Class XII

ANSWER KEY

802 Information Technology

Part-B: Subject Specific Skills

1. Database Concepts-RDBMS Tool

Unsolved Exercise

Section A
(Objective Type Questions)

A.

1. ii	2. iii	3. iv	4 i	
5. i	6. iii	7. ii	8. i	

B.

1. Data	2. digital filing system	3. RDBMS	4. Application programmers
5. passwords	6. Relation state	7. degree	
8. Cardinality	9. Inner join	10. Left outer join	

Section B
(Subjective Type Questions)

A.

1. RDBMS is a relational DBMS in which tables are linked to each other by fields. In addition to all advantages of DBMS (as discussed), RDBMS helps in the management of a database in a broader way.
2. Data is a collection of raw facts and figures, that is processed to produce meaningful information. For Example, A student's Name, Class, Roll No. and the marks in the different subject is **Data**, the calculation command given for percentage is the Process, the result that we get is the **Output** and the all the processed data which adds some meaning is termed as **Information**.
3. **Relational schema:** A relational schema can be defined as a set of relational tables and associated items that are related to one another.

   Relation: A table is called as a Relation.
4. Referential Integrity constraint is specified between two relations. The main purpose of this constraint is to check that data entered in one relation is consistent with the data entered in another relation.
5. A join clause is used to join two or more table rows based on the related columns between them.

B. 1.

DBMS	RDBMS
DBMS stores data as file.	RDBMS stores data in tabular form.
No relationship between data.	Data is stored in the form of tables which are related to each other.
DBMS does not support distributed database.	RDBMS supports distributed database.
It deals with small quantity of data.	It deals with large amount of data.
Data redundancy is common in this model.	Keys and indexes do not allow Data redundancy.
It is used for small organization and deal with small data.	It is used to handle large amount of data.
It supports single user.	It supports multiple users.
Examples: XML, Window Registry, etc.	Examples: MySQL, PostgreSQL, SQL Server, Oracle, Microsoft Access etc.

2. The different languages present in DBMS are Data Definition Language (DDL) and Data Manipulation Language (DML). DDL is a language used to specify the restrictions and structure of data, while DML is used to add, alter, and remove data from a database.
3. **Primary key** is used to identify tuples in a relation. If a relation has many candidate keys it is preferable to choose that one as the primary key which has the least number of attributes.

   Foreign key in a relation R1 is the set of attributes in R1 that refer to the primary key in another relation R2 if the domain of foreign key attributes is the same as that of primary key attributes and the value of foreign key either occurs as a value of primary key in some tuple of R2 or is NULL.
4. The following are the important differences between DELETE and DROP in SQL:

DELETE command removes some or all tuples/records from a relation/table.	DROP command removes entire database objects like relations/table, constraints or indexes.
DELETE is a DML command.	DROP is a DDL command.
WHERE clause is used to add filtering.	No WHERE clause is available.
DELETE command cannot be rolled back using a transaction.	DROP command cannot be rolled back using a transaction.

5. A join clause is used to join two or more table rows based on the related columns between them. Different types of join in SQL are:
   - **Inner Join:** The **INNER JOIN** keyword selects all rows from both the tables as long as the condition is satisfied. This keyword will create the result-set by combining all rows from both the tables where the condition satisfies i.e value of the common field will be the same.
   - **Left Join:** This join returns all the rows of the table on the left side of the join and matches rows for the table on the right side of the join.

For the rows for which there is no matching row on the right side, the result-set will contain null. **LEFT JOIN** is also known as **LEFT OUTER JOIN**.

- **Right Join:** This join returns all the rows of the table on the right side of the join and matching rows for the table on the left side of the join. For the rows for which there is no matching row on the left side, the result-set will contain null. **RIGHT JOIN** is also known as **RIGHT OUTER JOIN**.
- **Full Join:** This Join creates the result-set by combining results of both **LEFT JOIN** and **RIGHT JOIN**. The result-set will contain all the rows from both tables. For the rows for which there is no matching, the result-set will contain null values.

