Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-101

F.Y. B.C.A. (Science) (I Semester) EXAMINATION, 2019

BCA-101 : FUNDAMENTALS OF COMPUTER

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A & B) is compulsory question.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7×1=7]

(*i*) The storage unit of the computer holds data and :

(*a*) Messages

(*b*) Information

(*c*) Instructions

(*d*) Both (*b*) and (*c*)

(*ii*) The full form of CCD is :

(*a*) Charge Coupled Device

(*b*) Change Coupled Device

(*c*) Charge Coupled Driver

(*d*) None of the above

P.T.O.

(*iii*) Disk Operating System is referred for :

(*a*) DOS

(*b*) OS which contains the disk command

(*c*) Both (*a*) and (*b*)

(*d*) None of the above

(*iv*) ..... type of charts can Excel produce.

(*a*) Line graphs and pie chart only

(*b*) Only line graphs

(*c*) Bar charts, line graphs and pie charts

(*d*) Bar charts and line graphs only

(*v*) The VI editor is a screen-based editor used by many ..... users.

(*a*) Graphics

(*b*) Unix

(*c*) Word

(*d*) None of the above

(*vi*) ..... file format can be added to a PowerPoint show.

(*a*) .jpg

(*b*) .giv

(*c*) .wav

(*d*) All of the above

(*vii*) An external modem connects to a PC via ..... .

(*a*) A docking port

(*b*) A serial port

(*c*) A mouse port

(*d*) Either (*b*) or (*c*)

(B) Define the following terms : [7×1=7]

(*i*) Software

(*ii*) Driver

(*iii*) EPROM

(*iv*) Spreadsheet

(*v*) Database

(*vi*) Registers

(*vii*) BIOS.

Group I

2. Answer the following :

(*a*) Explain Bar Code Reader. [5]

(*b*) Explain PowerPoint and its usage. [5]

(*c*) Explain Operating System with its functions. [4]

3. Solve the following :

(*a*) Convert the following decimal number to octal number : [4]

(*i*) $(1792)_{10}$

(*ii*) $(359)_{10}$

(*iii*) $(5100)_{10}$

(*iv*) $(345)_{10}$.

(*b*) Explain the functioning of CPU in detail. [4]

(*c*) Describe scanner in detail. [3]

(*d*) Compare analog and digital computer. [3]

4. Answer the following :

(*a*) Explain Impact Printer. [4]

(*b*) Differentiate between Imperative Knowledge and Definitional Knowledge. [4]

(*c*) What is the purpose of Spreadsheet ? [3]

(*d*) Explain Motherboard in detail. [3]

Group II

5. Answer the following :

(*a*) Describe graphics in detail. [5]

(*b*) Explain networking related problems. [5]

(*c*) What is meant by charts ? Enlist its types. [4]

6. Solve the following :

(*a*) Explain secondary storage devices. Explain any *two* secondary storage devices. [4]

(*b*) What is Logical Fault isolation ? [4]

(*c*) Solve the following : [3]

(*i*) 0011010 – 001100

(*ii*) 0011010 * 001100

(*iii*) 0011010 + 001100.

(*d*) Explain types of computers. [3]

7. Answer the following :

(*a*) State and explain any *five* internal DOS commands. [4]

(*b*) Explain characteristics of computer. [4]

(*c*) Differentiate between High Level Language and Low Level Language. [3]

(*d*) Write a short note on Real Time Operating System. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-102

F.Y. B.C.A. (Science) (I Semester) EXAMINATION, 2019

BCA-102 : BASIC PROGRAMMING IN C

(Introduction to Programming and Programming in C)

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A & B) is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* answer from the options : [7]

(*i*) ..... is correct order with respect to the size of data types.

(*a*) char > int > float

(*b*) int > char > float

(*c*) char < int < float

(*d*) char > double > int

(*ii*) Standard library function clrscr( ) belongs to ..... header file.

(*a*) <stdio.h>

(*b*) <conio.h>

(*c*) <stdlib.h>

(*d*) <math.h>

P.T.O.

(*iii*) Integer division in C program results in ..... .

(*a*) truncation

(*b*) rounding

(*c*) underflow

(*d*) None of the above

(*iv*) ..... bitwise operator is suitable for checking whether a particular bit is on or off.

(*a*) >>

(*b*) &

(*c*) ~

(*d*) !

(*v*) The output of the following code is :

```
main( )
{
   int i;
   for(i = 0; i < 10; i++);
   print("%d", i);
}
```

(*a*) 0123456789

(*b*) Compile error

(*c*) Run time error

(*d*) 9

(*vi*) By default, C uses ..... method to pass arguments.

(*a*) Call by reference

(*b*) Call by value

(*c*) Call by name

(*d*) None of the above

(*vii*) In C, if you pass an array as an argument to a function, ... gets passed.

(*a*) Value of elements in array

(*b*) First element of array

(*c*) Base address of array

(*d*) Address of last element of array

(B) Answer the following : [7×1=7]

(*i*) List properties of an algorithm.

(*ii*) Define constant PI in C language.

(*iii*) Define associativity.

(*iv*) Which unary operator flips the bits from 0 to 1 or vice versa ?

(*v*) What is recursion ?

(*vi*) Declare and initialize one-dimension character array.

(*vii*) In switch statement, the default is written at end only. Justify true *or* false.

Group I

2. Attempt the following :

(*a*) Explain different logical and relational operators with example. [5]

(*b*) Write an algorithm to find sum of first *n* node numbers. [5]

(*c*) Explain structure of C program. [4]

3. Attempt the following :

(*a*) What is constant ? Explain different types of constant in C. [4]

(*b*) Draw flowchart to check whether given number is Armstrong or not. [4]

(*c*) Explain size and sign qualifiers in C. [3]

(*d*) Differentiate between Algorithm and Flowchart. [3]

4. Attempt the following :

(*a*) Explain methods of passing parameters to function with example. [4]

(*b*) Write a C program to count occurrence of particular number in array. [4]

(*c*) Differentiate between break and continue. [3]

(*d*) Explain use of getchar() and putchar() with example. [3]

Group II

5. Attempt the following :

(*a*) Write C program to display the following pattern : [5]

A

A B

A B C

A B C D

(*b*) Write a short note on storage classes. [5]

(*c*) Explain jump statements in C. [4]

6. Attempt the following :

(*a*) Write recursive function to find GCD of two numbers. [4]

(*b*) Explain memory representation of 2-Dimensional array. [4]

(*c*) Explain conditional statements in C. [3]

(*d*) Find the output of the following code : [3]

```
main()
{
   if(printf("C is good"))
      printf("I know C");
   else
      printf("I know C++");
}
```

7. Attempt the following :

(*a*) Draw flowchart to find roots of quadratic equation :

$$ax^2 + bx + c = 0.$$ [4]

(*b*) Write an algorithm to accept *n* numbers and display only negative numbers. [4]

(*c*) Explain user defined data types. [3]

(*d*) Write the correct code for the following : [3]

```
main()
{
   int size, i;
   scanf("%d", & size);
   int a[size];
   for(i = 1; i <= size; i++)
      {
         scanf("%d", a[i]);
         printf("%d", a[i]);
      }
}
```

Total No. of Questions—**7**] [Total No. of Printed Pages—**6**

Seat No.	

[5526]-103

F.Y. B.C.A. (I Semester) EXAMINATION, 2019

APPLIED MATHEMATICS–I

Paper BCA-103

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group I and two questions from Group II.

(*iii*) Figures to the right indicate full marks.

1. (A) Choose the *correct* alternative : [7]

(1) If $|S| = 3$ and $|T| = 4$, then $|S \times T|$ is ..... .

(*a*) 7

(*b*) 12

(*c*) 1

(*d*) None of the above

(2) Which of the following inequalities is true ?

(*a*) G.M. $\leq$ H.M.

(*b*) A.M. $\leq$ H.M.

(*c*) G.M. $\leq$ A.M.

(*d*) None of the above

P.T.O.

(3) The binary representation of 9 is :

(*a*) $(1110)_2$

(*b*) $(1001)_2$

(*c*) $(1000)_2$

(*d*) None of the above

(4) Let S be any set such that $|S| = 5$. Then $|P(S)|$ is :

(*a*) 16

(*b*) 32

(*c*) 48

(*d*) None of the above

(5) A function $f : R \to R$ is defined by $f(x) = 3x - 2$. Then f is :

(*a*) injective function

(*b*) surjective function

(*c*) bijective function

(*d*) None of the above

(6) Choose the correct alternative :

(*a*) $\sum_{n=1}^{N} n = \frac{n(n+1)}{2}$

(*b*) $\sum_{n=1}^{N} n^2 = \left(\frac{n(n+1)}{2}\right)^2$

(*c*) $\sum_{n=1}^{N} n^3 = \left(\frac{n(n+1)}{2}\right)^3$

(*d*) None of the above

(7) Let $p = 312$ and $q = 231$ be permutation. Then $p \times q$ is :

(a) 132

(b) 321

(c) 123

(d) None of the above

(B) Answer the following in one *or* two lines : [7]

(i) Determine whether the given permutation is even or odd :

$$g = 3217645.$$

(ii) Evaluate $\sum_{r=1}^{105} r$.

(iii) Translate the following into symbolic form. Hence write its negation :

"There is an x in A such that for all b in B, $b > x$".

(iv) Determine the coefficient of $x^{12}y^{13}$ in expansion of $(2x-3y)^{25}$.

(v) Let $A = \{1, 2, 3, 4\}$ and $B = \{a, b\}$. Find the number of onto functions that can be defined from A to B.

(vi) Define Harmonic Mean.

(vii) Determine whether the rule $f : R \to R$ defined by :

$$f(x) = \begin{cases} \dfrac{((x+3)^2 - 9)}{x}, & \text{if } x \neq 0 \\ 6 \qquad\qquad , & \text{if } x = 0 \end{cases}.$$

Group I

2. Attempt the following :

(*a*) Let A and B subsets of universal set U. Then show that :

$$(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$$

and check this when :

$A = \{1, 2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7, 8\}$. [5]

(*b*) Prove that :

$$3xyz \leq x^3 + y^3 + z^3$$

for non-negative x, y, z. [5]

(*c*) "If $f + g$ and fg are bounded then f and g are bounded." Is this statement true ? Justify your answer. [4]

3. Attempt the following :

(*a*) Prove that the statements $P \rightarrow Q$ and $Q \rightarrow R$ imply $P \rightarrow R$. [4]

(*b*) Prove that an integer is even if and only if it is the sum of two odd integers. [4]

(*c*) Let

$$S = \{(x, y) \in R^2 / (1 - x)(1 - y) \geq 1 - x - y\}.$$

Give a simple description of S involving the signs of x and y. [3]

(*d*) Obtain the condition that the equation $ax^2 + bx + c = 0$ has two distinct real solutions, exactly one solution and no real solution. [3]

4. Attempt the following :

(*a*) Which integer is bigger :

$$333_{12} \text{ or } 3333_5.$$ [4]

(*b*) Let $f : \mathrm{N} \times \mathrm{N} \to \mathrm{R}$ be defined by :

$$f(a, b) = \frac{(a+1)\,(a+2b)}{2},$$

then show that the image of f is contained in N. [4]

(*c*) If a coin is flipped 10 times, what is the probability of 8 or more heads ? [3]

(*d*) Prove that :

$$\sum_{r=0}^{n} 2^r \cdot \binom{n}{r} = 3^n,$$

by using Binomial theorem. [3]

Group II

5. Attempt the following :

(*a*) The Fibonacci numbers a_0, a_1, a_2, ... are defined :

$$a_0 = a_1 = 1,\ a_n = a_{n-1} + a_{n-2},\ \forall n \geq 2.$$

Prove that :

$$a_n \leq \left(\frac{7}{4}\right)^n \ \forall n \in \mathrm{N}.$$ [5]

(*b*) For $n \in \mathrm{N}$, prove that :

$$\sum_{i=1}^{n} i(i+1) = \frac{n(n+1)\,(n+2)}{3}.$$ [5]

(*c*) Verify that :

$$f(x) = \frac{2x-1}{2x(1-x)}$$

defines a bijection from the interval (0, 1) to R. [4]

6. Attempt the following :

(*a*) In how many different orders can 10 exam papers be set so that no two of the three mathematics papers are consecutive ? [4]

(*b*) Draw the functional digraph of permutation :

$$f = (13)\,(265)\,(4)\,(789)\,.$$ [4]

(*c*) How many integers greater than 5400 have both the following properties ?

(*i*) the digits are distinct

(*ii*) The digits 2 and 7 do not occur. [3]

(*d*) Prove that :

$$k\binom{n}{k} = n\binom{n-1}{k-1}.$$ [3]

7. Attempt the following :

(*a*) Show that, the set of integer combinations of a and b is the set of multiples of gcd(a, b). [4]

(*b*) Find the gcd of a = 484 and b = 24 and write in the combination of a and b. [4]

(*c*) What are the integer solutions of $6x + 15y = 99$? [3]

(*d*) Prove that, every ideal in R[x] is a principal ideal. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-104

F.Y. B.C.A. (Science) (I Semester) EXAMINATION, 2019

104 : COMMUNICATION SKILLS

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1 (A & B)** is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* options : [7×1=7]

(1) Environmental barriers are the same as ..... noise.

(*a*) Physiological

(*b*) Psychological

(*c*) Physical

(*d*) Sociological

(2) Communication is non-stop ..... .

(*a*) Paper

(*b*) Process

(*c*) Program

(*d*) Plan

P.T.O.

(3) In your initial greeting—avoid using good morning or good afternoon, why ?

(*a*) Missing the correct hour

(*b*) Caller in a different time zone

(*c*) Caller might be having a BAD DAY

(*d*) No reason, personal choice

(4) A business letter is usually a letter from one ..... to another.

