```
(i) LABEL RDBUFF F2, BUFFER, LENGTH, (04, 12)
(ii) RDBUFF OE, BUFF, RLENG, , 2048
RDBUFF MACRO &INDEV, &BUFADR, &RECLTH, &EOR, &MAXLTH
&EORCT SET %NITEMS (&EOR)
        CLAER X
        CLEAR A
        IF (&MAXLTH EQ ' ')
        +LDT #4096
        ELSE
        +LDT #&MAXLTH
        ENDIF
$LOOP TD =X '&INDEV'
        JEQ $LOOP
        RD =X '&INDEV'
&CTR SET 1
        WHILE (&CTR LE &EORCT)
        COMP =X '0000 &EOR[&CTR]'
        JEQ $EXIT
&CTR SET &CTR+1
        ENDW
        STCH &BUFADR, X
        TIXR T
        JLT $LOOP
$EXIT STX &RECLTH
        MEND
```

(07 Marks)

c. Write a short note on 'Keyword macro parameters'.

(03 Marks)

7 a. List and explain the different design options for a macro processor.

(12 Marks)

b. Write a short note on 'Parser – lexer communication'.

(03 Marks)

c. Write a LEX program to count the number of vowels and consonants in a given string.

(05 Marks)

8 a. Explain regular expressions in UNIX with proper examples.

(06 Marks)

b. Explain the structure of a YACC program.

(06 Marks)

c. Give the LEX and YACC specifications to recognize parenthesized arithmetic expressions.

(08 Marks)

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06CS53

Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Operating System

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions, answering at least Two from each part .

PART - A

- 1 a. Define an Operating System. Discuss its role from different perspectives. (07 Marks)
 b. List out the different services that an operating system provides. Explain. (06 Marks)
 c. Explain the concept of virtual machines. Bring out its advantages. (05 Marks)
 d. Differentiate between a trap and an interrupt. (02 Marks)

- 2 a. What is a process? Draw and explain the process state diagram. (05 Marks)
 b. Discuss the operations of process creation and process termination in UNIX. (07 Marks)
 c. Describe the implementation of IPC using shared memory and message passing. (08 Marks)

- 3 a. Why is a thread called a LWP? Describe any one threading, model and cite an operating system which implements it. Also explain any one of the many threading issues. (06 Marks)
 b. Consider the following data about processes

Process	Arrival Time	Burst Time	Priority
P ₁	0	7	3
P ₂	3	2	2
P ₃	4	3	1
P ₄	4	1	1
P ₅	5	3	3

- i) Draw charts to illustrate execution using SRTF, preemptive priority and RR (TS = 1msec).
 ii) Compute waiting time in each of the cases.
 iii) Which of them provide minimal average waiting time and turnaround time?
 iv) Find out the time at which there are maximum numbers of processes in the ready queue in the above scenario? (10 Marks)
 c. Consider a system running 10 I/O bound tasks and one CPU bound task. Assume I/O bound tasks issue an I/O once for every msec of CPU computing and that each I/O operation takes 10msecs to complete. Also assume that the context switching overhead is 0.1msec. and that all processes are long running tasks. Comment on the CPU utilization for a RR scheduler when TS = 1msec and TS = 10msec. (04 Marks)
- 4 a. Define race condition. List the requirements that a solution to critical section problem must satisfy. (04 Marks)
 b. Define the algorithms Test and Set () and Swap (). Show that they satisfy mutual exclusion. (06 Marks)

- c. Consider the following snapshot of resource – allocation at time t_1 :

	Allocation			Request			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	0	0	0	0	0	0
P_1	2	0	0	2	0	2			
P_2	3	0	3	0	0	0			
P_3	2	1	1	1	0	0			
P_4	0	0	2	0	0	2			

- i) Show that the system is not deadlocked by generating one safe sequence.
 ii) At instance t_2 , P_2 makes one additional request for instance of type C. Show that the system is deadlocked if the request is granted. Write down the deadlocked processes.

