Total No. of Questions : 4]

SEAT No. : ____

PA-1078

[Total No. of Pages : 2

[5905]-11

First Year B.C.A. (Science)

BCA111 : FUNDAMENTALS OF COMPUTER

(2019 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***Figures to the eight indicate full marks.***
2) ***Draw neat diagrams wherever necessary.***

Q1) A) Choose the correct option: **[5×1=5]**

a) Which of the following is used in EBCDIC?

i) Super Computers ii) Mainframes

iii) Machine codes iv) Programming

b) The value of base in a decimal number system is _____.

i) 8 ii) 2

iii) 10 iv) 16

c) Which of the following is known as the language made up of binary-coded instructions?

i) High level ii) BASIC

iii) 'C' iv) Machine

d) The full form of CPU is

i) Central Programming Unit ii) Central Processing Unit

iii) Centre Processor Unit iv) None of the above

e) Which is the following is designed to control the operations of a computer?

i) Utility software ii) User

iii) System software iv) Application software

B) Answer the following **[5×1=5]**

a) List any two network devices?

b) What is the full form of IDE?

c) What is Open Solaris?

d) What is GUI?

e) Define compiler.

P.T.O.

Q2) Answer the following (Any Five) **[5×3=15]**

a) Convert:

i) $(1534)_8 = (?)_{10}$

ii) $(11001110)_2 = (?)_{16}$

b) Write a short note on NIC.

c) Define:

i) Antivirus

ii) ROM

iii) EPROM

d) What are the pointing devices? Explain any one.

e) Write short note on troubleshooting PC hardware.

f) What is public domain software? Give examples.

Q3) Answer the following (Any Five) **[5×4=20]**

a) Write a difference between Assembler and Interpreter.

b) Explain application software with example.

c) Write a features of slides in PPT.

d) What are the advantages of routers?

e) What is desktop publishing? Give any two features.

f) Write short note on BIOS in detail.

g) What is word processors? Give an examples of basic and advanced editors.

Q4) Answer the following (Any Five) **[5×5=25]**

a) What is operating system? Explain its types.

b) What is plotters? Give advantages and disadvantages of plotters in detail.

c) Explain Hexadecimal number system in detail.

d) What is programming languages? Explain its types.

e) Explain characteristics of computers.

f) Write a note on compression and decompression of files.

g) Solve:

i) 101101 ÷101

ii) 10111 × 110

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Total No. of Questions : 4]

SEAT No. : ____

PA-1079

[Total No. of Pages : 3

[5905]-12

F.Y. B.C.A

SCIENCE

BCA-112 : Problem Solving and C programming

(2019 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Neat diagrams must be drawn wherever necessary.***

Q1) A) Choose the correct option: **[5×1=5]**

a) The continue statement cannot be used with _____.

i) for statement ii) switch statement

iii) do statement iv) while statement

b) In C, index of array starts with _____.

i) –2 ii) –1

iii) 0 iv) 1

c) Register variable initialized to _____ by default.

i) 0 ii) 1

iii) –1 iv) Garbage value

d) The size of float data type is _____ bytes.

i) 1 ii) 2

iii) 4 iv) 8

e) %*x* format specifier used to display _____ number

i) decimal ii) octal

iii) hexadecimal iv) positive

B) Answer the following. **[5×1=5]**

a) Write usage of islower ().

b) List any two basic data types.

c) What is ternary operator?

d) What is local variable?

e) Which symbol is used to write multiline comment?

P.T.O.

Q2) Answer the following. (Any Five) **[5×3=15]**

a) What are the limitations of array?

b) What will be the output of given code?

```
main () {
        int a [] = {10, 20, 30};
        printf ("%d, %d", *a, *(a + 1));
      }
```

(Ignore syntax error if any.)

c) Write difference between do-while and while loop.

d) Write note on qualifiers in C.

e) Explain jump statements in C language.

f) Write usage of following functions:

i) getchar ()

ii) printf ()

iii) sqrt ()

Q3) Answer the following (Any Five) **[5×4=20]**

a) Define algorithm and write its characteristics.

b) Explain switch statement with example.

c) Write recursive function to find power of given number.

d) What are the features of C language?

e) Find and justify the output of given code. (Ignore Syntax error)

```
main ()
{
  int a = 10, b = 20;
  modify (a, & b);
  printf ("%d %d", a, b);
}
```

```
modify (int p,int *q)
{
  p = 20;
  *q = 40;
}
```

f) List and explain any two storage classes.

g) What will be the output of given code? Justify.

```
int a = –1;
while (+ + a)
{
  printf ("%d", + + a);
}
```

Q4) Answer the following (Any Five) **[5×5=25]**

a) What is loop? Explain for loop in detail.

b) Write a program to check the given number is positive or negative using function.

c) Discuss the various forms of increment and decrement operator with an example.

d) Differentiate between pass by value and pass by reterence.

e) Write an algorithm and draw flowchart to find factorial of given number.

f) Write a program to display following pattern using loop.

```
1
2  2
3  3  3
4  4  4  4
```

g) What is Howchart? Explain any 4 Howchart symbols.

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Total No. of Questions :4]

SEAT No. : ____

PA-1080

[Total No. of Pages : 4

[5905]-13
First Year B.C.A. (Computer Application)
SCIENCE
BCA-113 : Applied Mathematics
(2019 Pattern) (Semester-I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***

Q1) Attempt the following.

A) Choose the correct option. **[5×1=5]**

a) If p & q are two statements, then compound statement p or q is called....

i) Conjunction ii) Disjunction

iii) Tautology iv) Negation

b) If A & B be two finite sets, then $|A \cup B| = |A| + |B| - |A \cap B|$ is the .....

i) Inclusion- Exclusion principle for two set

ii) Modulon principle

iii) Pigeon hole principle

iv) Multiplication principle

c) A sample space is.....

i) a set of data space in which a sample experiment can be performed to resolve a particular problem

ii) the set of all possible outcomes of a random experiment

iii) a space from which a sample for study may be drawn

iv) the set of all possible outcomes that belong to a particular sample

P.T.O.

d) A coin is tossed three times in succession and the outcomes are noted. The number of sample points in the sample space is .....

i) 6 ii) 8

iii) 3 iv) 9

e) Sample is .....

i) subset of population ii) Part of population

iii) 5% of population iv) at least 50% of population

B) Answer the following. **[5×1=5]**

a) Explain biconditional statement

b) Define bijective function

c) What is symmetric relation?

d) Write pigeon hole principle

e) Define power set of a set.

Q2) Answer the following: (Any Five) **[5×3=15]**

a) By using truth table show that $p \rightarrow q \equiv \sim p \vee q$

b) Let A = {1, 2, 3, 4, 5} and B = {4, 5, 7, 8, 9, 10}. Define a relation R from A to B as R = {(a,b): a+b is a perfect square}. Find Dom(R) and Ran (R).

c) Let $f : A \rightarrow B$ such that $f(x) = x - 1$ and $g : B \rightarrow C$ such that $g(y) = y^2$ find.

i) (fog) (2)

ii) (gof) (y)

iii) (fof) (y)

d) Show that the set of odd Positive integers is countable.

e) Consider the permutations $\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 1 & 4 & 2 \end{pmatrix}$ & $\beta = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 1 & 2 \end{pmatrix}$ on 4 symbols find

i) α^{-1}

ii) $\alpha \cdot \beta$

iii) $\beta \cdot \alpha$

f) Prove that for every integer n; $7^n - 3^n$ is divisible by 4.

Q3) Answer the following: (Any Five). **[5×4=20]**

a) Suppose the arithmetic mean of 50 observations is 120. Find the arithmetic mean of each observation is.

i) increased by 10

ii) decreased by 5

iii) doubled

iv) reduced to one third

b) The following is a distribution of monthly salaries of the employees of a firm. Compute arithmetic mean of salaries.

Salaries in ₹	No. of employees
0 – 500	2
500 – 1000	8
1000 – 1500	12
1500 – 2000	23
2000 – 2500	25
2500 – 3000	20
3000 – 3500	9
3500 – 4000	1

c) Let A, B, C be any three events on a sample space Ω write expressions for the events.

i) At least one of the events A, B, C occurs

ii) Only A occurs

iii) A and B occur but not C

iv) All three events occur

d) If $P(A) = 0.6$, $P(B) = 0.5$, $P(A \cap B) = 0.3$ then find

i) $P(A')$

ii) $P(A \cup B)$

iii) $P(A' \cap B)$

iv) $P(A' \cap B')$

e) Arithmetic mean of 50 items is 104. While checking it was notice that observation 98 was misread as 89. Find the correct value of mean.

f) Compute the first quartiles, second quartiles and third quartiles for the following series of observations.
26, 30, 35, 5, 6, 7, 9, 20, 40, 45, 11, 18, 15, 49, 60

g) Find correlation coefficient between X and Y, given that

$n = 25, \Sigma x = 75, \Sigma y = 100, \Sigma x^2 = 250, \Sigma y^2 = 500, \Sigma xy = 325.$

Q4) Answer the following: (Any Five) **[5×5=25]**

a) How many positive integers less than or equal to 1000 are divisible either by 3 or 5 or 11?

b) Determine which is a tautology or Fallancy.
i) $(p \Rightarrow q) \wedge (q \Rightarrow p)$
ii) $(p \wedge q) \wedge (p \vee q)$

c) Write the converse and contrapositive of the following statements
i) If it is raining then grass is wet
ii) Rain is necessary for it to be cloudy

d) Calculate median for the following frequency distribution

Marks	below 20	21-40	41-60	61-80	81-100
No.of Students	1	9	32	16	7

e) Compare correlation between the height of father and son from the following data.

Height of father (in inches)	65	63	67	64	68	70	68	71
Height of son (in. inches)	68	65	68	65	69	68	71	70

f) The number of runs scored by cricketers A and B in 5 test matches are show below

A	5	20	90	76	102	90	6	108	20	16
B	40	35	60	62	58	76	42	30	30	20

find
i) Which cricketer is better in average?
ii) Which cricketer is more consistent?

g) The total daily sell of a departmental store exceeds ₹ 10,000 with probability 1/3. Suppose the store is open on 6 days in week. Find the probability that the sell will exceed ₹ 10,000.
i) on 4 days
ii) on atleast 2 days
iii) on at most 1 day
iv) on exactly 2 days

Total No. of Questions : 4]

SEAT No. : ____

PA-1081

[Total No. of Pages : 2

[5905]-14

F.Y. B.C.A. (Science)

BCA-114 : BUSINESS COMMUNICATION

(2019 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures in the right indicate full marks.***
3) ***Draw figures wherever necessary.***

Q1) Attempt the following.

