Q1) A) Choose the appropriate option.

a) __________ is a translator that translates source instruction into target instruction, one to one basis.
   i) Assembler   ii) Machine Compiler
   iii) Converter  iv) Interpreter

b) M B R Stands for____
   i) Mini Boot Record   ii) Master Break Record
   iii) Master Boot Race  iv) Master Boot Record

c) Which DOS Command is used to list all of the files in the current directory?
   i) CLS   ii) DIR
   iii) SHOW  iv) None of the above

d) GUI stands for____
   i) Geographical User Interchange
   ii) Geometrical User Interface
   iii) Graphical User Interface
   iv) None of the above
e) ____ is the process of consolidating fragmented data on a Volume so it will work more efficiently.
   i) Disk defragmentation   ii) Program
   iii) Compression         iv) Disk cleanup
f) ____ is Volatile Memory device.
   i) PROM                  ii) EPROM
   iii) ROM                iv) RAM

g) ____ is a systematic approach to problem solving that is often used to find and correct issues with complex machines, electronics, computers and software system.
   i) Troubleshooting      ii) PC Wizard
   iii) HW Info            iv) None of the above

B) Define following terms: [7]
   a) PROM
   b) Compiler
   c) Vi editor
   d) Desktop
   e) Theme
   f) Registers
   g) Spreadsheet

GROUP - I

Q2) Answer the following.
   a) What is input devices? Explain at least two input devices in detail. [5]
   b) What is computer? What are the characteristics of computer. [5]
   c) Write notes on:
      i) ROM
      ii) Application Software

[5319]-1001  2
Q3) Attempt the following.
   a) Explain Mainframe Computer in detail
   b) Write short note on:
      i) BIOS
      ii) Octal Number System
   c) Convert following decimal number in to binary number
      i) \((56)_{10}\)
      ii) \((187)_{10}\)
   d) Explain the Usage of spreadsheet

Q4) Answer the following.
   a) Explain block diagram of computer in detail
   b) Explain CRT monitor in detail
   c) Explain various Presentation tools
   d) Explain various Spreadsheet Software

GROUP-II

Q5) Answer the following.
   a) Define O.S? Explain any four function of O.S.
   b) What do you mean by High level language? What are features of High level language?
   c) Write Short note on:
      i) Motherboard
      ii) Scanner

Q6) Answer the following.
   a) Explain any four networking related Problem with Solution
   b) What is hardware? Explain types of Hardware
   c) Write note on:
      i) Slide Animation
      ii) Powerpoint Background
   d) Explain any three features of word processor
Q7) Answer the following.

a) Explain any four external DOS Commands with example [4]

b) Write short note on: [4]
   i) Dot Matrix Printer
   ii) Menu

c) Convert the following. [3]
   i) \((14268)_{10} = (?)_{16}\)
   ii) \((436)_{8} = (?)_{2}\)
   iii) \((1011)_{2} = (?)_{8}\)

d) Solve the following. [3]
   i) \(1100110 + 1001101\)
   ii) \(1101 - 111\)
P1003

F.Y.B.C.A.

SCIENCE

BCA - 102: Basic Programming in ‘c’
(2016 Pattern) (Semester-I)

Time : 3 Hours

Instructions to the candidates :
1) Question No.1 (A and B) are compulsory.
2) Attempt any two questions from Group-I.
3) Attempt any two questions from Group-II.
4) Figures to the right indicate full Marks.

Q1) A) Choose Correct Option. [7]

a) The operator? : is a _____ operator.
   i) unary  ii) binary
   iii) ternary  iv) none of these.

b) The Prototype of a function is used to ____
   i) define a function  ii) declare a function
   iii) delete a function  iv) all of these.

c) Which of the following is not an arithmetic operator.
   i)  a * = 10  ii)  a/ = 10
   iii)  a ! = 10  iv)  a % = 10

d) The value obtained in the function is given back to main by using keyword____
   i)  return  ii)  static
   iii)  new  iv)  volatile

P.T.O.
e) Size of an array can be evaluated by (assuming array declaration int a [10];)
   i) size of (a)  
   ii) size of (*a)  
   iii) size of (a[10])  
   iv) size of (a) * 10  

f) ____ of the following is unconditional control statement.
   i) do - while  
   ii) goto  
   iii) for  
   iv) if - else

   g) The function ‘getch’ is define in ______ header file.
   i) < conio.h >  
   ii) < stdio.h >  
   iii) < math.h >  
   iv) < cty pe-h >

B) Answer the following. [7]
   a) What is the use of printf statement?
   b) Define function.
   c) What is escape sequence for null character?
   d) What is the use of puts ().
   e) Define array. Give example.
   f) What is type casting.
   g) What does associativity specify?

GROUP - I

Q2) Attempt the following. [5]
   a) Explain basic data types in ‘c’ language.
   b) Give advantages and disadvantages of algorithm.
   c) Draw a flowchart to find maximum of three numbers.
Q3) Attempt the following.

a) Describe the structure of ‘c’ program with the help of diagram. [4]


c) Write an algorithm to check if the given number is prime or not [3]

d) Explain enumerated data type with syntax. [3]

Q4) Attempt the following.

a) What is recursion? Explain with example. [4]

b) Trace the output with justification.

int main ()
{
  int arr [] = { }

  printf ("%d", size of (arr) ) ;

  return o ;

}

c) Give the difference between entry controlled loop and exit controlled loop. [3]

d) Explain switch-case statement with an example. [3]

GROUP-II

Q5) Attempt the following.

a) Explain “for” loop with syntax & example. [5]

b) Write a “c” program to reverse the given number. [5]

c) Explain different storage classes. [4]
**Q6)** Attempt the following.

a) What is escape sequence? Explain with examples. \([4]\)

b) Explain with an example row and column major representation of two-dimensional array. \([4]\)

c) Explain call by reference with example. \([3]\)

d) Explain the following functions with an example. \([3]\)
   
i) `getchar ( )`
   
ii) `Putchar ( )`
   
iii) `getch ( )`

**Q7)** Attempt the following.

a) Define a flow chart & explain its symbols. \([4]\)

b) Explain features of ‘c’ language. \([4]\)

c) Write an algorithm to convert temperature from celcius to Fahrenheit. \([3]\)

d) Explain different types of constants with an example. \([3]\)

---

[5319]-1002 4
Q1) A) Choose the correct alternatives. [7]

a) If A and B are any two sets in universal set U then \((A \cap B)^c\) is

i) \(A^c \cup B^c\)  
ii) \(A^c \cap B^c\)

iii) \(A^c \cup B\)  
iv) None of these

b) Which of the following is correct

i) \(N \subset Z \subset R\)  
ii) \(R \subset Z \subset N\)

iii) \(N \subset R \subset Z\)  
iv) None of these

c) If \(A = \{1, 2, 3\}\) then power set \(A\) is

i) \(|P(A)| = 8\)  
ii) \(|P(A)| = 9\)

iii) \(|P(A)| = 6\)  
iv) None of these

d) Sum the squares of the first \(n\) natural numbers is

i) \(n^2\)  
ii) \(\frac{n^2(n+1)^2}{4}\)

iii) \(\frac{n(n+1)(2n+1)}{6}\)  
iv) None of these

P.T.O.
e) Consider the following two equations

\[ x^2 - 10x + 16 = 0 \quad \text{and} \quad x^2 = 8x \]

The set of solutions of equations in \( z \) are

i) same  
ii) disjoint  

iii) Not same  
iv) None of these

f) The permutation \( f = 23514 \) of (5) is an

i) odd permutation  
ii) even permutation  

iii) Identity permutation  
iv) None of these

g) Every non-empty subset of \( N \) has

i) a maximum element  
ii) a least element  

iii) zero element  
iv) none of these

B) Answer the following in one or two lines.

