

**2014**  
**COMPUTER SCIENCE**  
[HONOURS]  
Paper : X  
[PRACTICAL]

Full Marks : 80

Time : 6 Hours

**Mark Allotment :**

Sessional - 10 marks

Viva voce - 20 marks

Experiment - 50 marks

**Instructions:**

Answer any one question from Group A and one question from Group B, to be selected on lottery basis.

Each question of Group A is of 25 marks and group B of 25 marks. Illustrate the program wherever necessary and write your own code with proper indentation.

**Group-A**

**(Relational Database Management System)**

1. Write a PL/SQL code to do simple arithmetic like addition, subtraction, multiplication and division- generate Fibonacci series.

[Turn over]

2. Consider a Student Management System with following relational schema.

DEPT(dept\_id, Dname)

STAFF(emp\_id, Ename, Eaddress, dept\_id, post\_id)

SALARY(post\_id, post\_name, Basic, Other\_ammulmets, Total\_salary)

Create the above tables and input at least 10 data by creating suitable forms using Dev2000/VB.

Write the queries for the following:

- i) To get the names of employees working in a particular department
- ii) Get the names and department of employees with annual salary more than 40,000.
- iii) Get the names of the employee who is getting the maximum salary with department name.

3. A library system consists of number of books on different subjects. Each book has a identification number, author name, price, publisher name. Users of the library can borrow the book and return within a due date(issue date + 15 days). Fine is imposed for overdue books @ of 10/- per week. Construct the necessary database and write SQL commands to do the following:

- i) List all books of a particular author.
- ii) List all books of a particular publisher.
- iii) Calculate the fine if any after return of a particular book.

4. Consider the following schema HOTEL ROOM (Room\_No, Rtype, Charge, Offseason discount, Occupied or vacant) and ROOM OCCUPANT (Name, Room\_No, No\_of\_days\_stay, Discount). Create the database and write SQL command for (i) Retrieving the Hotel room details (ii) Retrieve the room nos which are having maximum charges (iii) Get details of any occupant (iv) View the rooms which are vacant.
5. Create a table Product(product#, p\_name, price, shop) and answer the following queries:
- Alter that table by adding column p\_qtv for the quantity of product.
  - Retrieve the names of the product whose price exceeds 250/-
  - Retrieve the name of shop where a product with a particular serial no is found and with atleast 10 quantity.
  - Find the list of shop where a product is available.
6. Write a PL/SQL code for finding the largest of three given numbers.

7. Design a VB form to make entry / delete into an Insurance Management System. The system has the following schema:

POLICY(policy\_no, policy\_name, duration, amount, maturity\_amount)

CUSTOMER(CID, CNAME, policy\_no, date\_of\_purchase)

Make entries in the database through the from.

Develop a trigger for reminder of maturity of any policy.

8. Consider the following relational schema:

Customer (Cid, Cname, City, Discount)

Products(Pid, PName, City, Quantity, Price)

Agents(Aid, AName, City, Percent)

Orders(Ord No, Month, Cid, Pid, Aid, Qty, Amount)

Create the database and enter sufficient data by designing proper forms using Dev 2000 /VB.

Write a query to get agents details booking any order for customer XYZ. Also get product names ordered by at least one customer.

9. Write a VB code to create a table. Enter 20 data into the table using VB. The company decides to give a hike to all employees of department id 25, 35, 15 by 50% and 12 by 25%. Whether any such rise is given to employees a record for the same is maintained in emp\_hike table. Write a cursor update the salary of each such employee and insert record in the emp\_hike table. Finally retrieve information that which employees have got a hike. Take suitable attributes for the tables.

10. Write a PL/SQL code to invert an inputted number and write both numbers in words.

11. Write a PL/SQL code that will accept a registration no. of a student. If the student has 75% as an aggregate in all courses then he is selected for direct admission for masters, provided the students have cleared all dues. The process is to be fired in Students table with at least 10 data and take proper attributes.

12. Write a PL/SQL code to generate Fibonacci series.

13. Consider a Library Database Management System with following schema:

BOOK (Acc\_No, Index\_No, Author, Publisher, Price)

STAFF(Card\_No, Staff\_id, Name, Address)

ISSUE(Card\_No, Acc\_No, Date of issue, Date of return)

Create the above tables and input at least 20 data.

