

## CURRICULUM ~ COMPUTER SCIENCE

Grade 12

Subject Code: 4281

Credit Hours: 5

Working Hours: 80T+80P

### Scope and Sequence of Contents

S.N.	Content Area	Contents	Working Hours
1.	<b>Database Management System (DBMS)</b>	1.1 Introduction to data, database, Database system, DBMS 1.2 Field, Record, Objects, Primary Key, Alternate key, Candidate key 1.3 Advantages of using DBMS 1.4 DDL (Data Definition Language) and DML (Data Manipulation Language) 1.5 Database Model: Network Model, Hierarchical Model, Relational database model 1.6 Concept of Normalization: 1NF, 2NF, 3NF 1.7 Centralized Vs. Distributed Database 1.8 Database Security	12
2.	<b>Data Communication and Networking</b>	2.1 Basic elements of Communication System 2.2 Concept of Communication System 2.3 Block Diagram of communication System /Model 2.4 Elements of Data Communication/Transmission 2.5 Simplex, Half duplex and Full duplex communication mode 2.6 Concept of LAN and WAN 2.7 Transmission Medium: Guided and Unguided 2.8 Transmission impairments terminology (Jitter, Singing, Echo, Crosstalk, Distortion, Noise, Bandwidth, Number of receivers) 2.9 Basic concept of Networks Architecture: Client-Server and Peer-to-Peer 2.10 Some Basic Terms and Tool Used in Computer Network: IP Address, Sub Net Mask and Gateway, MAC address, Internet, Intranet, Extranet 2.11 Network Tool: Packet tracer, Remote Login 2.12 Network Connecting Devices: NIC, Modem, router, switch 2.13 Network Topologies: Bus, Ring and star topology 2.14 Basic Concept OSI Reference Model 2.15 Internet Protocol Addressing	15
3.	<b>Web Technology II</b>	3.1 Introduction 3.2 Server side and Client-Side Scripting 3.3 Introduction of internet technology 3.4 Adding Java script to HTML page 3.5 Java script fundamental 3.6 Java Script Data types 3.7 Variables and operators 3.8 Functions and control structure if-else, if-else- if, switch-case, for, while, do while loop	12

		<ul style="list-style-type: none"> <li>3.9 Object based programming with Java Script and Event handling</li> <li>3.10 Image, event and form objects</li> <li>3.11 Form validation, JQuery</li> <li>3.12 Server-Side Scripting using PHP</li> <li>3.13 Introduction to PHP: Hardware and Software Requirements</li> <li>3.14 Object oriented programming with server-side scripting</li> <li>3.15 Basic PHP syntax</li> <li>3.16 PHP data types</li> <li>3.17 Basic Programming in PHP</li> <li>3.18 Operators (Arithmetic, logical, comparison, operator precedence)</li> <li>3.19 Variables Manipulation</li> <li>3.20 Database Connectivity</li> <li>3.21 Connecting server-side script to database</li> <li>3.22 Making SQL queries</li> <li>3.23 Fetching data sets getting data about data</li> <li>3.24 Creating SQL database with server-side scripting</li> <li>3.25 Displaying queries in tables</li> </ul>	
<b>4. Programming in C</b>		<ul style="list-style-type: none"> <li>4.1 Review of C programming concept</li> <li>4.2 Functions <ul style="list-style-type: none"> <li>4.2.1 Concept of library and user defined functions and advantages</li> <li>4.2.2 function definition, prototype, call and return statements</li> <li>4.2.3 Accessing a Function by passing values</li> <li>4.2.4 Concept of storage: automatic and external</li> <li>4.2.5 Concept of Recursion: factorial and Fibonacci problems</li> </ul> </li> <li>4.3 Structures and Unions <ul style="list-style-type: none"> <li>4.3.1 Structure: Definition, Declaration, Initialization and Size of Structure.</li> <li>4.3.2 Accessing member of structure</li> <li>4.3.3 Array of structure</li> <li>4.3.4 Union: Definition, Declaration</li> <li>4.3.5 Difference between union and structure</li> </ul> </li> <li>4.4 Pointers <ul style="list-style-type: none"> <li>4.4.1 Definition of Pointer</li> <li>4.4.2 Address (&amp;) and indirection (*) operator</li> <li>4.4.3 Pointer Expression and Assignment</li> <li>4.4.4 Call by values and call by reference</li> </ul> </li> <li>4.5 Working with Files <ul style="list-style-type: none"> <li>4.5.1 Concept of Data File</li> <li>4.5.2 Sequential and Random File</li> <li>4.5.3 File manipulation function: putw, getw, putc, getc, fscanf, fprintf</li> <li>4.5.4 Opening, Reading, Writing and Appending data file</li> </ul> </li> </ul>	12

5.	<b>Object-Oriented Programming</b>	5.1 Programming paradigms: procedural, structural and object oriented 5.2 Features of OOP: Class, Object, Polymorphism and Inheritance 5.3 Advantages of OOP 5.4 Applications of OOP	10
6.	<b>Software Process Model (SPM)</b>	6.1 Software Project Concept 6.2 Concept of software development process 6.3 Concept SDLC life cycle 6.4 System Analyst Vs Software Engineer 6.5 Requirement Collection Methods 6.6 Concept of system design 6.7 Software and quality 6.8 Software development model: waterfall, prototype, agile	10
7.	<b>Recent Trends in Technology</b>	7.1 Concept of Artificial Intelligence (AI) and Robotics 7.2 Concept of Cloud Computing 7.3 Concept of Big Data 7.4 Concept of Virtual Reality 7.5 Concept of e-commerce, e-medicine, e-governance 7.6 Concept of Mobile Computing 7.7 Concept of Internet of things (IoT)	9
		<b>Total</b>	<b>80</b>