[7]

a) Draw the functional digraph of permutation \( f = 23416785 \).

b) Determine the coefficient of \( x^4 \, y^5 \) in the expression of \( (x + y)^9 \).

c) What is the negation of statement “There is an honest politician”.

d) Find the sum: \( \sum_{x=1}^{k} X \).

e) Obtain the condition that the equation \( x^2 + bx + c = 0 \) has two distinct real solutions.

f) For \( n \in N \), obtain a formula for \( \sum_{i=1}^{n} n' \).

g) Define: Combinations.
Q2) Attempt the following questions:
   a) If X and Y are real numbers then show that \(2XY \leq X^2 + Y^2\) and
      \[XY \leq \left(\frac{X+Y}{2}\right)^2.\]  [5]
   b) Let \(S = \{(x,y) \in \mathbb{N}^2 \mid (2-x)(2+y) > 2(y-x)\}\)
      and \(T = \{(1, 1), (1, 2), (1, 3), (2, 1), (3, 1)\}\). Prove that \(S = T.\)  [5]
   c) State any four field axioms for addition.  [4]

Q3) Attempt the following questions:
   a) Show that \((P \rightarrow Q) \leftrightarrow ((\neg P) \vee Q)\) is a tautology.  [4]
   b) Prove that \(\sqrt{2}\) is an irrational.  [4]
   c) Using mathematical induction, prove that \(n < 2^n \forall n \in \mathbb{N}.\)  [3]
   d) Let \(f, g : \mathbb{R} \rightarrow \mathbb{R}\) be functions. If \(f\) and \(g\) are bounded then show that \(f + g\) is bounded.  [3]

Q4) Attempt the following questions:
   a) If \(a, r \in \mathbb{R}, r \neq 1\) and \(n \in \mathbb{N},\) then prove that
      \[\sum_{i=0}^{n} ar^i = a + ar + ar^2 + \ldots + ar^n = a \left(\frac{r^{n+1} - 1}{r - 1}\right).\]  [4]
   b) For all \(n \in \mathbb{N},\) show that \(\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}.\)  [4]
   c) Which integer is bigger \((222)_{(11)}\) or \((2222)_{(6)}\)? Justify.  [3]
   d) For \(n \in \mathbb{N},\) find the formula for, \(\sum_{k=1}^{n} \frac{1}{k(k+1)}.\)  [3]
[GROUP - II]

**Q5)** Attempt the following questions:

a) Prove that, there is one-to-one correspondence between N and Z. [5]

b) Determine whether the function \( f : \mathbb{R} \to \mathbb{R} \) determined by \( f(x) = \frac{1}{1 + x^2} \) is bijection. [5]

c) If there is a bijection \( f : [m] \to [n] \) then prove that \( m = n \). [4]

**Q6)** Attempt the following questions:

a) Show that, \( \mathbb{N} \times \mathbb{N} \) is countable. [4]

b) Show that the total number of subsets of a set S with \( n \) elements is \( 2^n \). [4]

c) If \( f = 132 \) and \( g = 213 \) are permutations of [3] then find functional digraph of \( fog \) and \( gof \). [3]

d) Represent rotation by 90 degrees in permutation form. [3]

**Q7)** Attempt the following questions.

a) If \( P \) is a prime number and \( P | ab \) then prove that either \( P \) divides \( a \) or \( P \) divides \( b \). [4]

b) Show that there are infinitely many primes. [4]

c) Solve the following Dart Board problem \( 2x + 3y = 1 \). [3]

d) Find g.c.d of \( P = x^3 - 2x^2 + 6x - 5 \) and \( q = x^2 - 2x + 1 \). [3]

\[ E E E \]
Instructions to the candidates:

1) Question No-1(a and b) are compulsory.
2) Attempt any two questions from group-I.
3) Attempt any two questions from group-II.
4) Figures to the right indicate full marks.
5) Draw Neat diagrams wherever necessary.

Q1) A) Choose correct answer from the options. [7]

a) Stage fear is ________ barrier.
   i) Technical
   ii) Physical
   iii) Cultural
   iv) Psychological

b) Memo is
   i) Warning
   ii) appreciation
   iii) Promotion
   iv) appology

c) Notice of meeting is__________
   i) Agenda
   ii) information
   iii) legal action
   iv) verbal

d) Gossip is__________ Communication.
   i) Emotional
   ii) informal
   iii) Non-verbal
   iv) memo

e) Empathy means______________
   i) Conflict
   ii) body language
   iii) understanding others
   iv) agenda

P.T.O.
f) Traffic signal is ___________ communication.
   i) Oral   ii) verbal
   iii) Non-verbal   iv) Formal

g) Feedback is ___________ of communication.
   i) Conclusion   ii) Channel
   iii) mode   iv) Formal way

Q1) B) Answer briefly. [7]
   a) Silence - effective communication.
   b) Importance of feedback.
   c) Reasons of conflict.
   d) Manner of oral communication.
   e) Psychological barriers.
   f) objectives of Non-verbal communication.
   g) Informal communication.

