Note: Attempt Five questions in all, selecting one question from each Section. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. Answer the following questions in short:
   (a) Define the term Computer with Block Diagram. 2
   (b) What is a Dynamic RAM? 2
   (c) Explain the term Application Software. 2
   (d) What do you mean by Multiprogramming Operating System? 2
   (e) What is Debugging? 2
   (f) What is a Flowchart? 2
   (g) Explain Sorting. 2
   (h) What is an Assembler? 2

(5)L-1190 1
Unit I

2. (a) Classify the Computer according to Size and Power.  

(b) Explain various Computer Generations.  

3. (a) Differentiate between Primary Memory and Secondary Memory.  

(b) What is ROM? Differentiate between EPROM and EEPROM.  

Unit II

4. (a) List various I/O Devices in detail.  

(b) Write short notes on the following:  

(i) Digitizers  

(ii) Plotters  

(iii) Magnetic Media Devices.  

5. (a) Difference between Multiprogramming, Multitasking and Multiprocessing Operating Systems.  

(b) How does Operating System act as user interface? Explain in detail.  

Unit III

6. (a) Differentiate between Testing and Debugging.  

(b) Explain Problem solving in detail.  

(5)L-1190 2
7. (a) What do you mean by Structured programming? Explain in detail.
8
(b) Describe the functions of various Flowchart Symbols.
8

Unit IV

8. (a) Explain various types of Searching techniques with example.
8
(b) Write Algorithm to implement Selection Sort and Bubble Sort.
8

9. (a) Differentiate between Compiler and Interpreter.
8
(b) What are the characteristics of High Level Language?
8
Note: Attempt Five questions in all, selecting one question from each Unit. Q. No. 1 is compulsory.

Compulsory Question

1. (a) What is the purpose of taskbar in windows?
(b) How can you use Web Camera in Windows?
(c) Write steps to insert/delete rows and columns in Excel.
(d) How can you use formula in Excel? 4×4

Unit I

2. (a) What is a window? Explain application and document window with examples.
(b) What is a shortcut icon? Discuss different methods of its creation. 8,8

(2)L-1191 1
3. (a) What is a Window Explorer? Explain its different facilities.
   (b) Discuss Paint and Word Pad Windows Accessories.

Unit II

4. (a) How can you install Hardware and Software in windows operating system?
   (b) Explain Scandisk and Disk Defragmenter System Tools.

5. (a) How you can share Folders and Drives in windows? Explain with examples.
   (b) What is the purpose of Internet Explorer? Explain its facilities.

Unit III

6. (a) Discuss various components of a Workbook.
   (b) Write steps to create and protect a Worksheet.

7. Discuss Editing and Formatting features in Excel with examples.
Unit IV

8. (a) Explain Logical and Statistical built-in functions in Excel.
   (b) Discuss various options of printing Workbook and Worksheets.

BCA/D-20
MATHEMATICAL FOUNDATION-I
BCA-113

Time : Three Hours] [Maximum Marks : 80

Note : Attempt Five questions in all, selecting one question from each Section. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) Verify that \((A \cap B)' = A' \cup B'\), where \(A = \{2, 3, 4, 5, 6\}\), \(B = \{3, 6, 7, 8\}\) are subsets of \(U = \{1, 2, 3, 4, 5, 6, 7, 8\}\).

(b) Find \(r\), if \(\binom{10}{r} + 1 = \frac{\binom{11}{r}}{10} = 30 : 11\).

(c) Find \(\frac{dy}{dx}\), when \(\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1\).

(d) Show that \(x^2 + 4y = 0\) is a solution of \(\left(\frac{dy}{dx}\right)^2 + x \frac{dy}{dx} - y = 0\).