Write the following SQL queries,

- i) Find the names of staff who have not borrowed any book of a particular publisher.
- ii) Find the names of staff who have borrowed more than three books.
- iii) Find the names of books which have never been issued.

14. Consider the following schema with their primary keys underlined.

CUSTOMER(Cust\_ID, Cname, Annual Turnover, City)

SHIPMENT( Shipment\_no, Cust\_ID, Weight, Veichle-No, Ship\_date)

TRUCK.(Truck\_no, driver\_name, capacity)

Write down the following queries using SQL:

- a) List the driver names who has gone to a particular city.
- b) List the customer who has maximum turnover.
- c) List the truck\_no and Customer name who has carried and got a shipment at a particular date.
- d) Get the Truck\_no and driver name who has carried load maximum to its capacity.

15. Create a table and insert the following data using a form developed In DV2000/VB.

Branch_id	Branch_name	Amount	City
K001	Kalyanil	25.000	kalyani
K002	Kanchrapara	45,678	kanchrapara
K003	Howrah 1	35,444	howrah
K004	Howrah 2	15,234	howrah
K005	Howrah 3	5,789	howrah
K006	Hooghly	1,50,213	hooghly
K008	Darjeeling	10,30,444	darjeeling
K010	Kolkata 1	1,00,034	kolkata
K101	Kolkata 2	45,765	kolkata

- i) Create a view showing branch details and amount under a particular city.
- ii) Create a view showing branch names which has amount between 45,000 to 2,00,000
- iii) Query the database to show total amount of all branches under a particular city.
- iv) Query to show all the branches and their details.

16. Write a PL/SQL code that accepts an account number from the user and impose a fine of Rs.1000/- and debit from the account whenever the balance goes below 1000. Take input from user to credit Rs.4500 to an account and debit an amount of Rs. 10789 from another user.
17. Write a PL/SQL code for finding the factorial of a given number.
18. Write a PL/SQL code that accepts an employee id from the user and checks how much bonus salary he has received. Take input from the user a value which is the perk of a particular user in a month and insert the value. Read a dept\_id and show the highest amount salary received by an employee in that department.

19. There is a library management system, where each book has an acc\_no, author, price, publisher name and price of the book. Users can borrow books and return the same within 15 days. Fine are imposed on overdue books. Using VB develop the system for entry of data and generating queries to list all books written by a particular author. Make a provision on the form for deletion of book.
20. Create the following schema EMP (EC#, EN, DNO, DESIGNATION, BASIC) and DEPT. (DNO#, DNAME, DLOC)

Answer the following queries:

- i) Find the name of employees working in either computer dept or civil dept.
- ii) find the name & dept name who draws the second maximum salary.
- iii) update the employees record by increasing 10% of salary who is either working in computer or civil dept.
- iv) delete the mechanical dept from dept table.
- v) display the maximum salary drawn from each dept.

21. Consider the following relational schema for a company:

Employee(ENO, Name, DOB, Address, Sex, Salary, Dept\_id)

Supervisor (Supervisor\_ENO, ENO)

Department (Dname, Dept\_id)

Project (Pname, Pid, Supervisor\_ENO, Dept\_id)

Works-on(ENO, Pid, Hours)

- i) Create the database and take care of integrity constants.
- ii) Insert sufficient data in the database.
- iii) Write SQL queries for the following:
  - a) Find the names of project and supervisor details.
  - b) Find the names of employees working under a particular supervisor,
  - c) Find the no. of hours for all the employees under a particular project.(If required make changes in schema).

22. Create a table for storing the details of employer for campus interview. The attributes are name of employer. Branches applicable. Salary offered, Name of HR, Address.

Design a form for inserting and updating information using Dev2000/VB.

Insert and update information from your form.

Your form will also have provision of the details of the company who has offered maximum salary.

23. Create Table name client\_master data\_types are client no.(p.k.), name (not null), address, city, pincode, state, bal\_date

1. Find name of all client having 'a' as tyhe second letter in their names
2. Find out the clients who stay in a city whose second letter is 'a'
3. Find the list of all client who stay "ranchi" or "kolkata"
4. Find the list of client no. whose bal-due is greater than value 100000.