(*a*) Company

(*b*) Organization

(*c*) Business

(*d*) None of the above

(5) A job application letter is also called a ..... .

(*a*) Cover letter

(*b*) Formal letter

(*c*) Both (*a*) and (*b*)

(*d*) None of the above

(6) ..... is the most important part of an application letter.

(*a*) Heading

(*b*) Exit

(*c*) Main body

(*d*) Paragraph

(7) Gesture is part of ..... communication.

(*a*) Written

(*b*) Non-verbal

(*c*) Channel

(*d*) Feedback

(B) Answer the following : [7×1=7]

(*i*) Define resume writing.

(*ii*) Write a scope of communication.

(*iii*) Define the intensive listening.

(*iv*) Define the teleconferencing.

(*v*) Define the Report Writing.

(*vi*) What is cover letter ?

(*vii*) What is communication ?

Group I

2. Answer the following :

(*a*) What are the principles of effective communication ? [5]

(*b*) What is the scope of communication ? [5]

(*c*) What is important of written message ? [4]

3. Solve the following :

(*a*) Explain the term Academic Listening. [4]

(*b*) What is Communication ? State the principles of effective communication. [4]

(*c*) Enlist *four* telephonic manners. [3]

(*d*) Write a note on body language. [3]

4. Answer the following :

(*a*) What is group discussion ? [4]

(*b*) How mobile phones changed communication ? [4]

(*c*) What are the advantages of telephonic communication ? [3]

(*d*) What is cultural barrier ? [3]

Group II

5. Answer the following :

(*a*) Draft a report on "Prize Distribution Event". [5]

(*b*) What points should you keep in mind while writing your Resume ? [5]

(*c*) Prepare an agenda for the meeting to discuss Annual Gathering. [4]

6. Solve the following :

(*a*) What are minutes of meeting ? [4]

(*b*) Write a business letter to the manager of a computer firm giving an order of 100 computers for the TCS Computer Lab. [4]

(*c*) What is meant by resume ? Elaborate sample of resume. [3]

(*d*) What is Negotiation Skills ? [3]

7. Answer the following :

(*a*) What is meant by empathy ? Elaborate its significance in communication ? [4]

(*b*) What is reflective thinking ? [4]

(*c*) Why are intrapersonal skills important in communication ? [3]

(*d*) How can critical thinking resolve problem ? [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-201

F.Y. B.C.A. (Second Semester) EXAMINATION, 2019

SCIENCE

(BCA-201 : Computer Organization)

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory.
(*ii*) Attempt any *two* questions from Group-I.
(*iii*) Attempt any *two* questions from Group-II.
(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7]

(*a*) ..... is a technique in which any sequential process is broken or decomposed into suboperations.
(*i*) Multiplexing (*ii*) De-multiplexing
(*iii*) Pipeline (*iv*) Interrupt

(*b*) Every interrupt service routine has a ..... byte starting address stored in IVT.
(*i*) 1 (*ii*) 2
(*iii*) 3 (*iv*) 4

(*c*) The transformation of data from main memory to cache memory is referred to as .....
(*i*) transfer process (*ii*) mapping process
(*iii*) hitting process (*iv*) none of these

(*d*) The octal number system has a radix .....
(*i*) 2 (*ii*) 8
(*iii*) 10 (*iv*) 16

P.T.O.

(*e*) ..... is a logic gate whose output is high when any one of its inputs or both are low.

(*i*) AND gate (*ii*) OR gate

(*iii*) NAND gate (*iv*) NOR gate

(*f*) If the flip-flop responds only to a particular state of the clock, i.e. '1' or '0', then it is called ..... flip-flop.

(*i*) JK (*ii*) T

(*iii*) Edge-triggered (*iv*) level triggered

(*g*) A stack is a unit to store information temporarily in the ..... manner.

(*i*) LILO (*ii*) LIFO

(*iii*) SIPO (*iv*) PISO

(B) Define the terms : [7]

(*a*) POP

(*b*) MIMD

(*c*) Hit ratio

(*d*) Weighted code

(*e*) Positive logic

(*f*) Multiplexer

(*g*) Flip-flop.

Group I

2. Answer the following :

(*a*) Explain with examples binary to decimal and decimal to binary conversion. [5]

(*b*) Build NOT, OR and AND gate using NAND gate. [5]

(*c*) Explain a 4 to 1 multiplexer with logic diagram and truth table. [4]

3. Answer the following :

(*a*) Describe the working of RS flip-flop with logic diagram and truth table. [4]

(*b*) Explain the working of Universal Adder-Subtractor with logic diagram. [4]

(*c*) Simplify (A + BC) ($\overline{B}$ + $\overline{C}$) and draw simplified diagram. [3]

(*d*) Perform (11110 – 1010) using 2's complement method. [3]

4. Answer the following :

(*a*) Explain the working of ALU with a neat block diagram. [4]

(*b*) Differentiate between synchronous and asynchronous counter with an example. [4]

(*c*) Explain decimal to BCD encoder with its logic diagram. [3]

(*d*) State DeMorgan's theorems and write its Boolean expression. [3]

Group II

5. Answer the following :

(*a*) Draw the block diagram of CPU and mention the functions of a CPU. [5]

(*b*) Using 1K × 8 chips build 8K × 8 memory system. [5]

(*c*) With a neat block diagram explain the working of a typical I/O interface. [4]

6. Answer the following :

(*a*) What is an interrupt ? Explain interrupt processing sequence. [4]

(*b*) What is virtual memory ? What are the ways of managing virtual memory ? [4]

(*c*) Draw block diagram of 8086 with proper label. [3]

(*d*) Draw block diagram of 8087 with proper label. [3]

7. Answer the following :

(*a*) What is meant by parallel processing ? Mention the different ways in which parallelism can be achieved. [4]

(*b*) With neat diagram explain parallel priority method of I/O transfer. [4]

(*c*) With neat diagram explain the working of a register stack. [3]

(*d*) Differentiate between D and T flip-flop. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-202

F.Y. B.C.A. (Science) (II Semester) EXAMINATION, 2019

BCA-202 : ADVANCED PROGRAMMING IN 'C'

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A & B) is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7]

(*i*) The ..... operator is used *p* with a pointer to de-reference the address contained in the pointer.

(*a*) &

(*b*) →

(*c*) *

(*d*) •

(*ii*) The size of union is size of the ..... element in the union.

(*a*) smallest

(*b*) longest

(*c*) both (*a*) and (*b*)

(*d*) none of the above

P.T.O.

(*iii*) The value returned by ftell() is of ..... type.

(*a*) long

(*b*) int

(*c*) int *

(*d*) double

(*iv*) The variables declared in a structure definition are called its :

(*a*) tag

(*b*) variables

(*c*) members

(*d*) None of the above

(*v*) The function ..... sets file pointer to the beginning of file.

(*a*) fflush()

(*b*) fclose()

(*c*) rewind()

(*d*) None of the above

(*vi*) Which of the following is *not* predefined macro ?

(*a*) —FILE—

(*b*) —LINE—

(*c*) —DATE—

(*d*) None of the above

(*vii*) Which of the following functions is more appropriate for reading in a multi-word string ?

(*a*) printf()

(*b*) scanf()

(*c*) gets()

(*d*) puts()

(B) Attempt the following : [7]

(*i*) Command line arguments are stored as strings. State True/False.

(*ii*) State the purpose of # error directive.

(*iii*) How can a pointer to pointer be declared ?

(*iv*) Which file mode is used to open a file for updation ?

(*v*) A ..... is a collection of data elements under one name in which the elements share the same memory.

(*vi*) How is size of structure calculated ?

(*vii*) State True/False :

When reading a string with scanf, it automatically inserts the terminating null character.

Group I

2. Attempt the following :

(*a*) Write a C program which accept a string and single character as command line arguments and check whether given character is present in a string or not. [5]

(*b*) Write a program which declare a structure student (roll, name, mark[ ]). Accept details of '*n*' students and find percentage of each student. [5]

(*c*) Write a note on preprocessor. [4]

3. Answer the following :

(*a*) Write a user defined function to reverse the given string without using standard library function. [4]

(*b*) Write syntax and purpose of fprintf() and fscanf() functions. [4]

(*c*) What is the difference between structure and union ? [3]

(*d*) Write a note on memory leak and dangling pointer. [3]

4. Attempt the following :

(*a*) What is Pointer ? Explain 'array of pointers' concept. [4]

(*b*) Explain how a structure can be passed to a function. [4]

(*c*) Write syntax and purpose of any *three* string handling functions. [3]

(*d*) Find error if any, in the following statements : [3]

```
FILE fp;
fp = fopen("a.txt", "at");
```

Group II

5. Attempt the following :

(*a*) Define a structure 'cricket' (player name, team, batting average) using cricket, declare an array of player with 10 elements. Write a program to read information about '*n*' players and print player names belonging to team 'India'. [5]

(*b*) Write a program which will read a string and display count of vowels present in given string. [5]

(*c*) What is pointer to function ? Explain with an example. [4]

6. Answer the following :

(*a*) What do you mean by 'array of structures' ? Explain with an example. [4]

(*b*) Differentiate Static Memory Allocation and Dynamic Memory Allocation. [4]

(*c*) What does the following statement do ? [3]

```
while (cx = get c (fp))! = EoF)
        printf("%c", x)
```

(*d*) Trace the output and justify : [3]

```
#define prod (a, b) (a * b)
void main()
{
   int x = 3, y = 4;
   printf("%d", prod (x + 2, y – 1));
}
```

7. Answer the following :

(*a*) Write a C program to allocate dynamic memory to a float and integer value. Read float and integer value from user and store these values in allocated memory. [4]

(*b*) Write a user defined function to copy one string into another string C without using standard library function. [4]

(*c*) Explain nesting of unions. Give example of it. [3]

(*d*) Given the declaration : [3]

```
struct abc a, b, c;
```

Which of the following statements are legal ? Justify.

(*i*) printf("%d", a);

(*ii*) a = b

(*iii*) if(b > c)

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-203

F.Y. B.C.A. (Sem. II) EXAMINATION, 2019

BCA-203 : APPLIED MATHEMATICS-II

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group-I and *two* questions from Group-II.

(*iii*) Figures to the right indicate full marks.

1. (A) Choose the correct alternative : [7]

(*i*) The roots of the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 0$ are.....

(*a*) $a = 5, 2$ (*b*) $a = -5, -2$

(*c*) $a = 3, 4$ (*d*) None of these

(*ii*) If $gcd(a,b) = 2$ and $lcm(a,b) = 60$ if $a = 6$, then b = ...

(*a*) 20 (*b*) 15

(*c*) Both 30 and 15 (*d*) None of these

(*iii*) If A = {1, 2, 3} and R = {(1, 2), (2, 3), (3, 1)}, then R is.....

(*a*) reflexive (*b*) transitive

(*c*) symmetric (*d*) None of these

(*iv*) In a walk no edges is repeated is called.....

(*a*) cycle (*b*) circuit

(*c*) path (*d*) None of these

P.T.O.

(*v*) If graph G with 8 vartices and each of degree 3, then G has.....number of edges.

(*a*) 14 (*b*) 12

(c) 30 (*d*) None of these

(*vi*) Complement of complete-graph with n vertices is.....

(*a*) K_n (*b*) N_n

(*c*) W_n (*d*) None of these

(*vii*) If G is connected plane graph with v-vertices, e-edges and f-faces, then.....

(*a*) $v - e + f = 2$ (*b*) $v + e - f = 2$

(*c*) $e - v + f = 2$ (*d*) None of these

(B) Answer the following in *one* or *two* lines : [7]

(*i*) Show that if there are 30 students in a class then at least two have last names that begin with the same letter.

(*ii*) Solve the recurrence relation $a_r + 6a_{r-1} + 12a_{r-2} + a_{r-3} = 0$

(*iii*) State Fermat's theorem.

(*iv*) Define planar graph.

(*v*) Obtain the Chromatic polynomial of tree with $n = 4$ vertices.

(*vi*) Draw $K_{4,3}$ graph.

(*vii*) Can a simple graph with 7 vertices, each of degree 3 exists ? Justify.

Group-I

2. Attempt the following :

(*a*) Let S be the set of humans on this planet. Define a relation R = $\{(x,y) \in S \times S \mid x$ and y are citizens of the same country.$\}$ Is R an equivalence relation ? [5]

(*b*) Find all integers X such that $X \equiv 2 \pmod 5$. $X \equiv 4 \pmod 7$ and $X \equiv 3 \pmod 9$. [5]

(*c*) State Wilson's theorem. [4]

3. Attempt the following :

(*a*) Prove that $n^5 - n$ is divisible by 30. [4]

(*b*) Find the remainder when $4^{37} + 82$ is divisible by 7. [4]

(*c*) Define subgroup and give any *two* examples. [3]

(*d*) Let p be odd prime prove that $2(p-3)! \equiv -1 \pmod p$. [3]

4. Attempt the following :

(*a*) Given m consecutive integers. Prove that there is one which is divisible by m. [4]

(*b*) How many positive integers not exceeding 1000 are divisible by 5 or by 9 ? [4]

(*c*) Show that if seven colours are used to paint 50 cars at least 8 cars will have the same colour. [3]

(*d*) Prove that every set of 5 points in the square of area one has two points separated by a distance atmost $\frac{\sqrt{2}}{2}$. [3]

Group-II

5. Attempt the following :

(*a*) State and prove, the principle of Inclusive and Exclusive. [5]

(*b*) If a graph has exactly *two* vertices of odd degree, then prove that there must be a path between these two vertices. [5]

(*c*) How many edges are there in a graph with 20 vertices each of degree 5 ? [4]

6. Attempt the following :

(*a*) State and prove Handshaking Lemma. [4]

(*b*) Show that, if G is simple Planar Graph with $n \geq 3$ vertices and e-edges then $e \leq 3n - 6$. [4]

(*c*) Draw the graphs : [3]

(*i*) Peterson's graph

(*ii*) Regular graph with degree 3.