A) Choose the correct option: **[5×1=5]**

a) Communication is a _____.

i) One way process ii) Two way process

iii) Three way process iv) Four way process

b) Gesture is part of _____ communication.

i) Written ii) Channel

iii) Non-verbal iv) Feedback

c) The response of a sender message is _____.

i) Feedback ii) Social services

iii) Back iv) Process

d) Which of the following is NOT a quality of leadership?

i) Doing right thing ii) Innovation

iii) Motivate iv) Quarrel each other

e) The list of points to be discussed in a meeting is called _____.

i) Notice ii) Agenda

iii) Memorandum iv) Presentation

B) Answer the following. **[5×1=5]**

a) What is Teleconference?

b) What is Minutes?

c) Define the leadership skill.

d) What is Report?

e) What is job application letter?

P.T.O.

Q2) Answer the following (Any Five) **[5×3=15]**

a) What are the techniques of effective speech?

b) Discuss the types of listening.

c) What is stress management?

d) Discuss the contents of Resume/Biodata.

e) Discuss the role of fax, email and video conferencing in communication.

f) Define team building skills.

Q3) Answer the following (Any Five) **[5×4=20]**

a) What is oral communication? Explain principles of effective oral communication.

b) Explain the term Group Discussion.

c) What are soft skills? Explain the types of soft skills.

d) Explain the difference between formal and informal communication.

e) What is written communication? Explain merits and limitations of written communication.

f) Define the process of listening and explain the principles of good listening.

g) You are the secretary of S.P. Sport Club in your college. The meeting of the club is scheduled on 25th June. Prepare an agenda for the meeting and then draft the minutes of the meeting.

Q4) Answer the following (Any Five) **[5×5=25]**

a) Define the term Communication. What are the barriers to Communication?

b) What is business letters? Explain in detail layout of business letters.

c) Explain the effective presentation skills.

d) What is non-verbal communication? Explain the elements of non-verbal communication.

e) Define the term creativity at workplace. Explain the six thinking Hat method Ethical Values.

f) Write a Job application letter to the Manager TATA company, Pune in response to an advertisement in daily Indian Express newspaper for the post of Software Analyst.

g) Discuss the term Downward communication and upward communication.

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Total No. of Questions : 4]

SEAT No. : ____

PA-1082

[Total No. of Pages : 2

[5905]-21

F.Y. B.C.A. (Science)

BCA-121 : COMPUTER ORGANIZATION

(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Figures in the right indicate full marks.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt the following.

A) Choose the correct option: **[5×1=5]**

i) The base of octal number system is

a) 10 b) 8

c) 2 d) 16

ii) $A \cdot (\overline{A} + B) =$

a) AB b) A + B

c) B d) A

iii) The bubbled OR gate is equivalent to

a) NAND gate b) AND gate

c) NOR gate d) OR gate

iv) Which combinational circuit is used for addition of two bits?

a) Half adder b) Multiplexer

c) Encoder d) Subtractor

v) Which flip flop is used to remove invalid condition?

a) SR b) JK

c) Clocked SR d) Master Slave

B) Answer the following **[5×1=5]**

a) Define Base.

b) What is combinational circuit?

c) Draw logic symbol for NAND gate.

d) What do you mean by modulus of counter?

e) Define term “Hit Ratio”.

P.T.O.

Q2) Answer the following (Any Five) **[5×3=15]**

a) Perform the following operation.

i) $(27)_{10} = (?)_{BCD}$

ii) $(396)_{10} = (?)_{\text{Excess-3}}$

iii) $(217)_{10} = (?)_{8}$

b) Draw the logic symbol, Boolean function and truth table for an Ex-OR gate.

c) Explain with neat diagram half adder, circuit.

d) Solve the following

i) $11011 \cdot 101 + 1010 \cdot 111$

ii) Perform 11110 – 1010 using 2's complement.

e) With neat diagram explain working of S-R latch.

f) Mention the function of CPU.

Q3) Answer the following (Any Five) **[5×4=20]**

a) Give function of interrupt unit, oscillater unit, memory and parallel parts in 8051.

b) Differentiate between RISC and CISC.

c) Draw neat diagram of 3-bit asynchronous up counter and explain its working.

d) Explain decimal to BCD encoder with its diagram.

e) State and prove De Morgan's Theorems.

f) Write a brief note on Karnaugh's map.

g) Explain with example binary to decimal and decimal to binary conversion.

Q4) Answer the following (Any Five) **[5×5=25]**

a) What is the base of an octal system? Explain octal to decimal and decimal to octal conversion with example.

b) What is a flag? Draw the structure of flag register in real mode and give the function of various flags.

c) With neat block diagram explain the signals in a DMA controller.

d) Describe the working of RS flip flop with logic diagram and truth table.

e) Explain 1 to 4 Demultiplexer with circuit. Write application of demultiplexer.

f) Write a note on Comparater.

g) What is Register? Explain SISO Shift register with neat diagram.

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Total No. of Questions : 4]

SEAT No. : ____

PA-1083

[Total No. of Pages : 3

[5905]-22

F.Y. B.C.A. (Science)

BCA 122 : ADVANCED C PROGRAMMING

(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Question 1 (A and B) is compulsory.***
2) ***Figures to the right indicate full marks.***

Q1) A) Choose the correct option: **[5×1=5]**

a) A _____ is sequence of bytes of data which program can read from or write to.

i) String ii) Stream
iii) Union iv) Structure

b) Which of the following is appropriate for reading multiword string?

i) printf ii) scanf
iii) gets iv) puts

c) The address of union variable can be obtained using _____ operator.

i) & ii) #
iii) $ iv) *

d) The operation of accessing variable using pointer is called _____.

i) reference ii) dereference
iii) allocation iv) deallocation

e) Preprocess or directive begins with _____.

i) $ ii) //
iii) / iv) #

B) Attempt the following: **[5×1=5]**

a) Define pointer to pointer.
b) What is # pragma directive?
c) What is purpose of strtok() function?
d) Which are the two types of file?
e) Define Structure.

P.T.O.

Q2) Attempt the following (Any Five) **[5×3=15]**

a) Discuss file opening modes in detail.

b) How the declaration of array of structure is done? Can it be initialized? Give an example.

c) Explain any three predefined macros.

d) Write C program to check whether string is palindrome or not.

e) Differentiate between static memory allocation and dynamic memory allocation.

f) What is difference between structure and union?

Q3) Attempt the following (Any Five) **[5×4=20]**

a) Write C program to accept string and character as command line argument and replace each occurrence of character in string by given character.

b) Explain nested structure with example.

c) Differentiate between printf & fprintf, scanf & fscanf.

d) Explain in short:

ftell, rewind, fseek, fflush.

e) Write in short about:

i) Passing pointer to function

ii) Function returning a pointer

f) Explain macro substitution in brief with example.

g) Explain following:

i) enum

ii) bitfields

Q4) Attempt the following (Any Five) **[5×5=25]**

a) Enlist and explain five types of operation that can be performed on file.

b) Write C program to create structure student containing rollno, name and percentage. Read information of n students and display record in descending order of percentage.

c) What is union? How it is declared? Explain how to access its member.

d) Explain any five string handling functions with their usage.

e) Write program to accept item information (itemno, itemname, qty & price) for n items. Store in file and display this in well defined format.

f) Write C program to find sum of n elements entered by user. To perform this program allocate memory dynamically using malloc () function.

g) Trace the output and justify.

i)
```
int main ()
{
   static char s[] = "Tendulkar";
   char *p;
   p=&s[8]–8;
   while (*p)
   printf ("%c", *p++);
}
```

ii)
```
main ()
{
   char a[5*2/2] = {'a', 'b', 'x', 'y', 'z'};
   printf ("%c/n", a[3]);
}
```

Total No. of Questions : 4]

SEAT No. : ____

PA-1084

[Total No. of Pages : 3

[5905]-23

F.Y. B.C.A. (Science)

BCA 123 : OPERATING SYSTEM CONCEPTS

(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw Diagram whenever necessary.***

Q1) Attempt the following.

A) Choose the correct option: **[5×1=5]**

i) In linux, everything is stored as _____.

a) Directory b) File

c) Executables d) Process

ii) Process which terminate before the parent process exist is known as _____.

a) Orphan b) Zombie

c) Child d) Background

iii) _____ command will bring the background job to foreground.

a) bg b) fg

c) kill d) grep

iv) The first line in any shell scripts begin with a _____.

a) & b) !

c) $ d) #

v) Which key is used for deleting text?

a) d b) y

c) f d) k

B) Answer the following **[5×1=5]**

a) Explain in short HOME variable.

b) What is inode?

c) What is use of sudo command?

d) Define parent and child process.

e) Write note on : printf command.

P.T.O.

Q2) Answer the following (Any Five) **[5×3=15]**

a) What is command? Explain types of command.

b) Explain process of DNS resolution.

c) Explain features of linux.

d) Explain 'Is' command with options.

e) What is shell? Explain different types of shell.

f) Explain following command:

i) head

ii) tail

iii) set

Q3) Answer the following (Any Five) **[5×4=20]**

a) Explain 'man' command with keyword option.

b) What is process? Explain states of process with diagram.

c) What is mean by system call? Explain types of system call.

d) Explain methods of changing permission with example.

e) Explain following command in short:

i) pipe

ii) grep

iii) egrep

iv) find

f) Explain working with password. How password are stored in Linux?

g) Write shell script to reverse given number and check whether it is pallindrome or not.

Q4) Answer the following (Any Five) **[5×5=25]**

a) Explain 'find' command with option and example.

b) What are the different services provided by operating system.

c) What is file? Explain different types of file.

d) What is vi editor? Explain with its different modes.

e) Explain network protocol with its different types.

f) Explain control structure in shell programming.

g) Write note on following command.

i) pwd

ii) cat

iii) rmdir

iv) cp

v) wc

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Total No. of Questions : 4]

SEAT No. : ____

PA-1085

[Total No. of Pages : 3

[5905]-24

F.Y. B.C.A.

SCIENCE

BCA -124 : Database Management Systems - I

(2019 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw neat diagrams wherever necessary.***

Q1) A) Choose the correct option: **[5×1=5]**

a) Functional dependencies are the types of constraints that are based on _____.

i) Key ii) Key revisited

iii) Superset key iv) Composite key

b) GRANT is a command.

i) DDL ii) DCL

iii) DML iv) None of the above

c) In E-R diagram total participation is represented by

i) Double lines ii) Dashed lines

iii) Single lines iv) Triangle

d) DBMS is a general purpose software system that facilitate the process of.

i) Defining a database ii) Constructing a database

iii) Manipulating a database iv) All of the above

e) A subschema express?

i) The logical view ii) The physical view

iii) The external view iv) All of the above

B) Answer the following. **[5×1=5]**

a) What is a physical file?

b) Define second normal form (2NF)

c) What is SQL?

d) State any two types of integrity constraints.

e) What is data model?

P.T.O.

