

C.Y.B.Sc. Computer Science Paper IV  
P IV

Con. 6480-12.

(REVISED COURSE)

(3 Hours)

HK-5191

[Total Marks : 100

13/10/12

- N.B: (1) All questions are compulsory.  
(2) Figures to the right indicate marks.  
(3) Illustrations, in-depth answers and diagrams will be appreciated.  
(4) Mixing of sub-questions is not allowed.

1. Write short notes (**any FOUR**) :

- |   |   |
|---|---|
| (a) Lock Manager                        | 5 |
| (b) CASE statement in PL/SQL            | 5 |
| (c) Responsibilities of Project Manager | 5 |
| (d) Phases in Unified Process           | 5 |
| (e) Stages /phases in static testing    | 5 |
| (f) Closure set of FD                   | 5 |

2. Attempt the following (**any FOUR**) :

- |   |   |
|---|---|
| (a) Explain the concept of transaction & schedule with example.                     | 5 |
| (b) State the structures associated with recovery., Explain any one of them.        | 5 |
| (c) How to prevent Dead locks?  | 5 |
| (d) Discuss the anomalies associated with interleaved transactions.                 | 5 |
| (e) Write in brief about Analysis phase of ARIES.                                   | 5 |
| (f) What is the need of decomposition? Explain loss-less property of decomposition. | 5 |

3. Attempt the following (**any FOUR**) :

- |  |   |
|--|---|
| (a) What is Sequence? How to use sequences explain with example.   | 5 |
| (b) Assume Book table consisting of columns bookno, name, no-of_copies & price. Write a PL/SQL code to accept bookno, copies & transaction code( A for add & R for remove). Display current stock & cost (copies*price)of specified book & then update table according to transaction code, also display the updated copies. | 5 |
| (c) What is system catalog? Explain its structure.   | 5 |
| (d) With example explain query evaluation plan.  | 5 |
| (e) State the relational operators. Explain the techniques used for evaluation of relational operators.  | 5 |
| (f) What is cursor? Explain cursor attributes.   | 5 |

4. Attempt the following (**any FOUR**) :

- |  |   |
|--|---|
| (a) Which activities are involved in project management process? How these activities are grouped?   | 5 |
| (b) State the basic steps in COCOMO. Suppose 'Inventory module' for medical shop has to be designed. The requirements indicate the system is small & size estimated for different sub-modules is as follows:<br>Data Entry & update 1.2 KLOC, Data access 1.0 KLOC, Reports 0.8KLOC<br>Other cost drivers are as follows :<br>Complexity Low 0.88, Storage very high 1.21 Experience high 0.91.<br>Calculate effort adjustment factor, initial effort estimate & adjusted effort estimate. | 5 |
| (c) Which functionalities are needed from Configuration management process.  | 5 |
| (d) Explain principles of agile development .  | 5 |
| (e) What is the use of charts like Gantt & PERT/CPM  | 5 |
| (f) State metrics from CK Metrics suite. Explain two of them.  | 5 |

[ TURN OVER

5. Attempt the following (any FOUR) :
- (a) State the objectives of software testing. Explain any two. 5
  - (b) Explain following types of testing: Unit Testing, System Testing. 5
  - (c) What are the elements of Software Quality Assurance? 5
  - (d) What are the knowledge sources for Black box testing? 5
  - (e) Considering following function code draw a flow graph , Find basic paths & calculate cyclomatic complexity. 5  
Public void update()  
{ if( upd=="Yes")  
    Update record()  
    Exit()  
  Else  
    If ( upd = "Reset")  
      Clear()  
    Else  
      Exit()  
}
  - (f) List the challenges in software testing. Suggest the solution to meet these challenges. 5

P IV - March 2012

10<sup>th</sup> April, 2012

- N.B: (1) All questions are compulsory.  
(2) Figures to the right indicate marks.  
(3) Illustrations, in-depth answers and diagrams will be appreciated.  
(4) Mixing of sub-questions is not allowed.