Group-I

Q2) a) ‘Factors causing psychological barrier are internal’ Explain. [5]
   c) What is the significance of body language. [4]

Q3) a) Define verbal communication and state examples. [4]
   b) What are the aspects of report writing. [4]
   c) What is informal communication? How it is different from formal? [3]
   d) Write note on Body language. [3]

Q4) a) State the advantages of verbal communication. [4]
   b) What is the scope of language in communication? [4]
   c) What is principle of Selecting proper channel? [3]
   d) What is the process of communication? [3]
Group-II

Q5) a) How communication solve conflicts? [5]
   b) Write a letter of enquiry asking for the rates of S.T Bus for industrial visit? [5]
   c) Draft a report of Independence day Celebrated in your college? [4]

Q6) a) Write an application letter for the post of marketing manager? [4]
   b) Draft a resume. [4]
   c) How effective are SMS today? [3]

Q7) a) What are steps of resolving conflict? [4]
   b) What is negotiation skill? [4]
   c) What are the aspects of interview? [3]
   d) Why group discussion is important? [3]
Q1) A) Choose the correct option.

a) Which combinational circuit is used for addition of two bits?
   i) Half Adder ii) Multiplexer
   iii) Encoder iv) Subtractor

b) Which of the following is the example of weighted number system?
   i) Gray ii) Hexadecimal
   iii) Ascll iv) EBCDIC

c) Which Flip Flop is used to remove invalid condition?
   i) SR ii) JK
   iii) Clocked SR iv) Master slave JK

d) Pop operation is used to _________
   i) Read data from stack ii) Write data in to stack
   iii) Write data to Rom iv) None

e) _________ is the IC for 2 I/P OR gate operation.
   i) IC7400 ii) IC7402
   iii) YE7432 iv) IC7408

P.T.O.
f) Which combinational circuit is used for subtraction of two bits.
   i) Half Adder  ii) Multiplexer
   iii) Encoder  iv) Subtractor

g) Which of the following is not in memory hierarchy.
   i) RAM  ii) ROM
   iii) PROM  iv) None of the above

B) Define the terms: [7]
   a) Pipe line
   b) Ring counter
   c) IVT
   d) ALU
   e) Cache memory
   f) Encoder
   g) Parity

**Group-I**

**Q2)** Answer the following;
   a) Describe the working of RS flip flop with logic diagram & truth table. [5]
   b) Explain 1 to 4 Demultiplexer with circuit. Write applications of demultiplexer. [5]
   c) Write a short note on registers in 8086? [4]

**Q3)** Answer the following;
   a) How to implement full adder using two half adders. Draw logic diagram & its truth table. [4]
   b) Write a short note on weighted & unweighted codes with an example. [4]
   c) State De- Morgan’s 2nd Theorem & prove it. [3]
   d) Differentiate between synchronous and asynchronous counters with an example. [3]
**Q4** Answer the following:

a) What is stack? What are the different operation on a stack?  

b) Draw neat diagram of 3-bit combined up down asynchronous counter & Explain its working.  

c) Simplify \((A + \overline{A})\). \((BA + BA \overline{C})\) and draw simplified circuit.  

d) What is an Interrupt? What are its types?  

---

**Group-II**

**Q5** Answer the following:

a) Draw block Diagram of 8086 and Explain the flag register.  

b) Write a short note on memory hierarchy.  

c) Perform the following conversions.

\[
\begin{align*}
\text{i)} & \quad (234)_{10} = (?)_{16} \\
\text{ii)} & \quad (142)_{10} = (?)_{2} \\
\text{iii)} & \quad (1011)_{2} = (?)_{\text{gray}} \\
\text{iv)} & \quad (1101)_{\text{gray}} = (?)_{2}
\end{align*}
\]

---

**Q6** Answer the following:

a) Explain implementation of D and T flip flop and their applications.  

b) Differentiate between RISC and CISC.  

c) Build OR & AND gate using NOR gate.  

d) Write a note on Excess-3 code.  

---

**Q7** Answer the following:

a) Draw logic gate, Boolean equation & truth table for all 3 I/P universal logic gates.  

b) What are the different ways of serial data transfer? Explain the typical frame format of synchronous and asynchronous data.  

c) Distinguish between serial and parallel data transfer.  

d) Mention the functions of a CPU.
P1007

[5319] - 2002
F.Y. B.C.A. (Science)

BCA-202: ADVANCED PROGRAMMING IN ‘C’
(2016 Pattern) (Semester II)

Time : 3 Hours] [Max. Marks : 70

Instructions to the candidates:

1) Question No.1 (a and b) are compulsory.
2) Attempt any two questions from Group-I.
3) Attempt any two questions from Group-II.
4) Figures to the right indicate full marks.

Q1) a) Choose correct option:

i) ______ symbol is used to terminate a string.

   1) NULL  2) \0
   3) .  4) /0

ii) Trace the output.
   char str [20] = “Bye”;
   printf (“ % C ”, * str);

   1) Bye  2) B
   3) y  4) Error

iii) Which of the following is macro continuation preprocessor operator.

   1) #  2) # #
   3) /  4) \
iv) Which of the following is appropriate for reading multi - word string?
   1) printf ( ) 2) scanf ( )
   3) gets ( ) 4) puts ( )

v) Data written into a file using fwrite ( )
   Can be read back using
   1) fscanf ( ) 2) fread ( )
   3) fgets ( ) 4) All of the above

vi) If variable is a pointer to a structure, then which of the following operator is used to access data members of the structure.
   1) & 2) .
   3) * 4) \rightarrow

vii) Which of the following is compiler control directive?
   1) #ifdef 2) #define
   3) #include 4) All of the above

b) Answer the following: [7]

i) What is # pragma directive?

ii) What is purpose of strtok ( ) Function?

iii) Define pointer to pointer.

iv) How is a union declared?

v) Give syntax of fseek ( ) function.

vi) Find memory required for the following:
   struct demo
   {
       int x ;
       char y [15] ;
   } d ;
   [Note - Assume ‘int’ takes 4 bytes]

vii) What is significance of orgv [0]?
Group - I

Q2) Attempt the following:
   a) What do you mean by ‘Array of pointers’ and ‘pointer to array’? Explain with an example. [5]

   b) Write a C program that accepts ‘n’ words and display the longest word.[5]

   c) Explain Bitfield concept with an example. [4]

Q3) Attempt the following:
   a) Write a C program to check whether a string is palindrome or not. [4]

   b) Write a difference between structure and union with example. [4]

   c) Trace the out put and Justify.

```
int main()
{
    static char s[] = “Tendulkar”;
    char * P;
    P = &S[8] - 8;
    while (* P )
        printf(“% C “ * p++) ;
}
```
   d) Explain nested structure with an example. [3]

Q4) Attempt the following:
   a) Explain ‘Function returning pointer’ concept. [4]

   b) Write a C program to copy contents of one file into another file. [4]

   c) Trace the output and Justify.

```
union exam
{
    int a, b;
};
```

```
e.a = 5;
e.b =7
printf(“% d”, e.a);
```
   d) List any three string handling function with their usage. [3]
Group - II

Q5) Attempt the following:
   a) Write a C program to accept and display book details of ‘n’ books as book-title, author, publisher and cost. [5]
   b) Write user defined functions to copy one string into another string and reverse the string without using standard library functions. [5]
   c) Define Dynamic memory Allocation. What are the advantages of dynamic memory allocation over static allocation? [4]

