Total No. of Questions : 4]

SEAT No. :

P5243

[Total No. of Pages : 2

[5826]-101

F. Y. B.C.A.

BCA - 111 : FUNDAMENTALS OF COMPUTERS

(2019 Pattern) (Semester - I)

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

Instruction to the candidates:

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

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

i) GUI stands for _____.

a) Graphical User Interaction
b) Graphical Usual Interface
c) Graphical User Interface
d) None of the above

ii) _____ is volatile memory device.

a) PROM b) ROM
c) EPROM d) RAM

iii) Java is an _____ level language.

a) High b) Middle
c) Low d) Assembly

iv) _____ is a document that store data grid of rows and columns.

a) Notepad b) Word Processor
c) Spreadsheet d) None of the above

v) OSS stands for _____.

a) Open System Software
b) Open System Service
c) Open Source Software
d) Open Synchronization Software

P.T.O.

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

i) Define Assembler.
ii) Enlist any two Pointing Devices.
iii) Define term Antivirus.
iv) Give two examples of open source software.
v) Define term BIOS.

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

a) Give any three difference between primary storage and secondary storage.
b) Explain Application Software.
c) What is Defragmentation and Disk cleaning?
d) What is Desktop publishing? Explain with Example.
e) What is Google sheet? Explain its features.
f) Write a note on word processor.

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

a) Write difference between Assembly language and high level language.
b) What is RAM? Explain its type in briefly.
c) What is GUI? Explain with example.
d) Explain Google docs and Google forms in details.
e) What is wikipedia? Explain its advantages in details.
f) Write a short note on network interface card.
g) Convert the following :
   i) $(114267)_{10} = (?)_{16}$
   ii) $(1163)_{10} = (?)_{2}$

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

a) Explain characteristics of computer.
b) What is meant by Network Devices? Explain any two network devices.
c) What is operating system? Explain three functions of operating system.
d) What is image editing software? Give example.
e) Explain any five Linux Commands.
f) What is Trouble shooting? Explain stepwise procedure of trouble Shooting.
g) What is graphics card? Explain its working.

❄ ❄ ❄

Total No. of Questions : 4]

SEAT No. :

P5244

[Total No. of Pages : 3

[5826]-102

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) ***Draw neat diagrams wherever necessary.***

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

i) C language is an _____

a) Assembly level language b) High level language

c) Middle level language d) None of the above

ii) Find add one out _____

a) printf b) fprintf

c) scanf d) putchar

iii) _____ is an unconditional control statement.

a) do ------- while b) goto

c) for d) if - else

iv) _____ is the default return type of main( ) function

a) int b) void

c) float d) short int

v) The function 'getch()' is define in _____ header file.

a) <conio.h> b) <stdio.h>

c) <math.h> d) <ctype.h>

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

i) Enlist four symbols of flow chart.

ii) What is type casting?

iii) What is the use of gets( )?

iv) Enlist different types of constants.

v) Define Array. Give example

P.T.O.

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

a) Explain basic data types of C language.

b) What is increment and decrement operator? Explain with example?

c) Discuss any three escape sequence characters with meaning.

d) What is Nested-if statement? Give example.

e) State the features of C language.

f) Write an algorithm for table generation of given number.

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

a) Explain characteristics of an algorithm.

b) Explain program development life cycle in detail.

c) Write difference between auto and static storage class.

d) Explain "for loop" with syntax and example.

e) Write an algorithm for factorial of a number.

f) Draw flow chart to print the digits in reverse order of the given number 'N'.

g) Write a C program to accept a matrix and display the largest number from matrix.

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

a) Write an algorithm to check whether given number is armstrong number or not.

b) Explain call by value and call by reference with example.

c) What is Array? Explain types of array with example.

d) What is Recursion? Write a program to find x^y using recursion.

e) Write a program to accept character from user and check whether it is vowel or consonant.

f) Trace the output with explanation.

```
main ( )
   {
      int i = 5;
      while (i)
         {
            i--;
         if (i = =3)
         continue;
         Printf ("in Hello");
      }
}
```

g) Trace the output with explanation.

```
main ( )
{
   Static int num [5] = {1,0,0,0,0};
   int i, j;
for (j=0; j<5;++j)
   for (i=0; i<j;++i)
         num [j] = num [j]+num [i];
   for (i=0; i<5; i++)
   printf ("%d\t" , num [i]);
   }
```


Total No. of Questions : 4]

SEAT No. :

P5245

[Total No. of Pages : 4

[5826]-103

F.Y. B.C.A. (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 : **[5 × 1 = 5]**

a) Choose the correct option :

i) If p & q are two statements then compound statement p and q is called _____

A) Conjunction B) Disjunction

C) Tautology D) Negation

ii) If A = (a, b), the power set of A has _____ element.

