

**2020**

**COMPUTER SCIENCE — GENERAL**

**Paper : DSE-A-1**

**[ Database Management System (DBMS) ]**

**Full Marks : 50**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**Day 2**

Answer **question no. 1** and **any four** questions from the rest.

1. Answer **any five** questions : 2×5
  - (a) Define DBMS.
  - (b) Why is normalization necessary?
  - (c) Name any two DML and DDL commands in SQL.
  - (d) What do you understand by data independence?
  - (e) Name any four normal forms.
  - (f) Write the purpose of join operation.
  - (g) Define primary key of a relation. Give an example.
  - (h) What is functional dependency?
  
2.
  - (a) State any five advantages of using DBMS.
  - (b) Differentiate between strong entities and weak entities. Also, mention the role of partial key in a weak entity. 5+(4+1)
  
3.
  - (a) Explain the levels of ANSI / SPARC architecture.
  - (b) What is aggregation? Explain with an example. 5+5
  
4.
  - (a) Discuss the importance of entity integrity constraint.
  - (b) Define foreign key. Give an example.
  - (c) Why are duplicate tuples not allowed in a relation? 3+(2+2)+3

**Please Turn Over**

5. (a) Find candidate keys of the relation R (A, B, C, D, E) which has the following functional dependencies :
- A → D
  - B → A
  - BC → D
  - AC → E
- (b) Describe the concept of a 3NF relation with the help of an example. 5+5
6. (a) Explain the meanings of existential quantifier ( $\exists$ ) and universal quantifier ( $\forall$ ) in tuple relational calculus.
- (b) Explain the concept of specialization and generalization. 5+5
7. (a) Given the relational schema :
- BOOK (BID, BNAME, AUTHOR, PUBLISHER, YEAR)
- Write a relational algebra query to retrieve all books published in 2020.
- (b) Discuss binary relationships with the aid of an example and ER diagram. 5+5
8. Write short notes on **any two** of the following : 5×2
- (a) Aggregation
  - (b) Tuple Relational Calculus
  - (c) BCNF
  - (d) Functional Dependency.
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