Q6) Attempt the following:
   a) Explain fseek ( ) function in detail. [4]
   b) Compare Macro and Function. [4]
   c) Trace the output and Justify.
      struct student
      {
         int roll;
         char name [10];
      } S1, * P, S[5];
      printf (“% d % d % d”, sizeof (S1), sizeof (P), sizeof (S)); [3]
   d) Define union. Explain how to access it’s member. Give example. [3]

Q7) Attempt the following:
   a) Explain ‘pointer to structure’ concept with example. [4]
   c) Explain any three predefined macros. [3]
   d) Explain the purpose of each of the following.
      declarations
      i) int *P [5]
      ii) int f1 (int *P [ ])
      iii) int * f2 (int *P [])

[5319] - 2002  4
Q1) A) Attempt all of the following: [7×1=7]

a) Which of the following is not the type of file organisation.
   i) heap 
   ii) sort 
   iii) hash 
   iv) sparse

b) A set of logically related record forms a ________
   i) database 
   ii) file 
   iii) record 
   iv) None

c) In ER diagram, weak entity is represented by_______
   i) double rectangle 
   ii) Rectangle 
   iii) double ellipse 
   iv) dashed ellipse

d) In relational model, relations are termed as_______
   i) tuples 
   ii) attributes 
   iii) tables 
   iv) rows

e) The language that require a user to specify the data to be retrieved without specifying exact to get it is_______
   i) procedural DML 
   ii) non-procedural DML 
   iii) procedural DDL 
   iv) non-procedural DDL

f) SQL uses logical connectives not as_______
   i) and 
   ii) or 
   iii) not 
   iv) as
g) If A → C, CD → E then A → E is, ____________
   i) transitivity rule ii) pseudo transitivity rule
   iii) union rule iv) none

B) Attempt all of the following: [7x1=7]
   a) What do you mean by physical and logical file?
   b) Define variable length record.
   c) Define : instance of database.
   d) Define : weak entity set
   e) What do you mean by a domain?
   f) Explain the use of order by clause.
   g) What do you mean by decomposition?

GROUP-I

Q2) Attempt all of the following: [5+5+4=14]
   a) Differentiate between ISAM & B+tree structure?
   b) A motor vehicle branch administers driving tests and issues driver’s licenses. Any person who wants a driver’s licence must first take a learner’s exam at any motor vehicle branch in the province. If he/she fails the exam, he can take the exam again any time after a week of the failed exam date, at any branch. If he passes the exam, he is issued a license (type=learners) with a unique licence number. The person may take his drives exam at any branch any time before the learner’s licence expiry date (Which is usually set at six months after the licence issue date). If he passes the exam, branch issues him a driver’s licence.
   Identify the entities and attributes.
   Draw ER diagram.
   c) Write a short note on key constraints.

Q3) Attempt all of the following: [4+4+3+3=14]
   a) Define constraint state & explain any two types of constraint.
   b) Define a key. Differentiate between primary key, candidate key & superkey.
   c) Consider following entity relationship diagram and convert it into relational model

   ![ER Diagram]

   d) Explain basic structure at SQL queries.
**Q4** Attempt all of the following \( [4+4+3+3=14] \)

a) Consider, \( R(A, B, C, D, G, H, I) \) & Set of functional dependency are \( F=\{ A \rightarrow B, A \rightarrow C, CG \rightarrow H, CG \rightarrow I, B \rightarrow H \} \)

Compute \( F^+ \).

b) What are the types of SQL joins?

c) Consider following relational schema.

Game (gno, gname, no. of players, coach name, captain)

Player (Pno, Pname).

Game and player are related with many-many.

Draw an ER diagram.

d) What is DBA? Explain any two functions of DBA.

**GROUP-II**

**Q5** Attempt all of the following: \( [5+5+4=14] \)

a) Consider the following

Wholesaler (wno, wname, addr, city)

Product (Pno, Pname)

Wholesaler and product are related with m-m. Create a relational dB for above & convert it in 3NF & solve following queries

i) List all the wholesaler of product books.

ii) Count the number at wholesaler in city Mumbai.

iii) To print wholesalerwise product.

b) Consider following relation.

Person (pnumber, pname, birthdate, in come)

Area (aname, area-type)

Area can have 1/more person living in it but person belongs to exactly one area.

An attribute area type can have vaule urban/rural. Convert dB into 3NF and solve.

i) List names of all people in rural area

ii) Give count of people whose income is below 30,000

iii) List names of all people whose birthday is in January

c) What are SQL clauses to modify to database? Explain.

**Q6** Attempt all of the following: \( [4+4+3+3=14] \)

a) Explain the aggregate functions is SQL

b) Explain set membership & set comparison in SQL.
c) Explain the 3NF algorithm

d) What are advantages and disadvantages of DBMS?

**Q7** Attempt all of the following; 

**[4+4+3+3=14]**

a) Consider, \( R = \{A, B, C, D, E, F, G, H\} \)

\[ F = \{ A \rightarrow D, AB \rightarrow DE, CE \rightarrow G, E \rightarrow H \} \]

Determine \( AB^+ \) & \( CF^+ \).

b) What is decomposition? What are desirable properties of decomposition?

c) Explain pitfalls in RDBMS.

d) Explain different data types in SQL.

\[ \checkmark \checkmark \checkmark \]
P1010

[5319] - 3001
S.Y.B.C.A. (Science)
BCA-301: DATA STRUCTURE
(2016 Pattern) (Semester - III)

Time : 3 Hours] 
[Max. Marks : 70

Instructions to the candidates:

1) Question No. 1 is compulsory.
2) Attempt any two questions from Group I and any two questions from Group II.
3) All questions carry equal marks.
4) Figures to the right indicate full marks.
5) Assume suitable data if necessary.

Q1) A) Attempt the following: [7]

a) An array is a ________ datatype.
   i) user-defined   ii) derived
   iii) enumerated   iv) none of these

b) The complexity of linear search is ________.
   i) O (log (n))   ii) O (n)
   iii) O (n log n)   iv) none of these

c) An empty linked list consists of ________.
   i) a variable   ii) data and a link
   iii) two nodes   iv) a null head pointer

d) State true/false
   Stack allow us to add and remove elements from one end i.e top.
   i) true    ii) false

P.T.O.
e) Queue _______.
   i) can be created by setting up an ordinary contiguous array to hold the items
   ii) can take care of delete operation automatically
   iii) need one pointer to handle addition and deletion of an item
   iv) none of these
f) The indegree of ________ of a tree is always zero.
   i) any node  ii) branch node
   iii) the root node  iv) a leaf node
g) The number of distinct simple graph upto 3 nodes is _______.
   i) 15  ii) 10
   iii) 7  iv) 9