(e) Solve the differential equation : \(\frac{d^2y}{dx^2} - 4 \frac{dy}{dx} + y = 0\).
Unit I

2. (a) In a class of 1000 students, 625 students pass in Mathematics and 525 pass in English. How many students pass in Mathematics only and how many pass in English only? 8

(b) In a set of integers, let a relation R be defined as $aRb$ if and only if $a-b$ is even. Prove that R is an equivalence relation. 8

3. (a) Find the number of arrangements that can be made out of the letters of the word PERMUTATION. In how many of these 5 vowels are together? 8

(b) A polygon has 44 diagonals. Find the number of its sides. 8

Unit II

4. (a) Using $\varepsilon$-$\delta$ definition, prove that: $\lim_{x \to a} \cos x = \cos a$, where $a \in \mathbb{R}$. 8

(b) Differentiate: $\tan^{-1} \frac{\sqrt{1 + x^2} - 1}{x}$ w.r.t. $\sin^{-1} \frac{2x}{1+x^2}$. 8

(3) L-1192 2
5. (a) If \( x^p y^q = (x + y)^{p+q} \), prove that:
\[
\frac{dy}{dx} = \frac{y}{x}
\]
(b) If \( y = e^{\tan^{-1} x} \), prove that:
\[
(1 + x^2)\frac{y_2}{y} + (2x - 1)\frac{y_1}{y} = 0.
\]

Unit III

6. (a) Find the differential equation of the family of the curves \( y = Ae^{3x} + Be^{5x} \), where A and B are arbitrary constants.

(b) Solve the differential equation:
\[
(1 + x^2)\frac{dy}{dx} + 2xy - 4x^2 = 0
\]

7. (a) Solve the differential equation:
\[
(y \log x - 1) ydx = xdy
\]

(b) Verify that the differential equation:
\[
xdy + ydy = a^2 \frac{(xdy - ydx)}{x^2 + y^2}
\]
is exact and solve it.

(3)L-1192
8. (a) Solve the differential equation :
\[ \frac{d^3 y}{dx^3} + \frac{d^2 y}{dx^2} + \frac{dy}{dx} + y = \sin 2x \]

(b) Solve the differential equation :
\[ \frac{d^2 y}{dx^2} + y = x - e^{2x} \]

9. (a) Solve the differential equation :
\[ x^2 \frac{d^2 y}{dx^2} - 2x \frac{dy}{dx} - 4y = x^4 \]

(b) Solve the differential equation :
\[ (3x + 2)^2 \frac{d^2 y}{dx^2} + 3(3x + 2) \frac{dy}{dx} - 36y = 3x^2 + 4x + 1 \]
(Compulsory Question)

1. (a) What do you mean by Fixed Point Representation of Numbers?
   (b) Differentiate between Coding and Convention?
   (c) What do you mean by Switching Algebra?
   (d) What are Boolean Postulates?
   (e) What do you mean by Universal Gate?
   (f) Explain NAND Gate.
   (g) Differentiate between Multiplexer and Demultiplexer.
   (h) Draw the logic diagram of Half Adder. 8×2=16
Unit I

2. Represent the decimal No. 8620 in :
   (a) BCD
   (b) Excess-3 code
   (c) 2421 Code
   (d) as a Binary Number.

3. (a) Solve the following :
   (i) \((130)_{10} = (?)_{3}\)
   (ii) \((1000)_{3} = (?)_{10}\)
   (iii) \((8554)_{10} = (?)_{6}\)
   (iv) \((221)_{6} = (?)_{10}\)

   (b) Perform the following using 8-bit notation and 2’s Complement :

   (i) \((78)_{10} - (36)_{10}\)
   (ii) \(-(45)_{10} - (35)_{10}\)

Unit II

4. (a) What is Venn Diagram? Draw Venn diagram for AND, OR, NOT operations. Also prove Second Absorption Law \(a + (\overline{a} \cdot b) = a + b\) using Venn diagram.

   (b) Simplify \(\overline{X} \overline{Y} + X + XY\).

(3)L-1193
5. (a) Convert the expression \( F = (\overline{X} + Y)X + Z(Y + Z) \) into standard POS form.
(b) Examine the validity of:
\( (XY)(YZ) = (\overline{X} + \overline{Y})(\overline{Y} + \overline{Z}) \)

**Unit III**

6. What is Combinational Logic? What are its characteristics? Explain the analysis procedure of Combinational logic.

7. Implement the following Boolean Functions using NOR gate:
(a) \( F = (A + \overline{B} + C)(A + \overline{B} + \overline{C})(A + B + C)(\overline{A} + \overline{B} + C) \)
(b) \( F = \overline{ABC} + \overline{ABC} + \overline{ABC} + ABC \)

**Unit IV**

8. What is Multiplexer? Explain all types of Multiplexer by using an example.

9. (a) Explain Half Subtractor.
(b) What is Decoder? Design 5 × 32 decoder with the help of 3 × 8 decoder.
Roll No. .......................... Total Pages : 04

BCA/D-20             1194
COMMUNICATIVE ENGLISH
BCA-115

Time : Three Hours] [Maximum Marks : 80

Note : Answer five questions in all, selecting exactly one question from each Unit. All questions carry equal marks.