6. i. Database Management Systems are used in schools and hospitals.

   ii.
```
Select Name, Marks
From Student
Where Name =Like 'P';
```

7. i. INSERT INTO Menu ("P009", "Lemon Rice", "South Indian", 140);

   ii. SELECT Item FROM Menu ORDER BY Price DESC;

   iii. SELECT Item, Description FROM Menu WHERE Price > 100 AND Price < 150;

   iv. ALTER TABLE Menu ADD Rating int;

C. Competency-based/Application-based questions:

Anju can use SQL Data Manipulation Language (DML) commands to retrieve, update, insert, and delete data in a database. The common statements for each of these operations are as follows:

- **Retrieve Data:** The SELECT statement is used to retrieve data from one or more tables in a database.

  Syntax:

  SELECT column1, column2 FROM table_name WHERE condition;

- **Update Data:** The UPDATE statement is used to modify existing data in a table.

  Syntax:

  UPDATE table_name SET column1 = value1, column2 = value2, ...

  WHERE condition;

- **Insert Data:** The INSERT statement is used to add new rows of data into a table.

  Syntax:

  INSERT INTO table_name (column_name1, column_name2, ...)

  VALUES (value1, value2);

- **Delete Data:** The DELETE statement is used to remove existing rows of data from a table.

  Syntax:

  DELETE FROM table_name WHERE condition;

2. Operating Web Based Applications

Unsolved Exercise

Section A
(Objective Type Questions)

A. 1. iii 2. iii 3. i 4. ii 5. iv

B. 1. Webinars 2. Board Infinity 3. implementation
4. how 5. Project management 6. online

C. 1. False 2. True 3. True 4. True 5. True

Section B
(Subjective Type Questions)

A. 1. Some of the advantages of online reservation system for providers are as follows:

- **Requires Less Staffing:** Since all tasks are completed by computers, less manpower is required.
- **No Spatial Restrictions:** The company that provides online reservations could be operating out of their basement, garage, tiny office space, huge commercial mall office, or their own building. A customer who is reserving tickets online does not care where the office is physically located. As a result, any firm, large or small, can choose their office space based on their requirements. Although initial costs for setting up and maintaining the website must be incurred, online reservations minimise bills for office rent, power, and other expenses.

2. **India.gov.in** is India's National Portal, which provides a single point of access to information and services provided by various Indian Government entities. The content in this portal is the result of a collaborative effort by various ministries and departments of the Indian government at the central, state, and district levels. The National Informatics Centre (NIC), DeitY, MoCIT, Government of India, designed and maintains this portal as a Mission Mode Project under the National E-Governance Plan.
3. Four examples of online shopping websites are as follows:
   - Amazon: www.amazon.com
   - Flipkart: www.flipkart.com
   - Myntra: www.myntra.com
   - Snapdeal: www.snapdeal.com
4. Web application development can be broadly divided into four phases. One must adhere to the following four development phases:
   i. Requirements Definition Phase

ii. Design Phase

iii. Implementation Phase

iv. Testing Phase

5. Project management is the process of attaining the objectives of the project through a series of activities carried out within the time frame, to produce the desired result. It is the application of knowledge, skills, tools, and techniques to project activities in order to fulfil project requirements.

B. 1. Online shopping is useful in many situations. Some of these situations are:

- The customer does not have enough time to go to a store and buy items.
- The store where you will get what you need could be quite far away.
- If there is any overhead when purchasing online, it is significantly less than the cost of going to the store, parking the car, etc. The product you're looking for isn't available in the market.
- If you wish to send a gift to a friend, you can shop online and include the recipient's address. You save time and energy by having the product delivered to a friend's house in another city.

2. Online tutorials may require various forms of interaction with the user. For example,

- Lecture videos or lecture slides are accessible under video or slide lessons. The learner can go to the website and watch the tutorials.
- The user in an interactive lesson must adhere to the instructions, take the appropriate action, and get feedback
- Webinars are live lectures in which users can participate, ask questions, and have their questions answered.