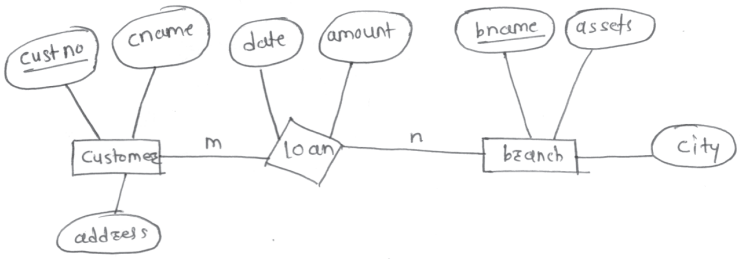
Q2) Answer the following (Any Five) **[5×3=15]**

a) Give the disadvantages of file processing system.

b) What are the basic notations available in E-R model?

c) What is recovery scheme?

d) Consider the following E-R diagram:



Convert the above E-R diagram into relational model.

e) Explain any four data functions used in DBMS.

f) Define:

i) Super key

ii) Candidate key

iii) Foreign key

Q3) Answer the following (Any Five) **[5×4=20]**

a) Explain partial dependency with example.

b) What is aggregation? Explain with example.

c) Consider the following relation:

R(A, B, C, D, E) and the set of FD'S defined on R as:

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

Compute the closure of F i.e F^+

d) Write a note on aggregate functions used in SQL.

e) What is attribute? Explain different types of attributes.

f) What is Normalization? Specify the rules conversion of 3NF.

g) Explain the structure of DBMS.

Q4) Answer the following (Any Five) **[5×5=25]**

a) What is ER Diagram? Explain the components of ER Diagram.

b) Explain the difference between logical and physical file organization.

c) Find 3NF decomposition of given relation schema and FD'S Bank-info = (branch-name, cust-name, banker-name, off-no.)

FD's are : {banker-name → branch-name, off-no, cust-name, branch-name → banker-name}

d) Let R(A, B, C, D, E) is a relational schema with the following functional dependencies:

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

List the candidate keys for R.

e) Consider the following relations:

Company (c-id, c-product, c-name, region, state)

Branches (b-id, b-name, b-product, city)

Company and Branches are related with one to many relationship. Create a relational database in 3NF and solve the following queries in SQL:

i) List all cities having branch product 'CPU' and 'MOUSE'.

ii) List all the states whose branch product is 'pendrive'.

iii) Print citywise branches in descending order.

f) Explain the generalization with example.

g) Write a note on Hierarchical data model.

✠ ✠ ✠

Total No. of Questions : 4]

SEAT No. : ____

PA-1086

[Total No. of Pages : 3

[5905]-31

S.Y. B.C.A. (Science)

BCA-231 : DATA STRUCTURES

(2019 Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***Figures in the right indicate full marks.***
2) ***Draw diagram whenever necessary.***

Q1) Attempt the following.

A) Choose the correct options. **[5×1=5]**

i) _____ case indicate the minimum time required for program execution.

a) Best b) Average

c) Worst d) Space

ii) _____ algorithm design technique is used in the quick sort algorithm.

a) Dynamic Programming b) Backtracking

c) Divide and Conquer d) Greedy method

iii) Stack can be implemented using ____and _____.

a) Array and Binary Tree b) Linked list and Graph

c) Array and Linked list d) Queue and Linked list

iv) Consider the following difinition in C programming language.

```
struct node
{
    int data ;
    struct node *next ;
}
    typedef struct node NODE ;
    NODE *ptr;
```

_____ C code is used to create new node.

a) ptr = (NODE*) molloc (NODE);

b) ptr = (NODE*) molloc (sizeof (NODE*));

c) ptr = (NODE*) molloc (sizeof(NODE));

d) ptr = (NODE) molloc (sizeof (NODE));

P.T.O.

v) _____ type of traversal of Binary search tree outputs the value in sorted order.

a) Preorder b) Inorder

c) Postorder d) Recursive

B) Answer the following. (any 5) **[5×1=5]**

i) Why do we need data structures?

ii) What is linear search?

iii) Where can stack data structure be used?

iv) List out operations on linked list.

v) How do you find the height of a node in a tree?

Q2) Answer the following. (Any five) **[5×3=15]**

a) Write a 'C' function to count leaf nodes in a binary tree.

b) Assuming int A[2] [3]={1, 2, 3, 4, 5, 6} is stored in a column major order with first element of A is at address 1000 and each integer occupying 2 bytes. What would be the address of the element A[1] [2]?

c) Sort the following numbers using Bubble sort method.

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

d) Write a 'C' function for Binary search.

e) What is graph? Explain applications of graph.

f) Write a 'C' function to insert node at middle into singly linked list.

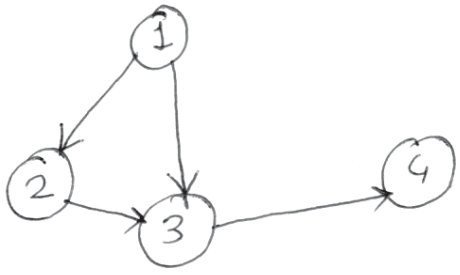
Q3) Answer the following. (Any five) **[5×4=20]**

a) Write a 'C'function to implement following operations on stack.

i) Push

ii) Pop

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



c) Write a 'C' function to search elements in Singly linked list.

d) What is Tree? Explain any three types of tree

e) Difference between Tree and Graph.

f) Write a note on Asymptotic notations.

g) What is Queue? Explain types of Queue.

Q4) Answer the following. (Any 5) **[5×5=25]**

a) Construct BST for the following data.

11, 7, 15, 25, 18, 5, 12, 20

b) Write 'C' function for Enqueue and dequeue operation.

c) Explain quick sort algorithm with example.

d) Convert following expressions.

i) Convert Infix to Postfix

1) (A + B)* C + (D – E)/F + G

2) A–B/C * A/K–L

ii) Exaluate postfix expressions.

1) Postfix : 34 * 25* +

2) Postfix : 23 * 45 + *

e) Define Graph traversal. Explain with its techniques.

f) What is linked list? Explain representation of linked list in memory.

g) Explain Algorithm analysis in detail with example.

Total No. of Questions :4]

SEAT No. : ____

PA-1087

[Total No. of Pages : 4

[5905]-32
S.Y. B.C.A. (Science)
BCA-232 : DATABASE MANAGEMENT SYSTEMS-II
(2019 Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***Figures to the right side indicate full marks.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt the following:

A) Choose the correct options. **[5×1=5]**

a) _____is used to throw the exception in PL/SQL.

i) THROW ii) RAISE

iii) NOTICE iv) WARNING

b) Record is ____.

i) Placeholder ii) Variable

iii) Datatype iv) Keyword

c) _____is not type of parallel database.

i) Shared memory ii) Shared disk

iii) Shared nothing iv) Shared processor

d) Log record contains ____.

i) Old value ii) New value

iii) Both (i) & (ii) iv) Error value

e) Prevention of access to the database by unauthorized users is referred to as ____.

i) Integrity ii) Productivity

iii) Security iv) Reliability

P.T.O.

B) Answer the following. **[5×1=5]**

a) What is function?

b) What is Schedule?

c) What is lock?

d) Enlist various types of errors in transaction failure

e) List types of server systems.

Q2) Answer the following: (Any Five) **[5×3=15]**

a) Define view. Explain how to create view with example.

b) What is serializability? Explain conflict serializability.

c) Define terms

Strict 2PL

Rigorous 2PL

Conservative 2PL

d) What is system crash? Explain in detail.

e) Write a note on statistical database security.

f) State the features of distributed databases.

Q3) Answer the following: (Any Five) **[5×4=20]**

a) Consider following database:

Student (sno, sname, sclass, saddr)

Teacher (tno, tname, qualification, experience)

Relationship between Student and Teacher is M-M with descriptive attribute subject.

Create a trigger for following:

Write a trigger before insert the record of student table. If sno is less than or equal to zero give message "Invalid Number".

b) Consider the following transaction. Give two non-serial schedule <T1,T2>

T1	T2
Read (c)	Read (c)
Read (a)	Read (a)
a = a–c	a = a+c
Write (a)	Write (a)
Read (b)	
b = b–c	
Write (b)	

c) Following is the list of events in an interleaved execution of set T_1, T_2, T_3 and T_4 assuming 2PL. Is there a Deadlock? If yes which transactions are involved in Deadlock?

Time	Transaction	Code
t1	T1	Lock (A,X)
t2	T2	Lock (B,X)
t3	T3	Lock (A,S)
t4	T4	Lock (B,S)
t5	T1	Lock (B,S)
t6	T2	Lock (D,S)
t7	T3	Lock (C,S)
t8	T4	Lock (C,X)

d) Explain different types of failure in detail.

e) Explain methods for database security.

f) Explain two-tier client-server structure. Also state advantages & disadvantages of it.

g) Write a short note on cascadeless schedule.

Q4) Attempt the following (Any Five) **[5×5=25]**

a) Consider following database

Movie (mno, mname, release_year, budget)

Actor (ano, aname, role, charges, addr)

Relationship between Movie and Actor is M-M

Write a stored function to accept movie name as input and print the name of actors working in that movie.

b) Consider the following transactions. Give two non-serial schedule that are serializable.

T1	T2
Read (Y)	Read (X)
Read (A)	Read (A)
Y = Y+A	X=X+A
Write (Y)	Write (X)
	Read (Y)
	Y=Y+A
	Write (Y)

c) Explain Deadlock Recovery Techniques.

d) Consider the following log image, that is obtained during recovery after crash:

<T1, Start>
<T1, X, 10, 10>
<T1, Y, 20, 5>
<T2, Start>
<T2, X, 20, 200>
<T1, Commit>
<T3, Start>
<T3, Z, 10, 20>
<Checkpoint>
<T3, K, 20, 200>
<T2, Commit>
<T4, Start>
<T4, X, 200, 100>
← System crash

1) List contents in the List L
2) List contents in
   i) Undo list
   ii) Redo list

e) What is a cursor? How to declare it? Explain with example.

f) List and Explain properties of transaction.

g) What is shadow paging? State advantages and disadvantages of shadow paging.

Total No. of Questions :4]

SEAT No. : ____

PA-1088

[Total No. of Pages : 3

[5905]-33
S.Y. B.C.A. (Science)
BCA-233 : COMPUTER NETWORKS
(2019 Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***
3) ***Draw lebeled diagram wherever necessary.***

Q1) Attemt the following.

A) Choose the correct option. **[5×1=5]**

a) In _____ method, one station is designated as a primary station and others are secondary stations.

i) Token Passing ii) Channelization

iii) Polling iv) Reservation

b) Which topology requires multipoint connection?

i) Star ii) Bus

iii) Ring iv) Mesh

c) Which type of noise is caused due to spikes?

i) Induced ii) Impulse

iii) Thermal iv) Crosstalk

d) SMTP uses _____commands.

i) 32 ii) 5

iii) 14 iv) 12

e) A _____IP address consists of network address and host address.

i) 4 byte ii) 2 byte

iii) 4 giga byte iv) 5 byte

P.T.O.