Unit I

1. How did Gandhiji import the training of the spirit ?

Or

Discuss the play as a satire upon the Judicial system.
(Rory Aforesaid)

2. (i) How does Otto react when he learns that Dr. Krauss is coming to visit them?
(ii) Why would not Mr. Thomson be able to appear on behalf of MacCullum?
(iii) How did Ranji lose the “magic” bat?
(iv) How did the death of his mother come about?
(v) What was the complaint against the foreman? What was Foreman’s reply?

(3)L-1194 1
(vi) What is Narayan’s opinion about the prevailing system of Examination?

(vii) What does major say about Pokero?

**Unit II**

3. **Passage for comprehension**:

At a certain university in America I met an advanced soul. He taught Political Science. One month before the annual examination, he cycled the questions and distributed them among his students, who thereafter spent nearly twelve hours a day, in the library in the ‘assigned reading room’.

(a) Why is the teacher of political science described as “an advanced soul”?
(b) What did the teacher do one month before the examination?
(c) How did the students prepare themselves for the examination thereafter?
(d) How much time did they spend in the library?
(e) What conclusion can you draw from this paragraph?

4. (a) Write an e-Mail to your friend inviting him/her to your birthday party.
(b) Write down a fax to CEO Gary Fischer (987) 654-3210 regarding your plans to incorporate your recently acquired company into business circle.
(c) What is the text messaging and also write down the uses of text messaging?
Unit III

5. Attempt any eight sentences based on Grammar:
   (a) He is...............S.D.O. (Put a, an)
   (b) She is................good girl. (Put a, an)
   (c) Tom kills a tiger. (Change the voice)
   (d) The peon opened the gate. (Change the voice)
   (e) He works................8 to 9. (Preposition)
   (f) What’s the time............your watch? (Preposition)
   (g) He...................to college yesterday. (go, went)
   (h) She...................living in this city for last two years.
   (i) Children...................to school everyday. (go, goes)
   (j) They....................do exercise daily. (do not, does not)

6. Write down a paragraph of about 150 words on any one of given topics:
   (a) Water conservation
   (b) Female education
   (c) Environmental pollution
   (d) Computerisation: Its Advantages and Hazards.

Unit IV

7. Application for the post of Manager in Company.

   Or

   Write a letter to a firm of Transistors inquiring about the pocket transistors.

(3)L-1194 3

Unit V

9. Define Right to Information Act, 2005 and also explain its meaning, nature and scope of RTI, Sample RTI application form.

10. What is PIO (Public Information Officer) ? What are his/her obligations ? What kind of information can he/she refuse to give ?
1. (a) How is string constant different from character constant?
(b) List the operators having right to left associativity.
(c) How infinite loop is created?
(d) Can formal arguments and actual arguments have the same name?
(e) What is the default storage class of the variable?
(f) What are the inherent dangers of using external variables? 4,2,2,2,2,4
Unit I

2. Explain the characteristics and limitations of ‘C’ language.  
16

3. (a) What are the rules for naming identifier ?  
(b) Explain the purpose of various, backslash characters available in ‘C’.  
6,10

Unit II

4. (a) Discuss the hierarchy of operators ?  
(b) Differentiate between automatic types conversion and type casting.  
10,6

5. Explain switch statement. Compare it with nested IF structure.  
16

Unit III

6. (a) Explain continue statement. Differentiate between continue statement and break statement.  
(b) Write a program to print prime numbers between 1 and 200.  
6,10

7. Define function. How is it declared, called and defined ? Explain.  
16

(3)L-1195  2
Unit IV

8. Explain the following:
   (a) Scope of auto and static variables
   (b) Lifetime of static and External variables 8,8

9. (a) How a linear array is declared and initialized?
    How are the elements accessed?
   (b) Write a program to find largest and smallest among
    n array elements. 6,10
1. (a) Differentiate between structure and class.
   (b) How destructor function is defined?
   (c) How array of objects are created?
   (d) What are the functions available in C++ for manipulating strings?  
   \[4 \times 4 = 16\]