B) Attempt the following: [7]
   a) Define: Data object.
   b) Calculate address of A (2, 3) of integer array of size 4×4 with base address 100.
   c) Define: Linked list
   d) List the different primitive stack operations.
   e) Traverse the following tree in:
      i) Preorder
      ii) Inorder

f) Define complete graph.
   g) List the applications of queue.
GROUP-I

Q2) Attempt the following:
   a) Describe different types of linked list. [5]
   b) Sort the given array using quick sort algorithm
      35 45 42 57 26 [5]
   c) Explain the derived data types. [4]

Q3) Attempt the following:
   a) Write the algorithm for bubble sort. [4]
   b) Write an algorithm for traversing a linked list and also give its function. [4]
   c) Explain the row-major representation of an array. [3]
   d) List the applications of linked list and explain any one. [3]

Q4) Attempt the following:
   a) Consider the postfix expression PQ+RS−*. Give the steps for evaluation
      when P = 9, Q = 8, R = 7 and S = 4. [4]
   b) What is a circular queue. Give its advantages. [4]
   c) Define the terms: [3]
      i) Node
      ii) Edge
      iii) Path
   d) What is a critical path. [3]

GROUP-II

Q5) Attempt the following:
   a) What are the different tree traversal methods. Explain with example. [5]
   b) Illustrate different forms of writing an arithmetic expression with proper
      example. [5]
   c) Write the functions to implement following operations on queue [4]
      i) insert
      ii) delete
      iii) isfull
      iv) isempty
**Q6)** Attempt the following:

a) Write the function to count leaf nodes of a binary tree.  

b) Construct adjacency matrix and adjacency list for the following graph.  

![Graph Image]

c) What is Priority Queue. How are they implemented.  

d) Construct a Binary search tree for the following elements: 

\[ 16 \ 12 \ 14 \ 9 \ 10 \ 18 \]

**Q7)** Attempt the following:

a) Draw the generalised list for given polynomial  

\[ P(x) = 3x^5 + 9x^2 + 15x + 3 \]

b) Explain the static implementation of stack.  

c) State the disadvantages of array representation of linked list.  

d) Define algorithm. Give its characteristics.
Q1) Attempt the following.

A) Answer the following. [7]

a) _______ attribute is used to declare a variable with datatype of referenced data base object.
   i) $ type           ii) * type
   iii) @ type         iv) % type

b) Isolation of transaction is ensured by _______
   i) System Server    ii) Recovery Manager.
   iii) Application Programmer iv) Concurrency control.

c) Which technique is used to restore a database upto the last consistent state after system failure.
   i) Backup           ii) Recovery
   iii) Both (i) & (ii) iv) None

d) Database security involves _______
   i) data encryption   ii) a view
   iii) finger print    iv) all
e) ______ is used to store files on fast hard disk.

   i)  print server       ii)  fax service  
   iii) file server       iv)  transaction ser.

f) A schedule where operation of each transaction are executed consecutively without interruption is ______

   i)  Serial Schedule       ii)  Aborted schedule  
   iii) Concurrent Schedule   iv)  Committed schedule.

g) A ______ is a Process Which provides services to more than one client.

   i)  Server         ii)  Network  
   iii) Layer         iv)  Tower.

B) Answer the following. [7]

   a)  List any two features of PL/PgSQL.
   c)  What are various entries in System log.
   d)  State different levels of Security.
   e)  What are client Components.
   f)  What is Schedule. Give types of schedule.
   g)  What do you mean by backup?

**GROUP - I**

Q2) Attempt the following.

   a)  What is stored procedure? How to create it Explain with example. [5]
   b)  List and explain Properties of transaction. [5]
   c)  What are various datatypes available in PL/PgSQL. [4]
Q3) Attempt the following.
   a) Consider the following entities & the relationship. Employee (eno, ename, sex, joining date, designation, salary, dno) Dept (dno, dname) Write a PL/SQL block to list the names of all employees. Who are Male & are earning the maximum salary in their department. [4]
   b) Explain how 2PL ensures serializibility. [4]
   c) What are types of triggers. [3]
   d) What is multiplie granularity. [3]

Q4) Attempt the following.
   a) Write a short note on log based recovery. [4]
   b) What are different privileges that can be granted, on a relation, to the database users. [4]
   c) State the Properties that any client-server database must satisfy. [3]
   d) Write short note on checkpoints. [3]

GROUP-II

Q5) Attempt the following.
   a) Explain the recovery with concurrent transaction. [5]
   b) Write short note on encryption techniques in database security. [5]
   c) Explain client-server architecture interaction with diagram. [4]

Q6) Attempt the following.
   a) Write short note on Aries algorithm. [4]
   b) Explain different types of services provided by different servers in a client-server enviroment. [4]
   c) Write short note on Buffer Management. [3]
   d) What are types of client-server architecture. Explain with diagram. [3]
Q7) Attempt the following.

a) Consider the transact

<table>
<thead>
<tr>
<th>$T_1$</th>
<th>$T_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read (x)</td>
<td>Read (y)</td>
</tr>
<tr>
<td>$x = x - 70$</td>
<td>$y = y + 10$</td>
</tr>
<tr>
<td>Write (x)</td>
<td>Write (y)</td>
</tr>
<tr>
<td>Read (y)</td>
<td>Read (z)</td>
</tr>
<tr>
<td>$b := b + 70;$</td>
<td>$z := z - 5;$</td>
</tr>
<tr>
<td>Write (y)</td>
<td>Read (x)</td>
</tr>
<tr>
<td></td>
<td>Write (z)</td>
</tr>
<tr>
<td></td>
<td>$x = x - 15$</td>
</tr>
<tr>
<td></td>
<td>Write (x)</td>
</tr>
</tbody>
</table>

Give atleast 2 non-serial schedule that are serializable. [4]

b) What is a cursor. How to declare it explain with e.g. [4]

c) State & Explain Thomas write Rule. [3]

d) How triggers are declared & implemented. Explain with example. [3]
P1012

[5319] - 3003

S.Y.B.C.A.

SCIENCE

BCA - 303 : Software Engineering

(2016 Pattern) (Semester - III)

Time : 3 Hours]  |  [Max. Marks : 70

Instructions to the candidates:

1)  Question 1 is compulsory.
2)  Attempt any two questions from Group - I & any two questions from Group - II.
3)  All questions carry equal marks.
4)  Figures to the right indicate full marks.

Q1) Attempt the following.

A)  Multiple Choice Questions: [7]

1)  Which of the following is not the element of the system.
   a)  Control  b)  Feed back
   c)  Risk  d)  Environment.

2)  Robotics comes under which category
   a)  System software  b)  Artificial intelligence
   c)  Business software  d)  Net sourcing

3)  Checking the individual programs for correctness means ______.
   a)  System Testing  b)  Unit Testing
   c)  Integration Testing  d)  Alpha Testing

P.T.O.
4) Which of the following is not a fact finding technique?
   a) Specification  b) Interview
   c) Questionnaire  d) Observation.