24. Create a table and insert the following data using form developed in DV2000/VB.

Branch_id	Branch_name	Amount	City
VR001	Behala	23,101	Kolkata
VR020	Salt Lake1	43,567	Salt Lake
VR021	Salt Lake2	33,789	Salt Lake
VR002	Howrah	1,20,678	Howrah
VR101	Bardhman 1	12,34,567	Bardhman
VR102	Bardhman 2	67,894	Bardhman
VR022	New Town	74,678	New Town
VR003	Kalyani	15,20,456	Kalyani
VR005	Naihati	1,50,456	Naihati
VR103	Dum Dum	99,456	Dum Dum

- (i) Create a view showing branch details and amount under a particular city.
- (ii) Create view showing branch names which has amount between 1,00,000 to 15,00,000.
- (iii) Write a query for showing total amount of all branches under a particular city.
- (iv) Write a query to find the maximum and minimum amount among all branches.

25. Write a PL/SQL code to check if any string is palindrome or not.

26. A Consumer item lease Company leases various household items to its clients for their use for a specific period of time and maintains the following schema:

Clients (client ID), name, address, contact-Phone)

Itemlist (itemID- itemName, itemCost, purchase Date )

Leaselist (client ID, transaction NO, item ID, start Date, return Date, amount TO be Charged)

**Note:** A client may lease an item many times. Amount to be charged is calculated as per a fixed rate multiplied by number of days item is leased. All items have unique itemID. However, two or more items may have same name. Create the tables having appropriate referential integrity constraints. Write and run the following SQL queries on the tables:

- i) Find all the client names that have not got any item leased during the last month and no leased item is pending with them.
- ii) Find the list of all the items that were leased or returned last month.

27. Construct the following relational schema:

Customer(Cut\_id, Cust-name, Annual-revenue)

Shipment(Shipment\_no, Cust-id, weight, Truck\_id, Destination, shipment\_date)

Truck(Truck id, Driver\_name)

Create the database and make entry using forms developed using Dev 2000/VB.

- i) List the names of drivers who have delivered shipments weighing over 1000 kg.
- ii) List the details of shipments made on a particular month.
- iii) Give names of customers who have sent shipments to Hyderabad, Chennai and Mumbai.

All triggers have to be written under Developer 2000/VB.

28. Write a PL/SQL code to generate Fibonacci series.

[Turn over]

29. Develop a prototype database of Bank employee system, for that you need to create the following tables:

- (a) employee (emp\_name, address, age)
- (b) works (emp\_name, salary, bank\_name, designation)
- (c) bank (bank\_name, city)

Make entries and write the SQL queries for performing the following function:

- (i) Find the names of all bank employees in the database who live in the same city as the bank for which they work.
- (ii) Find the name of all bank employees whose salary > 200,00 and working as a Branch Manager.
- (iii) List the employees who have exceeded 50 years and working as a Zonal Manager in Delhi branch of the Bank.

30. Design a VB form to make entry/delete into an Insurance Management System. The system has the following relational schema.

POLICY (Policy\_no, Policy\_name, duration, amount, maturity \_amount)

CUSTOMER(CID,CNAME,policy\_no, date\_of\_purchase)

Make at least five(05) entries in the database through the form

Develop a trigger for reminder of maturity of any policy.

31. Write a PL/SQL block to check whether a given number is Armstrong or not.

32. To write a PL/SQL block to find Sum of Digits of a given Number.

33. Consider the following schema TRAVEL AGENT (Tour-S.No, Charge, Off-season-discount, Destination, Date, No.-of-travelers) and TRAVELER (Traveler\_id, Name, Age, Address, Tour-S-No, Discount). Create the database and write SQL command for (i) Retrieving the tour details for a particular month. (ii) Retrieve the names and address of travelers for a particular tour. (iii) View the total no. of travelers to check if new entry can be made. (iv) Amount of a traveler for a particular tour.

34. Create a Campus Management System, for storing details of employer for campus interview. Take suitable attributes to develop the system.

- i) Write SQL codes for making entry in the system.
- ii) Write a trigger for informing when all the students have been employed.
- iii) Write SQL code to display the company who has taken maximum no. of students.

35. Create a store entry system, the system must keep track of the records. The functionality being when a record is deleted or modified the original record details and the date of operations is stored in the audit client table, update is allowed to go through.

Write a trigger for the above problem.

Store master (Supplier\_id, Name- address, item\_no, qty, balance\_due)

Audit store (supplier\_id, name, operations, user\_id, op\_date)

Operations: Operation performed on the store master table.

