1. (a) Explain the various problem solving techniques.
   (b) Describe the structure of 'C' program with an example.

2. Explain the various types of control statements with examples.

3. Explain the various string handling functions with examples.
4. Illustrate with examples, about pointers, pointer declarations and bring out the differences between an integer pointer and a string pointer.

5. (a) Write a recursive function to find the factorial of a given number.

(b) What are bitwise operations? What instructions support such operations?

6. Explain with examples, the binary tree traversal methods.

7. Explain with examples, the insertion and deletion of an element into a stack.

8. Explain in detail on Heap Sort method with an example.
1. (a) Find the eigen values of the following matrix.
\[
\begin{pmatrix}
3 & -1 & 1 \\
-1 & 5 & -1 \\
1 & -1 & 3 \\
\end{pmatrix}
\]

(b) Find the rank of the following matrix
\[
\begin{pmatrix}
1 & 1 & -1 & 1 \\
1 & -1 & 2 & -1 \\
3 & 1 & 0 & 1 \\
\end{pmatrix}
\]

(10+10)
2. (a) Find the inverse of the following matrix

\[
\begin{pmatrix}
1 & 1 & 1 \\
1 & 2 & 3 \\
1 & 4 & 9 \\
\end{pmatrix}
\]

(b) (i) State any four properties of determinant of matrix

(ii) Find the determinant value of the following matrix

\[
\begin{pmatrix}
1 & 1 & 1 \\
1 & 2 & -3 \\
2 & -1 & 3 \\
\end{pmatrix}
\]

3. (a) State the laws of set theory.

(b) Define the following terms

(i) Power set

(ii) Duality principle

(iii) Min set

(iv) Max set

(v) Partition of a set.
4. (a) Prove that \( A - (B \cup C) = (A - B) \cap (A - C) \).

(b) In a medical examination of 300 students, 65 were suffering from liver trouble, 38 had eye trouble and 30 students were anaemic. If 15 students had both liver and eye trouble, 10 had liver trouble and anaemic, 12 had eye trouble and anaemic and 8 students had all the three. Find out how many students were free from any of the three troubles. (10+10)

5. (a) Construct the truth table for the following compound preposition and give your interpretation.

(i) \( (p \leftrightarrow q) \leftrightarrow ((p \land q) \lor \neg (p \land \neg q)) \)

(ii) \( \neg p \leftrightarrow \neg q \leftrightarrow (p \leftrightarrow q) \).

(b) Show that \((a \lor b)\) follows logically from the premises \( p \lor q, \ (p \lor q) \rightarrow \neg r, \neg r \rightarrow (s \land \neg t) \) and \( (s \land \neg t) \rightarrow (a \lor b) \). (6+6+8)

6. (a) Show that the premises

"One student wire class knows to write JAVA program"

"Every one knows how to wirte programe in Java can get a high paying job".

Imply the conclusion "some one in this class can get a high – paying job".

(b) Explain the concept of equivalence relation on a set. (12+8)
7. (a) If $R, S, T$ are relations on the set $A = \{0, 1, 2, 3\}$ defined by \( R = \{(a, b) / a + b = 3\} \)
\[ S = \{(a, b) / 3 \text{ is a division of } (a + b)\} \]
and \( T = \{(a, b) / \max(a, b) = 3\} \)
(b) If $f, g, h: R \rightarrow R$ are defined by
\[
    f(x) = x + 2, \quad g(x) = \frac{1}{x^2 + 1} \quad \text{and} \quad h(x) = 3
\]
Find $g, h, f$ and $h.g.f$. 

8. (a) Explain the various types of graph.
(b) Explain tree, binary tree and its properties.
(For the candidates admitted from 2007 onwards)

B.Sc. DEGREE EXAMINATION, MAY 2014.

