INFORMATICS PRACTICES (old) XII
(Code No. 265)
(For the Academic year 2019-20 only)
COURSE DESIGN

Unit	Topic	Period		Total periods
		Theory	Practical	
1	Networking and Open Standards	20	4	24
2	Programming	46	44	90
3	Relational Database Management System	50	40	90
4	IT Applications	10	26	36
	Total			240

Unit 1: Networking and Open Standards

Computer Networking:

- *Networking*: a brief overview,

- *Communication Media*: Wired Technologies – Co-Axial, Ethernet Cable, Optical Fiber; Wireless Technologies – Blue Tooth, Infrared, Microwave, Radio Link, Satellite Link;

- *Network Devices*: Modem, Hub, Switch, Repeater, Gateway – and their functions

- *Types of network*: LAN, MAN, WAN, PAN;

- *Network Topologies*: Star, Bus, Tree

- *Network Protocols*: HTTP, TCP/IP, PPP, Remote access software such as Team Viewer;

- *Identifying computers and users over a network*: Basic concept of domain name, MAC (Media Access Control), and IP Address, domain name resolution

- *Network Security Concepts*: Cyber Law, Firewall, Cookies, Hackers and Crackers

- *Network security threats*: Denial of service, Intrusion problems, Snooping, Eavesdropping

- *Internet Applications*: SMS, Voice Mail, Electronic Mail, Chat, Video Conferencing

- *Wireless/Mobile Communication*: GSM, CDMA, WLL, 3G, 4G

Open Source Concepts:

- Open Source Software (OSS), common FOSS/FLOSS examples (GNU/Linux, Firefox, OpenOffice, Java, Netbeans, MySQL). Common open standards (HTML, XML, ODF, TCP/IP, CSS)

- *Indian Language Computing*: Character encoding, UNICODE, different types of fonts (open type vs true type, static vs dynamic), Entering Indian Language Text – phonetic and key map based, Inscript.

Unit 2: Programming

Review of Class XI;

Programming Fundamentals

(Refer to Appendix A for Swing Control Methods & Properties, and Appendix B for sample guidelines of GUI Programming)

- Basic concept of Class, Object, Inheritance and

- Polymorphism Commonly used libraries:

- String class and methods: toString(), concat(), length(), toLowerCase(), toUpperCase(), trim(), subString()
- Math class methods: pow(), round()

- Accessing MySQL database using JDBC to connect with database.

- *Web application development*: URL, Web server, Communicating with the web server, concept of Client and Server Side

- HTML based web pages covering basic tags – <HTML>, <TITLE>, <BODY>, <H1><H6>, <B>,<I>,<U>, <CENTER>, <COMMENT>, <IMG>, ANCHOR <A>, Paragraph <P>, Line Break <BR>, Horizontal Rule <HR>, <FONT>, <TABLE>, <LIST> <UL>, <OL>, <FORM>

- Creating and accessing static pages using HTML and introduction to XML

Unit 3: Relational Database Management System

Review of RDBMS from Class XI

Database Fundamentals

- Concept of Database transaction, Committing and revoking a transaction using COMMIT and ROLLBACK AND SAVEPOINT.

- *Grouping Records*: GROUP BY, Group functions - MAX(), MIN(), AVG(), SUM(), COUNT(); using COUNT(*), DISTINCT clause with COUNT; Group Functions in case of Null Values.

- Creating a Table with PRIMARY KEY, Foreign Key, Unique and NOT NULL constraints, Viewing Constraints, Using DESC command to view constraints.

- *Displaying Data From Multiple Tables*: Cartesian product, Union, Intersection and Equi-Join

- ALTER TABLE for

  - Deleting column(s), modifying data type(s) of column(s),
  - Adding a constraint, enabling constraint, dropping constraints.

- DROP Table for deleting a table or a database.

Unit 4: IT Applications

- *Front-end Interface*: Introduction; content and features; identifying and using appropriate component (Text Field, Radio Button, CheckBox, List etc. as learnt in Unit 2 (Programming)) for data entry, validation and display.

- *Back-end Database*: Introduction and its purpose, exploring the requirement of databases, tables and its essential attributes.

