

2020**COMPUTER SCIENCE****[GENERAL]****Paper : III****Group : A****[OLD SYLLABUS]****[SUPPLEMENTARY]**

Full Marks : 50

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.**Answer questions from every Group.***GROUP-A**

1. Answer any **five** questions: $2 \times 5 = 10$
- What is ACID property?
 - What is the benefit of prototyping?
 - What are the differences between 3NF and BCNF?
 - What are different data models?
 - What is Data Flow Diagram?
 - What is fact finding techniques?

[Turn Over]

- What is a PERT chart?
- What is data dependency?

GROUP-BAnswer any **five** questions: $8 \times 5 = 40$

- What are the different types of cohesion?
 - What is the difference between Unit Testing and System Testing?
 - Why do we try to minimize coupling and maximize cohesion? $3+3+2=8$
- What do you mean by SRS?
 - Discuss the basic components of SRS.
 - Discuss various types of feasibility study. $2+3+3=8$
- Describe different types of integrity constraints with examples.
 - Why normalization is needed? $6+2=8$
- Draw level-1, level-2 and level-3 DFD of a program that finds the largest of three integers given by the user.
 - What do you mean by loss less decomposition? $6+2=8$

6. a) What are the basic operations in Relational algebra?
 b) Write the main characteristics of relational data model, network data model and hierarchical data model. $6+2=8$
7. a) Discuss different symbols used in the VER diagram.
 b) Explain different types of cardinality ratio in ER diagram.
 c) What do you mean by atomic transactions?
 $3+3+2=8$
8. Consider the following Database Schema and solve the following queries as directed :
- Car (car_id, purchase_date, price, owner_id)
 Owner (owner_id, name, address, contact, car_id)
 Driver (Driver_id, D_name, Address, Ph.No., Car_id)
- i) List all the cars having price greater than five lakhs (using relational calculus)
 ii) Find the price of the car of Saurav (using relational algebra)

iii) Find the name of the driver of the car owned by "Virat". (Using SQL)

iv) Find the average price of all cars. (using SQL)

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9. a) Consider a relation R as $R=\{E\text{No}, E\text{Name}, P\text{No}, P\text{Name}, P\text{Location}, \text{Hours}\}$

with the following set of functional dependencies

$F=\{E\text{No} \rightarrow E\text{ Name},$
 $P\text{No} \rightarrow \{P\text{Name}, P\text{Location}\},$
 $(E\text{No}, P\text{No}) \rightarrow \text{Hours}$

}

Now R is decomposed into 3 relations
 Employee = {ENo, Ename},

Project = {PNo, PName, PLocation},

Works_On=(ENo, PNo, Hours).

Check whether the decomposition is lossless.

- b) Explain advantages of DBMS over traditional file system. $4+4=8$