B) Attempt the following. **[5×1=5]**

a) Define netid and hostid.

b) List the framing methods in Data Link Layer.

c) Define bit interval and bit rate.

d) Define De-encapsulation.

e) Enlist any three categories of header.

Q2) Answer the following: (Any Five) **[5×3=15]**

a) Compare between Synchronous and Asynchronous data transmission.

b) Write short note on HAM.

c) State the advantages and disadvantages of Stop-and -Wait Protocol.

d) Explain IANA (Internet Assigned Numbers Authority) port number ranges.

e) Write a short note on UDP Datagram format.

f) Explain the fields in IPv4 Datagram.

Q3) Answer the following: (Any Five) **[5×4=20]**

a) Write a note on subnetting and supernetting.

b) Enlist different switching techniques. Explain any one switching technique in detail.

c) Explain UAN with its advantages and disadvantages.

d) Given the dataword 1010011110 and the divisor 10111.

i) Show the generation of the codeword at the sender site (using binary division).

ii) Show the checking of the codeword at the receiver site (assume no error).

e) Explain TCP/IP protocol suite with diagram.

f) Explain Domain Name System (DNS) in brief.

g) State advantages of IPv6

Q4) Answer the following: (Any Five) **[5×5=25]**

a) Differentiate between TCP and UDP.

b) Define Topology. Enlist types of topologies. Explain any three types of topologies.

c) Explain Data Link Layer framing concept in detail.

d) Write functions of Physical Layer.

e) Draw Graph for NRZ-L,NRZ-I for the following data.

i) 00000000

ii) 11111111

iii) 01010101

iv) 00110011

f) Explain TCP features.

g) Write a short note on E-MAIL Architecture.

Total No. of Questions : 3]

SEAT No. :

PA-2578

[Total No. of Pages : 1

[5905]-34

S.Y.B.Sc. (Computer Science) / Biotechnology / S.Y.B.C.A.

ENGLISH ABILITY ENHANCEMENT COURCE

Language Communication-I

(CBCS 2019 Pattern) (Semester-III) (LA-231)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***

Q1) Attempt any one of the following in about 150-200 words. **[15]**

a) Comment on the title of the poem 'La Belle Dame Sans Marci' and how it relates to what the poem is about?

b) How does the author deal with the idea of death and memory in the story 'A Shadow'?

Q2) Attempt any two of the following in about 50-80 words: **[10]**

a) Develop a dialogue on the following situation:

'Anil apalogises to his teacher for talking in class'.

b) Develop a dialogue asking your friend about his daily routine of newly joined job.

c) Write a dialogue on the following situation:

'Rahul inroduces his brother Ajit to his classmate Renuka'.

Q3) Attempt any two of the following in about 50-80 words: **[10]**

a) Write a job application letter for the post of 'Software Developer'.

b) Write a resume to be sent in response to the advertisement for the post of 'Lab Assistant'.

c) Explain the tips and techniques for making an effective presentation.

Total No. of Questions : 4]

SEAT No. :

PA1089

[Total No. of Pages : 4

[5905]-41
S.Y.B.C.A. (Science)
BCA-241 : OBJECT ORIENTED PROGRAMMING AND C++
(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat diagram wherever necessary.***

Q1) A) Choose the correct option **[5×1=5]**

a) _____ is used to format the data display.

i) Interator ii) Punctuator

iii) Manipulator iv) Allocator

b) Operator overloading is _____.

i) Making operators work with objects.

ii) Giving new meaning to existing operators

iii) Making new operators.

iv) Giving operators more than they can handle.

c) An object is an instance of _____.

i) Class ii) State

iii) Behaviour iv) Message

d) _____ class supports opening file in write mode

i) ofstream ii) ifstream

iii) cstream iv) wstream

e) State whether following statements are true or false

1) Constructor should be declared in private section

2) Constructors are invoked automatically when the objects are created.

i) True, True ii) True, False

iii) False, True iv) False, False

P.T.O.

B) Answer the following. **[5×1=5]**

a) What is Abstract class?
b) List the different types of constructor.
c) Write the syntax to create a class.
d) List file opening modes.
e) Define Encapsulation.

Q2) Answer the following. (Any Five) **[5×3=15]**

a) What is Inline function? Write its syntax and advantages.
b) Write any 3 differences between OOP (Object Oriented Programming) and POP (Procedure Oriented Programming)
c) Write a program to find area of rectangle using constructor.
d) What is static data member? List its characteristics.
e) What is Exception? Which Keywords are used? Write its general syntax.
f) Write a program to display factors of a number.

Q3) Answer the following (any five) **[5×4=20]**

a) Define constructor. Explain constructor overloading with example.
b) What is Inheritance? What ambiguity can arise in Multiple Inheritance? How it is solved?
c) What is friend function? Explain its characteristics.
d) Enlist the rules of operator overloading.
e) Write a program to create a class student having roll no, name and percentage. Write a member function to accept and display details of students (use Array of objects)
f) What is Manipulator? Explain syntax and use of any three.
g) What are the various file operations performed write a program to read the contents from the text file.

Q4) Answer the following: (Any five) **[5×5=25]**

a) Explain virtual Base class concept with example.
b) What is function overloading? Write a program to overload function volume to calculate volume of cube and cylinder.
c) Read the code and answer the questions.

```
classA
{
    int   x;
    public:
        void display ( )
        {
            cout << x << endl;
        }
};
```

```
class B : public A
{
    int y;
    public:
        void display ( )
        {
            cout << y << endl;
        }
};
main ( )
{
    B b;
    ..... statement 1
    ..... statement 2
}
```

i) Which object oriented feature in illustrated.
ii) Write statement 1 to execute member function display in class A.
iii) Write statement 2 to execute member function display in class B.
iv) In which section are data members x and y declared.

d) Explain Basic to class type conversion with example.
e) Write the rules for virtual function.
f) Write the significance of the following.
   i) New operator
   ii) Delete operator
   iii) Destructor
   iv) Friend function
   v) Insertion and extraction operator.
g) Find output and justify
   i)

```
# include < iostream.h>
class  Test
{
private:
        int x;
public:
    void set (int x)
    { Test : : x = x;}
    void print ( )
    {
        cout << "x = " <<x<<endl;
    }
};
```

```
main ( )
{
    Test obj;
    int x  = 40;
    obj. set (x);
    obj. print ( );
}
```

ii)
```
# include <iostream.h>
class Basel
{
    public:
        Base1 ( )
        {
            cout <<"Base 1 constructor is called";
        }
};
class Base 2
{
    public:
        Base 2 ( )
        {
        cout <<"Base 2 constructor is called";
        }
};
class Derived: public Base 1, public Base 2
{
    public:
        Derived ( )
        {
        cout <<"Derived constructor called";
        }
};
main ( )
{
    Derived d;
}
```

Total No. of Questions : 4] **SEAT No. :**

PA-1090 **[Total No. of Pages : 3**

[5905]-42
S.Y. B.C.A. (Science)
BCA - 242 : WEB TECHNOLOGY
(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***All questions are compulsory.***
3) ***Draw neat sketches whenever necessary to illustrate answer.***
4) ***Each question carries equal marks.***

Q1) Attempt the following. **[5 × 1 = 5]**

A) Choose the correct option :

a) Which of the following operator when added before an expression ignores error messages?

i) @ ii) %

iii) # iv) ^

b) Basic syntax for calling a function is _____.

i) Function - name (expression 1, expression 2)

ii) (Expression 1 : Function - name, expression 2 : Function - name)

iii) (Expression 1, Expression 2)

iv) None of them

c) Which one of the following is the right way to invoke a method?

i) $ object → method Name( );

ii) object → method Name( );

iii) object → method Name;

iv) $ object :: method Name;

d) How many predefined variables are used in PHP to authenticate a user?

i) 3 ii) 4

iii) 2 iv) 1

e) To open a database connection with pastgre SQL in database specific method, we use _____.

i) Postgres - open ( ) ii) PG - connect ( )

iii) DB :: connect ( ) iv) Pg - open ( )

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

a) Where AJAX cannot be used?

b) Write the use of Pg-Field-num( ).

c) State True / False :

exist - class ( ) Function is used to check if class exists or not.

d) Define Web Browser.

e) The array-splic( ) Function is used to insert as well as to remove elements from an array. State True or False.

Q2) Answer the following (Any 5) : **[5 × 3 = 15]**

a) Write a PHP program to calculate area of triangle with base = 3, height = 4.

b) What is multidimensional array? How to access elements from multidimensional array?

c) Write characteristics of an interface.

d) What is sticky form? Explain.

e) What are transactions? State the methods provided by PEAR DB for dealing with it.

f) What are the advantages of AJAX?

Q3) Answer the following (Any 5) : **[5 × 4 = 20]**

a) Explain the processing of result set in database specific method.

b) Write a PHP script to display the empbyee whose salary is greater than or equal to average salary. Consider the following tables

dept (deptno, deptname, location)

emp (empno, empname, after, phno, sal, teptno)

c) Write a PHP script to create session.

d) Differentiate between GET and POST method.

e) Define the terms :

i) Constructor

ii) Abstract class

iii) Inheritance

iv) Destructor

f) Write a PHP script to illustrate the concept of interface.

g) Write a PHP script to define a class Employee with emp-code, emp-name and emp-designation as data members.

Q4) Answer the following (Any 5) : **[5 × 5 = 25]**

a) Differentiate between for loop and For each loop.

b) Write a PHP script to define an interface which has methods area( ), volume ( ). Define constant PI. Create a class cylinder which implements interface methods and calculate area and volume. Also declare array of objects and call member functions area ( ) and volume ( ).

c) Consider a table marklist (seat-no, sub-code, marks). Write a PHP script which will accept seat-no, sub-code and updated marks from user and modify the marks of the student to changed marks.

(use PEAR DB method).

d) Write a PHP program to demonstrate DOM document.

e) What are the differences between AJAX and Java Script?

f) Write the syntax and purpose of the following functions :

in-array ( ), array-search ( ), array-reduce ( ), array-walk ( ), array-reverse ( )

g) What is XML parser? What are different types of it?