Second Year

Part III — Computer Science

C ++ PROGRAMMING

Time : Three hours  
Maximum : 100 marks

Answer any FIVE questions.
All questions carry equal marks.

\[(5 \times 20 = 100)\]

1. Give a detailed description on basic concepts of object oriented programming with suitable illustrations.

2. Write about basic and uses defined data types with illustrations and sample codings.

3. With flow charts, discuss the various control structures used in C++ language.
4. Discuss the concept of function overloading. Also develop a C++ program to overload the function volume for three different shapes.

5. Illustrate with a C++ program and explain the concept of overloading binary operators.

6. (a) Explain the concept of multiple inheritance with an example. (10)

(b) How do pointers are declared and initialized? Discuss with an illustration. (10)

7. Develop a C++ program to illustrate how pointers are used to derive objects.

8. (a) Elaborate the various unformatted I/O operations with syntax and examples. (14)

(b) Discuss the importance of class templates with parameters and function templates with multiple parameters along with general formats. (6)
Reg. No.: ................................

D 1524  Q.P. Code: [07 DSC 05]

(For the candidates admitted from 2007 onwards)

B.Sc. DEGREE EXAMINATION, MAY 2014.

Second Year

Part III — Computer Science

SYSTEM SOFTWARE AND OPERATING SYSTEM

Time: Three hours  Maximum: 100 marks

Answer any FIVE questions.

All questions carry equal marks.

1. (a) Explain symbol defining statements.
    (b) Define bootstrap loader.  (15+5)

2. Define Loader. Explain machine in dependent loader features.  (5+15)

3. Explain the General purpose macro processor.  (20)

4. Discuss on text Editors.  (20)

5. Explain the Intermediate form of a program with example.  (20)
   (4+8+8)

   (4+16)

8. (a) Explain the Disk performance optimization.  
    (b) Describe file system functions and organization.  
   (10+10)
SOFTWARE ENGINEERING

Time : Three hours 
Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks

\[(5 \times 20 = 100)\]

1. Explain the various size factors in software development and maintenance.

2. Elaborate on planning an organizational structures.

3. Describe the various software cost factors.

4. Explain staffing-level estimation and estimation of software maintenance costs.
5. Explain the various aspects in formal specification techniques.

6. Elaborate on the various design notations.

7. Explain the various structured coding techniques.

8. Explain the various aspects of unit testing and debugging.
D 1525

Q.P. Code : [07 DSC 07]

(For the candidates admitted from 2007 onwards)

B.Sc. DEGREE EXAMINATION, MAY 2014.

Second Year

Part III — Computer Science

JAVA PROGRAMMING

Time : Three hours  Maximum : 100 marks

Answer any FIVE questions.

1. (a) Give any four benefits of OOP.  (4)
   (b) Discuss about the Java two Features.  (16)

2. (a) Explain any two web browsers.  (4)
   (b) Explain the Structure of the Java programme.  (10)
   (c) Write a java program to calculate the square root of a number.  (6)

3. (a) Write a Java program to create a class for representing a ‘Rectangle’ and calculate the area.  (10)
   (b) Explain the Jumping in Loops with an example.  (10)
4. (a) What is single inheritance? Give an example program of the single inheritance.  (12)
   (b) Compare and contrast overloading and overriding methods.  (8)

5. (a) Write a Java program for sorting n strings in the alphabetical order.  (12)
   (b) How to create and access a package? Explain.  (8)

6. (a) Give an example of using the thread class.  (12)
   (b) Write an applet program to enter any two numbers in the relevant input box and display its sum. (8)

7. (a) Explain the Applet Life Cycle.  (12)
   (b) Discuss about the classification of Java Steam Classes.  (8)

8. (a) Write a Java program to read the contents of any one file and the output displayed in the screen.  (10)
   (b) How to append to a text file using random access? Explain.  (10)
Reg. No.: ....................................

D 1527  Q.P. Code: [07 DSC 09]

(For the candidates admitted from 2007 onwards)

B.Sc. DEGREE EXAMINATION, MAY 2014.