Unit I

2. Explain uses of scope resolution operator giving example.  
   \[16\]

3. (a) How class is declared? How objects are created? And member functions are called?
   (b) What are different ways of defining member functions? Give examples.  
   \[8, 8\]

(3) L-1196  
1
Unit II

4. Write a program to add two complex numbers. Use constructors only.  

5. Explain various manipulators used for formatting the console I/O.  

Unit III

6. (a) What is Friend function? What are its characteristics?  
   (b) Write a program to find average of \( n \) numbers?  
      (Use friend function for finding average).  

7. (a) What are reference variables? How are they declared?  
   (b) Write a program to interchange the value of two variables by using formal parameters as reference variables.  

Unit IV

8. (a) What is Operator Overloading? What are the rules of operator overloading?  
   (b) Write a program to overload operator \(+\) so that it joins two strings.  


(3)L-1196  2  

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Roll No. ..........................  Total Pages : 03

BCA/D-20                        1197
DATA STRUCTURES
BCA-232

Time : Three Hours]              [Maximum Marks : 80

Note : Attempt Five questions in all, selecting one question from each Unit in addition to compulsory Question No.1. All questions carry equal marks.

(Compulsory Question)

1. (a) Define Data Structure. Write a short note on complexity of algorithm. 4
   (b) How array and linked list differ from each other ? Explain. 4
   (c) Write a short note on applications of stack and queue. 4
   (d) Differentiate between tree and graph. 4

   Unit I

2. (a) Give classification of data structures with suitable examples. 10

(5)L-1197 1
(b) Elaborate on various data structure operations. 6

3. (a) Elaborate on various applications of data structures 8
(b) Write a short note on string operations. 8

Unit II

4. Define arrays and its types. Explain representation of one-dimensional and two-dimensional arrays in memory. Which operations can be performed on one-dimensional arrays? 16

5. How linked list is represented in the memory of computer? Explain traversing a linked list with suitable example. 16

Unit III

6. Define Stack. Which operations can be performed on Stack? Explain in detail with suitable examples. 16

7. How the queue can be implemented using array? Explain with suitable examples. Also elaborate on the type of operations that can be performed on queues. 16

(5)L-1197 2
Unit IV

8. What is the difference between general tree and binary tree? Explain the concept of tree traversal with suitable examples.

9. How can we represent graphs in memory? Explain the concept of traversing a graph with suitable examples.
Roll No. ................................. Total Pages : 03

BCA/D-20 1198

COMPUTER ARCHITECTURE
BCA-233

Time: Three Hours] [Maximum Marks : 80

Note: Attempt Five questions in all, selecting one question from each Unit in addition to compulsory Q. No. 1. All questions carry equal marks.

Compulsory Question

1. (a) Draw logic diagram of ADDER circuit.
   (b) What is Instruction Code?
   (c) What is RTL?
   (d) Explain circular shift left micro-operation with example.
   (e) What do you mean by control memory?
   (f) What is the function of Microprogram Sequencer?
   (g) Define Zero address instruction.
   (h) Write functions of I/O Interface.  \(8 \times 2 = 16\)

   \[8 \times 2 = 16\]

Unit I

2. (a) Write Instruction Format of a basic computer.  \[4\]

(2) L-1198 \[1\]
(b) What are the functions of Control Unit in Computer? 4
(c) Explain logic circuit for memory read and write operations. 8

3. Explain various Register Reference Instructions. 16

Unit II

4. (a) Explain design of Control Unit. 8
(b) Explain various Logic Micro-operations. 8

5. (a) Design 4-bit ALU circuit and explain its I/O operations. 8
(b) What will be the register value of binary data 10110110 after the following operations? 8
(i) Shift Left
(ii) Shift Right
(iii) Circular Shift Left
(iv) Circular Shift Right. 4×2=8

Unit III

6. (a) Explain stack organization with its operations. 8
(b) Design Microprogram control unit and explain its working. 8

(2)L-1198 2
7. Write notes on the following:
   (a) Program Control Data Transfer 8
   (b) Program Interrupt. 8

Unit IV

8. (a) Explain the role of Virtual Memory. 8
     (b) How is Cache Memory useful in increasing processing speed? 8

9. Distinguish RISC and CISC. Also describe various RISC instruction sets. 16
BCA/D-20 1199
SOFTWARE ENGINEERING
BCA-234

Time: Three Hours] [Maximum Marks: 80

Note: Attempt Five questions in all, selecting one question from each Unit in addition to the compulsory Q. No. 1.