▽▽▽▽

Total No. of Questions : 4]

SEAT No. :

PA-1091

[Total No. of Pages : 3

[5905]-43
S.Y. B.C.A.
BCA - 243 : SOFTWARE ENGINEERING
(2019 Pattern) (Semester - IV)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw neat diagram wherever necessary.***

Q1) A) Choose the correct option : **[5 × 1 = 5]**

a) _____ is a tabular method for describing the logic of the decisions to be taken.

i) Decision Tables ii) Decision Tree
iii) Decision Method iv) Decision Data

b) SRS stands for _____.

i) Software Request Specification
ii) Software Requirement Specification
iii) System request Specification
iv) System requirement Specification

c) Which of the following is not a McCall's quality factor under "Product Operation".

i) Reliability ii) Usability
iii) Flexibility iv) Efficiency

d) In data flow diagram which among the following process is at the most detailed level?

i) Data flows ii) Interface
iii) Functional Primitive iv) Transform description

e) Software consist of _____.

i) Set of instruction + operating procedures
ii) Programs + documentation + operating procedures
iii) Programs + hardware manual
iv) Set of programs

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

a) What is Scrum?

b) What is Pseudo Code?

c) Justify 'Software does not wear out'.

d) List basic components of a system.

e) State any two disadvantages of Prototype Model.

Q2) Answer the following (any five) : **[5 × 3 = 15]**

a) Explain any three human factors used for agile process.

b) Consider a hospital information system. When a patient admits, his/her personal information is recorded. Layout its input design.

c) Define system? Describe types of system.

d) Explain waterfall model with its example.

e) Explain the essence of Software Engineering Practice.

f) Differentiate between structured and unstructured interview.

Q3) Answer the following (any five) : **[5 × 4 = 20]**

a) Explain in detail an incremental process model with any two advantages.

b) What is Requirement Engineering? Explain any two types of requirement in detail.

c) What is DFD? Enlist and specify the purpose of Symbols used in DFD.

d) Define process flow. List and explain types of process flow in SDLC.

e) Explain Agility in brief.

f) What is SRS? What are the features of SRS?

g) Differentiate between system Analysis and System Design.

Q4) Answer the following (any five) : **[5 × 5 = 25]**

a) What are software quality factors?

b) What is feasibility study? Explain any two type in details.

c) Describe XP process diagrammatically.

d) Draw Context Level and 1st Level DFD for "Airline Reservation System".

e) Define data dictionary and explain four elements of data dictionary.

f) Write comparative analysis of waterfall model, incremental model and spiral model.

g) Consider the following case study for question A and B. An insurance company uses the following rule to determine the eligibility of driver for insurance. The driver will be insured if :

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

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

iii) The driver lives in a city with population 10,000 or more and should be married female.

iv) The driver is male over 30 years.

v) The driver is married and age is under 30.

1) Draw decision tree for above case study.

2) Draw decision table for above case study.

▽▽▽▽

Total No. of Questions : 3]

SEAT No. : [ ]

PA-2579

[Total No. of Pages : 1

[5905]-44

S.Y.B.Sc./ Computer Science/Biotechnology/B.C.A.
ENGLISH - LANGUAGE COMMUNICATION- II
Ability Enhancement Compulsory Course
(2019 Pattern) (Semester - IV) (LA -241)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***

Q1) Attempt any ONE of the following in about 150-200 words. **[15]**

a) What is the poet's prayer in the poem 'The Bird Sanctury'?

b) Why does the poet decide to continue the journey, despite the beauty of woods, in the poem 'Stopping by woods on a Snowy Evening'?

Q2) Attempt any TWO of the following in about 50-80 words. **[10]**

a) As you are the chairperson of sports committee of your college. Write a notice for the college notice board informing students to register their names for Indoor Games' scheduled in next month.

b) Write a note on 'Minutes'?

c) Discuss various video streaming sites and their functions.

Q3) Attempt any TWO of the following in about 50-80 words. **[10]**

a) Differentiate between 'Hard Skills' and 'Soft Skill's.

b) How does SWOT/C analysis help for personality development?

c) Explain various strategies to achieve 'Goals".

✡ ✡ ✡

Total No. of Questions : 4]

SEAT No. : ____

PA-1092

[Total No. of Pages : 3

[5905]-51
T.Y. B.C.A. (Science)
BCA - 351 : PROGRAMMING IN JAVA
(2019 Pattern) (Semester - V)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw diagram wherever necessary.***

Q1) **Attempt the following :** **[5 × 1 = 5]**

A) Choose the correct options :

i) _____ of these operators is used to allocate memory for an object.

a) malloc b) alloc

c) new d) give

ii) _____ of these keyword must be used to inherit class.

a) super b) this

c) extent d) extends

iii) When error will be occurring then if checked the exception type in _____ block.

a) try b) catch

c) throw d) block

iv) To create a menu user need to use _____ class.

a) J RadioButton b) J Menu

c) J menuitem d) J Frame

v) _____ interface is used to store the result of query?

a) Statement b) Connection

c) Resultset d) Object

P.T.O.

B) Attempt the following : **[5 × 1 = 5]**

a) What is J2EE?

b) What is meant by JDBC Driver?

c) Which swing classes are used to create menu?

d) "Vector is growable or changeble size" - Justify true of false.

e) List types of layout managers.

Q2) **Attempt the following : (Any Five)** **[5 × 3 = 15]**

a) Explain different types of comments with example.

b) What is polymorphism? With help of example explain. Runtime polymorphism.

c) What is Map? Explain any two types of Map Class.

d) Explain Dialogs with the suitable example.

e) Define the terms :

i) Statement

ii) Prepared Statement

iii) Callable Statement

f) What are different types of scripting elements?

Q3) **Attempt the following : (Any Five)** **[5 × 4 = 20]**

a) Explain Buffered Reader and Scanner Class with example.

b) What are the primitive data types in Java? Write about type conversion.

c) Write a Java program to check age is greater than 18. Give appropriate message (using exception handling)

d) With the help of diagram explain MVC Architecture.

e) Explain life cycle of a JSP.

f) What is 'Super' keyword explain with example.

g) How to create & access package.

Q4) **Attempt the following : (Any five)** **[5 × 5 = 25]**

a) With the help of diagram explain servlet life cycle.

b) Write a Java program to check whether number is armstrong or not.

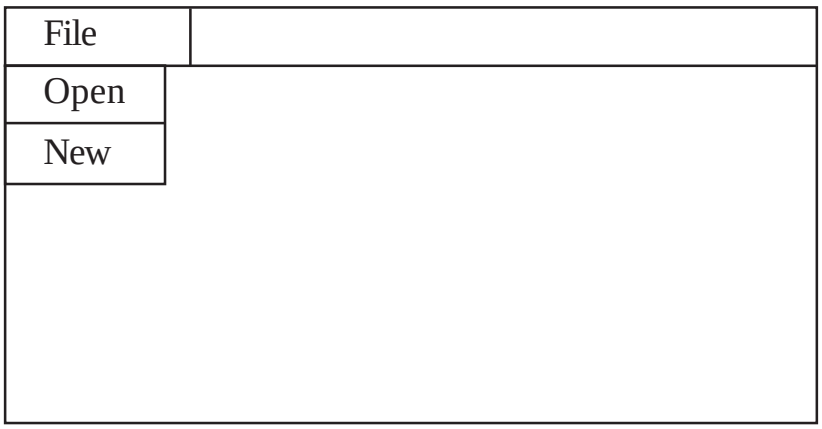
c) What is Adapter class? List the adapter classes.

d) Demonstrate constructor overloading concept.

e) Describe about various components in AWT.

f) List any five checked exception & explain it with example.

g) Write a Java program to create following.



❄ ❄ ❄

Total No. of Questions : 4]

SEAT No. : ____

PA-1093

[Total No. of Pages : 3

[5905]-52
T.Y. B.C.A. (Science)
BCA - 352 : DATA MINING AND DATA SCIENCE
(2019 Pattern) (Semester - V)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw labelled diagram wherever necessary.***

Q1) **Attempt the following :** **[5 × 1 = 5]**

A) Choose the correct options :

i) Which of the following options is true about K-NH algorithms ?

a) It can be used for classification

b) It can be used for regression

c) It can be used in both classification and regression

d) None of these

ii) Which of the following is structured data.

a) XML data b) Word file

c) PDF file d) Relational data

iii) Frequency of occurence of an itemset is called as _____.

a) Support count b) Confidence

c) Support d) Itemset

iv) _____ is the output of KDP

a) Query b) Useful Information

c) Data d) Information

v) IDA means

a) Inumate Data Analysis b) Init Data Analysis

c) Initial Data Analysis d) It data Analysis

P.T.O.

B) Attempt the following : **[5 × 1 = 5]**

a) What is data warehouse?

b) What is outliers?

c) Which are two types of data modeling.

d) What is multivariate data set?

e) What is perceptron?

Q2) **Answer the following : (Any Five)** **[5 × 3 = 15]**

a) Write Advantages and disadvantages of Decision tree.

b) What are the importance of Cluster Analysis?

c) Explain categories of Data.

d) What is Data mart? Explain it category.

e) Explain Applications of Data mining.

f) Explain Basic Principles of Data Visualization.

Q3) **Answer the following : (Any Five)** **[5 × 4 = 20]**

a) Explain types of Analytics.

b) Write difference between EDA approach and CDA approach.

c) Explain k-means algorithms with example.

d) Write difference between regression and classifications.

e) Explain different operations of OLAP.

f) What is data preprocessing? Explain Data Cleaning & Data Transformation?

g) Explain the attributes of selection measures

Q4) **Answer the following : (Any five)** **[5 × 5 = 25]**

a) Explain synthesis and optimization tools of EDA.

b) Explain Hierarchical methods in details.

c) What is data science? Explain its process.

d) What is database schema? Explain its type.

e) Explain k-Nearest Neighbor classifiers with example.

f) Explain Naive Bayesian classifications.

g) What are the issues of data mining.

❄ ❄ ❄

Total No. of Questions : 04]

SEAT No. : ____

PA-1094

[Total No. of Pages : 3

[5905]-53
T.Y.B.C.A. (Science)
BCA-353 : PRINCIPLES OF OPERATING SYSTEMS
(DSE-III)
(2019 Pattern) (Semester-V)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***
3) ***Draw diagram wherever necessary.***

Q1) Attempt following.

A) Choose the correct option. **[5×1=5]**

a) A logical is an address generated by _____.

i) Graphical processing unit

ii) Memory unit

iii) Central processing unit

iv) Command processing unit

b) Bankers safety Algorithm is used for

i) Deadlock detection ii) Deadlock preuention

iii) Allocation Avoidance iv) Recovery

c) _____ schedular loads the job from secondary storage to memory

i) Long term ii) Short term

iii) Mid term iv) Start term

d) _____ is not necessary condition in deadlock.

i) Safe state ii) Mutual exclusion

iii) Hold & wait iv) Circular wait

e) In a bit vector each block is represented by _____ if block is free & _____if block is allocated.

i) 1,0 ii) 0,1

iii) 0,0 iv) 1,1

P.T.O.

B) Attempt the following. **[5×1=5]**

a) What is wait-for-graph?

b) What is page fault?

c) What is access time?

d) What is acyclic graph?

e) What is Bit Map?