Q1. Attempt the following (any FOUR):

- (a) Describe Decomposition. Explain in short desirable properties of it. 5
- (b) Write a short note on sequence. Explain how to modify sequence. 5
- (c) Write a short note on WBS. 5
- (d) Discuss system testing. 5
- (e) Explain ARIES Algorithm. 5
- (f) List and explain the phases in Unified Process. 5

Q2. Attempt the following (any FOUR):

- (a) Explain the dependencies occurring in Fourth and Fifth Normal Form. 5
- (b) We are given Relation R with Attributes A, B, C, D, E, F and the FDs as below. Find & explain which Armstrong's Axioms can be applied here to find Closure, 5  
A → BC  
B → E  
CD → EF
- (c) Write down the difference in optimistic and pessimistic concurrency control. List the three phases in optimistic concurrency control. 5
- (d) Write a short note on Log. What is the role of LSN? 5
- (e) Describe the term Checkpoint. List and explain the three steps of Checkpointing in ARIES. 5
- (f) Comment on: - Two actions conflict if they operate on the same data object and at least one of them is a write action. 5

Q3. Attempt the following (any FOUR):

- (a) Write a short note CASE Expression in PL/SQL along with an example 5
- (b) Write a PL/SQL block to book the tickets for a movie. The tickets are of two types **D** for **Deluxe Rows** and **O** for **Ordinary Rows**. While booking the ticket the customer may ask for the option as **D** or **O** and Number of Tickets. For Deluxe the rate of the ticket is Rs 350/- and for Ordinary ticket it is Rs 200/-. Find out the total amount that the customer will have to pay if Number of Tickets is passed as an argument in a parameterized cursor. Use Ticket\_Details(Ticketid, Ticket Type, Rate, Number of Tickets) 5
- (c) Write down the difference in implicit cursor and explicit cursor. 5
- (d) Explain the following query given in relational algebra and draw the Query Evaluation Plan for the same. Refer Class(classcode, classname, strength) and student(rollno, name, classcode) 5  
$$\Pi_{rollno, name} \left( \sigma_{classcode = 'TYBSc' \wedge strength > 24} (Class \bowtie student) \right)$$
- (e) Discuss the Locking Strategy, Row Share and Row Exclusive Locks, 5
- (f) Write a short note on Query Optimization. 5

Q4

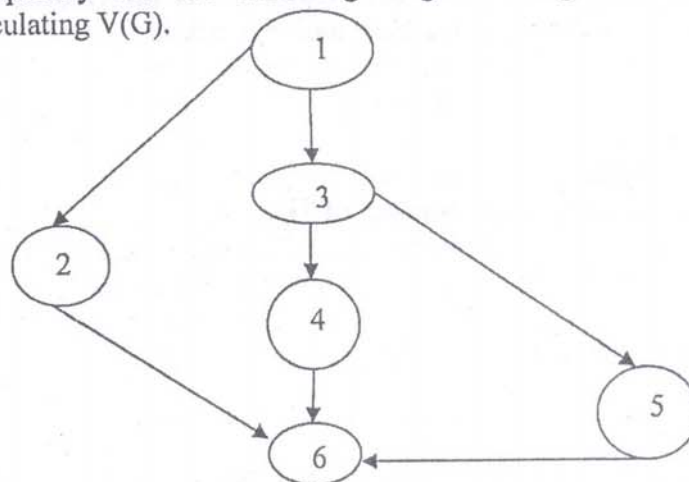
Attempt the following (any FOUR):