(Compulsory Question)

1. (a) Name the characteristics of SRS.
   (b) Data Dictionary is called structured repository of data. Explain.
   (c) What is the difference between alpha and beta testing?
   (d) Name the steps of software maintenance. 4×4=16

Unit I

2. Explain the prototype model of software development. 16

3. Discuss the factors on which software quality depends. 16

(2)L-1199 1
Unit II

4. Explain the methods used for problem analysis. 16

5. What are the components of SRS? Explain briefly. 16

Unit III

6. Define module coupling and explain various types of module coupling. 16

7. Describe various problems during maintenance. Describe some solutions to these problems. 16

Unit IV

8. (a) What are Project Management Activities? What are issues?
(b) What is quality assurance plan? How defects are injected in software and are how they removed? 4,12

9. Explain the following briefly:
   (a) Verification and validation
   (b) System testing
   (c) Acceptance testing. 16

(2)L-1199 2
BCA/D-20 1200
FUNDAMENTALS OF DATABASE SYSTEM
BCA-235

Time : Three Hours] [Maximum Marks : 80

Note : Q. No. 1 is compulsory. In addition to that attempt four more questions, selecting exactly one question from each Unit. All questions carry equal marks.

Compulsory Question

1. (a) What is difference between data and information ?
   (b) What is the need of DBMS ?
   (c) Name various components of DBMS.
   (d) Difference between primary and secondary key.
   (e) What is the role of database designer ?
   (f) What is E-R data model ?
   (g) Define Tuple and attribute.
   (h) What is instance of a schema ? Define with example.

   2x8=16

Unit I

2. How database system is different from traditional file system ? Explain along with advantages and disadvantages of database system.

   16
3. Explain various types of database users. Explain the role of each in detail. 16

Unit II

4. (a) What is Data Independence? Explain various types of data independence. 8
(b) Define the following terms:
   Schema, Subschema, Instance of Schema, Data Dictionary. 8

5. What is Centralized and client server architecture of DBMS? Explain. 16

Unit III

6. What do you mean by Data Model? Discuss the various types of Data Model along with their advantages and disadvantages. 16

7. (a) Draw an E-R diagram for Company database system. 8
(b) What is an Entity? Explain the term weak and strong entity. 8

(2) L-1200 2
Unit IV

8. (a) What are relational constraints? Explain with example. Define:
   (i) Data value    (ii) Super Key
   (iii) Domain      (iv) Candidate Key.

(b) What is relationship between tables and views in relational database management systems? Explain with example.

9. (a) What is a relation model? Explain various properties of a relation.

(b) Explain the following terms:
   (i) Degree of a relation
   (ii) Cardinality of the relation
   (iii) Extension
   (iv) Intension.
1. (a) An approximate value of π is given 3.14278152 and its true value is 3.14159265. Find absolute, relative and percentage errors in the value of π. 3

(b) Deduce the order of convergence of Newton Raphson method. 3

(c) Establish a relationship between Δ (forward difference operator) and ∇ (backward difference operator). 3

(d) Find the suitable initial approximate value of real roots of equation $x^3 - 9x + 1$? 2

(5) 1
(e) Illustrate ill conditions in equation with one example.

(f) Construct the divided difference table for the data 
(0, 1), (1, 4) (3, 40) and (4, 85).

Unit I

2. (a) Using Newton-Raphson method, find a real root of 
equation \( f(x) = 3x^2 - 2x + 1 = 0 \) by choosing 
initial approx. upto 3 iterations.

(b) Explain normalized representation of floating point-
numbers and discuss advantages and limitation of 
normalised representation.

3. (a) Using Barvstow’s method to find a quadratic factor 
of polynomial : 
\[ x^5 + 2x^4 - 4x^3 + 5x^2 + 5x + 4 = 0 \]
upto 2 Iterations.

(b) Develop method to find the value of \( \sqrt{N} \), where N
is a real number by using Iterative method.