(*d*) Let $a_n = 2^n + 5 \cdot 3^n$ for $n = 0, 1, 2, \ldots\ldots$ [3]

(*i*) Find a_0, a_1, a_2 and a_3.

(*ii*) Show that $a_n = 5a_{n-1} - 6a_{n-2}, \forall\, n \geq 2$.

7. Attempt the following :

(*a*) Prove that, if T is a tree on n-vertices then T is connected and $n - 1$ edges. [4]

(*b*) Find the particular solution of difference equation $a_r + 5a_{r-1} + 6a_{r-2} = 42.4^r$. [4]

(*c*) Find the total solution of recurrence relation $a_r = 2a_{r-1} - a_{r-2}$ with $a_0 = a_1 = 2$. [3]

(*d*) Draw a non-isomorphic trees with 6 vertices. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**6**

Seat No.	

[5526]-204

F.Y. B.C.A. (Science) (II Semester) EXAMINATION, 2019

BCA-204 : RELATIONAL DATABASE MANAGEMENT SYSTEM

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A & B) is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7×1=7]

(*i*) In ..... organization, an index record appears for every search-key value in file.

(*a*) Dense index

(*b*) Sparce index

(*c*) Cluster index

(*d*) Nearest index

(*ii*) A capacity to change the physical schema without having to change the logical or view schema is ..... .

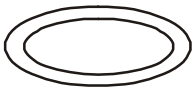
(*a*) Logical data independence

(*b*) View data independence

(*c*) Physical data independence

(*d*) Structure data independence

P.T.O.

(*iii*)  is a notation used for ..... .

(*a*) Derived attribute

(*b*) Null attribute

(*c*) Strong attribute

(*d*) Multivalued attribute

(*iv*) Relational model represents the database as a collection of ..... .

(*a*) Attributes

(*b*) Keys

(*c*) Relations

(*d*) References

(*v*) Which of the following is not a DML command ..... .

(*a*) Alter

(*b*) Insert

(*c*) Delete

(*d*) Update

(*vi*) A ..... is an association between several entities.

(*a*) Links

(*b*) Relationship

(*c*) Connectors

(*d*) Generalization

(*vii*) ..... are the anomalies in relational database.

(*a*) Insertion anomaly

(*b*) Deletion anomaly

(*c*) Wastage of memory

(*d*) All of the above

(B) Answer the following : [7]

(*i*) Define physical file and logical file.

(*ii*) Give advantages of DBMS.

(*iii*) What is composite key ?

(*iv*) Define the term Domain.

(*v*) Enlist the datatypes used in SQL.

(*vi*) What are goals of normalization ?

(*vii*) Give notation of the following ER components :

(*a*) Derived attribute

(*b*) Weak entity.

Group I

2. Attempt the following :

(*a*) What is data model ? Explain any *one* type of data model in detail. [5]

(*b*) What are the different ways in which a relation can be altered ? [5]

(*c*) Write a short note on closure of a set of a functional dependency. [4]

3. Attempt the following :

(*a*) Consider the following relations : [4]

Country (Con_Code, Name, Capital)

Population (Pop_code, Population_court).

Country and population are related with one to one relationship.

Create a RDB and solve the queries. (3NF expected).

(*i*) List the countries with highest population.

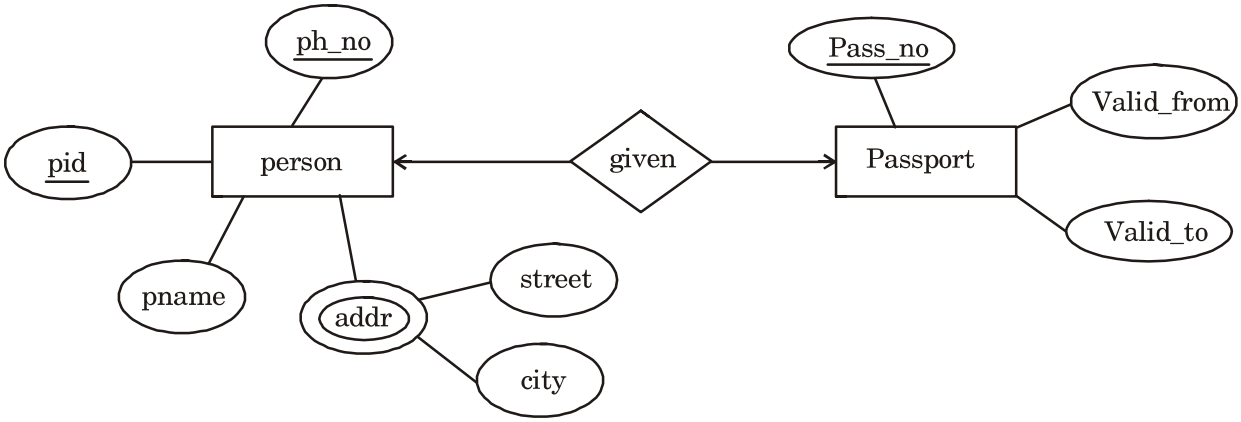
(*ii*) Give name and population of country whose capital is 'Delhi'.

(*iii*) List the name of all countries whose population is greater than 50,00,000.

(*b*) Write a short note on degree of relationship type. [4]

(*c*) Explain ISAM in detail. [3]

(*d*) Consider the following E-R diagram :



Convert above E-R diagram into relational model. [3]

4. Attempt the following :

(*a*) What are desirable properties of decomposition ? [4]

(*b*) What is outer join ? Explain in detail. [4]

(*c*) Design an ER diagram for a "Deep Hospital". Hospital consists of many patients where patients may be out-patient or in-patients. If in-patients, they are admitted in room. Patients are provided with all facilities like lab test and medicines. Hospital runs its own lab and medical store. Doctors treat the patient and their complete payroll is computerized. Identify the entities, attributes and relationships and draw an ER diagram. [3]

(*d*) Consider the relation R(A, B, C, D, E, F) and F is defined on R as :

$$F = \{A \rightarrow BC,\ E \rightarrow CF,\ B \rightarrow E,\ CD \rightarrow EF\}$$

Compute $(AB)^T$ under F. [3]

Group II

5. Attempt the following :

(*a*) Write a short note an data independence. [5]

(*b*) Explain group-by and order-by clause. [5]

(*c*) What is normalization ? Write a short note on BCNF. [4]

6. Attempt the following :

(*a*) Consider the following relations :

Item (i_code, i_name, price)

Order (o_code, date, cust_name)

Item and order are related in many to many relationship. Create a database in 3NF and solve the queries :

(*i*) List all orders before 4th October, 2012.

(*ii*) List all items with their price.

(*iii*) Find most costly item. [4]

(*b*) Write a short note on Generalization and Specialization. [4]

(*c*) Explain sequential file organization in detail. [3]

(*d*) Explain any *two* rules of converting ER model to relational model. [3]

7. Attempt the following :

(*a*) Write a short note on Armstrong's Axioms. [4]

(*b*) Explain any *two* DML commands with example. [4]

(*c*) Draw an ER diagram for car insurance company that has a set of customers. Each of customer owns one or more cars. Each car has associated with it zero or more accidents recorded. [3]

(*d*) Consider the relation R (A, B, C, D, E) with F defines on R as :

$$F = \{A \rightarrow B,\ CD \rightarrow E,\ A \rightarrow C,\ B \rightarrow D,\ E \rightarrow A\}$$

Compute closure of attribute set (AD) i.e. $(AD)^T$. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-301

S.Y. B.C.A. (Science) (III Semester) EXAMINATION, 2019

BCA-301 : DATA STRUCTURE

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A&B) is compulsory.

(*ii*) Attempt any *two* questions from Group I and any *two* questions from Group II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

(*v*) Assume suitable data, if necessary.

1. (A) Attempt the following : [7×1=7]

(*a*) ..... is an amount of time taken by a program for execution is the running time of program.

(*i*) Time complexity

(*ii*) Space complexity

(*iii*) Memory complexity

(*iv*) Both (*i*) and (*ii*)

(*b*) ..... is non-linear data structure.

(*i*) Strings

(*ii*) Stacks

(*iii*) Trees

(*iv*) Array

P.T.O.

(*c*) ..... is not the type of queue.

(*i*) Priority queue

(*ii*) Circular queue

(*iii*) Ordinary queue

(*iv*) Single ended queue

(*d*) Elements are not added at which position of stacks ?

(*i*) Top

(*ii*) Middle

(*iii*) Bottom

(*iv*) Both (*ii*) and (*iii*)

(*e*) Deletion can takes place one end called front operation carried out in ..... .

(*i*) Stack

(*ii*) Queue

(*iii*) Linked List

(*iv*) Array

(*f*) Children of same parent are called ..... .

(*i*) Node

(*ii*) Child node

(*iii*) Siblings

(*iv*) None of the above

(*g*) ..... is a closed graph with length 3 or more, such that starts and ends with same vertex.

(*i*) Cycle

(*ii*) Path

(*iii*) Degree

(*iv*) Vertex

(B) Answer the following : [7×1=7]

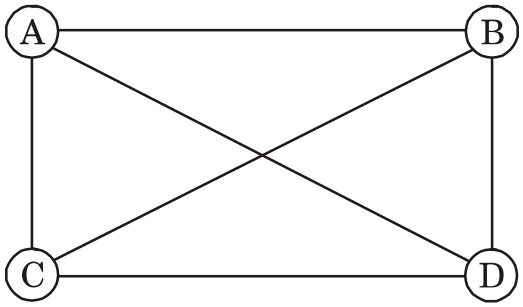
(*i*) Define Data Object.

(*ii*) Give *one* advantage of queue.

(*iii*) Define complete graph.

(*iv*) List out different operation on stack.

(*v*) Draw spanning tree of graph G :



Graph G

(*vi*) List different characteristics of an algorithm.

(*vii*) Define generalized linked list.

Group I

2. Attempt the following :

(*a*) Explain self referential structure. [5]

(*b*) Sort the following numbers using bubble sort method : [5]

108, 3, 97, 65, 71, 23, 57, 93, 100

(*c*) Explain complexity in detail. [4]

3. Attempt the following :

(*a*) Write the algorithm for merge sort. [4]

(*b*) Explain any *two* operations on linked list. [4]

(*c*) What are applications of stack ? [3]

(*d*) Explain linear searching technique in detail. [3]

4. Attempt the following :

(*a*) Write a function to delete an element from singular linked list (SLL). [4]

(*b*) Differentiate between array and linked list. [4]

(*c*) What is Mirroring the given tree means ? Explain it with example. [3]

(*d*) Define the following terms : [3]

(*i*) Strictly binary tree

(*ii*) Multigraph

(*iii*) Critical path.

Group II

5. Attempt the following :

(*a*) Write a 'C' function to insert a node in circular doubly linked list. [5]

(*b*) Build an AVL tree for the following keys :

Chaitra, Vaishakh, Jyeshtha, Aashad, Shravan, Bhadrapad, Ashwin, Kartik. [5]

(*c*) What is Graph ? How is it represented ? [4]

6. Attempt the following :

(*a*) Consider the following expression :

a/*b* + *c***d*

Let *a* = 6, *b* = 2, *c* = 3 and *d* = 4

Show how the given expression will be evaluated for the given values with the help of stack. [4]

(*b*) Write a function in 'C' to insert a node in binary search tree. [4]

(*c*) Sort the following number by heap sort : [3]

20, 49, 36, 12, 76, 89, 26, 95.

(*d*) Write a short note on priority queue. [3]

7. Attempt the following :

(*a*) Write a program to add the node at the beginning of singly linked list. [4]

(*b*) Explain static implementation of stack. [4]

(*c*) Define the following terms : [3]

(*i*) Abstract Data Type (ADT)

(*ii*) Big O notation

(*iii*) Height of tree

(*d*) Explain infix to prefix in stack in detail. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**6**

Seat No.	

[5526]-302

S.Y. B.C.A. (SCIENCE) (Sem. III) EXAMINATION, 2019

BCA-302 : ADVANCED RELATIONAL DATABASE MANAGEMENT SYSTEM

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group-I and any *two* questions from Group-II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

(*v*) Assume suitable data if necessary.

1. (A) Attempt the following questions : [1×7=7]

(*i*) The.....is used to declare a PL/PG-SQL row with the same structure as the row specified during declaration.

(*a*) % type (*b*) % Rowtype

(*c*) Declare (*d*) @ Type

(*ii*) If there are n transactions, then how many different schedules are possible ?

(*a*) $n!$ (*b*) $(n - 1)!$

(*c*) $n(n - 1)!$ (*d*) None of these

(*iii*) Durability of the transaction is ensured by.....

(*a*) Concurrency control (*b*) Application programs

(*c*) System server (*d*) Recovery manager

P.T.O.

(*iv*) .....Algorithm uses same key for encrypting and decrypting a message.

(*a*) Symmetric key (*b*) Asymmetric key

(*c*) Both (*a*) and (*b*) (*d*) None of these

(*v*) .....server maintains the information as an incremental reply for each request from client.

(*a*) FAT Server (*b*) Stateless Server

(c) Stateful Server (*d*) Thin Server

(*vi*) A schedule where operations of each transaction are executed consecutively without interruption is.....

(*a*) Serial schedule (*b*) Aborted schedule

(*c*) Concurrent schedule (*d*) Committed schedule

(*vii*) Record is a.....

(*a*) Placeholder (*b*) Variable

(*c*) Data type (*d*) Keyword

(B) Answer the following questions : [1×7=7]

(1) List any *two* advantages of shadow paging.

(2) Define transaction and list its properties.

(3) What is dirty read problem ?

(4) Define Fat Server.

(5) Give the syntax of creating view.

(6) Define checkpoint.

(7) What are different client component ?