Third Year

Part III — Computer Science

RDBMS AND ORACLE

Time: Three hours  Maximum: 100 marks

Answer any FIVE questions.

\( (5 \times 20 = 100) \)

1. (a) Explain briefly about relational data model.
    (b) Explain briefly about relational languages.

2. Explain the various levels of normalization with examples.

3. Explain the various data manipulation commands in oracle with examples.

4. Explain the join and set operations in oracle.

5. Discuss in detail about control structure and embedded SQL with examples.
6. Explain the following:
   (a) PL/SQL cursors
   (b) Exceptions.

7. Explain the various operations on tables with examples.

8. Describe in detail about function and procedures in PL/SQL.
Reg. No. : ........................................

D 1528       Q.P. Code : [07 DSC 10]

(For the candidates admitted from 2007 onwards)

B.Sc. DEGREE EXAMINATION, MAY 2014.

Third Year

Part III — Computer Science

VISUAL PROGRAMMING – VISUAL BASIC

Time : Three hours  Maximum : 100 marks

Answer any FIVE questions.

1. (a) Explain all the data types in VB.  (12)
    (b) How to open save run and close projects in VB? Explain.  (8)

2. (a) Explain any three mathematical library functions in VB.  (6)
    (b) Write a VB program to calculate sum of n odd numbers.  (10)
    (c) How to assign values to variables? Explain.  (4)
3. (a) How control tools are categorised? Explain any five control tools. (12)
   (b) Write a VB program to select any qualification from the given degree and display it. Add clear button to clear the contents. (8)

4. Write short notes on:
   (a) Accessing menu from keyboard
   (b) Menu enhancements
   (c) Sub menu
   (d) Popup menu. (20)

5. (a) Explain the combo box with an example. (10)
   (b) Explain the MsgBox and input box function. (10)

6. (a) Explain the event procedures and function procedures. (12)
   (b) Explain the array related functions. (8)

7. (a) How to create a control array at Runtime? Explain. (10)
   (b) How to pass arrays to procedures? Explain. (10)

8. (a) How to read, write and delete records in a sequential file? Explain. (12)
   (b) How to process a data file? Explain. (8)
B.Sc. DEGREE EXAMINATION, MAY 2014.
Third Year
Part III — Computer Science
SOFTWARE TESTING

Time: Three hours  Maximum: 100 marks

Answer any FIVE questions.
All questions carry equal marks.

1. Write notes on:
   (a) Waterfall model  (6)
   (b) Spiral model  (6)
   (c) V model  (8)

2. Summarize the procedure of static testing.  (20)

3. Explain the following black box testing procedures.
   (a) Positive and negative testing  (8)
   (b) Graph based testing  (12)
4. Compare and contrast top down integration testing procedure with bottom up integration testing. (20)

5. Give a neat description on functional system testing strategies. (20)

6. Summarize the following performance testing methodologies.
   (a) Analyzing the performance test results. (10)
   (b) Performance tuning. (10)

7. (a) Write about performing an initial "smoke" or "sanity" test. (10)
     (b) Discuss on testing tasks "size and effort estimation". (10)

8. List and explain the various project metrics in detail. (20)
D 1526

(For the candidates admitted from 2007–2008 onwards)

B.C.A./B.Sc. DEGREE EXAMINATION, MAY 2014.

Third Year

Part III — Computer Applications/Computer Science

COMPUTER NETWORKS

Time: Three hours

Maximum: 100 marks

Answer any FIVE questions.

\[(5 \times 20 = 100)\]

1. Explain the function of layers in the OSI reference model with a neat diagram.

2. Explain in detail, the various classifications of networks.

3. Discuss in detail, the guided transmission media used for communication.

4. Explain with suitable examples, the error detection and correction codes.
5. Discuss in detail on Bluetooth technology.

6. Explain the various issues to be addressed in connection establishment.

7. Discuss in detail on Domain Name system.

8. Explain the following:
   (a) Data Encryption Standard
   (b) Advanced Encryption standard.