B.C.A. DEGREE EXAMINATION, MAY 2014.
First Year
Part III – Computer Application

COBOL PROGRAMMING

Time : Three hours
Maximum : 100 marks

Answer any FIVE questions.
All questions carry equal marks.

1. (a) Explain the ENVIRONMENT DIVISION entries in COBOL. (10)
(b) Explain the use of PICTURE clause in COBOL. (10)

2. Explain the edit characters for numeric data in COBOL.

3. Explain the various arithmetic verbs in COBOL.

4. Explain the REDEFINES and RENAMES clause in COBOL.
5.  (a) Explain the IF statement in COBOL. (10)
     (b) Explain PERFORM with TIMES and until options in COBOL. (10)

6.  An employee file contains employee number, employee name, designation, sex-code ('M' for male, 'F' for Female), basic pay. Write a COBOL program to print a list of female employee drawing basic pay greater than Rs. 5000.

7.  Explain the PROCEDURE DIVISION statements for Indexed files in COBOL.

8.  Explain the PROCEDURE DIVISION statements for Relative files in COBOL.
1. (a) Implement using fundamental gates

\[ Q = A \overline{B} + \overline{A}B + \overline{A} \overline{B}. \]

(b) Prove by using Boolean theorems:

\[ \overline{A \overline{B} + \overline{A}B} = AB + \overline{A} \overline{B} \]

(c) Draw the circuit of a Full subtractor and give its truth table.
2. (a) Convert the octal number into decimal and hexadecimal number systems 40.5.
   (b) How will you convert a binary number into Gray code?

3. (a) Simplify using Karnaugh map and implement by using NOR gates only.
   \[ Q(A, B, C, D) = \sum m(1, 5, 6, 7, 11, 13, 14) \]
   (b) Draw the circuit of a JK flip flop and explain its working.

4. (a) Explain the 4 × 1 multiplexer with diagram. Using two such multiplexers, draw a 8 × 1 multiplexer.
   (b) Explain the rotate instructions with examples.

5. (a) Explain the instructions formats with respect to 8085.
   (b) Explain the addressing modes of 8085 with examples and specify the purpose of any two pins of 8085.

6. (a) Explain how priority is assigned to interrupts?
   (b) Differentiate synchronous from asynchronous counters.
7. Discuss the Associative memory, with a memory cell diagram and the match logic.

8. (a) Perform the following:
   1110 * 101 (in binary)
   222 + 666 (in octal)
   110 + 111 (in Hexa Decimal)

(b) Explain the use of XOR gate.
D 1514  Q.P. Code : [07 DSCA 03]

(For the candidates admitted from 2007 onwards)

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

First Year

Part III – Computer Applications

Allied I – COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

Time: Three hours  Maximum: 100 marks

Answer any FIVE questions.

All questions carry equal marks.

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

1. (a) Find all the roots of \(x^3 - 4x + 1 = 0\) using Newton-Raphson method.

(b) Assuming that a root of \(x^3 - 9x + 1 = 0\) lies in \((2, 4)\), find that root by Bisection method.

\((14 + 6)\)
2. (a) Solve the system of equations by Gauss-Jordan method.

\[ \begin{align*}
    x + y + z + w &= 2 \\
    2x - y + 2z - w &= -5 \\
    3x - 2y + 3z + 4w &= 7 \\
    x - 2y - 3z + 2w &= 5
\end{align*} \]

(b) Solve the following using Gauss-Seidel iterative procedure. \( (10 + 10) \)

\[ \begin{align*}
    4x_1 + x_2 + 2x_3 &= 16 \\
    x_1 + 3x_2 + x_3 &= 10 \\
    x_1 + 2x_2 + 5x_3 &= 12
\end{align*} \]

3. (a) Find the first and second derivatives at \( x = 1.5 \) from the following:

\[
\begin{array}{ccccccc}
X & 1.5 & 2.0 & 2.5 & 3.0 & 3.5 & 4.0 \\
Y & 3.375 & 7.000 & 13.625 & 24.000 & 38.875 & 59.000
\end{array}
\]

(b) From the following table find the area bounded by the curve and the x-axis from \( x = 2 \) to \( x = 7 \) using trapezoidal rule. \( (12 + 8) \)

\[
\begin{array}{ccccccc}
X & 2 & 3 & 4 & 5 & 6 & 7 \\
f(x) & 8 & 27 & 64 & 125 & 216 & 343
\end{array}
\]
4. (a) The table below gives the velocity $U$ of a moving particle at time $t$ seconds. Find the distance covered by the particle in 12 seconds. Also the acceleration at $t = 2$ seconds.