(10 Marks)

PART - B

- 5 a. Memory partitions of 100KB, 500KB, 200KB, 300KB, 600KB (in order) are available. How would first – fit, best – fit and worst – fit algorithms place processes of 212KB, 417KB, 112KB and 426KB (in order). Which algorithm makes the most efficient use of memory? (06 Marks)
- b. Differentiate between internal and external fragmentations? How are they overcome? (04 Marks)
- c. Consider the following page reference stream: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for LRU, FIFO and Optimal replacement algorithms assuming 3 and 5 frames? Which one of the above is most efficient? (10 Marks)
- 6 a. What is a file? Describe the different access methods on files. (07 Marks)
- b. What is file mounting? Explain. (04 Marks)
- c. Draw a neat diagram and explain linked file allocation. Is FAT linked allocation? Discuss. (09 Marks)
- 7 a. A drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending requests in FIFO order is : 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance travelled (in cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF, SCAN, LOOK. Illustrate with figures in each case. (12 Marks)
- b. Explain the access matrix model of implementing protection in operating systems. (08 Marks)
- 8 Write notes on :
- a. Buddy system of memory management in UNIX.
- b. Thrashing.
- c. Solution to bounded buffer problem using Semaphore.
- d. Bad blocks on disks. (20 Marks)

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Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Database Management Systems

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. List advantages of DBMS over traditional file systems. Briefly explain them. (08 Marks)
b. Define and explain the importance of database catalog. Explain the internal storage format of a catalog with an example. (06 Marks)
c. Describe the three schema architecture. What are the problems associated with three schema architecture. (06 Marks)
- 2 a. Discuss concepts related to structural constraints of a relationship type with examples. (10 Marks)
b. Design an E-R diagram for keeping track of information about a hospital database taking into account at least entities. (10 Marks)
- 3 a. Explain the need of primary and foreign keys with suitable examples. (04 Marks)
b. Explain the division operator with an example. How can a division operator be implemented using other relational algebraic operators? (04 Marks)
c. Consider the following schema for a company database:
Employee (Name, SSN, Salary, DNo, SuperSSN)
Department (DName, DNos, MGRSSN)
Project (Pname, Pnumber, DNum)
Works ON (ESSN, PNo, Hours)
Dependent (ESSN, Dependent-name, Sex)
Write the queries in relational algebra to
(i) List the name of all employees with at least two dependents.
(ii) Find the name of employees who work on all the projects controlled by department 5
(iii) Retrieve the name of managers who do not have female dependents. (12 Marks)
- 4 a. Explain the ALTER TABLE command. Explain how a new constraint can be added and also an existing constraint can be removed using suitable examples. (08 Marks)
b. Using the same tables given in Q.NO.3(c), write SQL queries to:
(i) Retrieve the name of employees who are paid the same salary as that of RAJ.
(ii) Retrieve the name of employees who have two or more dependents.
(iii) Retrieve the name of employees and their SuperSSN name. (12 Marks)

PART – B

- 5 a. How are triggers and assertions defined in SQL? Explain with examples. (10 Marks)
b. Give an example of declaring a C language data type in SQL and explain it. (10 Marks)
- 6 a. Which normal form is based on the concept of full functional dependency? Explain the same with an example. (08 Marks)
b. A relation R has four attributes ABCD. For each of the following sets of FD, identify the candidate key and the highest normal form:
(i) $C \rightarrow D, C \rightarrow A, B \rightarrow C$ (ii) $B \rightarrow C, D \rightarrow A$ (iii) $ABC \rightarrow D, D \rightarrow A$ (12 Marks)
- 7 a. Define multivalued dependency. Explain 4NF with an example. (10 Marks)
b. Explain all the phases involved in ARIES algorithm with an example. (10 Marks)
- 8 Write short notes on: (20 Marks)
 - a. Two phase locking protocol
 - b. Write ahead log protocol
 - c. Time stamp ordering algorithm
 - d. Transaction support in SQL.

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06CS56

Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Formal Languages and Automata Theory

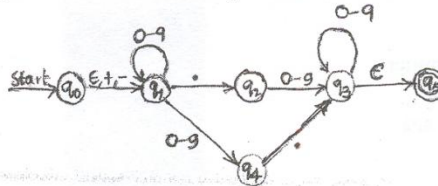
Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions selecting at least Two questions from each part.