3. Web-based online apps can be divided into two categories:

- Those that involve financial online transactions. For example, online reservation systems, online shopping, and bill payments.
- Those that provide information and allow engagement through filling out forms, posting queries, viewing data, sending email, or chatting. For example, e-governance, online tutorials, and tests.

4. Among the central initiatives for e-governance are the following:

- National e-Governance Plan (NeGP)
- National e-Governance Division (NeGD)
- e-Governance Infrastructure
- Mission Mode Projects
- Citizens Services
- Business Services

- Government Services
- Projects and Initiatives
- R&D in e-Governance

5. Coursera is an online education platform with 23 million users that is dedicated to offering high-quality online training courses worldwide. While partnering with world-class universities and businesses, it provides students the opportunity to receive certifications from renowned institutions upon joining their paid courses.
6. eGovernance empowers citizens by:
   i. Providing easy access to government services and information online, saving time and effort.
   ii. Promoting transparency and accountability through visibility of government processes and decisions.
   iii. Facilitating citizen participation and engagement in policymaking and decision-making processes through online platforms.

C. Competency-based/Application-based questions:

Sanaya is currently in the implementation phase.

3. Fundamentals of Java Programming

Unsolved Exercise

Section A
(Objective Type Questions)

A.

1. iv	2. ii	3. iii	4. i	5. iv
6. iv	7. iv	8. iii	9. i	10. iv

B.

1. Comments	2. Operators	3. switch	4. assert
5. catch	6. thread	7. constructor	8. for
9. Local	10. Shift+F6		

Section B
(Subjective Type Questions)

A. 1. A programming model that depends on the theory of classes and objects, and gives importance on data rather than functions is known as Object-oriented programming (OPP). It splits the programming code into number of entities, known as objects.

2. Java integrated development environments (IDEs) make it much easier to create, compile, and run Java applications.
3. To save the Java program, go to File → Save (Ctrl + S) or File → Save All (Ctrl + Shift + S) in the IDE toolbar.
4. The syntax of the Java switch statement is as follows:

```
switch (expression)
{ case constant_1 : statements;
break;
case constant_2 : statements;
break;
default : statements;
break;
}
```

5. By default, the primitive datatypes (such as int, float, and so on) of Java are passed by value and not by reference. Sometimes, you may need to pass the primitive datatypes by reference. That is when you can use wrapper classes provided by Java. These classes wrap the primitive datatype into an object of that class.
6. Java bytecode is a highly optimized set of instructions. When bytecode (also known as a Java class file) runs on your computer, it is converted to machine code by a Java interpreter called the Java Virtual Machine (JVM). The advantage of this approach is that once the Java program is converted to bytecode, it can run on any platform (Windows, Linux, Mac, etc.).
7. The error in the code is that the loop never increments the number variable. Therefore, it will cause an infinite loop. To fix this, you need to increment number inside the loop. Now, the corrected code is:

```
int number = 1;
while (number <= 5)
{System.out.print("Square of " + number);
System.out.println(" = " + number*number);
number++;}
```

8. 13

   True

   22

B. 1. Programmers use comments in their code to document their programs and provide explanatory remarks to anyone who view it. This is particularly beneficial in the real world, where massive applications are built by a single program and maintained by others. In a Java program, you can write comments in one of two ways:

   - Beginning a comment line with two consecutive forward slashes (//)

- Writing the comment between the symbols /* and */

2. The assignment operator is used to assign a value or an expression to a variable. The assignment operators are discussed in the table given below:

Operator	Description	Explanation	Example	Result (int a = 20, b = 30)
=	Simple Assignment	Assigns value of left side operand to right side operand	a=b	a becomes 30
+=	Add and Assignment	Adds value of left side operand to right side operand and assigns the result to the right-side operand Same as a = a+b	a+=b	a becomes 50 (20+30)
-=	Subtract and Assignment	Subtracts value of left side operand from right side operand and assigns the result to the right-side operand Same as a = a-b	a-=b	a becomes 10 (20-30)
*=	Multiply and Assignment	Multiplies value of left side operand to right side operand and assigns the result to the right side operand Same as a = a*b	a*=b	a becomes 600 (20*30)
/=	Divide and Assignment	Divides value of left side operand by right side operand and assigns the quotient to the right side operand Same as a = a/b	a/=b	a becomes 0 (20/30)
%=	Modulus and Assignment	Divides value of right side operand by left side operand and assigns the remainder to the right side operand Same as a = a%b	a%=b	a becomes 20 (20%30)

3.