Group-I

2. Answer the following questions :

(*a*) What is stored function ? Explain with an example. [5]

(*b*) Explain life cycle of transaction with a diagram. [5]

(*c*) Consider the following tables : [4]

Student (rno, name, address, class)

Subject (scode, subj-name).

Student_Subject related with M_M Relationship with descriptive attribute marks scored.

Define a trigger to ensure that the marks entered for a student, with respect to a subject is never less than 10 and greater than 100.

3. Answer the following questions :

(*a*) Consider the following Project-Employee database maintained by a company which stores the details of the projects assigned to the employees.

Project (pno, pname, ptype, duration)

Employee (eno, ename, qualification, joindate)

Relationship : M_M with descriptive attributes as start_date, no_of_hours_worked.

Write a stored function using cursor to accept project name as input and print the names of employees working on the project. [4]

(*b*) Explain two-phase locking protocol. [4]

(*c*) Define view. Explain how to create view with example. [3]

(*d*) Explain cascadeless schedule and recoverable schedule. [3]

4. Answer the following :

(*a*) Explain how encryption techniques is used in database security. [4]

(*b*) Explain deadlock prevention algorithm. [4]

(*c*) What is server ? List and explain different types of server. [3]

(*d*) Explain the concepts of Aries Algorithm. [3]

Group-II

5. Consider the following log image, that is obtained during recovery after a crash : [5]

< T_1, Start >

< T_1, X, 10, 10 >

< T_1, Y, 20, 5 >

< T_2, Start >

< T_2, X, 20, 200 >

< T_1, Commit >

< T_3, Start >

< T_3, Z, 10, 20 >

< Checkpoint >

< T_3, K, 20, 200 >

< T_2, Commit >

< T_4, Start >

< T_4, X, 200, 100 > ← system crash.

(*i*) List contents in the list L

(*ii*) List contents in

(*a*) Undo-List

(*b*) Redo-List.

(*b*) Explain 2-tier model. List advantages and disadvantages of the same. [5]

(*c*) Describe different database middleware components. [4]

6. Answer the following questions :

(*a*) Explain Log based Recovery. [4]

(*b*) Explain Timestamp ordering protocol. [4]

(*c*) Consider below scenario and write grant/revoke commands for the same : [3]

Employee (ename, address, salary, Bdate)

Suppose that the relation employee was created by user X, who wants to grant privileges to user A, that :

A can retrieve or modify employee relation and can grant any of these privileges to other users.

(*d*) Explain different data types in PL/PG-SQL. [3]

7. Answer the following questions :

(*a*) Check whether the below schedule is conflict serializable or not, using precedence graph : [4]

S : $R_1(B)$, $R_3(C)$, $R_1(A)$, $W_2(A)$, $W_1(A)$, $W_2(B)$, $W_3(B)$, $W_1(B)$, $W_3(B)$, $W_3(C)$.

(*b*) Consider the following database and relationships :

Bus (bno, capacity, depot_name)

Route (rno, source, destination, no._of_stations)

Driver (dno, dname, license no., address, dage, salary)

Relationship : Bus_Route : M_1

Bus_Driver : M_M.

Write a stored function using cursor to display the details of buses that run on Route no. = 1 and Route no. = 2. (Use two different cursor for raute_no.=1 and route_no. = 2). [4]

(*c*) Explain the syntax of while loop. [3]

(*d*) Define : [3]

(1) Lock

(2) Shared Lock

(3) Exclusive lock.

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-303

S.Y. B.C.A. (Science) (III Semester) EXAMINATION, 2019

BCA-303 : SOFTWARE ENGINEERING

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A & B) are compulsory.

(*ii*) Attempt any *two* questions from Group I and any *two* questions from Group II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

1. (A) Attempt the following questions : [7]

(1) ..... is a computer based information system that uses its knowledge about specific complex application area to act as an expert consultant to users.

(*a*) Expert system

(*b*) Knowledge system

(*c*) Control system

(*d*) None of the above

(2) ..... means asking the customer, the user and other people about objectives for system/product.

(*a*) Elaboration

(*b*) Elicitation

(*c*) Inception

(*d*) Negotiation

P.T.O.

(3) Context level DFD is also called ..... .

(*a*) Root level

(*b*) Level 0

(*c*) Level 1

(*d*) Level 2

(4) ..... includes modifications and updations done in order to correct or fix problems, which are either discovered by user or conducted by user error reports.

(*a*) Corrective maintenance

(*b*) Adaptive maintenance

(*c*) Perfective maintenance

(*d*) Preventive maintenance

(5) Maintainability, Flexibility and Testability are factors of ..... .

(*a*) Product operation

(*b*) Product revision

(*c*) Product transition

(*d*) None of above

(6) The alternate names used are called as ..... .

(*a*) Aliases

(*b*) Duplicate

(*c*) Rename

(*d*) None of above

(7) Glass box testing is also called as ..... .

(*a*) Black box testing

(*b*) Grey box testing

(*c*) White box testing

(*d*) None of the above

(B) Attempt the following : [7]

(*a*) Define open system.

(*b*) Define action and task.

(*c*) List the activities in SDLC.

(*d*) Define specification.

(*e*) What is Pseudocode ?

(*f*) Enlist the objectives of Input Design.

(*g*) Define defect.

Group I

2. Attempt the following :

(*a*) Explain general principles of software engineering. [5]

(*b*) Explain the generic process model. [5]

(*c*) What is feasibility study ? Explain any *one* type in detail. [4]

3. Attempt the following :

(*a*) Define software engineering. Discuss its layers. [4]

(*b*) Differentiate between system analysis and system design. [4]

(*c*) Write a short note on questionnaire. [3]

(*d*) Give any *three* advantages of extreme programming. [3]

4. Attempt the following :

(*a*) Write a short note on white box testing. [4]

(*b*) Write a short note on preventive maintenance. [4]

Consider the following case study for question *c* and *d* :

An insurance company uses the following rule to determine the eligibility of a driver for insurance. The driver will be insured if :

(*i*) The driver lives in a city with population < 10,000 and he is married.

(*ii*) The driver lives in a city with population < 10,000 and he is married and his age is above 30 years.

(*iii*) The driver lives in a city with population is 10,000 or more it is married female.

(*iv*) The driver is male over 30 years.

(*v*) The driver is married and under 30.

(*c*) Draw decision tree for above case study. [3]

(*d*) Draw decision table for above case study. [3]

Group II

5. Attempt the following :

(*a*) Draw context level and 1st level DFD for "Hostel Management system". [5]

(*b*) Explain the prototyping model with its advantages and disadvantages. [5]

(*c*) Explain the term restructuring with its process. [4]

6. Attempt the following :

(*a*) Explain the types of outputs. [4]

(*b*) Explain the life cycle of software testing. [4]

(*c*) Give advantages of smoke testing. [3]

(*d*) What is scrum ? [3]

7. Attempt the following :

(*a*) Differentiate between alpha and beta testing. [4]

(*b*) Differentiate between spiral and waterfall model. [4]

(*c*) Explain the term : Data capture. [3]

(*d*) State the benefits of automation testing. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-304

S.Y. B.C.A. (Science) (III Semester) EXAMINATION, 2019

B.C.A.-304 : INTRODUCTION TO COMPUTER NETWORK

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group I and any *two* questions from Group II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

(*v*) Use of scientific calculator is allowed.

1. (A) Attempt the following : [7×1=7]

(1) A pair of wires twisted with each other is known as ..... .

(*i*) Twisted pair cable

(*ii*) STP cable

(*iii*) Jacket

(*iv*) Co-axial wire

(2) Which of the following device operators is at the network layer of OSI model ?

(*i*) Router

(*ii*) Repeater

(*iii*) Bridge

(*iv*) None of the above

P.T.O.

(3) Which of the layer is not network support layer ?

(*i*) Network layer

(*ii*) Physical layer

(*iii*) Transport layer

(*iv*) None of the above

(4) Networking is a connection of two or more ..... .

(*i*) Computer system

(*ii*) MAN

(*iii*) Place

(*iv*) WAN

(5) In token passing method, each station has a predecessor and ..... .

(*i*) End

(*ii*) Successor

(*iii*) First

(*iv*) None of the above

(6) Physical or logical arrangement of network is ..... .

(*i*) Routing

(*ii*) Networking

(*iii*) Casting

(*iv*) Topology

(7) Most packet switches use this principle :

(*i*) Stop and wait

(*ii*) Store and forward

(*iii*) Both stop and wait and store and foward

(*iv*) None of the above

(B) Attempt the following : [7×1=7]

(*i*) Define Computer Network.

(*ii*) What is Multiplexing ?

(*iii*) What is FDM ?

(*iv*) List the layers of OSI.

(*v*) What are the types of Errors ?

(*vi*) What is Checksum ?

(*vii*) What are important topologies for network ?

Group I

2. Attempt the following :

(*a*) Compare TCP/IP and OSI model. [5]

(*b*) Write a note on Guided Media. [5]

(*c*) Write a note on framing methods in data link layer. [4]

3. Attempt the following :

(*a*) Explain fiber optic cable in detail. [4]

(*b*) Explain the characteristics on which data communication depends. [4]

(*c*) Write a short note on Bus Topology. [3]

(*d*) Define the following terms : [3]

(*i*) IP address

(*ii*) Jitter

(*iii*) Bit length

(*iv*) Bit interval.

4. Attempt the following :

(*a*) Explain message switching in detail. [4]

(*b*) Explain line coding schemes-NRZ. [4]

(*c*) Write a short note on Ethernet. [3]

(*d*) Explain TDM in detail. [3]

Group II

5. Attempt the following :

(*a*) Write a short note on Hubs. [5]

(*b*) Explain line coding characteristics. [5]

(*c*) Explain supernetting. [4]

6. Attempt the following :

(*a*) Explain the fields in IPV_4 datagram. [4]

(*b*) Explain slotted ALOHA in detail. [4]

(*c*) State advantage of CSMA/CD. [3]

(*d*) Give a channel with an intended capacity of 20 Mbps. The bandwidth of channel is 3 MHz. What signal to noise ratio is required in order to achieve this capacity ? [3]

7. Attempt the following :

(*a*) Write a note on WAN with its advantages and disadvantages. [4]

(*b*) Explain performance of Network Bandwidth. [4]

(*c*) Explain different transmission modes in detail. [3]

(*d*) Explain error detection code CRC. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**6**

Seat No.	

[5526]-401

S.Y. B.C.A. (Science) (IV Semester) EXAMINATION, 2019

BCA-401 : C++

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1 (A** and **B)** is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7×1=7]

(*i*) Scope resolution operator is used to unhide ..... variables.

(*a*) Global

(*b*) Local

(*c*) Main

(*d*) None of the above

(*ii*) The members declared in private section can be accessed by ..... .

(*a*) Member functions of same class

(*b*) Friend function of class

(*c*) Derived classes

(*d*) Member functions of their same class and friend of this class

P.T.O.

(*iii*) Function overloading means defining multiple functions having ..... name, which performs the ..... logical task.

(*a*) same, different

(*b*) same, same

(*c*) different, same

(*d*) different, different

(*iv*) The ..... explicit objects requires when overloading unary operator as a friend funtion.

(*a*) 0

(*b*) 1

(*c*) 2

(*d*) 3

(*v*) In public inheritance the public and protected data members of the base class remain ..... in the derived class.

(*a*) public

(*b*) private

(*c*) public and protected resp.

(*d*) protected

(*vi*) Only a ..... function of class can be declared as virtual.

(*a*) template

(*b*) member

(*c*) static

(*d*) inline

(*vii*) ..... function is used to check whether the file pointer has reached at end of file or not.

(*a*) eof( )

(*b*) close( )

(*c*) open( )

(*d*) exit( )

(B) Answer all of the following : [7×1=7]

(*i*) List the applications of object oriented programming.

(*ii*) What are the types of polymorphism ?

(*iii*) Define constructor.

(*iv*) Give the syntax for overloading insertion and extraction operators.

(*v*) Define abstract base class.

(*vi*) Give purpose of FilebuF Class From "Fstream.h".

(*vii*) What are the categories of containers from STL ?

Group I

2. Answer the following :

(*a*) Write a C++ program to define class books having members title and price. Define member functions accept( ) and display( ). Create 5 objects of class accept and display the info of books using array of objects. [5]

(*b*) Explain how to overload constructors in a class with example. [5]

(*c*) What is static class members ? Explain with suitable example. [4]

3. Answer the following :

(*a*) What is Friend Function ? Give its features. [4]

(*b*) Explain the ways to defining member functions. [4]

(*c*) Give difference between call by value and call by reference. [3]

(*d*) State rules for operator overloading. [3]

4. Answer the following :

(*a*) Explain various file opening modes in C++. [4]

(*b*) Give advantages and limitations of templates. [4]

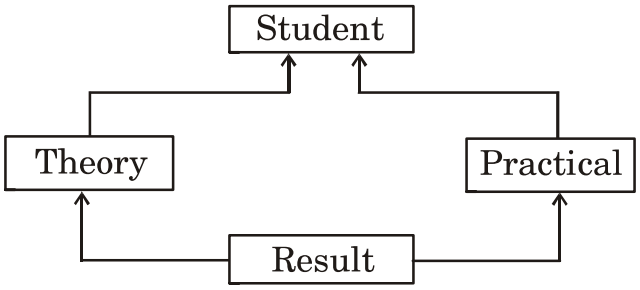
(*c*) Give difference between virtual and pure virtual function. [3]

(*d*) Explain exception handling mechanism. [3]

Group II

5. Answer the following :

(*a*) Design the classes using the following inheritance : [5]



Each class has member functions accept and display. Write a program to accept details of '*n*' students and display their result.