Q2) Attempt the following (Any five) **[5×3=15]**

a) Discuss the requirements of critical problem solution.

b) Discuss symbols used in representation of resource allocated graph.

c) State & explain different types of thread.

d) Write short note on swapping.

e) List advantages & disadvantages of indexed allocation.

f) Write short note on process termination.

Q3) Attempt the following (any five) **[5×4=20]**

a) What is semaphore? Discuss its type.

b) Differentiate between deadlock & starvation.

c) Let the reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5 using FIFO algorithm find number of page faults

i) When there are 3 frames

ii) When there are 4 frames.

d) Explain tree structure directory structure.

e) Write short note on process control Block.

f) State advantages & disadvantages of dynamic linking.

f) Describe disk management in O.S.

Q4) Attempt the following (any five) **[5×5=25]**

a) Consider the following set of processes with CPU burest. time given in miliseconds.

Process	Burst Time	Arrival time
P_1	5	1
P_2	3	0
P_3	2	2
P_4	4	3
P_5	8	2

Illustrate the execution of these processes using preemptive SJF calculate average turn around time & average waiting time.

b) Define terms.
   i) Race condition
   ii) Bounded wait
   iii) Critical section
   iv) Process syncronization
   v) Counting semaphore

c) Let 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 occure for following page replacement algorithms assuming no. of frames = 4 for all initially empty.
   i) Optimal page replacement
   ii) LRU

d) What is FCFS scheduling? Explain with suitable example

e) Differentiate between contiguous allocation & linked allocation method of disk space.

f) Consider a given snapshot of system that has 5 processes & 4 resources.

	Allocation			
	A	B	C	D
P_1	0	6	3	2
P_2	0	0	1	2
P_3	1	0	0	0
P_4	1	3	5	4
P_5	0	0	1	4

	Max			
	A	B	C	D
P_1	0	6	5	2
P_2	0	0	1	2
P_3	1	7	5	0
P_4	2	3	5	6
P_5	0	6	5	6

Available			
A	B	C	D
1	5	2	0

Answer the following questions using Bankers algorithm.
   i) What is content of need matrix.
   ii) Is the system is in safe state? If yes then give safe sequence

g) Consider a disk queue with requests for I/O to block on cylinders 82, 170, 43, 140, 24, 16, 190. The head is initially at cylinder no. so calculate the head movements in curred while servicing this request using.
   i) FCFS (FIFO)
   ii) SSTF
   iii) SCAN
   iv) Look
   v) C-SCAN

Total No. of Questions : 10]

SEAT No. :

PA-1095

[Total No. of Pages : 3

[5905]-54
T.Y.B.C.A. (Science)
BCA 354 : ARTIFICIAL INTELLIGENCE
(2019 Pattern) (Semester-V)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right side indicate full marks.***
3) ***Draw diagram wherever necessary.***

Q1) Attempt any Eight of the following. (Out of Ten) **[8×1=8]**

a) _____ search method takes less memory.

i) Depth first search ii) Breadth first search

iii) Linear search iv) Optimal search

b) _____ search strategy is also called as blind search.

i) Informed search ii) Uniformed search

iii) Simple reflex search iv) Amonform search

c) _____ is the ability to represent all kinds of knowledge that are needed in the domain.

i) Inferential adequacy ii) Representation adequacy

iii) Inferential efficiency iv) Acquisition efficiency

d) _____ of the following elements constitutes the frame structure.

i) Fact or data

ii) Procedure and default values

iii) Frame names

iv) Frame reference in hierarchy

e) _____ machine learning deals with unlabeled data to find patterns from data.

i) Supervised ii) Unsupervised

iii) Reinforcement iv) Semi supervised

P.T.O.

f) _____ is the other name of informed search strategy.

i) Simple search ii) Heuristic search

iii) Online search iv) Reflex search

g) First order logic statements contains _____

i) Predicate and preposition ii) Subject and an object

iii) Predicate and subject iv) Preposition and an object

h) _____ of the following is not application of AI.

i) Intelligent robots ii) Handwriting recognition

iii) Speech recognition iv) Contain mining

i) _____ is a representation of problem elements at given moment.

i) State space ii) Search

iii) State iv) Problem

j) _____ data structure is used to implement BFS.

i) Linked list ii) Queue

iii) Priority queue iv) Stack

Q2) Attempt any four of the following (out of Five) **[4×2=8]**

a) What is search strategy.

b) Why we need Artificial intelligence?

c) What is resolution? Explain with an example.

d) List out the components of script. Explain any one component.

e) Define clustering with an example.

Q3) Attempt any two of the following (out of three) **[2×4=8]**

a) Write down the algorithm of breadth first search.

b) What is machine learning? Explain its types in detail.

c) Explain the algorithm for resolution in prepositional logic.

Q4) Attempt any two of the following (out of three) **[2×4=8]**

a) What is predictive analytic? Explain with example.

b) Define Artificial intelligence. Explain techniques of AI.

c) Explain predicate logic with an example.

Q5) Attempt the one of the following (out of two) **[1×3=3]**

a) Explain depth first search algorithm in detail.

b) Define knowledge. Explain any two types of knowledge.

Total No. of Questions : 5]

SEAT No. : ____

PA-1096

[Total No. of Pages : 2

[5905] - 55
T.Y. B.C.A. (Science)
BCA-355 : CLOUD COMPUTING
(2019 Pattern) (Semester - V) (SEC II)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Figures to the right indicate full marks.***
2) ***Draw labelled diagram wherever necessary.***

Q1) **Attempt any Eight of the following (Out of Ten) :** **[8 × 1 = 8]**

a) Private cloud means what?

b) Which cloud platform is provided by Microsoft?

c) Define Hypervisor.

d) What is virtualization?

e) Grid Computing Means what?

f) What is resource pooling?

g) Define the term Migration.

h) What is Docker in Containerization?

i) Define the term Data Breach.

j) IDS stands for –?

P.T.O.

Q2) **Attempt any Four of the following (Out of Five) :** **[4 × 2 = 8]**

a) What is the difference between Google App Engine and Google Compute Engine?

b) Write a note on Azure AI and ML.

c) What are the benefits of omni-cloud?

d) What is AI Cloud Computing?

e) Define the term paas Cloud Computing Security architecture.

Q3) **Attempt any Two of the following (Out of Three) :** **[2 × 4 = 8]**

a) What are the advantages & disadvantages of Saas?

b) Explain any two types of virtual machine.

c) What are the features of salesforce?

Q4) **Attempt any Two of the following (Out of Three) :** **[2 × 4 = 8]**

a) Explain important services offered by AWS.

b) List & define the services offered by Amazon Web Services.

c) What are the steps to highlights “Cloud-adapted RMF”

Q5) **Attempt any One of the following (Out of Two) :** **[1 × 3 = 3]**

a) Explain the Component Node (Slave) in Kubernetes architecture.

b) What are the application hosting options in Microsoft Azure?

Total No. of Questions : 4] **SEAT No. :**

PA-1097 **[Total No. of Pages : 3**

[5905] - 61

T.Y. B.C.A. (Science)

BCA 361 : ANDROID PROGRAMMING (DSE - IV)

(2019 Pattern) (Semester - VI)

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

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Draw diagram wherever necessary.***

Q1) **Attempt the following :**

A) Choose the Correct Options : **[5 × 1 = 5]**

a) _____ is a Mobile Operating System based on the Linux Kernel and now developed by Google.

i) Android ii) Unix
iii) IOS iv) Windows

b) A fragment can be used in _____ activities.

i) Single ii) Multiple
iii) Both i) & ii) iv) None of the mentioned

c) _____ is a view which groups several items and display them in Vertical Scrollable list.

i) Text view ii) List view
iii) Button iv) List Item

d) _____ class provides the functionality to use the SQLite database.

i) SQLiteOpenHelper ii) SQLiteCloseHelper
iii) SQLiteFetchHelper iv) SQLiteFoldHelper

e) _____ is the process of finding the geographical coordinates of given address or location.

i) Reverse Geocoding ii) Geocoding
iii) Both i) & ii) iv) All above

P.T.O.

B) Answer the following : **[5 × 1 = 5]**

a) What is SDK?

b) What is Activity?

c) What is Spinner?

d) Define term : Image View.

e) How to close database using SQLite?

Q2) **Answer any five from following :** **[5 × 3 = 15]**

a) Explain the term displaying Google Map in detail.

b) How to create database in SQLite? Explain with example.

c) Note on List Fragment and Dialog Fragment.

d) Explain different kinds of Layout.

e) Explain Life Cycle of Activity.

f) Explain any four features of Android.

Q3) **Answer the following (Any Five) :** **[5 × 4 = 20]**

a) How to do Navigation to a specific location?

b) Define terms :

i) SQLite Database.

ii) SQLite OpenHelper.

c) What is Menu? Explain types of Menus.

d) Explain any Four types of Buttons.

e) Describe life cycle of fragment diagrammatically.

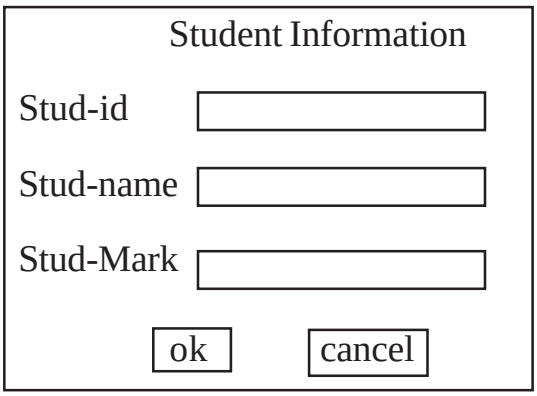
f) What is VideoView? How Optimize Video View?

g) What is Picker View? Types of Picker View.

Q4) **Answer the following (Any Five) :** **[5 × 5 = 25]**

a) Explain architecture of Android.

b) Write an application for the following Layout :



After clicking ok display detail on another activity.

c) Write steps for Linking activities using intents.

d) Write the use of onCreate( ), onUpgrade ( ) and getWritable Database ( ) methods. With example.

e) Write an application to send Email

(Using - To, Subject and Message) Intent.

f) Explain List View using adapter with the help of example.

g) Differentiate between :

i) Location based Services & Google Map.

ii) Geocoding and Reverse geocoding.