While Loop	Do While Loop

• A while loop is an entry-controlled loop – it tests for a condition prior to running a block of code.
• A while loop runs zero or more times. Body of loop may never be executed.
• The variables in the test condition must be initialized prior to entering the loop structure.
While
(condition)
{
Statements
}
	• A do-while loop is an exit-controlled loop it tests for a condition after running a block of code.
	• A do-while loop runs once or more times but at least once. Body of loop is executed at least once.
	• It is not necessary to initialize the variables in the test condition prior to entering the loop structure.
	do
	{
	statements
	}
	while (condition);

4. Some of your programs when executed may have terminated unexpectedly with runtime errors. Such an error situation that is unexpected in the program execution and causes it to terminate unexpectedly is called an exception. We need to handle the exceptions to run the program without any error and get the correct result.

5.
```
import java.util.*;
public class Main
{
    // Main driver method
    public static void main(String args[])
    {
    // Taking input from user
        Scanner sc = new Scanner(System.in);
        int n;     //Declaring Variables
        //Ask the user to enter the Array Size
        System.out.println("Enter the total subjects ");
        n=sc.nextInt();
        //Declare the array
        int arr[] = new int[n];
       System.out.println("Enter the marks secured in each  subject
");
        for(int i=0;i<n;i++)   //Initialize the array
```

```
        {
            arr[i]=sc.nextInt();
        }
        int total=0;
        //Calculate the total marks
        for(int i=0;i<n;i++)
        {
            total=total+arr[i];
        }
        //Display the total marks
        System.out.println("The total marks obtained is "+total);
        //Calculate the percentage
        float percentage;
        percentage = (total / (float)n);
        //Display the total percentage
         System.out.println( "Total Percentage : " + percentage +
"%");
    }
}
```

6. In Java, threads can be created in two ways:
   - By extending the Thread class
   - By implementing the Runnable interface

   The first method to create a thread is to create a class that extends the Thread class from the java.lang package and override the run() method. The run() method is the entry point for every new thread that is instantiated from the class. public class ExtendThread extends Thread

```
{
public void run()
{
System.out.println("Created a Thread");
for (int count = 1; count <= 3; count++)
System.out.println("Count="+count);
}
}
```

```
To create a thread, instantiate it from the ExtendThread class, and
to start its execution, call the start() method of the Thread class.
public static void main(String args[])
{
ExtendThread t1 =new ExtendThread();
t1.start();
}
```

Classes that you create by extending the Thread class cannot be extended further. The second method to create a thread is to create a class that implements the Runnable interface and override the run() method. Implementing the Runnable interface gives the flexibility to extend classes created by this method.

```
public class RunnableDemoimplements Runnable {
public void run()
{
System.out.println("Created a Thread"); for (int count = 1; count
<= 3; count++) System.out.println("Count="+count);
}
}
```

To create a thread, first instantiate the class that implements the Runnable interface, then pass that object to a Thread instance. As before, to start the execution of the thread call the start() method.

```
public static void main (String args[])
{
RunnableDemo r = new RunnableDemo();
Thread t1 = new Thread(r);
t1.start();
}
```

7. A method in Java is a block of statements grouped together to perform a specific task. A method has a name, a return type, an optional list of parameters, and a body. The user defined method that return product of two numbers is:

```
static double product (double number1, double number2)
{return (number1 * number2);}
```

8. i. To enable assertions at runtime, you can enable them from the command line by using the –ea option. For example, java –ea AssertionDemo

ii. In Java, threads can be created in two ways

- By extending the Thread class
- By implementing the Runnable interface

iii. intValue() member function of the Integer wrapper class allows access to the int value held in it.