(*b*) What is virtual function ? Explain with example. [5]

(*c*) Explain how to search file content with example. [4]

6. Answer the following :

(*a*) Explain template with multiple parameters with example. [4]

(*b*) Write a short note on algorithms in STL. [4]

(*c*) Define Inheritance. Give advantages of it. [3]

(*d*) Give purpose of protected keyword. [3]

7. Answer the following :

(*a*) Explain copy constructor with example. [4]

(*b*) Explain various stages involved in the process from creation to execution of C++ program. [4]

(*c*) Define manipulator. Explain setfill( ) with example. [3]

(*d*) Give advantages and disadvantages of inline functions. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**6**

Seat No.	

[5526]-402

S.Y. B.C.A. (Science) (IV Semester) EXAMINATION, 2019

BCA-402 : INTRODUCTION TO WEB TECHNOLOGY

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1 (A** and **B)** is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* answer of the following options : [7]

(*i*) Apart from <b> tag, ... tag makes text bold.

(*a*) <text>

(*b*)

(*c*) <bold>

(*d*) <emp>

(*ii*) ..... will make all paragraph elements in 'Red' colour.

(*a*) p.all {color : red;}

(*b*) p.all {color : # 990000;}

(*c*) all.p {color : # 998877;}

(*d*) p {color : red;}

P.T.O.

(*iii*) ..... HTTP method sends a document from server to client.

(*a*) GET

(*b*) POST

(*c*) HEAD

(*d*) PUT

(*iv*) ..... object contains properties of URL in JavaScript.

(*a*) History

(*b*) Screen

(*c*) Location

(*d*) Navigator

(*v*) ..... method in JavaScript inserts as well as removes elements from an array.

(*a*) slice( )

(*b*) substr( )

(*c*) splice( )

(*d*) split( )

(*vi*) ..... function is used to create array from variables in PHP.

(*a*) list( )

(*b*) extract( )

(*c*) join( )

(*d*) compact( )

(*vii*) What is output of the following in PHP :

```
<?php
    $a=7;
    if ($a===“7”)
        echo “equals”;
    else
        echo “not equal”;
?>
```

(*a*) Error

(*b*) Equals

(*c*) Not equal

(*d*) None of the above

(B) Attempt the following : [7]

(*i*) What are different parts of URL ?

(*ii*) What is main difference between and tag ?

(*iii*) List different types of selectors in CSS.

(*iv*) What is output of the following code :

```
<script>
document . write (math.ceil(1.4));
</script>
```

(*v*) Which array function or method in JavaScript removes first element from an array ?

(*vi*) What is purpose of execution operator in PHP ?

(*vii*) List the functions in PHP which sorts array by keys in ascending and descending order.

Group I

2. Attempt the following :

(*a*) Explain HTML tags to embed multimedia controls in web page with an example. [5]

(*b*) Explain types of cascading style sheet (CSS). [5]

(*c*) Write JavaScript to display time in text box. [4]

3. Attempt the following :

(*a*) What are different dialogue boxes provided by windows object in JavaScript ? [4]

(*b*) Explain client side image mapping in HTML with an example. [4]

(*c*) Explain HTTP request and response messages in brief. [3]

(*d*) Write HTML script to display the following table : [3]

Name	Region	
	City	Postal Code
Kiran	Pune	411001

4. Attempt the following :

(*a*) Explain any *four* properties and methods of document object in JavaScript. [4]

(*b*) Write JavaScript to display sum of first *n* numbers. [4]

(*c*) Explain datatypes supported in PHP. [3]

(*d*) Explain anonymous function with example in PHP. [3]

Group II

5. Attempt the following :

(*a*) Write PHP script to accept student information like rollno, name and marks of three subjects, calculate percentage and display information in tabular format on next page. [5]

(*b*) Explain the following functions of array with example in PHP : [5]

(*i*) array_slice( )

(*ii*) array_flip( )

(*iii*) array_splice( )

(*iv*) array_keys( )

(*v*) array_sum( )

(*c*) What are different functions in JavaScript to receive HTML form data ? [4]

6. Attempt the following :

(*a*) Explain any *two* event handling types with the example in JavaScript. [4]

(*b*) Explain variable functions concept in PHP with an example. [4]

(*c*) What is associative array ? What is the way to iterate over elements of an associative array ? [3]

(*d*) Find output of the following : [3]

```
<?php
$a1 = array ("red", "blue", "yellow", "orange", "black");
$a2 = array ("blue", "orange", "black");
$diff = array_diff ($a1, $a2);
print_r($diff);
?>
```

7. Attempt the following :

(*a*) Explain any *four* string methods in JavaScript with example. [4]

(*b*) How to retrieve information about the parameters passed to user defined function in PHP ? Explain with example. [4]

(*c*) What are disadvantages of static web sites ? [3]

(*d*) Explain any *three* CSS background properties with example. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-403

S.Y. B.C.A. (Science) (IV Semester) EXAMINATION, 2019

BCA-403 : ADVANCED NETWORKING AND NETWORK SECURITY

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1 (A** and **B)** are compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Attempt the following : [7]

(*i*) State True/False :

SCTP is a connectionless transport layer protocol.

(*ii*) In an asymmetric key cipher, the receiver uses the ..... key.

(*a*) Public

(*b*) Private

(*c*) Both (*a*) and (*b*)

(*d*) None of the above

(*iii*) Using differential cryptoanalysis, the minimum computation required to decipher the DCS algorithm is ..... .

(*a*) 2^{56}

(*b*) 2^{43}

(*c*) 2^{55}

(*d*) 2^{47}

P.T.O.

(*iv*) RSA stands for ..... .

(*a*) Rock, Shane and Amazen

(*b*) Rivest, Shamir and Adleman

(*c*) Rivest, Shane and Amazen

(*d*) Rock, Shamir and Adleman

(*v*) Typically ..... can receive application data from any application layer protocol but the protocol is normally http.

(*a*) SSL

(*b*) TLS

(*c*) SSL and TLS

(*d*) PGP

(*vi*) IPsec defines two protocols ..... and ..... .

(*a*) AH and SSL

(*b*) PGP and ESP

(*c*) AH and ESP

(*d*) None of the above

(*vii*) ..... provides the strongest authentication.

(*a*) Password

(*b*) Smart Card

(*c*) Smart Token

(*d*) Multifactor Authentications

(B) Attempt the following : [7]

(*i*) List the sections of UDP's checksum.

(*ii*) What is monoalphabetic cipher ?

(*iii*) Define confusion.

(*iv*) Define message digest.

(*v*) What is S-HTTP ?

(*vi*) What is bastion host ?

(*vii*) Define stegnography ?

Group I

2. Attempt the following :

(*a*) Explain the services offered by TCP. [5]

(*b*) List the possible types of attacks and explain. [5]

(*c*) Write a note on ECB mode. [4]

3. Attempt the following :

(*a*) Explain the steps in creation of digital signature. [4]

(*b*) Encrypt the following plain text using Hill cipher method : [4]

$$\text{where Key Matrix} = \begin{bmatrix} 6 & 24 & 1 \\ 13 & 16 & 10 \\ 20 & 17 & 15 \end{bmatrix}.$$

Plain text = BCA.

(*c*) What is SSL session and SSL connection ? [3]

(*d*) What is meet in the middle attack ? [3]

4. Attempt the following :

(*a*) Generate the secret key using Diffie Hellman Key exchange algorithm : [4]

Where $n = 11$ and $g = 7$

Consider $x = 2$ and $y = 3$.

(*b*) Write a short note on honey pots. [4]

(*c*) Explain time-stamping protocol. [3]

(*d*) What are the properties of hash function. [3]

Group II

5. Attempt the following :

(*a*) Given $p = 7$ and $q = 19$. Generate the public and private key using RSA algorithm. [5]

(*b*) Explain different types of UPN. [5]

(*c*) Differentiate between symmetric and asymmetric key cryptography. [4]

6. Attempt the following :

(*a*) What is user authentication ? Explain biometric authentication in brief. [4]

(*b*) Explain the steps in asymmetric key cryptography. [4]

(*c*) What is TSS ? [3]

(*d*) State the applications of UDP. [3]

7. Attempt the following :

(*a*) Explain the IPsec modes. [4]

(*b*) Explain the process-to-process delivery in detail. [4]

(*c*) State any *four* differences between stream and block cipher. [3]

(*d*) State the challenges faced by symmetric key algorithm. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**3**

Seat No.	

[5526]-404

S.Y. B.C.A. (Sem. IV) EXAMINATION, 2019

SCIENCE

BCA-404 : OOSE

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) are compulsory.

(*ii*) Attempt any *two* questions from Group-I.

(*iii*) Attempt any *two* questions from Group-II

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the appropriate questions : [7×1=7]

(*i*) Choose the following correct grouping thing.

(*a*) Object, class and component

(*b*) Note, collaboration and interface

(*c*) Use case and node

(*d*) Package.

(*ii*) A collection of similar types of objects is considered as a.....

(*a*) Class (*b*) Inheritance

(*c*) Object (*d*) Relationship

(*iii*) A package is a general purpose mechanism for organizing modeling elements into.....

(*a*) Class (*b*) Object

(*c*) Groups (*d*) Both (*a*) and (*b*)

P.T.O.

(*iv*) An.....is the specification of a significant that has a location in time and space.

(*a*) Signal (*b*) Time

(*c*) Event (*d*) Both (*a*) and (*b*)

(*v*) .....initiate and control the flow of activity, while passive classes store data and serve other classes.

(*a*) Classes (*b*) Active classes

(c) Objects (*d*) Both (*a*) and (*b*)

(*vi*) A mechanism is an instance of one or more :

(*a*) Frameworks (*b*) Noder

(*c*) Pattern (*d*) None of these

(*vii*) A collaboration diagram emphasizes the organization of the objects that participate in an.....

(*a*) Collaboration (*b*) Interaction

(*c*) Use case (*d*) None of these

(B) Answer in *one* sentence each : [7×1=7]

(*i*) What is joining ?

(*ii*) What is call event ?

(*iii*) Define polymorphism.

(*iv*) What is Role ?

(*v*) What are the features of VML ?

(*vi*) What is deployment ?

(*vii*) What is Dependency ?

Group-I

2. (*a*) What is object diagram ? Explain its purpose. [5]

(*b*) What is inheritance ? Explain its type with example. [5]

(*c*) What is interaction diagram ? Write its purpose. [4]

3. (*a*) Explain classes in detail. [4]

(*b*) Draw sequence diagram for online shopping system. [4]

(*c*) Explain the notations used for object diagram. [3]

(*d*) What is synchronization. [3]

4. (*a*) Explain the concept of activity diagram. [4]

(*b*) Explain the role and types with an example. [4]

(*c*) Define physical architecture and logical architecture. [3]

(*d*) Draw class diagram for book store management. [3]

Group-II

5. (*a*) Explain the notations of use case diagram. [5]

(*b*) Explain the features of VML. [5]

(*c*) What is component ? Explain with example. [4]

6. (*a*) What is relationship ? Enlist its types. [4]

(*b*) What symbols used in class diagrams ? [4]

(*c*) Draw use case diagram for online banking system. [3]

(*d*) Explain types of component. [3]

7. (*a*) Describe advanced class with example. [4]

(*b*) Explain depolyment specification. [4]

(*c*) Draw component diagram for hospital mgt system. [3]

(*d*) What is use case ? Explain with example. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-405

S.Y. B.C.A. (Science) (IV Semester) EXAMINATION, 2019

BCA-407 : GRID AND CLOUD COMPUTING

(2016 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Question No. **1 (A** and **B)** are compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Answer the following : [5]

(*i*) Which business type provides software as a service ?

(*a*) Internet Service Provider

(*b*) Infrastructure Service Provider

(*c*) Application Service Provider

(*d*) Platfrom Service Provider

(*ii*) Which virtualization standards does the websphere application Server/Hypervisor Edition use ?

(*a*) Interoperable

(*b*) Open Virtualization Format

(*c*) Common Image Format

(*d*) Open Virtual Appliance

P.T.O.

(*iii*) Amazon E_2C Engine is an example of ..... .

(*a*) PaaS

(*b*) IaaS

(*c*) SaaS

(*d*) None of the above

(*iv*) ..... is not a type of cloud.

(*a*) Private

(*b*) Public

(*c*) Protected

(*d*) Hybrid

(*v*) Enteroperatibility is enabled by ..... .

(*a*) A Composite Cloud

(*b*) Middleware

(*c*) A Cloud Operating System

(*d*) A Community Model

(B) Answer in short : [5]

(*i*) List the application areas of grid computing.

(*ii*) Define virtualization.

(*iii*) Give the benefits of cloud computing.

(*iv*) What is load balancing ?

(*v*) What is utility grid ?

Group I

2. Attempt the following :

(*a*) State the advantages of high performance. [4]

(*b*) Explain general structure of cloud computing in detail. (components of cloud) [4]

(*c*) Explain the term of Grid Network. [2]

3. Attempt the following :

(*a*) Explain in detail deployment model. [4]

(*b*) Explain in brief the centralized model of P2P. [4]

(*c*) What is Global Grid ? [2]

4. Attempt the following :

(*a*) Write short note on compute grids. [4]

(*b*) Explain PaaS service model of cloud computing. Give examples. [4]

(*c*) What are the disadvantages of cloud computing ? [2]

Group II

5. Attempt the following :

(*a*) Distinguish between grid computing and cloud computing. [4]

(*b*) Explain grid computing architecture model in brief with the help of diagram. [4]

(*c*) List essential characteristics of cloud computing. [2]

6. Attempt the following :

(*a*) Campare cluster computing and grid computing. [4]

(*b*) Explain in short case study Amazon EC2 as IaaS. [4]

(*c*) What are the goals of load balancing ? [2]

7. Attempt the following :

(*a*) State the advantages and disadvantages of Internet Computing. [4]

(*b*) Explain NIST model. [4]

(*c*) Write a note on Enterprise Grids. [2]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-501

T.Y. B.C.A. (Science) (Fifth Semester) EXAMINATION, 2019

BCA-501 : JAVA PROGRAMMING

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group-I and any *two* questions from Group-II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the correct option : [7]

(*a*) When does method overloading determine ?