Up date: The date when the operation was performed.

User id: the name of the user performing the operation.

36. Consider the following relational schema for a department maintaining student project database.

Student (Student\_id, Name, DOB, Address,  
Degree\_id, Branch\_id, Session, Year, project\_id)

Supervisor(Supervisor\_no, ENO)

Branch(Branch name, Branch\_id)

Project(Pname, Pid, Supervisor\_no\_Branch\_id, Year)

Degree(Degree name, Degree\_id)

Employee(ENO, name, address, Sal)

i) Create the database and take care of integrity constants.

ii) Insert sufficient data in the database.

iii) Write SQL queries for the following:

a) Find names of projects offered in a particular year.

b) Find the details of students under a particular project.

c) Find the details of supervisor who have offered projects in a particular year.

37. Consider the following schema:

Supplier(S\_id, Sname, Status, City)

Parts(P\_no, Pname, Color, Weight, City)

Projects(Project\_id, Pname, City)

Create the database and enter sufficient data using VB forms.

The form will have provision to display the details of Parts and supplier.

38. To write a PL/SQL block for inserting rows into EMP table with the following Calculations:

HRA=50% OF BASIC, DA =20% OF BASIC, PF=7% OF BASIC, NETPAY=BASIC + DA+HRA-PF.

The Employee schema is as given EMP (EMPNO, ENAME, BASIC, HIREDATE, DEPTNO, AGE)

39. Consider the following schema :

Customer(Cid, C\_name, City, Discount)

Products (Pid, Pname, Quantity, Price)

Agents(Aid, Aname, Percent)

Orders(Ord\_no, Month, Cid, Pid, Aid, Qty, Amount)

Create the database and enter sufficient data by designing proper forms using Dev 2000/VB. Write a query to get order details for a particular product. Also get agent name and percent gained by him/her for a particular order. Write a query to get details of a particular product.

40. Write a PL/SQL code that will accept a registration no. of a student. If the student has above 75% marks in all courses studied till now and he does not have gap of two years then he is entitled for direct placement interview. The process is to be fired in Students table with at least 10 data and take proper attributes.

41. The following relations keep track of airline flight information:

Flights (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)

Aircraft(aid: integer, aname: string, cruisingrange: integer)

Certified(eid: integer, aid: integer)

Employees(eid: integer, cname: string, salary: integer)

Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly .Write each of the following queries in SQL :

- (a) Find the names of aircraft such that all pilots certified to operate them earn more than \$80,000.
- (b) For each pilot who is certified for more than three aircrafts, find the eid and the maximum *cruisingrange* of the aircraft for which she or he is certified.

42. Create Stock table of Medicine Distributor with the following fields(item no, itemname, purchases, sales, costs). Design a form using Developer 2000/ VB to insert records in the fields. The form should also have provision to list the items purchased during a particular month and total sales in a day. It should also calculate closing stock at end of year (closing stock=purchase-sales).

### **Group-B**

#### **(Unix Shell Programming)**

1. Write a shell script that takes two birthdays (or, in the general case any two dates in history) as arguments in the form MM/DD/YYYY (e.g., 08/31/1956) and determines whether the two dates occurred on the same day of the week.
  
2. Write a shell script to find the first N prime numbers and the pairs within N, where difference in 2 like ( 3 and 5, 5 and 7 etc.)

3. Write a shell script that will display the setting of your path variable.
  
4. A file contains records of employees. Write a shell script to display the information of an employee given its employee id and total number of male employees. The record contains name, id, age, salary, sex.
  
5. Write a Shell Script to generate all combination of three numbers inputted from keyboard and write the numbers in words.
  
6. Write a Shell Script that will find average of N numbers where N is inputted through command line.
  
7. Write a Shell Script that accepts a file name from the user as a command line argument and then outputs the information when it was last modified.

8. Write a Shell Script to display the following information-number of users logged in, status of current user, the process that are running and by whom.
9. Take input from keyboard a username, check if it is a valid user or not. If it is valid user then print the userid, groupid, shell, home directory of the user. Check is the user is logged in or not. Write a shell script to do the work.
10. Write a shell script to generate the following pattern:

2

4    4

8    8    8

16    16    16    16

8    8    8

4    4

2

11. Show all the files in the home directory of a user in a file. Write a shell script to do this and then take input a file name from keyboard and then show if the file is present or not, if it is present show the permission of the file and type of the file.