C. Competency-based/Application-based questions:

The error in the code is a missing closing parenthesis in the 'println' statement. The correct code is:

```
int a=11, b=22, c;
  c = a + b + a++ + b++ + ++a + ++b;
  System.out.println("c="+c);
```

Output: `c=103`

4. Work Integrated Learning IT-DMA

Unsolved Exercise

Section A
(Objective Type Questions)

A. 1. iii 2. iv

3. **(This question is printed incorrect in the book. Please correct it in your text book.)**

Question: In Telecommunication sector, the database is used for storing which of the following.

i. Customers detail

ii. Call record

iii. Bills

iv. All of these

Ans. iv

4. iii

B. 1. Online shopping

2. **(This question is printed incorrect in the book. Please correct it in your text book.)**

Question: _____ provides efficient data storage and fast retrieval of data.

Ans. DBMS

3. implementation 4. display_category

Section B
(Subjective Type Questions)

A. 1. Password field helps us to shop online securely.

2. Two uses of database in airlines are as follows:
   - To store information about flight details such as arrival time, departure time, fares, passenger capacity, and number of bookings.
   - To store information to keep track of online and offline reservations.

3. **(This question is printed incorrect in the book. Please correct it in your text book.)**

   Question: List down any three uses of database in education.

Ans. Three uses of database in education are as follows:
- To keep data such as student information, grades, timetable and results.
- To keep track of staff and faculty details.
- To keep track of school/college information like departments and course offerings.

4. **(This question is printed incorrect in the book. Please correct it in your text book.)**

   Question: Explain the use of database in banking.

Ans. The use of database in banking are as follows:
- To keep track of consumer data. For instance, Customer personal information like residence, age, gender, PAN card, occupation, and contact information will be collected.
- To maintain account information details like deposit, withdraw and data pertaining to loans.
- To maintain details on the transactions that happen every day.
- To keep track of employee information like personal data, pay, PF information, leaves taken, joining date, and retirement year.

B. 1. Database management applications can be used in government sector:
- To store information on the voter registration list, all forms of taxes (such as income tax, sales tax, service tax, and property tax), and criminal histories.
- To save information about birth/death certificate registration, vehicle registration, PAN card and AADHAR card details.

2. **Schema:** SHIPMENT (Shipment_id. Details, Shipment_date)

Name	Type	Remarks
Shipment_id	INT(10)	Shipment number (Primary Key)
Details	VARCHAR(30)	Shipment details such as name, location from which order is dispatched
Shipment_date	DATE	Date of shipment

3.

Name	Type	Remarks
pid	Varchar(5)	Patient unique number
pname	Varchar(20)	Patient name
phone	Int(10)	Patient phone no
disease	Varchar(20)	Disease he/she is suffering from

Schema: Patient (pid, pname, phone, disease)

4. This table stores details of amount paid for an order. It will store information such as payment_id, order_ id, payment_amount, payment_date and mode of payment.

Schema: PAYMENT (Payment_id, Order_id, Payment_amount, Payment_date, Payment_mode)

Name	Data Type	Description
Payment_id	INT(10)	Payment number (Primary Key)
Order_id	INT(10)	Order number for which payment is made (Foreign key)
Payment_amount	INT(10)	Amount of payment
Payment_date	DATE	Date of payment
Payment_mode	VARCHAR(20)	Mode of payment such as debit card, credit card on delivery, e-gift voucher

5. The steps to be followed while shopping online are as follows:
   i. Open the shopping site, from where you want to shop online.
   ii. Login with your username and password.
   iii. You can select the products that you wish to buy and add them to your shopping cart.
   iv. Having selected your products, you can view what you have selected and the total amount to be paid by you.
   v. You may delete any product from the shopping cart, or proceed for payment.
   vi. Read the terms and conditions before making the payment.

C. Competency-based/Application-based questions:

To declare foreign keys in the COMMODITY table, you would typically reference the primary key fields from other related tables. The foreign keys of COMMODITY table are:

```
Category_id, Seller_id
```