Total No. of Questions : 4]

SEAT No. : ____

PA-1098

[Total No. of Pages : 4

[5905]-62

T.Y B.C.A. (Science)

BCA-362: DSE-V: PROGRAMMING IN GO

(2019 Pattern) (Semester - VI)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***All questions are compulsory.***
3) ***Draw neat sketches wherever necessary to illustrate answer.***
4) ***Each question carries equal marks.***

Q1) A) Choose the correct option. **[5 × 1 = 5]**

a) The statement _____ is true

i) GO supports operator overloading

ii) GO supports object oriented concepts

iii) GO is case sensitive programming language

iv) GO supports pointer arithmetic

b) _____ is initial (zero value) value for interfaces, slice, pointers, channels and functions.

i) 0 ii) " "

iii) Nil iv) False

c) The _____ function returns the total number of elements present in a slice.

i) cap( ) ii) size( )

iii) len( ) iv) size of( )

P.T.O.

d) _____ is about dealing with lot of things at once and _____ is about doing lots of things at once.

i) Parallelism, concurrency

ii) Concurrency, parallelism

iii) Virtual computing, multi-tasking

iv) Serial execution, non-serial execution

e) _____ means an unexpected condition arises in GO program due to which execution of program is terminated.

i) defer ii) recover

iii) panic iv) throw

B) Answer the following in one or two sentences : **[5 × 1 = 5]**

a) List different data types in GO programming.

b) What is blank identifier?

c) Justify True or False : Functions can be passed as an argument to another function in GO.

d) What is empty interface?

e) What is package?

Q2) Answer the following (Any Five) : **[5 × 3 = 15]**

a) What are different types of constants? How constants can be used for enumerations?

b) What is named return variables in GO?

c) How to iterate over arrays in GO?

d) What is type assertion in GO?

e) How concurrency is implemented in GO?

f) Find the output of following with explanation:

```
package main
import ("fmt")
func hello (i int) {
        fmt. println (i)
}
func main ( ) {
        i : = 5
        defer hello (i)
        i = i + 10
}
```

Q3) Answer the following (Any five) : **[5 × 4 = 20]**

a) What are the features of GO language?

b) Explain variadic function in GO with example.

c) What is slice? Explain the various ways to create slice.

d) What is a method in GO? Give example of pointer receiver method in GO?

e) Explain need of wait group and working of wait group?

f) Write a program in GO to store n employee information (empno, name, salary) and write a method to display employee information having maximum salary.

g) What is unit testing? How it is implemented in GO?

Q4) Answer the following (Any five) : **[5 × 5 = 25]**

a) What is string literal? Explain string functions for the following operations:

i) converting string in lower case

ii) check whether string contains a substring.

iii) counting occurrence of substring

iv) removing leading and trailing spaces in string

b) What is anonymous function? Explain closure of function with example.

c) What is structure? Explain function as field in structure with suitable example.

d) What is channel? What are different types of channel? Explain send and receive operation on channel.

e) Write a program in GO to create on interface shape that includes area and perimeter. Implement these methods in circle and rectangle type.

f) Explain different types of import methods in GO.

g) Write a program in GO to implement push and pop operations on stack data structure.

Total No. of Questions : 4]

SEAT No. : ____

PA-1099

[Total No. of Pages : 3

[5905]-63

T.Y B.C.A (Science)

BCA-363: SOFTWARE PROJECT MANAGEMENT

(2019 Pattern) (Semester - VI) (DSE - VI)

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

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw labeled diagram wherever necessary.***

Q1) Attempt the following : **[5 × 1 = 5]**

A) Choose the correct option.

a) _____ activity is undertaken once the development activities start.

i) Project planning

ii) Project size estimation

iii) Project Monitoring and control

iv) Project cost estimation

b) _____ of the following activity is not the part of project planning.

i) Project estimation

ii) Project scheduling

iii) Project monitoring

iv) Risk management

c) Net works usually indicate activity precedence constructed from _____.

i) Left to right ii) Right to left

iii) Bottom to up iv) Up to bottom

P.T.O.

d) _____ phases are there in scrum.

i) Four

ii) Three

iii) Two

iv) Five

e) _____ task is part of Software Configuration Management (SCM).

i) Audit control

ii) Change control

iii) Process control

iv) Management control

B) Attempt the following : **[5 × 1 = 5]**

a) What is communication plan?

b) List out the phases in scrum.

c) Define Backward Pass Method.

d) Define PDM.

e) What is Dependency?

Q2) Attempt the following (any Five) : **[5 × 3 = 15]**

a) Describe CPN (Constructing Precedence Networks) with an example.

b) Write a note on PMBOK.

c) Explain Forward Pass Technique with example.

d) Explain how to manage people? How to select staff.

e) Compare Agile and Non-Agile project.

f) How to manage the contract in Project Management?

Q3) Answer the following (any five) : **[5 × 4 = 20]**

a) Explain phases of project lifecycle.

b) What is Gantt chart? Explain with example.

c) Explain project scheduling in Agile Environment.

d) Explain Software Configuration Management.

e) What are the Roles and Responsibility of Software development team?

f) Describe CPM with an example.

g) What are the objectives of Activity Planning?

Q4) Answer the following (any five) : **[5 × 5 = 25]**

a) What is an Oldham Hackman model explain with example.

b) Explain Roles and Responsibility in agile team.

c) List and explain the different activity relationships in details.

d) Define WBS and explain its types with the help of diagram.

e) Explain visualizing progress in details with example.

f) Explain Network Planning Model and its types.

g) What is Contract Management? Explain how to manage contract?

Total No. of Questions : 5]

SEAT No. : ____

PA-1100

[Total No. of Pages : 2

[5905]-64
T.Y. B.C.A. (Science)
BCA 364 :SEC- III : MANAGEMENT INFORMATION SYSTEMS
(2019 Pattern) (Semester - VI)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Figures to the right side indicate full marks.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt any Eight of the following: **[8 × 1 = 8]**

i) _____ is backbone of any organization.

a) Information b) Management

c) Employee d) Capital

ii) _____ is the process of selecting best alternative from many alternatives.

a) Selection b) Decision making

c) Preprocessing d) Budgeting

iii) The full form of BPR is _____.

a) Business redevelopment b) Business design

c) Business process d) Business process reengineering

iv) _____ is the term for a radical rethinking of the nature of the business.

a) Transformational change b) Revolutionary change

c) Strategic planning d) Paradigm shift

v) _____ is the first step of SCM process.

a) Planning b) Packing

c) Assembling d) Manufacturing

vi) The CRM system consists of _____ components.

a) 2 b) 3

c) 4 d) many

P.T.O.

vii) ERP stands for _____.

a) Enterprise Resource Planning
b) Enter Resource Planning
c) Enhanced Resource Planning
d) Entertainment Resource Planning

viii) _____ type of DSS system doesnot involve computation analysis.

a) Data analysis systems
b) Accounting systems
c) Information analysis systems
d) Status Inquiry systems

ix) _____ is the process which convert tacit knowledge to tacit knowledge.

a) Externalization
b) Socialization
c) Combination
d) Internalization

x) The service sector is also known as _____ sector.

a) binary
b) secondary
c) unique
d) tertiary

Q2) Attempt any four of the following: **[4 × 2 =8]**

i) Define MIS and state its one objective.
ii) State the various tasks involved in information management.
iii) State the different phases of CRM.
iv) Write any two benefits of EIS.
v) Define financial MIS.

Q3) Attempt any two of the following: **[2 × 4 =8]**

i) Describe decision making process. (Simon's model)
ii) Explain various steps of supply chain.
iii) Explain different types of DSS.

Q4) Attempt any two of the following: **[2 × 4 =8]**

i) What is uncertainty avoidance in organizational decision making process?
ii) Differentiate between MIS and BPR.
iii) Explain various characteristics of ERP systems.

Q5) Attempt any One of the following: **[1 × 3 =3]**

i) Explain the roles of information technology in BPR.
ii) Explain in brief architecture of KMS.

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Total No. of Questions : 5]

SEAT No. : ____

PA-1101

[Total No. of Pages : 2

[5905]-65
T.Y. B.C.A. (Science)
BCA - 365 : INTERNET OF THINGS
(2019 Pattern) (Semester - VI)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Figures to the right indicate full marks.***
2) ***Draw lebeled diagram whenever necessary.***

Q1) Attempt the following any Eight : (Out of Ten) **[8 × 1 = 8]**

Choose the correct option:

i) Using _____ an embedded system communicate with outside world.

a) Memory b) Output

c) Peripherals d) Input

ii) _____ of the following is the way in which an IoT device is associated with data?

a) Internet b) Cloud

c) Automata d) Network

iii) _____ of the following IoT networks has a very short range.

a) Short network b) LPWAN

c) Sigfox d) Short - range wireless network

iv) WSN stands for _____

a) Wired sensor network b) Wireless sensor network

c) Wired sensor mode d) Wireless sensor node

v) What role of the cloud in smart grid architecture is _____?

a) Collect data b) Manage data

c) Security d) Store data

vi) The protection and security for an embedded system made by _____.

a) Security chip b) Memory disk

c) IPR d) OTP

P.T.O.

vii) RFID stands for _____.

a) Radio frequency device
b) Radio frequency information
c) Random frequency information
d) Radio frequency identification

viii) _____ numbers of element in the open IoT architecture?

a) Two b) Three
c) Four d) Seven

ix) An IoT network is a collection of _____ devices.

a) Signal b) Machine to Machine
c) Inter connected d) Network to Network

x) Arduino UNO is _____.

a) Software b) Hardware device
c) Network d) Protocol

Q2) Attempt any four of the following: (Out of Five) **[4 × 2 =8]**

i) What is embedded system?
ii) Define IoT. Why needs of IoT?
iii) Define AWS IoT.
iv) State and explain in short thread modeling.
v) Short note on sensor networks.

Q3) Attempt any two of the following: (Out of Three) **[2 × 4 =8]**

i) What are the components of embedded system.
ii) Explain any four protocols of IoT.
iii) Explain cloud storage model in details.

Q4) Attempt any two of the following: (Out of Three) **[2 × 4 =8]**

i) Explain pillars of IoT in details.
ii) Explain IP based protocols in details.
iii) Differentiate between Amazon web services & Sky net IoT.

Q5) Attempt any one of the following: (Out of Two) **[1 × 3 =3]**

i) Explain IoT security model in details.
ii) Differentiate between IoT communication model and IoT communication APIs.

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Total No. of Questions : 7]

SEAT No. : ____

PA-3490

[Total No. of Pages : 3

[5905]-71
S.Y. B.C.A.
SCIENCE
BCA 404 : OOSE
(2016 Pattern) (Semester - IV)

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

Instructions to the candidates:

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

Q1) A) Choose the appropriate options. **[7 × 1 = 7]**

i) Polymorphism means _____.

a) The ability to take one form

b) The ability to take more than one form

c) The ability to take only one and one form

d) None of above.

ii) _____ can be defined as a relationship in which two elements are connected.

a) Relation b) Inheritance

c) Realization d) All of the above

iii) An instance of association is called as _____.

a) Link b) Connection

c) Visibility d) Relation

iv) An object is an _____ of a class.

a) Attribute b) Operation

c) Link d) Instance

P.T.O.

v) A process is a _____ that can execute concurrently with other processes.

a) Lightweight flow b) Highweight flow

c) heavyweight flow d) None of these

vi) An activity diagram is used to display the sequence of _____.

a) Use cases b) Activities.

c) Interaction d) Connection

vii) CBD architecture stands for _____.

a) Component based diagram

b) Component based

c) Clear bond diagonal

d) None of these

B) Answer in one sentence. **[7 × 1 = 7]**

i) Define Action.

ii) Define object.

iii) What is structural modeling?

iv) Define thread.

v) Enlist common two uses of interaction diagram.

vi) What is deployment?

vii) What is system?

