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# Fifth Semester B.E. Degree Examination, June/July 2015 Database Management Systems

Time: 3 hrs.

Max. Marks: 100

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

a. Briefly discuss the advantages of using DBMS.

(10 Marks)

- b. Discuss the main characteristics of the database approach. How does it differ from the traditional file systems? (10 Marks)
- 2 a. List the summary of the notations of ER diagram. Include symbols used ER diagram and their meanings. (10 Marks)
  - b. Define an entity and an attribute. Explain the different types of attributes that occur in an ER model with an example. (10 Marks)
- a. Explain SELECT and PROJECT operations in relational algebra with an example. (10 Marks)
  - b. Explain different types of JOIN operations in relational algebra with example. (10 Marks)
- 4 a. With respect to SQL, explain with example:
  - i) DROP command
- ii) ALTER command.

(10 Marks)

b. Given the schema,

EMP (fname, £name, ssn, bdate, address, sex, salary, supperssn, dno)

DEPT (dname, <u>dnumber</u>, mgrssn, mgrstartdate)

DEPT LOC (dnumber, dloc)

PROJECT (pname, pnumber, ploc, dnum)

WORKS ON (essn, pno, hours)

DEPENDENT (essn. dependent - name, sex)

Write the SQL queries for the following:

- i) List female employees from dno = 20 earning more than 50000.
- ii) List 'CSE' department details.
- iii) Retrieve the firstname, lastname and salary of all employees who work in department no. 50 5 ·
- iv) Select the name of employee whose 1st letter is R and 3rd letter is M.
- v) Retrieve the name of the manager of each department.

(10 Marks)

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#### PART -- B

- 5 a. Explain the following:
  - i) Aggregate functions in SQL ii) Insert, update and delete commands

(10 Marks)

b. How are triggers and assertions defined in SQL? Explain with example.

(10 Marks)

6 a. What is functional dependency (FD)? Write an algorithm to find a minimal cover for a set of functional dependencies. Construct minimal cover M for the set of functional dependencies which are:

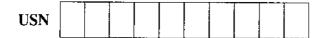
 $B \rightarrow A$ ,  $D \rightarrow A$ ,  $AB \rightarrow D$ .

(10 Marks)

b. Explain INF, 2NF and 3NF with examples.

- (10 Marks)
- 7 a. Explain multi valued dependency and fourth normal form, with an example. (10 Marks)
  - b. Explain: i) Inclusion dependencies and ii) Domain key normal form (10 Marks)
- 8 a. Briefly discuss the 2 phase locking (2PL) protocol used in concurrency control. (10 Marks)
  - b. Explain all the phases involved in ARIES algorithm with an example. (10 Marks)

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## Fifth Semester B.E. Degree Examination, June/July 2015 Systems Software

Time: 3 hrs. Max. Marks: 100

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

### PART - A

- 1 a. Give any two differences between SIC and SIC/XE machine architecture. (04 Marks)
  - b. Explain in detail the architecture of a SIC/XE machine. (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. What is a forward reference? How to solve this forward reference in assembler? (04 Marks)
  - b. What are the 3 different records used in object program and write their formats? (06 Marks)
  - c. Generate the object code for the instructions shown below: (10 Marks)

1) 0006 CLOOP	+JSUB	RDREC
2) 0017	J	CLOOP
3) 0020	LDA	#3
4) 103C	+LDT	#4096
5) 002A	J	@RETADR

Note: JSUB = 8, J = 3C, LDA = 00, LDT = 74, RDREC = 1036, RETADR = 0030

- 3 a. Enlist the various machine independent assembler features. (05 Marks)
  - b. With suitable example, explain the use of LTORG assembler directive. (05 Marks)
  - c. Explain the multi pass assembler with example. (10 Marks)
- 4 a. What are basic functions of a loader? Develop an algorithm for a bootstrap loader. (10 Marks)
  - b. What is the difference between linkage editor and linking loader? (04 Marks)
  - c. Explain various data structures used for a linking loader. (06 Marks)

### PART - B

- 5 a. Explain the relationship between editing and viewing buffers with relevant diagram.
  - (10 Marks)
  - b. Differentiate between tracing and traceback functions in a debugging system. (04 Marks)
  - c. Mention the different precessions for future assembler and compiler consistent interface with debugging system. (06 Marks)
- 6 a. List the different tables used for a macroprocessor. Explain their functions. (08 Marks)
  - b. Explain with example, concatenation of macro parameter and generation of unique lables.

(12 Marks)

7 a. Explain the structure of LEX specification with example.

- (10 Marks)
- b. What is symbol table? Write a LEX program to implement symbol table. (10 Marks)
- 8 a. What is YACC? Explain the different sections used in writing the YACC specification.

(10 Marks)

b. Explain conflicts in YACC with example.

- (05 Marks)
- c. Write YACC program to check whether the given string  $b^n a^n (n > 0)$  is accepted by grammar or not. (05 Marks)