12. Write a shell script to sum of the series

$$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!}$$

13. Take input a directory name from keyboard, delete the directory with all its subdirectory and files under it if the directory exists within the home directory of the user. Write a shell script to do the same.

14. Write a Shell Script to perform

- a) Count the number of lines in the file.
- b) Print the first five lines of the file.
- c) Print the last five lines of the file.

15. Write a shell program, which will read five words and count all occurrences of ‘vowel consonant’ sequences and print them.
  
16. Write a shell script which will take input a user name, check if it is valid user or not. If it is valid user then depending on the time the user has logged in wish “Good Morning”, “Good Afternoon” etc.
  
17. Write a shell script to find first n numbers of Fibonacci series.
  
18. Write a shell script to generate the following pattern:

\*  
\*  
\* \* \*  
\* \* \* \*  
\* \* \* \* \*  
\* \* \* \* \*  
\* \* \* \*  
\* \* \*  
\*  
\*

19. Write a shell script to find the sum of all integers greater than 100 and less than 200 that are divisible by 7.
20. Write a shell script to take three numbers from command line then double the first two numbers and add them. Finally multiply with the third number to give the result.
21. Write a shell script to take a directory name and check if the name is a part of present working directory of the user. If it is so then show the name and total no of files in that directory.
22. Write a shell script which takes a username and checks if it is valid username or not and then show its login shell name and home directory.

*[Turn over]*

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23. Write a shell script to read (x,y) coordinates of three points. Test whether points are the possible vertices of a triangle or not. Identify the type of the triangle.
24. Write a shell script to print all non-members of the following series:
- 1,1,2,3,,5,8,13,...(less than 100)
25. Write a shell script to find whether two strings contain equal number of characters.
26. Write a shell script which accepts a file name, check for its presence and change the characters of the file name to upper case if it is in lower case and vice-versa.

27. A text file contains list of items present in a departmental store with their unit rate, brand, and quantity. Write a shell script that can take input as item serial number and print the details of the item. Your script should also have provision of printing daily list of items which are having quantities less than or equal to ten as they need to be reordered to fill up the stock.

28. Write a shell script that accepts a directory name and checks for the following:

- a) the total number of files with extention .c in the directory.
- b) Find the directory(s) in this directory starting with f.
- c) Find the files in this directory ending with k.

29. Write a shell script which will prompt user to input numbers between 1-100 and check if they are within valid range.

30. A text file contains name, role number of all students of your class with their marks in each subject and overall percentage of B.Sc Part-III. Write a shell script that takes input as roll number of students and print his/her details. Your script should also have provision of printing ten toppers of your class if prompted.

31. Write a menu driven shell script for deleting and renaming file.

32. Write a shell script to perform the following string operations:

- a) To extract a substring from a given string
- b) To find the length of a given string.

33. Write a shell script that accepts a file name from the user as a command line argument and then outputs the information when it was last modified and size of the file.

34. Write a shell script to display the following:

2  
1 2  
2 1 2  
1 2 1 2  
2 1 2 1 2

35. Write a shell script that compares two given files and displays the count of common words in both of them.

36. Write a shell script that takes input as three numbers and print the combination of the three numbers in numerical and rewrite them in words.

37. Write a shell script which receives two files' names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

38. Write a shell script to check whether two strings entered are of equal length. If the strings are not of equal length then print the difference of characters.
39. Write a shell script to find sum of all numbers greater than 200 and less than 300 and divisible by 13.
40. Write a shell script that reads a decimal number and prints its corresponding binary, octal and hexadecimal.
41. Write a shell script to display the following pattern:

			1
		2	2
	3	3	3
4	4	4	4
5	5	5	5

42. Write a shell script to develop a menu driven program that will show current date, time, disk space, disk usage & the names of users logged in.
43. Write a shell script that will check if the directory entered is your present working directory, if it is then list the files modified and new files created in last 24 hours.
44. Write a shell script to check if the directory name entered is the present working directory. If it is not a directory then give proper error. But if it is a directory then print the name of files present in the directory and also total number of files at the end.

45. Write a shell script to generate the following pattern:

```
          3  
        9   9   9  
      27  27  27  27  27  
    81  81  81  81  81  81  81  
  27  27  27  27  27  27  
        9   9   9  
      3
```

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