PART - A

1. a. What is Automata? Discuss why study automata. (06 Marks)
- b. Define DFA and design the DFA for the following languages on $\Sigma = \{a, b\}$.
 - i) The set of all strings that either begins or ends or both with substring 'ab'.
 - ii) The set of all strings that ends with substring 'abb'.
 - iii) $L = \{W : |W| \bmod 5 < > 0\}$ (08 Marks)
- c. Define ϵ -NFA and design the ϵ -NFA or NFA for the following languages.
 - i) abc, abd, and aacd {Assume $\Sigma = a, b, c, d$ }
 - ii) $\{ab, abc\}^*$ {Assume $\Sigma = \{a, b, c\}$.} (06 Marks)
2. a. Convert the following ϵ -NFA to DFA using "Subset Construction scheme". (08 Marks)



- b. Define Regular expression and write Regular expression for the following languages.
 - i) $L = \{a^{2n} b^{2m+1} : m \geq 0, n \geq 0\}$.
 - ii) $L = \{a^n b^m : (m + n) \text{ is even}\}$.
 - iii) $L = \{a^n b^m : n \geq 4, m \leq 3\}$. (06 Marks)
- c. Prove that every language defined by a Regular expression is also defined by Finite automata. (06 Marks)
3. a. If L_1 and L_2 are regular languages then prove that family of regular language are closed under $L_1 - L_2$. (06 Marks)
- b. State and prove pumping lemma for regular languages. Apply pumping lemma for following languages and prove that it is not Regular $L = \{a^n : n \text{ is prime}\}$. (08 Marks)
- c. Consider the DFA

δ	0	1
$\rightarrow q_1$	q_2	q_3
q_2	q_3	q_5
*	q_3	q_4
q_4	q_3	q_5
*	q_5	q_2

- i) Draw the table of distinguishable and Indistinguishable states for the automata.
- ii) Construct minimum state equivalent of automata. (06 Marks)

- 4 a. Define context-free grammar and write context free grammar for the following languages.
- $L = \{a^i b^j c^k : i + j = k, i \geq 0, j \geq 0\}$.
 - $L = \{a^n b^m c^k : n + 2m = k\}$.
- (07 Marks)
- b. Consider the grammar.
- $$E \rightarrow +EE \mid *EE \mid -EE \mid x \mid y$$
- Find leftmost and rightmost derivation for the string $+*-xyxy$ and write parse tree.
- (08 Marks)
- c. What is ambiguous grammar? Prove that the following grammar is ambiguous on the string "aab". $S \rightarrow a \mid as \mid abs \mid \epsilon$.
- (05 Marks)

PART - B

- 5 a. Define PDA and construct a PDA that accepts the following languages.
 $L = \{w : w \in (a + b)^* \text{ and } n_a(w) = n_b(w)\}$. Write the instantaneous description for the string "aababb".
- (12 Marks)
- b. For the following grammar construct a PDA.
- $$S \rightarrow aABB \mid aAA$$
- $$A \rightarrow aBB \mid a$$
- $$B \rightarrow bBB \mid A$$
- $$C \rightarrow a.$$
- (08 Marks)
- 6 a. Consider the grammar.
- $$S \rightarrow ABC \mid BaB$$
- $$A \rightarrow aA \mid BaC \mid aaa$$
- $$B \rightarrow bBb \mid a \mid D$$
- $$C \rightarrow CA \mid AC$$
- $$D \rightarrow \epsilon$$
- Eliminate ϵ -productions.
 - Eliminate Unit productions in the resulting grammar.
 - Eliminate Useless production in the resulting grammar.
- (09 Marks)
- b. What is Chomsky normal form? Convert the following grammar to Chomsky normal form.
- $$S \rightarrow ABa$$
- $$A \rightarrow aab$$
- $$B \rightarrow Ac.$$
- (05 Marks)
- c. If L_1 and L_2 are context free languages then prove that family of Context-free languages are closed under Union and concatenation operations.
- (06 Marks)
- 7 a. Explain with neat diagram, the working of a Turing machine model. (06 Marks)
- b. Design a Turing Machine to accept all set of palindromes over $\{0, 1\}^*$. Also write its transition diagram and Instantaneous description on the string "1 0 1 0 1". (14Marks)
- 8 Write short notes on following:
- Post's correspondence problem.
 - Recursive languages.
 - Universal Turing Machine.
 - Pumping lemma for CFL.
- (20 Marks)