A) 6 B) 2

C) 4 D) 8

iii) The class intervals of the grouped data :

5-9	10-14	15-19	20-24

are of the type

A) inclusive class B) discrete class

C) exclusive class D) variable class

iv) Which one of the following is not a measure of central tendency?

A) Standard deviation B) Mean

C) Median D) Mode

v) The formula of quartile deviation or semi inter-quartile range is ___

A) $Q_3 - Q_1$ B) $Q_3 - Q_1 / Q_3 + Q_1$

C) $(Q_3 - Q_1)/2$ D) $(Q_1 - Q_3)/2$

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

i) Define power set of a set.

ii) Define biconditional statement.

iii) Define Transitive relation.

iv) Define bijective function.

v) State bionomial theorem.

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

a) Show that the set of odd positive integers is countable.

b) Show that $\cdot(\sim Q \cdot \wedge (P \rightarrow Q)) \rightarrow \sim P$ is a tautology.

c) Prove that for every integer n; $7^h - 3^h$ is divisiable by 4.

d) Let A = {1, 2, 3, 4, 5, 6}. A relation R is defined on the set A as below aRb iff a is multiple of b. Find the domain and range of R.

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

only 4 symbols. Find

i) α^{-1} ii) $\alpha \cdot \beta$ iii) $\beta \cdot \alpha$

f) 6 men and 5 women sit around a circular dining table in such a way that no two women are together. How many arrangements will be there?

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

a) Draw a pie diagram to represent the following data :

Group of item	Average monthly expenses (in ₹) of a family
Food	2400
Clothing	1400
House rent	1600
Fuel & lighting	600
Miscellaneous	2000

b) The following is a distibution 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) 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.

d) Calculate the coefficient of association between intelligence of fathers and that of sons given that :

Intelligent fathers will dullsons = 80

Intelligent fathers with intelligent sons = 250

Dull fathers with intelligent sons = 90

Dull fathers with dull sons = 580

e) 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

f) A random experiment results in an integer outcome between 1 and 10 (both inclusive). All numbers are equally likely. Let A be the event that an odd number occurs and B be the event that a number divisible by 3 occurs. Obtain

i) $P(A|B)$ ii) $P(B|A)$ iii) $P(A'|B)$ iv) $P(A|B')$

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

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

a) Show that the following statements are equivalent.

$A \rightarrow (B \vee C) \Leftrightarrow (A \wedge \sim B) \rightarrow C$

b) 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.

c) There are 325 colleges in a certain state that have atleast one of the three facilities viz. Hostel facility, credit shop and career guidance facility, 225 colleges have hostel facility, 90 colleges have credit shop facility and 60 have career guidance facility. Further 20 colleges have all three facilities. Find how many colleges have exactly two of three facilities.

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) Calculate standard deviation of the following frequency distribution.

Weight (in kg)	30-40	40-50	50-60	60-70	70-80
No. of standards	3	5	12	20	10

f) 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

g) Compute regression coefficients and hence verify that correlation coefficient lies between them.

$$n = 100, \bar{x} = 60, \bar{y} = 50, \sigma_x = 10, \sigma_y = 12, \sum (x - \bar{x})(y - \bar{y}) = 8400$$

Total No. of Questions : 4]

SEAT No. :

P5246

[Total No. of Pages : 3

[5826]-104

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

Q1) Attempt the following :

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

a) _____ refers to the special language of a trade.

i) Jargon ii) Colloquialism

iii) Expression iv) Suggestion

b) By definition, a team leader should not be _____.

i) Patient ii) Confident

iii) Mentally strong iv) Meek

c) Critical thinking concerns _____.

i) determining the psychological basis of our beliefs

ii) determining the causes of our beliefs

iii) without reason thinking

iv) Assessing the practical impact of our beliefs

d) A group of people working to achieve common goal is known as _____.

i) Group ii) Club

iii) Team iv) Campaign

P.T.O.

e) _____ barriers is related to encoding function.

i) Physical ii) Semantic

iii) Psychological iv) Technical

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

a) Define communication

b) Define Critical Thinking

c) What is creative thinking

d) What is re-learning?

e) What is upward communication?

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

a) What is listening? Explain the types of listening.

b) What are e-mail etiquettes?

c) What is negotiation? Explain its styles?

d) What are problem solving skills?

e) Enlist barriers to communication.

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

a) Differentiate between verbal and non-verbal communication.

b) What are pre-requisites of Presentation?

c) What are the tips and techniques for Group-discussion?

d) What are barriers to Listening?

e) What is six-thinking hat style?

f) Explain sources of stress.

g) What are decision making techniques?