(*i*) At a run time (*ii*) At a compile time

(*iii*) At a coding time (*iv*) At an execution time

(*b*) A package is a collection of .....

(*i*) Classes

(*ii*) Interfaces

(*iii*) Editing tools

(*iv*) Classes and interfaces

(*c*) Only one base class, one or more intermediate base classes and only one derived class is called as ..... inheritance.

(*i*) Multiple (*ii*) Multilevel

(*iii*) Single (*iv*) Hierarchical

P.T.O.

(*d*) When error will be occurring then if checked the exception type in ..... block.

(*i*) Try (*ii*) Catch

(*iii*) Throw (*iv*) Finally

(*e*) Which method is used to remove the blank space from string ?

(*i*) to string( ) (*ii*) equal ignore case( )

(*iii*) trim( ) (*iv*) compare to( )

(*f*) ..... statement is used question mark (?) for input values.

(*i*) Statement (*ii*) Prepared statement

(*iii*) Collable statement (*iv*) None of these

(*g*) What is the output of relational operator ?

(*i*) Integer (*ii*) Boolean

(*iii*) Char (*iv*) Double

(B) Attempt the following : [7]

(*a*) "Vector is a growable or changeable size"—justify true *or* false.

(*b*) What is use of final keyword ?

(*c*) State any *two* differences between throw and throws.

(*d*) What is constructor ?

(*e*) Write any *two* implicit object in JSP ?

(*f*) Name the package which import the tree set class.

(*g*) What is exception in Java ?

Group I

2. Attempt the following :

(A) What is servlet ? Explain the types of servlet in detail. [5]

(B) Create a student table with fields (roll_no, name, percentage) Write a JDBC program to insert, update and delete, display all student details. [5]

(C) Write a java program to accept *n* numbers in vector and display all statements sum. [4]

3. Attempt the following :

(A) What is interface ? Explain the use map interface with suitable example. [4]

(B) Write a java program to accept *n* number of city. Insert into array list collection and display the content of the same array list, remove all this element use (clear( )) method. [4]

(C) Write a difference between java application and java applet. [3]

(D) What is exception ? Explain try, catch and finally block. [3]

4. Attempt the following :

(A) Explain the abstraction in detail. [4]

(B) Write a program to copy content one file into another file replace the numbers with '*' and change the case. [4]

(C) Write a difference between array and vector. [3]

(D) Write a java program to accept *n* string from user and store it into vector. Display the first and last element of vector. [3]

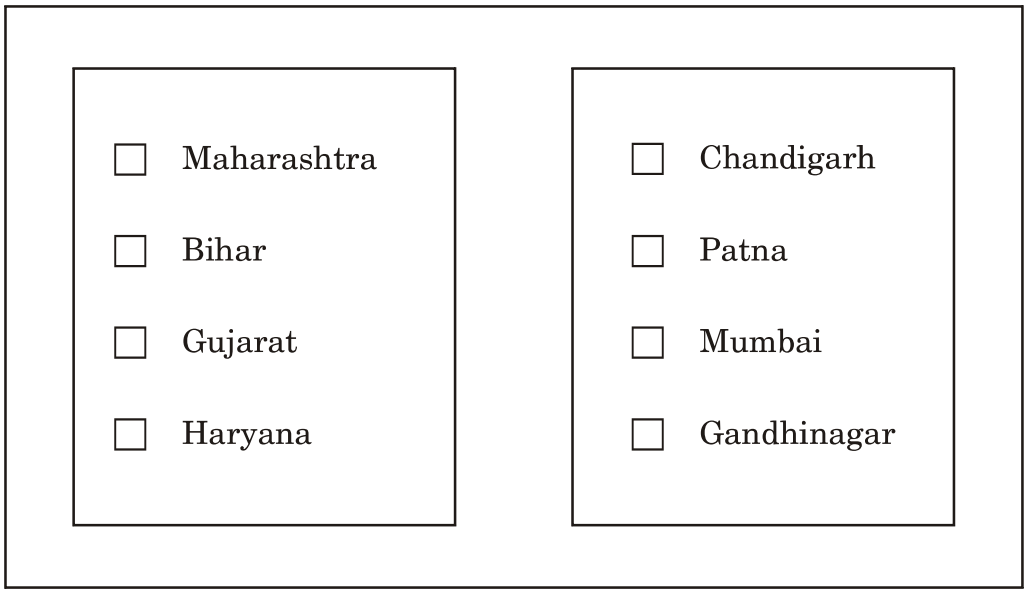
Group II

5. Attempt the following :

(A) Why is JSP fly compilation ? Explain implicit object in JSP ? [5]

(B) What is inheritance ? Explain hierarchical and multiple inheritance with an example. [5]

(C) Write a AWT program for the following : [4]



6. Attempt the following :

(A) What is JDBC ? Explain types of jdbc ? [4]

(B) Write java program to accept user name, password from HTML and pass to servlet and compare with DB and display appropriate message. [4]

(C) Write a short note on built-in package and user define package. [3]

(D) Explain any *three* JDK tools in Java. [3]

7. Answer the following :

(A) Explain constructor and destructor with a suitable example. [4]

(B) Write a java program to create abstract class person derived two classes Employee and Worker from it. Use proper method to accept and display for the same. Employee(eno, ename, address), similar fields are worker. [4]

(C) Create student class having data member (roll_no, name, percentage) accept values and display details (use commandline argument). [3]

(D) Difference between Iterator and Enumeration. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-502

T.Y. B.C.A. (Science) (Fifth Semester) EXAMINATION, 2019

BCA-502 : ADVANCED WEB TECHNOLOGY

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** is compulsory.

(*ii*) Attempt any *two* questions from Group-I and any *two* questions from Group-II.

(*iii*) *All* questions carry equal marks.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7]

(*a*) ..... returns the filename of currently executing script.

(*i*) $-SERVER['SERVER-NAME']

(*ii*) $-SERVER['PHP-SELF']

(*iii*) $-SERVER['SCRIPT-NAME']

(*iv*) $-SERVER['SCRIPT-URI']

(*b*) ..... function is used to create directory specify by path name.

(*i*) rmdir( ) (*ii*) dir( )

(*iii*) dirname( ) (*iv*) mkdir( )

(*c*) ..... is ability to hide details of implementation.

(*i*) Introspection (*ii*) Encapsulation

(*iii*) Inheritance (*iv*) Interpolation

P.T.O.

(*d*) XML-RPC stands for :

(*i*) XML-Reverse Protocol Call

(*ii*) XML-Return Protocol Call

(*iii*) XML-Based Remote Procedure Call

(*iv*) None of the above

(*e*) Which of the following functions is used to compile the query ?

(*i*) prepare( ) (*ii*) execute( )

(*iii*) execute multiple (*iv*) none of these

(*f*) Which one is *correct* ?

(*i*) <MOVIE> <name> XYZ </name> </MOVIE>

(*ii*) <movie> <name> XYZ </movie> </name>

(*iii*) <MOVIE> <NAME> XYZ </name> </movie>

(*iv*) None of the above

(*g*) ..... is used to get properties of class.

(*i*) get-class-methods( ) (*ii*) get-class-vars( )

(*iii*) get-object-vars( ) (*iv*) none of these

(B) Attempt the following : [7]

(*a*) What is UDDI ?

(*b*) What is object cloning ?

(*c*) Define destructor ?

(*d*) What is purpose of onreadystate( ) function ?

(*e*) Give any *five* name superglobal variable.

(*f*) Write syntax of pg_fetch_assoc( ) function ?

(*g*) List the examples of AJAX.

Group I

2. Attempt the following :

(A) Discuss the concept of cookies and session in PHP. [5]

(B) Write any *five* differences between AJAX and Javascript. [5]

(C) Write a php script to accept directory name and print contents of that directory. [4]

3. Attempt the following :

(A) What is an introspection ? Explain any *two* introspective functions in PHP. [4]

(B) What are the different PEAR DB methods ? Explain with an example. [4]

(C) Write a short note on SDAP. [3]

(D) Write PHP script to keep track of number of times of webpage has been access. [3]

4. Attempt the following :

(A) Derive a class square from class rectangle. Create one more class circle. Create an interface with only one method called area( ), implement this interfaces in all classes. Include data member and constructor in all classes. Write a program details of square, circle, rectangle and display area. [4]

(B) Write a note on an AJAX PHP framework. [4]

(C) Explain sticky form in detail. [3]

(D) Write any *four* operations on file. [3]

Group II

5. Attempt the following :

(A) What is XML ? Give any *three* advantages and disadvantages of XML. [5]

(B) Consider the following relational database : [5]

Project(P_group_no, project_title)

Student(seat_no, name, class, P-group_no)

Write a PHP script to accept project title and display list of students those who are working in particular project.

(C) What is difference between XML and HTML ? [4]

6. Attempt the following :

(A) Write PHP script using AJAX concept to check username and password are valid or invalid. [4]

(B) Write a PHP program to accept student rno, name, on page1.php and marks of three subjects on page2.php and display students all information page3.php [4]

(C) Write PHP script to read item.xml file (contain Ino, I-duc, price) and print items detail in tabular format using simple xml. [3]

(D) Write any *three* advanced database techniques. [3]

7. Attempt the following :

(A) What is interface ? Explain with an example. [4]

(B) Explain rules to write XML Elements and Attributes. [4]

(C) Write any *four* directory handling functions with its use. [3]

(D) Explain how to combine session and cookies. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-503

T.Y. B.C.A. (Science) (Fifth Semester) EXAMINATION, 2019

BCA-503 : SOFTWARE QUALITY ASSURANCE

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) are compulsory.

(*ii*) Attempt any *two* questions from Group-I.

(*iii*) Attempt any *two* questions from Group-II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7]

(1) Software ..... are software errors that cause the incorrect functioning of software during a specific application.

(*a*) errors (*b*) faults

(*c*) failures (*d*) all of these

(2) Review can be categorized as .....

(*a*) Formal design and peer review

(*b*) Product and documentation review

(*c*) Requirement and product review

(*d*) None of the above

(3) ..... examines the consistency of the product being developed with products developed in previous phases.

(*a*) Verification (*b*) Validation

(*c*) Qualification (*d*) None of these

P.T.O.

(4) Types of audit that should be performed prior to release of a product baseline or a revision of an existing baseline .....

(*a*) Physical Configuration Audit (PCA)

(*b*) Functional Configuration Audit (FCA)

(*c*) PCA and FCA

(*d*) Baseline Configuration Audit (BCA)

(5) ..... is a classic metric measures the size of software by thousands of code line.

(*a*) KLOC (*b*) LOC

(*c*) PLOC (*d*) MLOC

(6) The ..... certification process verifies that an organization's software development and maintenance processes fully comply with the standard's requirement.

(*a*) ISO 9000-3 (*b*) IEEE 1012

(*c*) IEEE/EIA 12207 (*d*) ISO 2009

(7) CASE ..... are set of software application programs, which are used to automate SDLC activities.

(*a*) Repository (*b*) Tools

(*c*) Dictionary (*d*) Manual

(B) Answer the following : [7]

(*a*) What is quality ?

(*b*) Give any *two* components of SQA architecture.

(*c*) Define the term qualification.

(*d*) Give the meaning of checklist.

(*e*) What is function point ?

(*f*) What are examples of quality management standards.

(*g*) What is software development life cycle (SDLC) ?

Group I

2. Attempt the following :

(A) Explain spiral model with features, advantages and disadvantages in detail. [5]

(B) Write a short note on SCM audit. [5]

(C) State and explain different categories of software errors. [4]

3. Attempt the following :

(A) Discuss software quality factors for product transition in detail. [4]

(B) Write a short note on product metrics in detail. [4]

(C) What are principles of capability maturity model. [3]

(D) Explain project life cycle with suitable diagram. [3]

4. Attempt the following :

(A) Explain quality management standards with an example. [4]

(B) Explain project life cycle with diagram. [4]

(C) List the uses of product metrics. [3]

(D) Write a short note on configuration management. [3]

Group II

5. Attempt the following :

(A) Describe the contribution of a CASE tools to software Maintenance Quality. [5]

(B) What are requirements for providing effective software Charge Control. [5]

(C) Explain various activities carried out in software Quality Assurance. [4]

6. Answer the following :

(A) Describe SQA architecture in detail. [4]

(B) What are features of good software quality metrics ? [4]

(C) What are types of quality measurement standards ? [3]

(D) What is case repository. [3]

7. Attempt the following :

(A) What is structure of capability maturity models ? Explain with diagram. [4]

(B) Write a short note on procedure manual. [4]

(C) Define the terms : [3]

(*i*) Adaptive maintenance

(*ii*) Corrective maintenance

(*iii*) Mean-time-to-failure.

(D) List the components of software Project Life Cycle. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-504

T.Y. B.C.A. (Science) (V Semester) EXAMINATION, 2019

BCA-504 : OPERATING SYSTEMS

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory.

(*ii*) Solve any *two* questions from Group I and any *two* questions from Group II.

(*iii*) Figures to the right indicate full marks.

1. (A) Attempt the following : [7]

(1) A Video Recorder, Keyboard, Audio Microphone are ..... devices.

(*a*) Storage

(*b*) Display

(*c*) Capture

(*d*) None of above

(2) ..... is a user interface.

(*a*) Common Line Interface

(*b*) Batch Interface

(*c*) Graphical User Interface

(*d*) All of above

P.T.O.

(3) ..... is a module that gives control of the CPU to the process selected by the short-term scheduler.

(*a*) Compiler

(*b*) Dispatcher

(*c*) Processor

(*d*) None of above

(4) Files, semaphores and monitors are ..... resources.