### SPECIFICATION GRID

S.N.	Content Area	Working Hours	Competency Level												Content Area / Unit-wise Marks										
			Remembering		Understanding				Applying			Higher Ability													
			MCQ	SAQ	MCQ	SAQ	LAQ	MCQ	SAQ	LAQ	MCQ	SAQ	LAQ												
			No. of Questions	Marks	No. of Questions	Marks	No. of Questions	Marks	No. of Questions	Marks	No. of Questions	Marks	No. of Questions	Marks											
1	Database Management System (DBMS)	12																						8	
2	Data Communication and Networking	15																							9
3	Web Technology II	12																							8
4	Programming in C	12	3	3	1	5	2	2	2	10	-	-	2	2	1	5	1	8	2	2	1	5	1	8	8
5	Object-oriented Programming	10																							6
6	Software Process Model (SPM)	10																							6
7	Recent Trends in Technology	9																							5
<b>Total</b>		<b>80</b>	<b>8</b>				<b>12</b>				<b>15</b>				<b>15</b>				<b>50</b>						

### QUESTION ITEMS FORMAT (OVERALL)

S.N.	Type of Questions	Marks Per Question	Total Questions	Total Marks	Time
1	Multiple Choice Questions (MCQs)	1	9	9	25 Minutes
2	Short Answer Question (SAQ)	5	5	25	95 Minutes
3	Long Answer Question (LAQ)	8	2	16	
<b>Grand Total</b>			<b>16</b>	<b>50</b>	<b>2 Hours</b>

### QUESTION ITEMS FORMAT (CHAPTER-WISE)

S.N.	Units / Chapters	MCQs	SAQs	LAQs	Total Marks
1	Database Management System (DBMS)	2	1	-	7
2	Data Communication and Networking	1	-	1	9
3	Web Technology II	2	1	-	7
4	Programming in C	1	-	1	9
5	Object-oriented Programming	1	1	-	6
6	Software Process Model (SPM)	1	1	-	6
7	Recent Trends in Technology	1	1	-	6
<b>Total</b>		<b>9</b>	<b>5</b>	<b>2</b>	<b>50</b>

**Model Question**  
**Computer Science - XII (2078)**

**Subject Code:** 4281

**Full Marks:** 50 (9 Marks Obj. + 41 marks Sub.)

**Time:** 2 Hours

**Group A: Multiple Choice questions:**

**[9x1=9]**

**Tick the correct answer.**

1. Which of the statements are used in DDL?
  - A. Create, alter and drop
  - B. Create, insert and select
  - C. Insert, update and delete
  - D. Delete, alter and drop
2. With SQL, how do you select all the records from a table named "Persons" where the value of the column "FirstName" ends with an "a"?
  - A. SELECT \* FROM Persons WHERE FirstName='a'
  - B. SELECT \* FROM Persons WHERE FirstName LIKE 'a%'
  - C. SELECT \* FROM Persons WHERE FirstName LIKE '%a'
  - D. SELECT \* FROM Persons WHERE FirstName='%a%'
3. Which of the following statements is true about a star network topology?
  - A. Each device is connected to a switch or hub
  - B. Each device is connected to each other
  - C. Each device is connected in a trunk
  - D. Each device is connected to a terminal
4. Which of the following is the correct syntax to display "Stay Safe" in an alert box using JavaScript?
  - A. alert-box ("Stay Safe");
  - B. confirm ("Stay Safe");
  - C. msgbox("Stay safe");
  - D. alert ("Stay Safe");
5. What is the use of <a> tag?
  - A. To insert an image
  - B. To create a link
  - C. To create a hyperlink
  - D. To create a list
6. What is the output of given C program?

```
void main (){
    char str1[] = "FIRST";
    char str2[20];
    strcpy(str2, str1);
    printf("%s %s ",str1,str2);
    printf(" %d ", (str1!=str2));
    printf(" %d ", strcmp(str1,str2));
}
```

  - A. FIRST FIRST 0 0
  - B. FIRST FIRST 1 1
  - C. FIRST FIRST 1 0
  - D. FIRST FIRST 0 1
7. Where is a class derived in inheritance?

- A. Super Class
  - B. Subclass
  - C. Subset Class
  - D. Relative Class
8. Which of these is the correct order of the SDLC?
- A. Analysis, Design, Coding, Testing, Implementation
  - B. Analysis, Design, Testing, Implementation, Coding
  - C. Implementation, Coding, Analysis, Design, Testing
  - D. Design, Testing, Implementation, Coding, Analysis
9. Why is cloud computing popular nowadays?
- A. Cost-sharing and easily accessible
  - B. As modern technology and costly
  - C. Accessible and freely available
  - D. Affordable to all

**Group B: Short Answer Questions:**

[5x5=25]

1. Explain 2NF and 3NF with examples.

**OR**

Demonstrate the basic DML statement with an example.

2. Write a function to add any two numbers in JavaScript.

**OR**

Demonstrate the external CSS implemented in the web page.

3. Describe any five features of OOPs.  
4. What are the different stages of software planning? Describe.  
5. Define the concept of AI and IoT.

(2+3)

**Group C: Long Answer Questions:**

[2x8=16]

6. How do you implement the Class C IP address in the local area network? Describe.  
7. Write a program to enter ten integer numbers into an array, sort and display them in ascending order.

**OR**

Write a program to read the marks of any 5 students in a subject and count how many students are pass and fail.

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