5) Identify the symbol used for Data Store in DFD.
   a)  
   b)  
   c)  
   d)  

6) _____ is the primary requirements validation mechanism.
   a) Megotiation  b) Formal Technical Review
   c) Elaboration   d) Specification

7) Which of the following is not a type of software maintanance.
   a) Corrective  b) adaptive
   c) Preventive  d) Quality

B) Attempt the following.  [7]
   a) Define software.
   b) List two advantages of waterfall model.
   c) Define Data Dictionary.
   d) List the types of maintenance.
   e) Define validation.
   f) What is forward Engineering.
   g) What is Agility.
Group - I

Q2) Attempt the following.
   a) Write a short note on Mc call’s Quality factors. [5]
   b) What is prototyping? Explain the steps in prototyping. [5]
   c) List & Explain any 4 tasks involved in Requirement Engineering. [4]

Q3) Attempt the following.
   a) Write a short note on preliminary Investigation of SDLC. [4]
   b) Compare Structured Interview with unstructured Interview. [4]
   c) Explain advantages of spiral model. [3]
   d) Explain characteristics of system. [3]

Q4) Attempt the following.
   a) State all symbols of DFD. [4]
   b) Write a short note on Stress Testing. [4]
   c) What is Data Dictionary? Explain the importance of Data Dictionary. [3]
   d) Explain any three numan factors for agile process. [3]

Group - II

Q5) Attempt the following.
   a) Draw context level & 1st level DFD for “Airline Reservation System”. [5]
   b) Write a short note on Extreme programming values. [5]
   c) State the difference between verification & validation. [4]
Q6) Attempt the following.
   a) Explain system testing with it’s types. [4]
   b) Explain Decision Table with example. [4]
   c) Write a short note on Reverse Engineering. [3]
   d) Explain any (three) principle to achieve agility [3]

Q7) Attempt the following.
   a) Explain any four umbrella activities. [4]
   b) Write a short note on feasibility study. [4]
   c) Explain the essence of Software Engineering Practice. [3]
   d) State & Explain any three framework activities in Software Engineering. [3]

摘
BCA-304: Introduction to Computer Network
(2016 Pattern) (Semester-III)

Time : 3 Hours
(Max. Marks : 70)

Instructions to the candidates:
1) Question No. 1 is compulsory.
2) Attempt any two questions from group-I and any two questions from group-II
3) All questions carry equal marks.
4) Figures to the right indicate full marks.
5) Use of scientific calculator is allowed.

Q1) A) Attempt the following [7]
   a) In a __________ connection more than two devices can share a single link.
      i) Point -to -Point
      ii) Primary
      iii) Multi point
      iv) Secondary
   b) Which layer of the OSS Reference model corresponds to IP protocol of TCP/SP protocol stack.
      i) Transport
      ii) Network
      iii) Internet
      iv) Data link
   c) The RG number gives us information about __________
      i) Optical fibres
      ii) Twisted pairs
      iii) Coaxial cables
      iv) All of above
   d) A telephone Network is an example of __________
      i) Circuit switched network
      ii) Packet switched
      iii) Message switched network
      iv) None of the above
   e) Which one of the following is multiple access protocol for channel access control.
      i) CSMA/CD
      ii) CSMA/CA
      iii) Both i) & ii)
      iv) None of these

P.T.O.
f) The length of IP address is _______ bits.
   i) 46  
   ii) 32 
   iii) 16  
   iv) 64 

g) In _______ the available bandwidth is divided into frequency bands.
   i) FDMA  
   ii) TDMA 
   iii) CDMA  
   iv) None of these 

B) Attempt the following. [7]
   a) Define Topology. 
   b) What is interface. 
   c) Define bit rate and bit length. 
   d) Convert following IPV4 address from decimal rotation to binary: 221.34.7.82 
   e) Define channelization. 
   f) Define Netid & hostid. 
   g) List the framing methods in Data link Layer. 

GROUP-I

Q2) Attempt the following. [5]
   a) What are hybrid networks give its advantages and disadvantages. 
   b) Compare and contrast OSS and TCP/IP reference model. 
   c) Write a short note on unguided media. 

Q3) Attempt the following. [4]
   a) Explain straight through cable and cross over cabling. 
   b) Explain the characteristics on which data communication depends. 
   c) Define the terms: 
      i) Bit Interval  
      ii) Bit rate  
      iii) Bit length 
   d) Write a short note on star topology. 

Q4) Attempt the following. [4]
   a) Give the advantages of Token passing. 
   b) Explain filtering in bridges. 
   c) Explain IPv6 address space 
   d) Draw graph for NRZ-I coding for following data. 
      i) 00000000  
      ii) 01010101  
      iii) 00110011 

[5319]-3004  2
GROUP-II

Q5) Attempt the following.
   a) Write a short note on cyclic Redundancy check [5]
   b) Explain the line coding characteristics. [5]
   c) Explain supernetting. [4]

Q6) Attempt the following.
   a) What is unipolar line coding scheme. gives its drawbacks. [4]
   b) Given a data word 1010011110 and divisor 10111
      i) Show the generation of codeword at sender side (using binary division). [4]
      ii) Show the checking of the codeword at receiver side (assume no error).
   c) Explain the fields in IPV4 datagram. [3]
   d) State the advantages and disadvantages of Non persisant CSMA. [3]

Q7) Attempt the following.
   a) Give the advantages of computer Network. [4]
   c) Explain the different modes of transmission. [3]
   d) Write a note on Infrared waves. [3]
Instructions to the candidates:

1) Question No.1 (A & B) are compulsory.
2) Attempt any two questions from group - I.
3) Attempt any two questions from group - II.
4) Figure to the right indicate full marks.

Q1) A) Attempt the following. [7×1=7]

a) In operator overloading ________ in the basic meaning of operator is not allowed.
   i) increment  
   ii) addition
   iii) change  
   iv) none

b) The read ( ) and write ( ) functions handle data in ________ form
   i) Text  
   ii) Binary
   iii) Character  
   iv) none of these

c) The words which has predefined meaning and cannot be changed by the users are known as ________.
   i) constants  
   ii) identifiers
   iii) key words  
   iv) none

P.T.O.
d) What are mandatory parts in function declarations?
   
i) return type, function name
   
i) return type, fun name, parameter
   
iii) both i & ii
   
iv) none of these

 e) The try block contain the statements that _______.
   
i) Throws exception 
   
ii) catch exceptions
   
iii) correct exception 
   
iv) all of these

f) A class is inherited known as _______.
   
i) Base class 
   
ii) Hybrid
   
iii) derived 
   
iv) both i & ii

g) By default members of class are
   
i) protected 
   
ii) private
   
iii) public 
   
v) all of above

B) Attempt all of the following. [7×1=7]

   a) List the operations of string

   b) Write the operators which cannot be overloaded.

   c) What is generic programming?