Unit II

4. (a) Solve the system of equations:

\[ 6x_1 - 2x_2 + x_3 = 11 \]
\[ -2x_1 + 7x_2 + 2x_3 = 5 \]
\[ x_1 + 2x_2 - 5x_3 = -1 \]

starting with initial vector [0, 0, 0] using Gauss Seidel method up to 2 Iterations.

(b) Given \( \frac{dy}{dx} = xy + y^2 \) and \( y(0) = 1, \ y(0.1) = 1.1169, \)
\( y(0.2) = 1.2773 \) and \( y(0.3) = .2267 \). Evaluate \( y(0.4) \) by predictor corrector method?

5. (a) Using Gauss Elimination method, solve the system of equations i.e.:

\[ 28x + 4y - z = 32 \]
\[ x + 3y + 10z = 24 \]
\[ 2x + 17y + 4z = 35 \]

(b) Find \( y(0.1), \ y(0.2) \) and \( y(0.3) \) from \( \frac{dy}{dx} = x + y^2; \)

(5)L-1201
\[ y(0) = 1 \] by using Runge Kutta method of 4th order and find \( y(0.4) \).

**Unit III**

6. (a) Using Lagrange’s interpolation formula, find the interpolated value of \( f(x) \) for \( x = 3 \) for table:

\[
\begin{array}{ccccc}
  x & 3.2 & 2.7 & 1.0 & 4.8 \\
  f(x) & 22.0 & 17.8 & 14.2 & 38.2 \\
\end{array}
\]

(b) The table gives the distance in nautical miles of visible horizon for height in feet above the earth surface as:

\[
\begin{array}{cccccccc}
  \text{Height} (x) & 100 & 150 & 200 & 250 & 300 & 350 & 400 \\
  \text{Distance} (y) & 10.63 & 13.03 & 15.04 & 16.81 & 18.42 & 19.9 & 21.27 \\
\end{array}
\]

Find the value of \( y \) when \( x = 218 \) feet using Newton Gregory forward interpolation formula.

7. (a) Given \( \frac{dy}{dx} = x + y^2 \); \( y(0) = 1 \) using Taylor’s series method to find value of \( y(0.1), \ y(0.2) \) and \( y(0.3) \).
(b) Define Chebyshev’s polynomials and their orthogonal properties. Write one application of Chebyshev’s polynomial.  

Unit IV

8. (a) Given that:

\[
\begin{array}{cccccccc}
  x & : & 1.0 & 1.1 & 1.2 & 1.3 & 1.4 & 1.5 & 1.6 \\
\end{array}
\]

Find \( \frac{dy}{dx} \) at \( x = 1.1 \).  

(b) Using Trapezoide’s rule, calculate \( \int_{0}^{1} x^2 \, dx \) by taking \( h = 0.2 \).  

9. (a) Apply Gaussian Quadrature formula to evaluate \( \int_{0}^{2} x^{-2} \, dx \).  

(b) Using Simpson’s \( \frac{1}{3} \) rd rule evaluate \( \int_{0}^{1} (1+x)^3 \, dx \) using \( n = 6 \) strips.  

(5)L-1201  

5
1. Write notes on the following:

(i) URL  
(ii) DNS  
(iii) FTP  
(iv) What do you mean by ‘Hypertext’ in HTML?  
(v) Why HTML is not considered a programming language?  
(vi) Differentiate between a Web Browser and a Search Engine using suitable example.  
(vii) Differentiate between a website and a webpage.

(5)L-1202 1
Unit I

2. Define Web Server. How a web server is different from any other computer? Explain the role of web servers in Internet based communication. 16

3. (a) Explain Hypertext Transfer Protocol. How HTTP is different from HTTPS? 8
   (b) What is the role of Internet Protocol (IP) in Internet? Briefly explain IPv4 and IPv6. 8

Unit II

4. (a) Explain different steps involved in developing a website. 8
   (b) Explain different Principles of good website design. 8

5. Explain website development process in detail. 16

Unit III

6. (a) What is HTML? Write history of HTML evolution. What are different elements of HTML program? 8
   (b) Create a webpage in HTML to indicate use of List <LI> tag. Use all types of lists in your webpage. 8 (5)L-1202  2
7. (a) Explain usage of Marquee tag in HTML with suitable example.  
    (b) Explain Font tag in HTML, giving all its attributes. Also create a webpage to indicate its use.