- *Front-End and Database Connectivity*: Introduction, requirement and benefits

- Demonstration and development of appropriate Front-end interface and Back-end Database for e-Governance, e-Business and e-Learning applications

- *Impact of ICT on society*: Social, Environmental and Economic benefits.

In each of the above domains, identify at least two real-life problems, list the expected outputs and the input(s) required for the output, and describe the problem solving approach and develop relevant front-end interface and back-end database.

COURSE DESIGN
Class XII (2019-20) (Practical)

S.No.	Description		Marks
1	Problem Solving using Java		10
2	SQL Queries		5
3	Practical Record • Identify Network configuration and OSS used in school • Simple problems using IDE Java and Database Connectivity • SQL Queries • IT Applications	1 2 1 2	6
4	Project Work : IT Applications		5
5	Viva Voce		4
	Total		**30**

Evaluation of Practical Examination

1. **Problem Solving using Java**

   Student is required to solve programming problems based on all concepts covered in theory throughout the year and maintain a record of these in the practical file.

   Student will be given a problem to be solved using Java during final practical examination to be conducted at the end of the academic session.

2. **SQL Queries**

   Students will be practicing SQL queries in MySQL throughout the year alongwith course coverage in theory.

   Student will be asked to write four queries based on one table and one query based on two tables during final practical examination to be conducted at the end of the academic session

3. **Practical Record File**

   A practical record file is required to be created during the entire academic session. It should be duly signed by the concerned teacher on regular basis and is to be produced at the time of Final Practical Examination for evaluation. It should include the following:

   • Network Configuration and open source software used in your school.

   • At least 12 solutions of simple problems using IDE based Java (refer to Appendices 'A' & 'B') and Solution of at least 2 simple problems incorporating Java Application & Database connectivity

   • At least 24 SQL queries based on one and/or two tables

   • At least two web pages using HTML

4. **Project File**

   Students in group of 2-3 are required to work collaboratively to develop a project using Programming and Database skills learnt during the course. The project should be an application in any one of the

domains – e-Governance, e-Business and e-Learning - with GUI front-end and corresponding database at the back-end.

5. **Viva Voce**

    Students will be asked oral questions during practical examination to be conducted at the end of the course. The questions will be from the entire course covered in the academic session.

Question Paper Design
Class-XI (2019-20) and XII (2019-20)

S.No.	Typology of Questions	Very Short Answer (VSA) (1 mark)	Short Answer-I (SA-I) (2 marks)	Short Answer-II (SA-II) (4 marks)	Long Answer (L.A) (6 marks)	Total Marks	% Weightage
1	Knowledge Based	4	3	2	-	18	25.7
2	Conceptual Understanding	4	5	1	-	18	25.7
3	Reasoning Based	4	-	2	1	18	25.7
4	Skill based	-	1	2	1	16	22.9
	Total marks	**12**	**9**	**7**	**2**	**70(30)**	**100**

1. No chapter wise weightage. Care to be taken to cover all the chapters.

2. The above template is only a sample. Suitable internal variations may be made for generating similar templates keeping the overall weightage to different form of questions and topology of questions same.

3. Questions may be case based requiring problem solving skills.

4. LA Questions may be case-based requiring problem–finding and problem –solving skills.

Appendix 'A'

Swing Control Methods & Properties

Class:	**Jbutton**
Swing Control:	**jButton**
Methods:	**getText(), setText()**
Properties:	Background, **Enabled,** Font, Foreground, **Text, Label**
Class:	**Jlabel**
Swing Control:	**jLabel**
Methods:	**getText(), setText()**
Properties:	Background, **Enabled,** Font, Foreground, **Text**
Class:	**JtextField**
Swing Control:	**jTextField**
Methods:	**getText(), isEditable(), isEnabled(), setText()**
Properties:	Background, **Editable, Enabled,** Font, Foreground, **Text**
Class:	**JRadioButton**
Swing Control:	**jRadioButton**
Methods:	**getText(), setText(), isSelected(), setSelected()**
Properties:	Background, **Button Group, Enabled,** Font, Foreground, **Label, Selected, Text**
Class:	**JcheckBox**
Swing Control:	**jCheckBox**
Methods:	**getText(), setText(), isSelected(), setSelected()**
Properties:	**Button Group, Font, Foreground, Label, Selected, Text**
Class:	**ButtonGroup**
Swing Control:	**jButtonGroup**
Methods:	
Properties:	**Add**
Class:	**JcomboBox**
Swing Control:	**jComboBox**
Methods:	**getSelectedItem(), getSelectedIndex(), setModel()**
Properties:	**Background, ButtonGroup, Editable, Enabled, Font, Foreground, Model, SelectedIndex, SelectedItem, Text**
Class:	**Jlist**
Swing Control:	**jList**
Methods:	**getSelectedValue()**
Properties:	**Background, Enabled, Font, Foreground, Model, SelectedIndex, SelectedItem, SelectionMode, Text**
Class:	**Jtable**
Swing Control:	**jTable**