(*a*) Physical

(*b*) Logical

(*c*) Technical

(*d*) None of above

(5) A system is in safe state only if there exists a .....

(*a*) Continuous sequence

(*b*) Safe sequence

(*c*) None of above

(6) A logical address is an address generated by .....

(*a*) Memory unit

(*b*) Central processing unit

(*c*) Graphics processing unit

(*d*) None of above

(7) In a bit vector each block is represented by ..... if block is free and ..... if block is allocated.

(*a*) 1, 0

(*b*) 0, 1

(*c*) 0, 0

(*d*) 1, 1

(B) Attempt the following : [7]

(1) List the types of clustering.

(2) What is ready queue ?

(3) Define throughput.

(4) What is race condition ?

(5) What is mutual exclusion ?

(6) Define system table.

(7) What is compile time ?

Group I

2. Attempt the following :

(*a*) Explain in depth relationship between API, system call and operating system. [5]

(*b*) Write a short note on virtualization. [5]

(*c*) State the benefits of multithreaded programming. [4]

3. Attempt the following :

(*a*) Consider the following set of processes, with the length of the CPU burst time given in :

A	3	2	4
B	3	0	2
C	6	4	1 (highest)
D	4	1	3

Compute the average turn around time and average waiting time for Non-preemptive shortest job first algorithm. [4]

(*b*) What is semaphores ? Discuss its types. [4]

(*c*) Write a short note on process termination. [3]

(*d*) Explain the working of memory management unit in short. [3]

4. Attempt the following :

(*a*) Let the reference string be 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Use FIFO algorithm to find the number of page faults : [4]

(*a*) when there are 3 frames

(*b*) where there are 4 frames.

(*b*) Explain tree-structure directory structure. [4]

(*c*) Write a note on working of I/O scheduler. [3]

(*d*) State the necessary conditions for deadlock to occur. [3]

Group II

5. Attempt the following :

(*a*) Let the reference string be 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults will occur for the following page replacement algorithms, assuming 4 frames for all initially empty :

(*a*) Optimal replacement

(*b*) LRU. [5]

(*b*) Differentiate between contiguous allocation and linked allocation method of disk space. [5]

(*c*) Write a short note on Polling. [4]

6. Attempt the following :

(*a*) State the advantages and disadvantages of dynamic linking. [4]

(*b*) Consider the following snapshot of the system. A system has 5 processes A through E and 4 resources type R_1 through R_4.

	Allocation				Max			
	R_1	R_2	R_3	R_4	R_1	R_2	R_3	R_4
A	3	6	1	1	4	1	1	1
B	0	1	0	0	0	2	1	2
C	1	1	1	0	4	2	1	0
D	1	1	0	1	1	1	1	1
E	0	0	0	0	2	1	1	0

Total			
R_1	R_2	R_3	R_4
6	3	4	2

Answer the following question using Banker's algorithm :

If the system is in safe state give the safe sequence. [4]

(*c*) What is spooling ? [3]

(*d*) Discuss the requirements of the critical problem solution. [3]

7. Attempt the following :

(*a*) Explain the different issues related to message passing system. [4]

(*b*) Write a short note on Preemptive Scheduling. [4]

(*c*) Write a note on client server computing. [3]

(*d*) Discuss the symbols used for representation of resource allocation graph. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-505

T.Y. B.C.A. (Science) (V Semester) EXAMINATION, 2019

BCA-507 : SOFT COMPUTING

(2016 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory.

(*ii*) Attempt any *two* questions from Group I and any *two* questions from Group II.

(*iii*) Figures to the right indicate full marks.

1. (A) Attempt the following : [5]

(1) A/An ..... algorithm applies the principles of evolution found in nature to the problem of finding an optimal solution to a solved problem.

(*a*) biological/artificial

(*b*) chemical/biological

(*c*) genetic/evolutionary

(*d*) All of the mentioned

(2) ..... is an important concept in relating set theoretic forms to function theoretic representations of information.

(*a*) Mapping

(*b*) Binding

(*c*) Combining

(*d*) All of the above

P.T.O.

(3) ..... is the process of choosing two parents from the population.

(*a*) Selection

(*b*) Initialization

(*c*) Termination

(*d*) All of the above

(4) Reinforcement learning ..... .

(*a*) learns a behaviour that maximizes rewards

(*b*) is a kind of neural network

(*c*) is used for continuous optimization problems

(*d*) None of the above

(5) Artificial Neural Network is used for ..... .

(*a*) Pattern recognition

(*b*) Classification

(*c*) Clustering

(*d*) All of the above

(B) Attempt the following : [5]

(1) List any *four* applications of soft computing.

(2) If the elements in two sets A and B are given as A = {2, 5} and B = {*a*, *b*, *c*, *d*} then :

(*i*) A × B = ?

(*ii*) B × A = ?

(3) What is the universe of discourse ?

(4) Define bias.

(5) What is permutation encoding ?

Group I

2. Attempt the following :

(*a*) Explain the properties of fuzzy sets. [4]

(*b*) Using genetic algorithm maximize $f(x) = x^2$ over {0, 1, 2, ..., 31} with initial x values of (13, 24, 8, 19). [4]

(*c*) Which are the principal components of soft computing ? [2]

3. Attempt the following :

(*a*) Discuss the different classes of evolutionary algorithm. [4]

(*b*) Discuss the merits and demerits of Perceptron Network. [4]

(*c*) Let $\underset{\sim}{A} = \left\{\frac{0.9}{2} + \frac{0.6}{3} + \frac{0.5}{4} + \frac{0.3}{5}\right\}$

$$\underset{\sim}{B} = \left\{\frac{0.1}{2} + \frac{0.4}{3} + \frac{0.5}{4} + \frac{0.7}{5}\right\}$$

Perform Union and Intersection. [2]

4. Attempt the following :

(*a*) What are the *four* steps in back propagation algorithm. [4]

(*b*) What is selection ? Explain any *two* techniques. [4]

(*c*) Which are the different membership functions ? Plot the fuzzy membership function for "Weight of People" where :

Very Thin (VT) : $W \leq 25$

Thin (T) : $25 < W \leq 45$

Average (Av) : $45 < W \leq 60$

FAT (F) : $60 < W \leq 75$

Very Fat (VF) : $W > 75$ [2]

Group II

5. Attempt the following :

(*a*) Given the following fuzzy numbers A and B, using Zadeh's extension principle calculate fuzzy number "Approximately 12".

$$A = \text{approximately } 2 = \left\{\frac{0.6}{1} + \frac{1}{2} + \frac{0.8}{3}\right\}$$

$$B = \text{approximately } 6 = \left\{\frac{0.8}{5} + \frac{1}{6} + \frac{0.1}{7}\right\}$$ [4]

(*b*) Distinguish between supervised and unsupervised learning. [4]

(*c*) Define : [2]

(*i*) Solution

(*ii*) Fitness function.

6. Attempt the following :

(*a*) Write a short note on reinforcement learning. [4]

(*b*) Consider the fuzzy sets on universe $x = \{a, b, c, d\}$ and

$$\underset{\sim}{A} = \text{young} = \left\{\frac{1}{1} + \frac{0.8}{2} + \frac{0.6}{3} + \frac{0.4}{4} + \frac{0.2}{5}\right\}$$

$$\underset{\sim}{B} = \text{old} = \left\{\frac{0.2}{1} + \frac{0.4}{2} + \frac{0.6}{3} + \frac{0.8}{4} + \frac{1}{5}\right\}$$

Determine the implication relation : If A THEN NOT B. [4]

(*c*) Give the application areas of fuzzy logic. [2]

7. Attempt the following :

(*a*) Differentiate between hard and soft computing. [4]

(*b*) Define : [4]

(*i*) Core

(*ii*) Support

(*iii*) Height of fuzzy set

(*iv*) Fuzzy number

(*c*) What is optimization ? Give its classification. [2]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

Seat No.	

[5526]-601

T.Y. B.C.A. (Science) (VI Semester) EXAMINATION, 2019

BCA-601 : ANDROID PROGRAMMING

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory question.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the appropriate option : [7]

(*i*) ..... are small activities that can be added or removed from activity.

(*a*) Action Bar

(*b*) Intent

(*c*) Fragment

(*d*) Views

(*ii*) ..... groups view in rows and columns.

(*a*) Linear Layout

(*b*) Absolute Layout

(*c*) Relative Layout

(*d*) Table Layout

P.T.O.

(*iii*) ..... constant is used to access the state of the network.

(*a*) ACCESS-STATE-NETWORK

(*b*) ACCESS-COARSE-NETWORK

(*c*) CHANGE-NETWORK-STATE

(*d*) ACCESS-NETWORK-STATE

(*iv*) The ..... displays one item at a time from a list and enables user to choose among them.

(*a*) List View

(*b*) Spinner View

(*c*) Time Picker View

(*d*) Dialogfragment View

(*v*) ..... show items in a center-locked, horizontal scrolling list.

(*a*) Gallery

(*b*) Image View

(*c*) Image

(*d*) Image Switcher

(*vi*) ..... is a method of SQLite Database.

(*a*) rawQuery()

(*b*) onCreate()

(*c*) onUpgrade()

(*d*) getWritable Database()

(*vii*) To check the feedback of SMS message sending process ..... is one of the object passed as an argument to sendTextMessage() method.

(*a*) receivedPI

(*b*) receivedMessage

(*c*) sentPI

(*d*) sentMessage

(B) Answer the following : [7]

(*i*) Define ADT.

(*ii*) What is fragment ?

(*iii*) What is ViewGroup ?

(*iv*) Explain use of DatePicker.

(*v*) List the types of Menu.

(*vi*) Write the purpose of OnUpgrade() method.

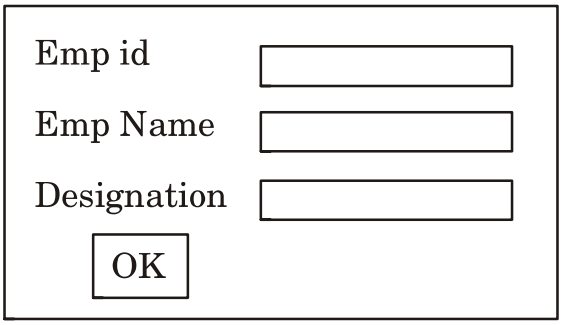
(*vii*) Differentiate between ListView and Spinner.

Group I

2. Answer the following :

(*a*) Explain architecture of Android. [5]

(*b*) Write an application for the following layout : [5]

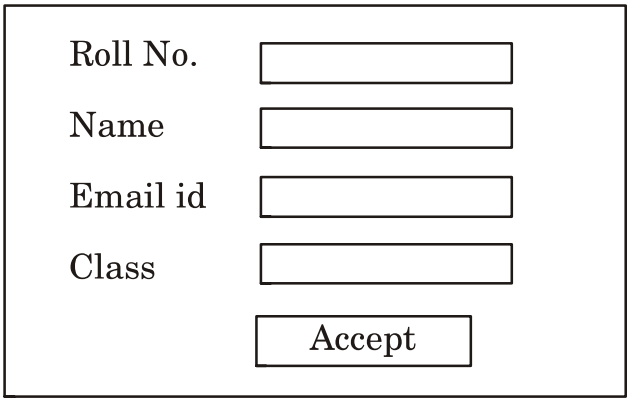


After clicking OK button display employee details from one activity to another.

(*c*) List all types of Layout and explain any *two*. [4]

3. Answer the following :

(*a*) Write a program to design the following layout : [4]



(*b*) List Basic Views and explain any *three* with example. [4]

(*c*) List and explain methods of SQLiteOpenHelper. [3]

(*d*) Which methods are overriden while implementing an OptionMenu in activity ? [3]

4. Answer the following :

(*a*) List the types of Specialized Fragments and explain any *two*. [4]

(*b*) Write an application to send E-mail. (Using,—To, Subject and Message) [4]

(*c*) Write any *three* functional areas of Action Bar and explain each in brief. [3]

(*d*) List methods of Address class. Explain any *two* methods. [3]

Group II

5. Answer the following :

(*a*) Write an application to select all records from Book (id, name, author, price). [5]

(*b*) Write a short note on Lifecycle of Activity. [5]

(*c*) List and explain ImageViews to dispaly pictures. [4]

6. Answer the following :

(*a*) Design a layout to read percentage from user. On clicking OK button, display appropriate message : [4]

if per ≥ 70 then display "Distinction"

if per ≥ 60 and per < 70, display "First class"

if per ≥ 50 and per < 60, display "Second class"

if per ≥ 40 and per < 50, display "Pass class"

else display "fail".

(*b*) Explain Date Picker and Time Picker. List any *three* methods of each. [4]

(*c*) How to get feedback after sending SMS ? [3]

(*d*) Differentiate between : [3]

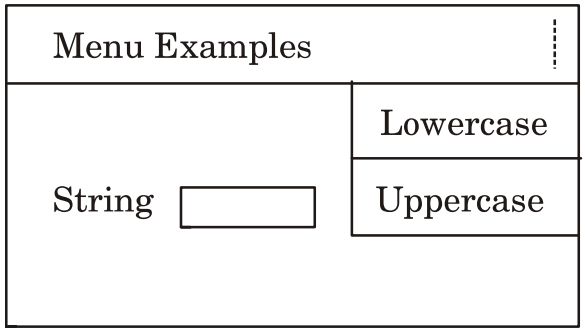
(*i*) Location based services and Google Map.

(*ii*) Geocoding and reserve geocoding.

7. Answer the following :

(*a*) Write steps for linking activities using intents. [4]

(*b*) Write an application to perform lowercase and uppercase conversion of a string when user clicks on respective menu option. [4]



(*c*) Write the use of onCreate(), onUpgrade() and getwritable Database() methods. [3]

(*d*) Write steps to control the orientation of the activity. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4+1**

Seat No.	