Unit IV

8. How can we create a table in HTML webpage? Explain all tags used in table creation. Also write a program for creating a table of your choice with proper formatting.

9. (a) What is a form? Describe syntax and use of &lt;FORM&gt; tag.  
    (b) Explain the following tags in HTML using suitable example:  
        (i) Radio Button     (ii) Check Box.
1. (a) What is an operating system? Explain its main functions.
   (b) What is a process? What is the difference between a program and a process?
   (c) What are the objectives of scheduling?
   (d) Describe the operations on processes.
   (e) What is a deadlock? What are the necessary conditions for a deadlock?
   (f) Describe critical section.
   (g) What is the difference between paging and segmentation in Memory Management?
   (h) Explain various input/output communication techniques.
Section A

2. (a) Explain different types of operating systems in detail.
What is the difference between batch processing and online processing?

(b) What is client server model? How is it different from other operating system structure? Write various advantages of client server model. 16

3. (a) Explain different process states and their transitions.

(b) What is CPU scheduling? What are the criteria for CPU scheduling? Also give a brief description of levels of CPU scheduling (schedulers). 16

Section B

4. (a) Explain the concept of time sharing system in detail.
What is time slice? How time sharing systems are different from distributed systems?

(b) Explain the concept of parallel processing systems.
What are the three commonly used architectural models for parallel machines? 16

(5)L-1203 2
5. (a) Explain various methods for handling deadlocks in detail.
   (b) Explain various deadlock detection and recovery algorithms.  

Section C

6. (a) Explain the concept of memory management. What are the different techniques of memory allocation in a system? What are the advantages and disadvantages of different memory allocation techniques?
   (b) Describe the concept of Page Memory Management or Paging in detail.  

7. (a) Explain the concept of virtual memory in detail. Write its advantages and disadvantages.
   (b) What is demand paging? What is a page fault? Write the steps to handle a page fault.  

Section D

8. (a) Explain the concept of file management in detail. What are the different methods for accessing a file?
(b) Write short notes on the following:
   (i) Contiguous allocation method
   (ii) Linked allocation method
   (iii) Indexed allocation method.

9. (a) Explain the concept of real time systems. How are they different from time sharing systems?
(b) Define multiprogramming. How is it different from multitasking O.S.? Explain, how multiprogramming ensures effective utilisation of main memory and CPU?
1. (a) What is an operating system? Explain its main functions.
(b) What is a process? What is the difference between a program and a process?
(c) What are the objectives of scheduling?
(d) Describe the operations on processes.
(e) What is a deadlock? What are the necessary conditions for a deadlock?
(f) Describe critical section.
(g) What is the difference between paging and segmentation in Memory Management?
(h) Explain various input/output communication techniques.
Section A

2. (a) Explain different types of operating systems in detail. What is the difference between batch processing and online processing?

(b) What is client server model? How is it different from other operating system structure? Write various advantages of client server model.  

3. (a) Explain different process states and their transitions.

(b) What is CPU scheduling? What are the criteria for CPU scheduling? Also give a brief description of levels of CPU scheduling (schedulers).

Section B

4. (a) Explain the concept of time sharing system in detail. What is time slice? How time sharing systems are different from distributed systems?

(b) Explain the concept of parallel processing systems. What are the three commonly used architectural models for parallel machines?  

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2

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Roll No. .........................  Total Pages : 03

BCA/D-20  1204
ARTIFICIAL INTELLIGENCE
BCA-353

Time : Three Hours]  [Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.
In addition to compulsory question, student will have to attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

*(Compulsory Question)*

1. (a) Discuss Turing Test  4
   (b) What are the advantages of Speech Recognition ?  4
   (c) What is Expert System ? Discuss.  4
   (d) Explain Best First Search.  4

   **Unit I**

2. What is Artificial Intelligence ? Discuss methods of Problem representation in AI along with their characteristics.  16

(5)L-1204  1
3. Discuss the historical evolution of AI. Also discuss the various application areas of AI.  

   Unit II

4. Discuss the features of Expert System. Also discuss the various categories of Expert System.  

5. (a) Explain the life-cycle of an Expert System.  
   (b) Discuss the application areas of Expert Systems.  