   d) What is compile time polymorphism?

   e) What is dynamic constructor

   f) What is difference between oop & pop?

   g) The ‘This’ pointer must be declared in program state true or false.
Group - I

Q2) Attempt all of the following.
   a) Write C++ program to accept employee details like empno, empname, city, idate salary, deptname using accept ( ) and display ( ) function for array of object. [5]
   b) Explain function overloading with example. [5]
   c) Explain the manipulators uses in C++. [4]

Q3) Attempt all of the following.
   a) What is friend function? Explain with properties & example. [4]
   b) What is class? Explain access specifies use in it with example. [4]
   c) Write a C++ program to find maximum no of three number using parameterized constructor. [3]
   d) Explain applications of C++. [3]

Q4) Attempt all of the following.
   a) Explain pure virtual function with example. [4]
   b) What is inheritance? Explain single inheritance with example. [4]
   c) Write short note on function template. [3]
   d) Explain hierarchy of file stream classes with proper diagram. [3]

Group - II

Q5) Attempt all of the following.
   a) Explain all the forms of inheritance. [5]
   b) Write C++ program for how the unary minus operator is overloaded. [5]
   c) Explain how run time polymorphism is achieved using virtual function. [4]
Q6) Attempt all of the following.
   a) Explain simple try & catch mechanism with example. [4]
   b) What is STL? Explain its components. [4]
   c) Write a program for opening two files with same stream & storing the content in it. [3]
   d) What is abstract class. [3]

Q7) Attempt all of the following.
   a) Write a short note on this pointer. [4]
   b) Explain scope resolution operator with example. [4]
   c) Write the rules of operator overloading. [3]
   d) Write a corrected code of the following program segment by underlining the corrected error removed code.

   Void main ( )
   {
   int a, b;
   Cin << a;
   b = a ;
   Cout << “b =”, a;
   }

   [3]
P1015

[5319]-4002
S.Y.B.C.A
SCIENCE
BCA-402: Introduction to Web Technology
(2016 Pattern) (Semester-IV)

Time: 3 Hours

Instructions to the candidates:
1) Question No-1 is compulsory.
2) Attempt any two questions from group-I and any two questions from Group-II
3) All questions carry equal marks.
4) Figures to the right indicate full marks.

Q1) A) Attempt the following.

[7×1 = 7]

a) HTTP stands for
   i) Hyper Text Transport protocol
   ii) Hyper Text Transmission protocol
   iii) Hyper Text Transfer protocol
   iv) Hyper Text Timer protocol

b) Find the odd man out
   i) .Wav
   ii) .Mov
   iii) .Mpeg
   iv) .Webm

c) Choose the correct HTML element for the largest heading.
   i) < head >
   ii) < heading >
   iii) < h_1 >
   iv) < h_n >

d) Java script is a _________ side scripting language.
   i) Client
   ii) Server
   iii) Web
   iv) Customer

e) Subscript range of indexed array in PHP always starts with _________
   i) 0 (zero)
   ii) 1
   iii) -1
   iv) none

P.T.O.
f) Which function sorts the array by keys in descending order.
   i) Ksort
   ii) Ksort
   iii) Uksort
   iv) Uksort

   g) What is the output of the following
   < ? php
     $a="1E3 points of light" +1,
     echo "$a",
   ?>
   i) 1000
   ii) 1001
   iii) 1E3
   iv) Error

B) Answer the following. [7×1=7]
   a) What is portal Web site.
   b) What are the HPCS of HTML tags.
   c) Explain < font > tag with two attributes.
   d) List any two math functions in Javascript.
   e) List border properties in CSS.
   f) Which function identifies a subset of an array based on its values.
   g) How anonymous function is created in PHP.

GROUP-I

Q2) Attempt the following. [5]
   a) What are the advantages of static website.
   b) Explain any two types of lists used in HTML.
   c) Write a Javascript code for accepting name and mobile number from user.(user validation).

Q3) Attempt the following. [4]
   a) Define the terms : i) Webpage  ii) Website
      iii) WWW  iv) Internet
   b) What is selector. Explain any three types of selector.
c) Explain the events associated with mouse in Java script. Give Example. [3]

d) Write a PHP program to find the elements from the array that matches the given value using appropriate search function. [3]

**Q4** Attempt the following;

a) Define Anonymous function. Write anonymous function for addition of two integers. [4]

b) Write a PHP program to sort the array by values in ascending and Descending order. Also sort the array by values without changing the keys. [4]

c) Explain Window object defined in detail used in Javascript. [3]

d) How to create CSS? Explain with example. [3]

**GROUP-II**

**Q5** Attempt the following.

a) Explain any two selection statements in Javascript with example. [5]

b) Explain the features of PHP. [5]

c) Design a HTML form to accept a number from the user and write a PHP Script to find factorial of a number using user defined function. [4]

**Q6** Attempt the following.


b) Write a HTML code which generate the following output. [4]

i) Fruits
   - mango
   - Apple
   - Orange

ii) Vegetables
   - Tomata
   - Potato
   - Onion
c) Differentiate between client-side scripting and server-side scripting. [3]

d) Write a menu driven program to perform the following operations on
   Associative arrays.
   i) Find the union of two arrays.                        [3]
   ii) Find the intersection of two arrays.

Q7) Attempt the following.

   a) Describe Multidimensional array with example.        [4]
   b) Write the purpose of implode and explode function.   [4]
   c) State and explain types of CSS.                      [3]
   d) Write a Javascript program to display current Day, Date, Month, Year and Time on the Webpage and greet the user accordingly. [3]
Instructions to the candidates:

1) Question No-1 (A and B) are compulsory.
2) Attempt any two questions from group-I.
3) Attempt any two questions from group-II.
4) Figures to the right indicate full marks.

Q1) A) Choose the appropriate options.

a) SCTP is a _______ transport layer protocol.
   i) Reliable
   ii) Connectionless
   iii) Connection oriented
   iv) None of these

b) In a _______ the key is called the secret key.
   i) Symmetric key
   ii) Asymmetric key
   iii) Either (i) or (ii)
   iv) Key

c) How many keys does the triple DES algorithm use?
   i) 2
   ii) 3
   iii) 4
   iv) 2 or 3

d) Asymmetric key is also called _______
   i) Public key
   ii) Secret key
   iii) Private key
   iv) Plain key

e) Following are the internet security threats.
   i) TCP
   ii) Malware and spam
   iii) (i) & (ii)
   iv) Datamal

P.T.O.
f) Tunnel mode IPSec protects the_____.
i) IP header ii) Entire IP packet
iii) IP payload iv) One IP layer
g) PKC stands for ________.  
i) Public key case ii) Public key cryptography
iii) Public key cipher iv) None of these

B) Answer in one sentence
a) What is SMTP?
b) What is process-to-process Delivery.
c) Define term- steganography.
d) State the types of DES.
e) Define trapdoor functions.
f) What is digital certificate?
g) What is intrusion?