Methods:	addRow(), getModel()
Properties:	model
Class:	JoptionPane
Swing Control:	
Methods:	showMessageDialog()
Properties:	
Class:	DefaultTableModel
Swing Control:	
Methods:	getRowCount(), removeRow(), addRow()
Properties:	

Commonly used Methods

Class	Methods
Integer	parseInt(), toDouble(), toString()
String	concat(), length(), substring(), toDouble(), toLowerCase(), toUpperCase(), trim()
Double	parseDouble(), toString(), toInt()
Math	pow(), round()

Database Connectivity Methods

Class	Methods
Connection	createStatement(), close()
DriverManager	getConnection()
Statement	executeQuery()
ResultSet	next(), first(), last(), getString()
Exception	getMessage()
System	exit()

Note: The visual properties of any of the elements and Data connectivity methods (the properties/methods, which are not highlighted in the above tables) will not be tested in the Theory examination but may be used by the student in the Practicals and Projects.

Appendix 'B'

Sample Guidelines for GUI Programming

1. To display a message using Label, TextBox, MessageDialog using simple GUI applications

2. To concatenate two text entries and display using simple GUI application

3. To perform a simple arithmetic operation (+,-,*,/) and display the result in MessageDialog or TextBox using simple GUI application

4. To perform simple arithmetic operation (+,-,*,/) and display the result in TextBox using simple GUI application

5. To make simple decision making (if statement) solution and display relevant message using GUI application (Example - Problems related to Eligibility for a given value of Age, "Profit" or "Loss" messages for given values of Cost Price and Sale Price, Grade Display for given values of Marks of students etc.)

6. To create a simple GUI application to perform both arithmetic and logical operation together (Example – Total, Average and Grade calculation for given marks, Salary Calculation on different criteria)

7. To create a simple GUI application to perform an operation based on the criteria input by the user in a CheckBox or a RadioButton.

   (**Example 1**: Find the Discount of an item on the basis of Category of item [Electrical Appliance/Electronic Gadget/Stationary specified using a Radio button] and its Cost [Below 1000/Above 1000/Equal to 1000 specified using a Radio button]).

   (**Example 2**: Calculate the incentive of a Sales Person on the basis of his Sales Amount, Customer Feedback, Count of Customer specified using CheckBox)

8. To create a simple GUI application to change the property of a swing element based on the selection made by the user

   (**Example 1**: To change the background or Foreground color of any of the Swing elements of the form based on the color selected from a list)

   (**Example 2**: To change the foreground and background color of a label based on the values input/stored in a combo box)

9. To create a simple GUI application for repeatedly doing a task based on the user

   input. (Example: To display the multiplication table of a number input by the user)

10. To store the data (Admission No., Name, Date of Birth, Class and Section) of 10 students in a table [Table] and find total number of students in each class and section.

Sample Guidelines for Connectivity Problems

11. To create a simple GUI application that counts and displays the number of records present in a database table.

12. To create a simple GUI application that displays the records of a database table in a tabular format (using jTable) on the GUI form.

13. To create a simple GUI application that displays the records of a database table in a tabular format (using jTable) on the GUI form based on a criteria input by the user.

14. To create a simple GUI application to perform a calculation based on a value retrieved from database table and a value entered by the user in a GUI application.

Know More (beyond syllabus):

- Teachers may also motivate students to search for topics of emerging ICT technologies such as Web Services, Cloud Computing, SDK on Android etc. for group discussions and presentations.

- Students may be encouraged for collaborative programming and remote trouble shooting.

Suggested Textbooks:

- Informatics Practices (Class XI) published by CBSE
- Informatics Practices (Class XII) published by CBSE