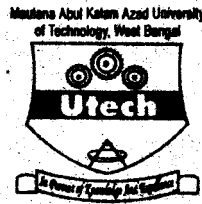


**CS/MCA/EVEN/SEM-4/MCA-401/2015-16**



**MAULANA ABUL KALAM AZAD UNIVERSITY OF  
TECHNOLOGY, WEST BENGAL**

**Paper Code : MCA-401**

**SOFTWARE ENGINEERING & TQM**

*Time Allotted : 3 Hours*

*Full Marks : 70*

*The figures in the margin indicate full marks.*

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

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

$10 \times 1 = 10$

- i) Evolutionary model is sometimes known as
  - a) meta model
  - b) successive version and incremental model
  - c) both (a) and (b)
  - d) none of these.
- ii) What part does not belong to Feasibility Study ?
  - a) Legal Feasibility
  - b) Economic Feasibility
  - c) Political Feasibility
  - d) Operational Feasibility.

4/40025

[ Turn over

CS/MCA/EVEN/SEM-4/MCA-401/2015-16

- iii) Which phase is included in the SRS ?
  - a) Error handling
  - b) Data descriptions
  - c) Functional Description
  - d) Performance Description.
- iv) Which of the following is able to measure the size of the software without its source code ?
  - a) FPA
  - b) IFM
  - c) Cyclomatic Complexity
  - d) None of these.
- v) The most desirable type of coupling is
  - a) control coupling      b) Common coupling
  - c) Data coupling      d) Stamp coupling.
- vi) Cardinality in an ER-Diagram represents
  - a) number of attributes in an entity
  - b) the order of co-related entities
  - c) the number of sub-entities
  - d) degree of a relationship.
- vii) Critical Path Method is a task of
  - a) Project Planning      b) Project Scheduling
  - c) Project Assessment      d) Risk Assessment.
- viii) Which of the following models require the maximum involvement of users ?
  - a) V model
  - b) Prototype Model
  - c) Spiral Model
  - d) Formal Method Model.

CS/MCA/EVEN/SEM-4/MCA-401/2015-16

- ix) According to COCOMO no. of cost drivers is
- a) 10
  - b) 15
  - c) 20
  - d) 14.
- x) Data hiding can be achieved by
- a) Inheritance
  - b) Encapsulation
  - c) Abstraction
  - d) Polymorphism.

**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following  $3 \times 5 = 15$

- 2. "Every Binary Relational schema is in BCNF". Prove this statement. Define Candidate key.  $4 + 1$
- 3. Discuss different kinds of Anomalies with an example. Define Lossless join decomposition with example.  $3 + 2$
- 4. Show by example that there are schedules possible under the Tree Protocol that are not possible under the Two Phase Protocol and vice versa.  $2\frac{1}{2} + 2\frac{1}{2}$
- 5. Explain with example a preemptive technique for deadlock prevention.
- 6. Explain the usefulness of ACID properties.  $1 + 4$

**GROUP - C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

- 7. a) Consider the following set F of functional dependencies for relation schema R = (A, B, C, D, E) and  $F = \{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$ .
  - i) Compute  $F^+$ . (Closure of F)
  - ii) Compute  $B^+$ . (Closure of attribute B)
  - iii) List the candidate keys for R.  $5 + 3 + 2$

CS/MCA/EVEN/SEM-4/MCA-401/2015-16

- b) For the relation  $R = (A, B, C, D)$  and FD  $F = \{A \rightarrow B, A \rightarrow C, C \rightarrow D\}$ ,  $R$  is decomposed into  $R_1 = (A, B, C, P)$  and  $R_2 = (C, D)$ . Is the above decomposition lossless join decomposition? Does this decomposition preserve the dependency? 5
8. a) Let  $R(A, B, C, D)$  be a relation, and  $F = \{A \twoheadrightarrow B, A \twoheadrightarrow C\}$  set of MVD. Decompose  $R$  to design 4 NF.  
b) What are the features of OODBMS? What are the advantages and disadvantages of OODBMS?  
c) State the rules of concurrency control. 5 + (3 + 2 + 2) + 3
9. a) Draw the precedence graph to test conflict serializability of the following schedule:  
 $R_1(X); R_2(X); W_1(X); R_1(Y); W_2(X); W_1(Y)$ .  
b) What is cascadeless schedule? Why is cascadelessness of schedules desirable? Prove that every cascadeless schedule is also recoverable schedule.  
c) Define DKNF. Give an example. 5 + (1+2+3) + (2+2)
10. a) What are the advantages of DDBMS over DBMS?  
b) Describe the different kinds of fragmentations.  
c) Explain the different levels of distributed transparency. 5 + 6 + 4
11. Write short notes on any *three* of the following: 3 × 5  
a) Checkpoints.  
b) Shadow Paging.  
c) CASE tools  
d) Advantages of PL/SQL over SQL.  
e) Timestamp ordering protocol.
-