1. **Data Representation**
   i. Data definition:
      - Numeric, alphabetic and alphanumeric
   ii. Number systems:
      - Decimal, Binary, Octal & Hexadecimal
   iii. Number system conversion
   iv. Representation of numbers using (1’s) and (2’s) complements
   v. Binary arithmetic:
      - Addition, subtraction, multiplication and division
   vi. Fixed and floating point number representation
   vii. Code:
      - Coding scheme (Binary Coded Decimal, ASCII)

2. **Boolean Algebra**
   i. Boolean constant, variable, logical operators, Boolean expressions, Boolean functions
   ii. Laws and theorems of Boolean algebra
   iii. Truth tables
   iv. Simplification of Boolean functions, laws and Karnaugh maps

3. **Problem Solving**
   i. Defining the problem
   ii. Analysis of the problem, illustrated with examples
   iii. Algorithms
   iv. Flow charts:
      - Flow charts symbols, examples of flow charts using daily life applications
   v. Computer programming:
      - Conversion of flow chart, algorithm into computer language instructions
   vi. Running and debugging programs
   vii. Implementation
   viii. Documentation

4. **Data Types Assignment (INPUT/OUTPUT) Statement**
   i. Character sets, reserved words, commands and statements
   ii. Numeric and strings
   iii. Constants and variables
   iv. Operators: arithmetic, relational and logical
   v. Hierarchy of operators, expressions
   vi. Arithmetic, relational and logical
   vii. Assignment statements
   viii. Input, READ-DATA
   ix. PRINT, PRINT USING

5. **Control Statements**
i. Go to, ON – GO TO
ii. If – Then – Else, on Error – Go to...
iii. For … Next statement, While and Wend statement, Loops and nested loops

6. Arrays
i. One and two – dimensional arrays
ii. Reading, writing and manipulation of arrays

7. Sub-Program and File Handling
i. Functions:
   - Built-in functions (ABS, INT, RND, SQR, LOG, EXP, SIN, COS, TAN, CINT, INT, SGN, FIX, HEX$, LEFT$, MID$, CHR$, STR$, TIME$, INKEY$, SPACE$) and user defined functions
ii. Subroutines
iii. Reading and writing into files

8. Graphics
i. Sketching and drawing of graphics using utilities such as DRAW and COLOR
ii. Generating lines, rectangles, circles etc

PRACTICALS
For Class X (marks 20)
1. Writing a program to demonstrate simple arithmetic operations (e.g. calculation of the area of a triangle, volume of a cylinder and speed of an object, conversion of temperature from °C to °F and vice-versa).
2. Writing a program to demonstrate the use of formatted input/output statements, (calculation of class grades for different students, selection of the largest number out of given 10 numbers without using a list).
3. Writing a program that uses iteration statements (write a program that reads 5 values from user and find the mean value and compare the mean value against an actual value of 9.8 meters/sec^2).
4. Writing a program that reads 10 values into an array and after doing some arithmetic operations, prints the desired results.
5. Repeating Experiment No.3 using a sub-routine, named average and call this sub-routine in the main program.
6. Drawing a line, a circle and a rectangle using system defined built-in functions for graphics.

RECOMMENDED REFERENCE BOOKS FOR CLASS X
The question papers will be syllabus oriented. However, the following books are recommended for reference and supplementary reading:

1. Computer Science
   National Book Foundation, Islamabad.
2. Computer Science
   Punjab Text Book Board, Lahore.
3. Computer Science
   NWFP Textbook Board, Peshawar.
4. Computer Science
   Baluchistan Textbook Board, Quetta.
5. A Textbook of Computer Science for class IX-X,
   Prof. Shaukat Ayub Burki,
   Gaba Educational Book,
   Urdu Bazaar, M.A. Jinnah Road, Karachi
Note: Attempt any THREE questions.

Q.1  Write the following program on computer by converting the same into FOR-NEXT loop:  

10  CLS  
20  COUNT = 1  
30  SUM = 0  
40  WHILE COUNT <= 10  
50  SUM = SUM + COUNT  
60  COUNT = COUNT + 1  
70  WEND  
80  PRINT “SUM =”; SUM  
90  END  

Q.2  Find out the smallest number in an array of ten elements by writing a program in BASIC.  

Q.3  Draw five concentric circles in different colours using CIRCLE statement in BASIC.
Q.4 Convert the following flowchart into BASIC program using computer:

```
Start

Read price

Is price > 5000?

Yes

Discount = price × 5/100

net_price = price - Discount

No

net_price = price

PRINT net_price

END
```