<table>
<thead>
<tr>
<th>$t$</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$v$</td>
<td>4</td>
<td>6</td>
<td>16</td>
<td>34</td>
<td>60</td>
<td>90</td>
<td>136</td>
</tr>
</tbody>
</table>

(b) From the following data find $\theta$ at $x = 43$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\theta$</td>
<td>184</td>
<td>204</td>
<td>226</td>
<td>250</td>
<td>276</td>
<td>304</td>
</tr>
</tbody>
</table>

Use Newton-Gregory forward difference formula.

5. (a) Use Lagrange's formula to find the value of $y$ when $x = 1$.

<table>
<thead>
<tr>
<th>$X$</th>
<th>-1</th>
<th>0</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y$</td>
<td>-8</td>
<td>3</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

(b) Using Runge-Kutta fourth order method, find $y(0.8)$, given that $\frac{dy}{dx} = y - x^2$.

$y(0.6) = 1.7379$ with $h = 0.1$.

6. (a) Compute mean, median and mode from the following data

<table>
<thead>
<tr>
<th>$x$</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
<th>70-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f$</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>14</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

| 3 | D 1514 |
(b) Calculate mean deviation from mean from the following data

100, 150, 200, 250, 360, 490, 500, 600, and 671.

7. (a) Calculate the correlation coefficient for the following:

<table>
<thead>
<tr>
<th>X</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>85</td>
<td>93</td>
<td>95</td>
<td>105</td>
<td>120</td>
<td>130</td>
<td>150</td>
<td>160</td>
</tr>
</tbody>
</table>

(b) From the following data calculate Rank correlation coefficient after making adjustment for tied ranks.

<table>
<thead>
<tr>
<th>X</th>
<th>48</th>
<th>33</th>
<th>40</th>
<th>9</th>
<th>16</th>
<th>16</th>
<th>65</th>
<th>24</th>
<th>16</th>
<th>57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>13</td>
<td>13</td>
<td>24</td>
<td>6</td>
<td>15</td>
<td>4</td>
<td>20</td>
<td>9</td>
<td>6</td>
<td>19</td>
</tr>
</tbody>
</table>

8. (a) Calculate the correlation coefficient and obtain the lines of regression for the following:

<table>
<thead>
<tr>
<th>X</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>9</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

(b) From the following regression equations find the mean values of x and y also find the correlation coefficient.

\[8x - 10y = -66\]
\[40x - 18y = 214\]
Reg. No. : 

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Q.P. Code : [07 DSCA 05]

(For the candidates admitted from 2007 onwards)

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

Second Year

Part III – Computer Applications

DATA STRUCTURES AND ALGORITHMS

Time : Three hours 
Maximum : 100 marks

Answer any FIVE questions.
All questions carry equal marks.
\[(5 \times 20 = 100)\]

1. (a) What is SPARKS? Describe rules of creating good looking program using SPARKS.
   
   (b) Explain the phases in the process of creating programs. \[(10+10)\]

2. (a) Explain the use of stack in evaluating arithmetic expressions with an example. \[(12)\]
   
   (b) Write a note on infix and post fix notations. \[(8)\]

3. (a) What is Queue? Explain the various operations performed on queue.
   