[5526]-602

T.Y. B.C.A. (Science) (VI Semester) EXAMINATION, 2019

BCA-602 : PYTHON PROGRAMMING

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) are compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option from the following : [7×1=7]

(*i*) All objects in Python can be ..... .

(*a*) Either mutable or immutable

(*b*) Neither mutable nor immutable

(*c*) Mutable

(*d*) Immutable

(*ii*) The 'in' operator in Python is ..... .

(*a*) Identity operator

(*b*) Membership operator

(*c*) Arithmetic operator

(*d*) Assignment operator

P.T.O.

(*iii*) Raw string uses the prefix ..... .

(*a*) R or *r*

(*b*) U or *u*

(*c*) *d* or D

(*d*) *s* or S

(*iv*) Tuples in Python is shown by ..... .

(*a*) { }

(*b*) [ ]

(*c*) ( )

(*d*) < >

(*v*) Python's duck typing is a special case of ..... .

(*a*) Static typing

(*b*) Weak typing

(*c*) Dynamic typing

(*d*) Strong typing

(*vi*) When will the else part of try-except-else be executed ?

(*a*) Always

(*b*) When an exception occurs

(*c*) When no exception occurs

(*d*) When an execution occurs into except block

(*vii*) To instantiate the object of the class, ... method is used.

(*a*) .....instance.....()

(*b*) .....init.....()

(*c*) .....class.....()

(*d*) .....obj.....()

(B) Answer the following : [7×1=7]

(*i*) State *two* differences between programming and scripting.

(*ii*) Write a syntax of "for loop" in Python.

(*iii*) What is the output of the following statements :

```
l = [1, 2, 3, 4]
print (l[0 : 2])
```

(*iv*) How will you create sets in Python ?

(*v*) What is the use of "del" statement in the dictionary ?

(*vi*) List methods of os.path module in Python.

(*vii*) Write the definition of class method.

Group I

2. Attempt the following :

(*a*) Write a Python program to generate and print a dictionary that contains a number between 1 and 10 in the form $(x, x * x)$. Expected output is :

{1 : 1, 2 : 4, 3 : 9, 4 : 16, ...}. [5]

(*b*) Write a Python program to print string in reverse order. (Use recursive function) [5]

(*c*) Discuss range() function with syntax and example. [4]

3. Attempt the following :

(*a*) Explain Python break, continue and pass statement. [4]

(*b*) Write a Python program to replace all occurrences of '*a*' with $ in a string. [4]

(*c*) Explain any *two* tuple operations with an example. [3]

(*d*) Explain the concept mutable and immutable data type. [3]

4. Attempt the following :

(*a*) Explain various ways of accessing the elements of a list with an examples. [4]

(*b*) Write a Python program to add and remove the items in the set. Illustrate both operations with examples. [4]

(*c*) Python is a powerful dynamically typed language. Comment. [3]

(*d*) Explain the following methods with syntax : [3]

(*i*) list.count

(*ii*) copy

(*iii*) list-index

Group II

5. Attempt the following :

(*a*) Explain the concept of anonymous functions with an example. [5]

(*b*) Write a Python program to create class student (rollno., name, course) and class test which inherits the student attributes. Display the student information with test marks using inheritance. [5]

(*c*) Explain reading and writing of a file. [4]

6. Attempt the following :

(*a*) Write a python program to count the number of words and lines in a text file. [4]

(*b*) Explain any *four* built-in class attributes. [4]

(*c*) How try ..... except clause works ? [4]

(*d*) Explain any *three* built-in dictionary functions. [3]

7. Attempt the following :

(*a*) Write a Python program to create a tuple of numbers and print 4th element from last of a tuple. [4]

(*b*) Write a Python program to find GCD of numbers using recursion. [4]

(*c*) Discuss multilevel inheritance in Python. [3]

(*d*) Explain the use of tell() & seek() methods. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

Seat No.	

[5526]-603

T.Y. B.C.A. (Science) (VI Semester) EXAMINATION, 2019

BCA-603 : RECENT TRENDS IN IT (INTERNET OF THINGS)

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory.

(*ii*) Solve any *two* questions from Group I and any *two* questions from Group II.

(*iii*) Figures to the right indicate full marks.

1. (A) Attempt the following : [7]

(1) An APU is a processor that includes both the CPU and GPU on a ..... chip.

(*a*) Single

(*b*) Double

(*c*) Triple

(*d*) None of the above

(2) RISC is ..... .

(*a*) Real instructions set computer

(*b*) Reduced instruction set computer

(*c*) Reduce instructions small computer

(*d*) None of the above

P.T.O.

(3) Two wire interface is also called as ..... .

(*a*) UART

(*b*) SPI

(*c*) I2C

(*d*) USART

(4) SDA is having a ..... transition when the clock line SCL is high.

(*a*) High to low

(*b*) Low to high

(*c*) Low to low

(*d*) High to high

(5) Gateway act as an edge device, obscuring the sensor nodes from the ..... internet.

(*a*) Private

(*b*) Public

(*c*) Protected

(*d*) None of the above

(6) The fourth industrial revolution paves the way to and for the ..... factory.

(*a*) Smart

(*b*) Dumb

(*c*) Simple

(*d*) None of the above

(7) Which of the following issues are considered in IOT ?

(*a*) Security Issue

(*b*) Reliability Issue

(*c*) Standard Issues

(*d*) All of these issues

(B) Attempt the following : [7]

(1) What is Middleware ?

(2) What is XMPP ?

(3) List the IOT protocols.

(4) Explain the linux commands :

(*a*) Mxdir

(*b*) rmdir.

(5) List any *three* applications of UART.

(6) State any *two* temperature sensors.

(7) What is energy grid ?

Group I

2. Attempt the following :

(*a*) Describe universal plug and play (UPnP) a protocol. [5]

(*b*) Explain the block diagram and data framework of I2C. [5]

(*c*) Describe the role of IOT in production flow monitoring. [4]

3. Attempt the following :

(*a*) With a neat and labelled diagram explain HTTP request/response pattern. [4]

(*b*) What are the governance issues of Internet of things ? [4]

(*c*) State the features of Node js. [3]

(*d*) Elaborate any smart home appliance. [3]

4. Attempt the following :

(*a*) State the advantages of I2C. [4]

(*b*) How do Humidity sensors work ? [4]

(*c*) Discuss the basic security properties that need to be implemented in IOT. [3]

(*d*) Write a note on APU. [3]

Group II

5. Attempt the following :

(*a*) Elaborate the MQTT architecture with the help of suitable diagram. [5]

(*b*) Write a python programme for interfacing a digital sensor to Raspberry Pi. [5]

(*c*) Explain IOT in logistics and supply chain optimization. [4]

6. Attempt the following :

(*a*) Write a short note on GPGPU (General Purpose Graphics Processing Unit). [4]

(*b*) Explain smartish approach for IOT. [4]

(*c*) State the disadvantages of SPI. [3]

(*d*) Explain challenges of IOT in brief. [3]

7. Attempt the following :

(*a*) Discuss the components of SOC architecture. [4]

(*b*) Give the steps for the *two* methods to access the Raspberry Pi. [4]

(*c*) Write a short note on SPGA (Sield Programmable Get Array). [3]

(*d*) What are Access Point ? [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**5**

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[5526]-604

T.Y. B.C.A. (Science) (VI Semester) EXAMINATION, 2019

BCA-604 : DATA ANALYTICS

(2016 PATTERN)

Time : Three Hours **Maximum Marks : 70**

N.B. **:—** (*i*) Question No. **1** (A and B) is compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option from the following : [7×1=7]

(*i*) Satellite image is an example of ..... .

(*a*) Structured

(*b*) Semi-structured

(*c*) Unstructured

(*d*) None

(*ii*) ..... distribution is used to compute probabilities for a process where only one of two possible outcomes may occur on each trial.

(*a*) Binomial

(*b*) Poisson

(*c*) Geometric

(*d*) Continuous

P.T.O.

(*iii*) Find odd man out :

(*a*) K-mean

(*b*) K-medoid

(*c*) DBSCAN

(*d*) PAM

(*iv*) A ..... is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs and utility.

(*a*) Decision tree

(*b*) Graphs

(*c*) Trees

(*d*) Neural Networks

(*v*) ..... provides original view of data in ndarray in numpy.

(*a*) Fancy indexing

(*b*) Advanced indexing

(*c*) Slicing

(*d*) None

(*vi*) ..... method of dataframe tells information about dataframe.

(*a*) Describe()

(*b*) Info()

(*c*) Desc()

(*d*) None

(*vii*) ..... is an amazing visualization library in Python for 2D plots of arrays.

(*a*) Scilearn

(*b*) Matplotlib

(*c*) Matlab

(*d*) Scilab

(B) Answer the following : [7×1=7]

(*i*) Define probability distribution.

(*ii*) List skill sets required by data scientist.

(*iii*) Define term lift.

(*iv*) What is cluster analysis ?

(*v*) List datatypes supported in Numpy.

(*vi*) What is use of pivot table ?

(*vii*) List vector image file formats supported by Matplotlib library.

Group I

2. Attempt the following :

(*a*) What is data analytics ? Explain different types of data analytics. [5]

(*b*) Explain Apriori algorithm for finding freqeuent item sets. [5]

(*c*) Explain in brief Support Vector Machine (SVM). [4]

3. Attempt the following :

(*a*) Explain K-Means algorithm for cluster analysis. [4]

(*b*) Define terms : [4]

(*i*) Support

(*ii*) Entropy

(*iii*) Population

(*iv*) Sample

(*c*) What is regression analysis ? Discuss different types of regression analysis. [3]

(*d*) What is need of data science ? [3]

4. Attempt the following :

(*a*) Explain functions zeros(), ones(), empty(), full() in Numpy with example. [4]

(*b*) What is data visualization ? Discuss different techniques of data visualization. [4]

(*c*) Write short note on Sci-kit Learn. [3]

(*d*) How to iterate over rows in dataframe in Pandas ? [3]

Group II

5. Attempt the following :

(*a*) Explain how to merge two data frames with example. [5]

(*b*) What functions are available for plotting bar, scatter diagram, histogram and pie chart in Matplotlib library ? [5]

(*c*) Differentiate between supervised and unsupervised machine learning. [4]

6. Attempt the following :

(*a*) How to import and export data from .csv file to dataframe in pandas ? [4]

(*b*) Write a Numpy program to compute sum of each column and sum of each row of an given array. [4]

(*c*) State features of Scipy. [3]

(*d*) What is output of the following code ? [3]

```
importnumpy as np
x=np.array ([1, 2, 3), (3, 4, 5)])
y=np.array ([1, 2, 3), (3, 4, 5)])
print(x-y)
print (x*y)
print (x/y)
```

7. Attempt the following :

(*a*) Explain semi-structured data in data analytics with example. [4]

(*b*) Explain K-Nearest Neighbour (KNN) algorithm. [4]

(*c*) Explain any *three* dataframe methods with example. [3]

(*d*) Discuss tree and graph visualization in brief. [3]

Total No. of Questions—**7**] [Total No. of Printed Pages—**4**

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[5526]-605

T.Y. B.C.A. (Science) (VI Semester) EXAMINATION, 2019

BCA-607 : INTRODUCTION TO GREEN COMPUTING

(2016 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Question No. **1** (A and B) are compulsory.

(*ii*) Solve any *two* questions from Group I and any *two* questions from Group II.

(*iii*) Figures to the right indicate full marks.

1. (A) Attempt the following : [5]

(1) "Power distribution unit distributes the power at the required voltage throughout racks and enclosures." State true or false.

(2) Energy Star served as a kind of voluntary label awarded to computing products that succeeded in ..... the use of energy while ..... efficiency.

(*a*) minimizing, minimizing

(*b*) minimizing, maximizing

(*c*) maximizing, minimizing

(*d*) None

P.T.O.

(3) Abstraction of computer resources, such as the running two or more logical computer systems on one set of physical hardware is called ..... .

(*a*) Virtualization

(*b*) Visualization

(*c*) Replication

(*d*) None

(4) ADT Business Security allows business owners to :

(*a*) View live security footage

(*b*) Control lights and temperature

(*c*) Lock or unlock doors from their phones

(*d*) All of the above

(5) At the server level "....." can really help drive consolidation because they provide higher-density computing for the power consumed.

(*a*) Glade servers

(*b*) Rack servers

(*c*) Blade servers

(*d*) None of the above

(B) Attempt the following : [5]

(1) What is energy crisis ?

(2) What do you mean by IT efficiency ?

(3) What is IOT ?

(4) State the benefits of cloud computing.

(5) Explain the term Biometrics.

Group I

2. Attempt the following :

(*a*) Explain any *two* methods of saving energy on a single machine. [4]

(*b*) Explain how computing technology can be used for greener transportation. [4]

(*c*) Define Green Computing. [2]

3. Attempt the following :

(*a*) What are carbon footprint calculators ? [4]

(*b*) State the benefits of green transportation. [4]

(*c*) What is green manufacturing ? [2]

4. Attempt the following :

(*a*) Explain the terms : overpopulation, overconsumption. [4]

(*b*) Explain Virtualizing of servers and storage. [4]

(*c*) What are green buildings ? [2]

Group II

5. Attempt the following :

(*a*) Explain the eco-strategies incorporated into company's Eco-portfolio. [4]

(*b*) Explain how IOT can improve the construction technology. [4]

(*c*) What is consolidated storage ? [2]

6. Attempt the following :

(*a*) Explain the methods that can be used to reduce the cooling costs. [4]

(*b*) What is green business ? Explain the criteria that are used to describe a business as green. [4]

(*c*) Explain the concept of multiple occupant vehicles. [2]

7. Attempt the following :

(*a*) Write note on Green Disposal. [4]

(*b*) Write short notes on : [4]

(*i*) Leveraging Unused Computer Resource

(*ii*) Data Compression

(*c*) Why do we need green computing ? [2]