- (a) Explain the process of change management. 5
- (b) Find out & explain which of the 3 VAF(Value Adjustment Factors) of FP are applicable in the following case study :- 5  
 A library needs an information system to manage circulation. The system should allow patrons to check out books for a two-week term, with renewals for two weeks at a time. Patrons who need books that are currently checked out may request that a book be recalled. Books that have been recalled may not be renewed. If a book has not been returned by its due date, fine increases at the rate of Rs.5 per book per day, including weekends. If a book has not been returned after three weeks, the system should send a letter to remind the patron. If books are overdue, patrons should not be allowed to check out additional books. Librarians will check out books to patrons, examine current circulation records, generate receipts when fines have been paid, and generate reminder letters to be mailed. Entry of the new books will also be done from time to time as and when they are ordered.  
 Write down the formulae for calculating CAF(complexity adjustment factor) and DFP (delivered function points).
- (c) Depict and explain the diagram of Configuration management and development process. What is SCI? 5
- (d) Write a short note on CMM. 5
- (e) State and explain the characteristics of metrics for Object Oriented Design. 5
- (f) Write a short note on Agile Development. 5

Q5.

Attempt the following (any FOUR):

- (a) State and explain any 5 elements which are required for Software Quality Assurance. 5
- (b) Explain how Recovery testing is different from Security testing. 5
- (c) Write a short note on cyclomatic complexity and find out cyclomatic complexity for the following diagram using two formulae for calculating V(G). 5



- (d) Write a short note on Black Box Testing. 5
- (e) Discuss the contents of the Test Plan. 5
- (f) State and explain the characteristics for OO test case design suggested by Berard. 5

Con. 93-13.

(3 Hours)

P-IV

March 2013

NR-2083

[Total Marks : 100

15114113

- N.B. :** (1) All questions are compulsory.  
 (2) Figures to the right indicate marks.  
 (3) Illustrations, in-depth answers and diagrams will be appreciated.  
 (4) Mixing of sub-questions is not allowed.

1. Write a short notes on (any four) :— 20
- |                                   |                        |
|-----------------------------------|------------------------|
| (a) ACID                          | (d) Test plan          |
| (b) Relational operators of RDBMS | (e) The Log            |
| (c) LOC                           | (f) Agile Development. |
2. Attempt the following (any four) :— 20
- (a) Write a short note on Time Stamping.  
 (b) Discuss about Reading Uncommitted Data and Overwriting Uncommitted Data.  
 (c) Consider  $A \rightarrow BC$ ,  $E \rightarrow CF$ ,  $B \rightarrow E$ ,  $CD \rightarrow EF$ .  
 Discuss which Armstrong's Axioms will be applied here.  
 (d) Two transactions  $T_i$  and  $T_j$  are executed. If transaction  $T_i$  requests a lock and  $T_j$  holds a conflicting lock then, which two policies are used by lock manager ?  
 (e) Explain the Aries algorithm.  
 (f) State and explain the three phases in check pointing.
3. Attempt the following (any four) :— 20
- (a) Write a PL/SQL block to display the tax on join-basic in empdata (empno, ename, join,-basic, tax) based on the following. Calculate the tax by using CASE structure—
- | join-basic      | Tax              |
|-----------------|------------------|
| less than 15000 | No tax           |
| 15000 to 25000  | 5% of join-basic |
| 25001 to 35000  | 7% of join-basic |
| above 35000     | 9% of join-basic |
- (b) Explain the syntax of defining variables and constants in PL/Sql and the data types used in PL/Sql block.  
 (c) Discuss the parameterized cursors by giving suitable example.  
 (d) Draw the Query Evaluation plan for :  
 $\pi$  ord-data, product.name ( $\sigma$ ord-no == 4 ^ ord-type == 'pending') (Product  $\bowtie$  order)  
 (e) Explain the purpose of using cursor. List the types of cursor and explain any one along with an example.  
 (f) Write the queries for the following :—
- Create sequence seq1 which will start with 5, will have all odd numbers.
  - Add the records in the table orders (ord-no, ord-date) with the help of sequence seq1 (assuming table is created)
  - Save the changes done till now.
  - Show the recent value and next value present in the sequence seq1.
  - Update the ord-date as 13th April, 2013 for ord-no 11.
  - Undo the changes done.