   (b) What are the capabilities of linked representations? \[(12+8)\]
4. (a) Write the algorithm for polynomial addition using linked list.
    (b) Write about garbage collection and compaction. (12+8)

5. (a) Explain the various search techniques.
    (b) Distinguish between internal and external sortings. (12+8)

6. (a) Elaborate on the various file organizations.
    (b) What is symbol table? (12+8)

7. (a) Discuss the different flashing functions.
    (b) Write a note on various index techniques. (12+8)

8. Write and explain with example of quick sort. (20)
D 1518

Q.P. Code : [07 DSCA 07]

(For the candidates admitted from 2007 onwards)

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

Second Year

Part III – Computer Application

OPERATING SYSTEMS

Time : Three hours  Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

1. What are major achievements of an operating system? Explain.

2. (a) Narrate the developments leading to modern operating systems. (10)

(b) Give a note on traditional UNIX systems. (10)

3. Explain the concept of operating system structure.

4. Discuss the various I/O scheduling policies.

5. (a) Elucidate the evolution of multi programming. (10)

(b) Give a brief account on process state transitions. (10)
6. Describe the variable partitioned memory management technique with allocation algorithm.

7. Elaborate on paging concept with implementation procedures of page map labels.

8. Give a detailed description on client/server computing technology.
(For the candidates admitted from 2007-2008 onwards)

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

Third Year

Part III – Computer Applications

JAVA PROGRAMMING

Time: Three hours                       Maximum: 100 marks

Answer any FIVE questions.

1. (a) Explain the basic concepts of object-oriented programming (14)

   (b) Explain the web browsers. (6)

2. (a) Give the benefits of object oriented programming. (12)

   (b) Write a Java program to find the greatest number from given three numbers. (8)

3. (a) Explain the various types of operators in Java with an example. (10)

   (b) Explain the switch statement with an example. (10)
4. (a) Write a java program for sorting strings in alphabetical order. 
(b) What is method of overloading? Give an example program.

5. (a) Explain multiple inheritance with a suitable program.
(b) How to create, access and use a package in java? Explain.

6. (a) Write an applet to display four radio buttons with the captions “Computers Science”, “Information Technology”, “Computer Applications” and “Cyber Technology”. Create a text field and use it to indicate which course is selected.
(b) Explain the applet life cycle.

7. (a) Explain the input and output stream classes.
(b) How to read and write characters in a file? Explain.

8. (a) Write a java program to read a content of an input file and display the screen.
(b) Explain the random access files.
(For the candidates admitted from 2007 onwards)

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

Third Year

Part III – Computer Applications

DATABASE CONCEPTS AND VISUAL PROGRAMMING

Time : Three hours Maximum : 100 marks

Answer any FIVE questions.

1. (a) Design a date model for a library information system. (10)

(b) What is functional dependency? What is full functional dependency? Explain. (10)

2. (a) Explain the conditions for a relation to be in 2NF with examples. (10)

(b) Explain the hierarchy of exciting the operation in VB, with suitable examples. (10)

3. (a) Discuss the looping structures in VB. (12)

(b) What is meant by event driven programming? Explain. (8)
4. (a) What is a control away? Explain. (10)
(b) Explain any five control with purpose and few methods. (10)

5. (a) Explain how a form is created and code is added to a control. (14)
(b) Explain the use of a timer control. (6)

6. (a) Explain the msgbox with example. (10)
(b) Drawn the different types of menus. (10)

7. (a) What is a sub procedure? Explain with example. (10)
(b) Write VB code to read an essay and to add the elements one-by-one to a list control. (10)

8. (a) Discuss the file handling features of VB. (12)
(b) Write VB code to read the contents of a file and to display it on the text area. (8)
(For the candidates admitted from 2007–2008 onwards)

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

Third Year

Part III — Computer Applications

E–COMMERCE

Time : Three hours  Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

1. (a) Narrate the several drivers that support E–Commerce survival and growth.  (12)
    (b) Write down the myths of E–Commerce.  (8)

2. (a) Summarize the benefits and limitations of the Internet.  (12)
    (b) List out and discuss the different business models of E–Commerce.  (8)

3. Give a neat description on wireless application protocol with its advantages and limitations.  (20)
4. (a) Elaborate on Bluetooth architecture and its applications. (12)
(b) With an example, discuss the importance of supply chain management process. (8)

5. Explain the B2B models in detail. (20)

6. Describe the ways and means of providing security in cyberspace. (20)

7. (a) Give a brief account on client and server security threats. (10)
(b) Discuss on types of biometrics system. Also state the advantages and drawbacks of biometric devices. (10)

8. List out the different types of electronic payment media and explain in detail. (20)