   Unit III

6. Explain Brute Force Search Techniques with suitable example.  

7. Explain the following:  
   (a) Mean End Analysis  
   (b) Hill Climbing Algorithm.  

   Unit IV

8. Explain need of natural language processing. What are the solutions of Natural Language Processing Problems? Discuss.  

(5)L-1204  

2
9. (a) Explain the concept of a robot along with its major components.

(b) Discuss the following:
   (i) Intelligent Robots
   (ii) Mobile Robots.
BCA/D-20
COMPUTER NETWORKING
Paper : BCA-354

Time : Three Hours] [Maximum Marks : 80

Note : Candidates are required to attempt *Five* questions in all. Q. No. 1 is compulsory. In addition to compulsory question, candidates have to attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

**Unit I**

1. (a) Write a short note on Repeaters. 2
   (b) Explain Web Based Model. 2
   (c) Define Baud Rate. 2
   (d) What do you mean by Cable Modem ? 2
   (e) What is Load shedding ? 2
   (f) Write a short note on CSMA. 2
   (g) Write short note on Digital Signature. 2
   (h) What do you mean by Token Ring ? 2

(5)L-1205 1
Unit II

2. Explain OSI model in detail. 16

3. (a) Differentiate between client server model and Peer to Peer Network Model. 8
      (b) Write a short note on connectors, PC cards, Bridges, Transceivers. 8

Unit III

4. (a) Explain wireless Transmission Media in detail. 8
      (b) Explain ADSL in detail. 8

5. Explain Switching Techniques in detail. 16

Unit IV

6. (a) Explain ALOHA and Slotted ALOHA in detail. 8
      (b) Explain Sliding Window Protocol. 8

7. Give a brief description of various wired technologies. 16

Unit V

8. (a) Distinguish between Distance vector routing and Link State Routing. 8

(5)L-1205 2
(b) Define Choke Packets and Flooding. 8

9. (a) What are Firewall? Explain types of firewall. 8
(b) Explain shortest path routing. 8
BCA/D-20 1206
PROGRAMMING USING VISUAL BASIC
Paper : 355

Time : Three Hours] [Maximum Marks : 80

Note : Attempt Five questions in all, selecting one question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. Attempt all parts of this question : 16
   (i) VB as Event driven and object based Language
   (ii) Scope and life time of a variable
   (iii) Static and dynamic array
   (iv) General and event procedure.

Unit I

2. Explain the various features of Visual Basic (VB). 16
3. Explain the default controls in Event Driven programming. 16

Unit II

4. Explain various data types available in Visual Basic. 16

(5)L-1206 1
5. Which are various controls for Input/output in VB?
   Explain. 16

Unit III

6. Explain various decision statements in VB. 16
7. Explain various looping statements in VB. 16

Unit IV

8. Write a program in VB to find HCF of two given numbers. 16
9. Write a program in VB to find greatest among N numbers. 16
Note: Attempt Five questions in all. Q. No. 1 is compulsory.

In addition to compulsory question, attempt four more questions, selecting at least one question from each Unit.

1. (a) Describe the basic characteristics of requirements for selecting a multimedia authority tool.
   
   (b) Describe the components of multimedia.
   
   (c) What are the multimedia supported audio format in android?
   
   (d) State ADPCM.  

   Unit I

2. (a) Define multimedia authoring tools. How is it better than multimedia programming tools.

   (b) Differentiate hypermedia and multimedia.

(5)L-1207
3. What are the hardware and software requirements for multimedia computer? Explain the various multimedia applications.

Unit II

4. (a) Distinguish between the following:
(i) Image and graphics
(ii) Video and animation.
(b) Write a short note on Analog Video Standards: PAL and SECA.

5. Explain various color models in images and videos.

Unit III

6. What is quantization in multimedia? How to perform the transmission of audio? Explain.

7. (a) With a diagram show how MIDI instruments can be interfaced with a PC.
(b) What is pulse code modulation?

Unit IV

8. Explain run-length coding and transform coding in detail.

(5)L-1207
9. (a) Discuss in detail the JPEG compression scheme.
(b) Explain any two video compression techniques: 10
   (i) H.261
   (ii) H.263
   (ii) MPEG