[TURN OVER

4. Attempt the following (any four) :—

- (a) Discuss the role of Project Manager.
- (b) Assuming there is a computerized library system. This system should have the following functionality :
  - Allow the operator to enter an existing member or entries made for the new member along with their details.
  - Allow the operator to enter the books being ordered.
  - Check the availability of the books being ordered.
  - Check the availability of the books in the library, check if the members ask for such books only.
  - Check for the books which can be issued.
  - Check whether the members are returning books in 7 days.
  - If the books are not returned within specific duration then the fine is paid by the members.
  - Update the book's status whether available/returned to the library.
  - Produce the invoice of fine paid by the member.
  - Update member details and current books records from time to time.
- List and count the external inputs, outputs, logical internal file, external interface file and external inquiries for calculating FP. List out the characteristics (for environment complexity), which are fit for this case study.
- (c) State the major categories of COCOMO and explain any two of them along with attributes.
- (d) Write a short note on CMM.
- (e) Discuss risk assessment and list any 3 risk items produced by Boehm.
- (f) Discuss XP(Extreme Programming).

5. Attempt the following (any four) :—

- (a) Discuss unit testing.
- (b) Define : Bug, Fault, Failure in context with testing.
- (c) What is the difference in Alpha and Beta Testing ?
- (d) Explain the use case oriented Metrics.
- (e) Find out the cyclomatic complexity for the following code by all the three methods :

```

While (TRUE)
{
    if (reply == 'y')
        add record ( ) ;
        exit ( )
    else
        if (reply == 'n')
            clear record ( )
            else
                exit ( )
        else
            if (option == "update")
                update record ( )
            else
                exit ( )
}
    
```

- (f) Describe the objectives of webapp testing.

- N.B. :** (1) **All** questions are **compulsory**.  
(2) **Figures** to the **right** indicate **marks**.  
(3) Illustration, in-**depth** answers and **diagrams** will be **appreciated**.  
(4) **Mixing** of sub-questions is **not** allowed.

1. Write short note on (any **four**) :- 20
- (a) Closure set of FD.
  - (b) Transaction management commands in SQL.
  - (c) Use case estimation.
  - (d) Phases in Unified processes.
  - (e) Dead Lock prevention
  - (f) CMM.
2. Attempt the following (any **four**) :- 20
- (a) What is the need of decomposition ? Explain one property of decomposition.
  - (b) Discuss anomalies associated with interleaved transactions.
  - (c) What is schedule ? Explain the concept of conflict serializability.
  - (d) What is the role of Lock Manager ? Explain the concept of upgrading and downgrading locks.
  - (e) Explain the working of 'Redo Phase' of ARIES.
  - (f) How checkpoint mechanism helps in recovery of database ?
3. Attempt the following (any **four**) :- 20
- (a) With syntax explain any loop construct in PL/SQL. Give example.
  - (b) Consider table product with columns prodno, name, quantity and rate. Write a PL/SQL code to update rate of specified product. Give proper error message if product does not exist.
  - (c) Define sequence to generate list of numbers as 10, 20, 30,-----, 1000. Use this sequence to insert data into product table given in *Question No.3(b)*. (i.e. product nos. as 10, 20,-----). Also explain pseudo columns of sequence.
  - (d) What is cursor ? Explain any three cursor attributes.
  - (e) Write a note on system catalog.
  - (f) Write in brief about evaluation of relational operators.

4. Attempt the following (any **four**) :– **20**
- (a) What is the role of Project Manager ?
  - (b) Write in brief about 'Requirement change management.'
  - (c) Explain the concept of LOC with example.
  - (d) Explain the concept of WBS with example.
  - (e) Discuss the principles of agile development.
  - (f) List the various metrics from CK metric suit. Explain any two.
5. Attempt the following (any **four**) :– **20**
- (a) What are the objectives of software testing ? Explain any two.
  - (b) With respect to testing define following :–  
Fault, Error, Test case, Test bed, Test.
  - (c) What is static testing ? Explain in brief.
  - (d) What is Integration testing and Validation testing ?
  - (e) Discuss advantages and disadvantages of Black box testing.
  - (f) Explain boundary value analysis.

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