Group - I

Q2) Answer the following questions:

a) Write short note on: Advanced relationships. **[5]**

b) What is object diagram? Explain its purpose. **[5]**

c) Explain roles and types with example. **[4]**

Q3) Attempt the following questions:

a) What is meant by UML diagrams? Explain it in brief. **[4]**

b) Prepare class diagram for information system of college. **[4]**

c) What is instances? Explain with example. **[3]**

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

i) Interface

ii) Inheritance

iii) Software Engineering.

Q4) Attempt the following questions:

a) Draw and explain sequence diagram in detail for library management. **[4]**

b) Draw activity diagram for online mobile recharge. **[4]**

c) Explain collarboration diagram with example. **[3]**

d) Explain frameworks and mechanism in details. **[3]**

Group - II

Q5) Attempt the following questions:

a) Explain common use of interaction diagram. **[5]**

b) What is structural aspects of pattern. **[5]**

c) What is generalization? **[4]**

Q6) Attempt the following questions:

a) Draw component diagram for Hotel management system. **[4]**

b) Draw use-case diagram for vending machine. **[4]**

c) Explain state machine with example. **[3]**

d) What is actor and collaboration. **[3]**

Q7) Attempt the following questions:

a) Describe advanced classes with example. **[4]**

b) What are different notation used in activity diagram? Explain in brief. **[4]**

c) Explain state chart diagram in details with its notations. **[3]**

d) Draw deployment diagram for college administration **[3]**

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Total No. of Questions : 7]

SEAT No. : ____

PA-3493

[Total No. of Pages : 3

[5905]-72
T.Y. B.C.A.
SCIENCE
BCA 507 : Soft Computing
(2016 Pattern) (Semester - V)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

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

Q1) A) Choose the correct option from the following: **[5 × 1 = 5]**

i) Fuzzy logic is extension of _____ logic.

a) Boolean b) Demorgan

c) Cartesian d) All of the above

ii) An _____ neuron as a model of biological neuron.

a) Genetic b) Artificial

c) Both a and b d) None of above

iii) A _____ set is described by membership function whose membership value is strictly monotonically increasing or strictly monotonically decreasing.

a) Normal fuzzy set b) Subnormal fuzzy set

c) Convex fuzzy set d) Non-convex fuzzy set

iv) A _____ is one element position of chromosome.

a) Population b) Chromosome

c) Gene d) Allele.

P.T.O.

v) Perceptron is a _____.

a) Feed - forward neural network

b) Back-propagation algorithm

c) Back tracking algorithm

d) Feed-forward backward algorithm

B) Answer the following: **[5 × 1 = 5]**

i) What is soft computing?

ii) List operations on fuzzy relations.

iii) State excluded middle axioms for crisp set.

iv) Define bias in neural network.

v) Define genotype.

Group - I

Q2) Attempt the following:

a) Enlist and explain phases of GA. **[4]**

b) Enlist and explain different membership functions in fuzzy logic. **[4]**

c) Explain simple forms of GA. **[2]**

Q3) Attempt the following:

a) Explain multilayered network architectures. **[4]**

b) Determine if X is in P then Y is in R for given fuzzy set. **[4**

$$\underset{\sim}{P} = \left\{ \frac{0.1}{a} + \frac{0.9}{b} + \frac{0.0}{c} \right\}$$

$$\underset{\sim}{R} = \left\{ \frac{0}{d} + \frac{1}{e} + \frac{0}{n} \right\}$$

c) Write note on evolutionary algorithm. **[2]**

Q4) Attempt the following:

a) Write note on selection process and explain techniques used. **[4]**

b) Explain structure of biological neural network with diagram. **[4]**

c) Define support in membership function. **[2]**

Group - II

Q5) Attempt the following:

a) Differentiate supervised and unsupervised learning. **[4]**

b) Write note on - crossover. **[4]**

c) Enlist and explain operator used in GA. **[2]**

Q6) Attempt the following:

a) Consider following fuzzy set

$$\underset{\sim}{A}=\left\{\frac{1}{x_1}+\frac{0.5}{x_2}+\frac{0.2}{x_3}\right\}\ B=\left\{\frac{0}{y_1}+\frac{0.5}{y_2}+\frac{0.3}{y_3}\right\}\ C=\left\{\frac{0.1}{z_1}+\frac{0.6}{z_2}+\frac{1}{z_3}\right\}$$

Find i) $R = A \times B$ ii) $S = B \times C$ iii) $T = R^{o}S$. **[4]**

Using max-min composition

b) Explain feedback or recurrent neural network. **[4]**

c) Enlist different forms of mutation. **[2]**

Q7) Attempt the following:

a) Write short note on history of soft computing. **[4]**

b) Explain features of membership function. **[4]**

c) For given two sets find difference. **[2]**

$$\underset{\sim}{A}=\left\{\frac{0.2}{1}+\frac{0.3}{2}+\frac{0.5}{3}+\frac{0.8}{4}\right\}$$

$$\underset{\sim}{B}=\left\{\frac{0.15}{1}+\frac{0.25}{2}+\frac{0.3}{3}+\frac{0.4}{4}\right\}$$

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Total No. of Questions : 7]

SEAT No. :

PA-3498

[Total No. of Pages : 3

[5905]-73
T.Y. B.C.A.
SCIENCE
BCA 602 : PYTHON PROGRAMMING
(2016 Pattern) (Semester - VI)

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

Instructions to the candidates:

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

Q1) A) Choose the correct option from the following: **[7 × 1 = 7]**

i) 'In' operator is

a) Identify operator b) Membership operator

c) Arithmetic operator d) Assignment operator

ii) Which is not a scripting language?

a) Java script b) VB script

c) C d) Ruby

iii) Which of the following items are present in the function header?

a) Function name

b) Function name and parameter list

c) Return value

d) Parameter list

iv) Formatting character to display unsigned decimal integer in a list

a) %d b) %c

c) % i d) %u

P.T.O.

v) Add elements in the set using method _____.

a) Union ( ) b) Add ( )

c) PoP ( ) d) Discard ( )

vi) Which of the following is not attribute of a file?

a) Soft space b) Mode

c) Closed d) Rename

vii) Which of the following statements can be used to check, whether an object "obj" is an instance of class a or not?

a) Obj.isinstance (A)

b) A.isinstance (obj)

c) Isinstance (obj, A)

d) Isinstance (A, obj)

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

i) What is list in Python?

ii) What is anonymous function?

iii) What is purpose of dict ( ) method in Python?

iv) What are file object attributes?

v) List disadvantages of Python.

vi) What is inheritance in Python programming?

vii) What is assertion?

Group - I

Q2) Attempt the following:

a) Write a program to generate prime numbers in specified range. **[5]**

b) What are different built in list functions available in Python? **[5]**

c) Explain built in tuple functions. **[4]**

Q3) Attempt the following:

a) How to access elements from dictionary? **[4]**

b) How to add and remove elements from set? **[4]**

c) What are applications of Python? **[3]**

d) Explain while loop with an example. **[3]**

Q4) Attempt the following:

a) What is use of constructor and destructor? **[4]**

b) Write a note on function ducktyping and polymorphism. **[4]**

c) Explain different access modes of file. **[3]**

d) Give a comparison between lists and dictionaries. **[3]**

Group - II

Q5) Attempt the following:

a) Write a Python program to create a simple calculator, that can add, subtract, multiply or divide depending upon the input from the user. **[5]**

b) What is method overriding in Python? **[5]**

c) Write a Python program to count the number of words, and lines in a text file. **[4]**

Q6) Attempt the following:

a) What are the different parameter passing techniques? **[4]**

b) What are the different attributes and methods in a Python class? **[4]**

c) Write syntax of Raise statement and explain it. **[3]**

d) Write program to count the occurences of a word in a text file. **[3]**

Q7) Attempt the following:

a) Write a program which finds sum of digits of a number. **[4]**

b) What is use of lambda( ) with filter? **[4]**

c) What are features of Python? **[3]**

d) Write a Python program to find maximum and the minimum value in a set. **[3]**

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Total No. of Questions : 7]

SEAT No. :

PA-3499

[Total No. of Pages : 3

[5905]-74
T.Y. B.C.A.
SCIENCE
BCA 607 : Introduction to Green Computing
(2016 Pattern) (Semester - VI)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

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

Q1) A) Attempt the following: **[5]**

i) Which is the non-toxic element

a) Lead b) Silver

c) Mercury d) Cadmium

ii) PDU in data centres stand for

a) Power Distribution Unit b) Power Development Unit

c) Power Display Unit d) Power Data Unit

iii) Which of the following is not mode of green transportation?

a) Electric bike b) Bicycle

c) Scooter d) Green train

iv) IOT is an idea of

a) An interconnected system of computers

b) An interconnected system of devices

c) An interconnected system of people

d) All of above

P.T.O.

v) IEA stand for-

a) International Energy Agency

b) International Economics Agency

c) International Energy Association

d) None of above

B) Attempt the following: **[5]**

i) List the three phases of Green computing.

ii) What is carbon footprint?

iii) What do you understand by Green transportation?

iv) Enlist any two benefits associated with smart Grid.

v) What is data Centre?

Group - I

Q2) Attempt the folloiwg:

a) Discuss the approaches for Green computing. **[4]**

b) Write a note on saving energy on a single machine. **[4]**

c) What is smart Grid? **[2]**

Q3) Attempt the following:

a) Discuss the causes of energy crisis. **[4]**

b) What are the major contributors for carbon footprint? **[4]**

c) What do you understand by hybernate mode. **[2]**

Q4) Attempt the following:

a) Write a note on

i) Coolclimate

ii) Center for climate and energy solution **[4]**

b) Discuss the goals of sustainable IT **[4]**

c) What is Green business **[2]**

Group - II

Q5) Attempt the following:

a) Discuss the major green initiatives. **[4]**

b) What is smart building? Explain. **[4]**

c) List information required to calculate carbon footprint. **[2]**

Q6) Attempt the following:

a) Write a note on access control and security for smart building. **[4]**

b) Explain corporate sustainable strategies. **[4]**

c) List any two areas where IOT can be used. **[2]**

Q7) Attempt the following:

a) What is virtualization? How it differs from traditional machines. **[4]**

b) What is energy crisis? How it can be prevented? **[4]**

c) List any two power management techniques. **[2]**

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