Group-I

Q2) Answer the following questions.
a) State difference between stream & block cipher. [5]
b) List possible types of attacks and explain it in details. [5]
c) Explain UDP in details with diagram? [4]

Q3) Answer the following questions.
a) What are the advantages and disadvantages of Diffie-Hellman? [4]
b) Convert following text in to cipher text message using one time pad NCBTZQARX. Message plain text-"How are you" [4]
c) Discuss different UDP operations? [3]
d) Explain password based Authentication? [3]
Q4) Answer the following questions.

b) What are various uses of message digest? [4]
c) Explain four essential control exercised by a firewall? [3]
d) What are advantages of Asymmetric key cryptography. [3]

Group-II

Q5) Answer the following questions:

a) Explain RSA Algorithm in detail. [5]
b) Explain virtual private network (VPN) and its features. [5]
c) Explain Architecture of TLS in details. [4]

Q6) Answer the following questions:

b) Describe Audit records in detail. [4]
c) What are two main challenges faced by symmetric key algorithms? [3]
d) Discuss VPN tunneling protocol? & Give any two advantage of VPN? [3]

Q7) Answer the following questions:

a) Explain CBC mode in details. [4]
b) What are two basic ways of transforming plaintext to ciphertext? [4]
c) Describe Multiplying in details. [3]
d) How can caesar cipher crack? [3]
Q1) A) Choose the appropriate options. [7x1=7]

a) An object is an ________ of a class.
   i) Data type ii) Operation.
   iii) Instance or occurrence iv) All of above

b) UML stands for ________
   i) Unified modeling language ii) Unique modeling language
   iii) Universal modeling language iv) None of above

c) Structural Modeling in the UML captures the ________ features of a system.
   i) Dynamic ii) Static
   iii) Architectural iv) i) & ii)

d) Generalization is another name for inheritance or an ________ relationship.
   i) is a ii) was a
   iii) has a iv) have a

e) A thread is a ________ that can execute concurrently with other threads within same process.
   i) Light weight flow ii) heavy weight flow
   iii) both i) & ii) iv) None of above

P.T.O.
f) Collaboration diagram is represented by _______ in a system.
   i)  modeling object    ii) modeling class
   iii) modeling operations  iv) modeling use case

g) A mechanism is an instance of one or more _______
   i)  framework    ii) nodes
   iii) patterns     iv) i) & iii)

B) Answer in one sentence. [7×1=7]
   i) Define Swimlanes.
   ii) Define the object “Book” with possible attributes and operations with visibility.
   iii) What is inheritance.
   iv) What is relationship.
   v) Define use case.
   vi) What is object interaction?
   vii) What do you meant by components?

**GROUP-I**

**Q2)** Answer the following questions:
   a) What is Package? Explain with example. [5]
   b) What is class diagram? Explain its purpose. [5]

**Q3)** Attempt the following question:
   a) What is UML diagram? Enlist UML diagrams. [4]
   b) Prepare a class diagram for medical shop management. [4]
   c) What is meant by structural modeling. [3]
   d) Define the following terms:
      i) Polymorphism
      ii) Software Engineering
      iii) System
Q4) Answer the following questions:
   a) Draw and explain sequence diagram with its components. [4]
   b) Draw state chart diagram for Automated Trading House system. [4]
   c) Compare component and Diployment diagram. [3]
   d) A student visit a college office for getting a scholarship amount. His/ Her claim is verified & if it is valid, a cheque is issued & entries are updated in an account. Draw activity diagram for above situations. [3]

GROUP-II

Q5) Answer the following questions:
   a) What is Actor and collaboration? Explain with example. [5]
   b) What is use of deployment diagram? Give example. [5]
   c) Explain common use of interaction diagram. [4]

Q6) Answer the following questions:
   a) Explain frameworks and mechanism in detail. [4]
   b) Explain Structural aspects of collaboration. [4]
   c) Draw use case diagram of retail store management system. [3]
   d) Draw sequence diagram of Automated Trading House system. [3]

Q7) Answer the following questions:
   a) Explain Structural diagram? What is Generalization? [4]
   b) Explain Activity diagram with example [4]
   c) Explain visibility with example. [3]
   d) Draw component and deployment diagram of Hotel management system [3]

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S.Y.B.C.A.

SCIENCE

BCA-407: Grid and Cloud Computing
(2016 Pattern) (Semester-IV)

Time: 3 Hours  
Max. Marks: 50

Instructions to the candidates:
1) Question No-1 (A and B) is compulsory.
2) Solve any two questions from group-I and any two questions from group-II.
3) Figures to the right indicate full marks.

Q1) A) Answer the following.  

a) __________ is an example of Internet computing.
   i) Genome @ Home
   ii) SETI @ Home
   iii) ECCP-109
   iv) All of these

b) The goal to virtualize the resources on the grid and uniformly handle __________ systems will create new opportunities to let manage a larger, more distributed infrastructure.
   i) heterogenous
   ii) homogeneous
   iii) hybrid
   iv) none

c) Google App Engine is an example of __________
   i) SaaS
   ii) PasS
   iii) IaaS
   iv) none of these

d) __________ is Type 1 Hypervisor.
   i) Wind River Simics
   ii) Vertical server 2005 R2
   iii) KVM
   iv) Lynx Secure

e) SOAP stands for __________.
   i) Simple online Access protocol
   ii) State object Access protocol
   iii) Simple object Access protocol
   iv) Static object Access protocol

P.T.O.
B) Answer in short.
  i) List the application areas of grid computing.
  ii) What is abstraction.
  iii) Define hypervisor.
  iv) List the areas where Internet Computing is used.
  v) What is data grid.

**Group-I**

**Q2)** Attempt the following:
  a) Explain in brief the centralised model of P2P.
  b) Explain general structure of cloud (components of cloud).
  c) State the need of grid.

**Q3)** Attempt the following.
  a) What is hybrid cloud. Explain with example.
  b) State the advantages of high performance computing.
  c) What is emulation.

**Q4)** Attempt the following.
  a) Write short note on compute grids.
  b) Explain IaaS service model of cloud computing. Give examples.
  c) What is software virtualization.

**Group-II**

**Q5)** Attempt the following.
  a) Write short note on reliability.
  b) With the help of diagram explain grid computing architecture model in brief.
  c) List essential characteristics of cloud computing.
Q6) Attempt the following:
   a) Compare cluster and grid computing. [4]
   b) Explain benefits of cloud computing in brief. [4]
   c) What are the goals of load balancing. [2]

Q7) Attempt the following:
   a) State the advantages and disadvantages of cluster computing. [4]
   b) Explain community cloud. [4]
   c) Explain in short case study sales force-com as SaaS. [2]