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

a) What are ways to cope with stress?

b) What are types of team?

c) Write a letter of complaint to the 'Swati Publication', letting them know about the damaged consignment of books. You are the Librarian of unique college of Business management.

d) What are elements of capacity building?

e) What are zones of learning?

f) What is Leadership? Explain its styles.

g) Write a notice for F.Y. B.C.A students imagine yourself as HOD, informing them about their 'Industrial visit' at Pune. Inform them about venue, time, date, fees accommodation.

Total No. of Questions : 4]

SEAT No. : ____

P5247

[Total No. of Pages : 3

[5826]-201

First Year B.C.A (Science)

BCA-121 : COMPUTER ORGANIZATION

(2019 Pattern) (Semester -II)

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

Instructions to the candidates:

1) ***Figure in the right indicates full marks.***
2) ***Draw diagram wherever necessary.***

Q1) Attempt the following. **[5]**

A) Choose the correct option

a) Which of the following is the example of weighted number system?

i) Gray ii) Hexadecimal

iii) ASCII iv) EBCDIC

b) The bubbled OR gate is equivalent to_____

i) NAND ii) AND

iii) NOR iv) OR

c) Which of the following combinational circuit use to perform arithmetic and logical operations?

i) Multiplexer ii) Encoder

iii) Adder iv) ALU

d) JK Flip Flop in toggle mode when_____

i) J=K=O ii) J=1, K=O

iii) J=O, K=1 iv) J=K=1

e) IC 7490 is a_____

i) Counter ii) Shift register

iii) Multiplexer iv) Adder

P.T.O.

B) Answer the following: **[5×1=5]**

a) Define positive logic.

b) Define multiplexer.

c) State different types of cache mapping process.

d) Give the function of bus interface unit.

e) What is address bus?

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

a) Perform the following conversion.

i) $(234)_{10}=(?)_{16}$

ii) $(142)_{10}=(?)_{2}$

iii) $(1011)_{2}=(?)_{Gray}$

b) Write a note on Karnaugh's map.

c) Build OR and AND gate using NOR gate.

d) Write a note on ALU.

e) Explain PIPO shift register with help of neat diagram.

f) With help of block diagram explain two level memory hierarchy.

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

a) With a neat block diagram explain the working. of CPV.

b) What is shift register? Explain SIPO shift register with neat diagram and functional table.

c) What is Encoder? With help of neat diagram explain working of decimal to BCD encoder.

d) What is subtractor? Explain working of 4-bit universal adder/subtractor with help of neat diagram.

e) Write a note on

i) ASCII code

ii) EBCDIC code.

f) What is Gray code? explain with example gray to binary code conversion.

g) What is pipelining? Explain in brief concept of pipeling.

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

a) What is need of interface unit? With a neat diagram explain the working of a typical I/O interface.

b) Explain the classification of memory.

c) Explain with timing diagram, action of 3 bit synchronous counter.

d) Draw the internal block diagram of IC 7490 and write a note on it.

e) Draw truth table for binary to gray conversion, using K-map obtain equation for each output variables.

f) What is combinational circuit? Draw a schematic diagram to compare 2 bits. Write the truth table for the same.

g) Draw the diode diagram of an OR gate and explain its working draw the logic symbol and give truth table.

Total No. of Questions : 4]

SEAT No. :

P5248

[Total No. of Pages : 3

[5826]-202

First Year 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 No.1 (A & B) is a compulsory questions.***
2) ***Figure to the right indicate full marks.***

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

a) A small subprogram which contains executable code is_____.

i) function ii) array

iii) pointer iv) macro

b) The only integer that can be assigned to a peinter variable is _____.

i) 1 ii) 2

iii) 0 iv) 3

c) Function call strcat (s2, s1) appends_____to_____.

i) s1, s2 ii) s2, s1

iii) both (i) and (ii) iv) None of above

d) Number of bytes in memory taken by the below structure is?

```
Struct test
{
    int k;
    char c;
};
```

i) Multiple of integer size ii) integer size + character size

iii) Depends on platform iv) Multiple of word size

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

i) Printf() ii) Scanf ()

iii) gets() iv) puts()

P.T.O.

B) Attempt the following. **[5×1=5]**

a) What is the use of ftell () function?
b) State the purpose of # error directive.
c) What is nested union?
d) Define structure.
e) What is Dereferencing operator?

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

a) List any three string handling function with their usage.
b) Explain nested structure with an example.
c) Compare Macro and Function.
d) Explain the purpose of Each of the following declaration.
   i) int * p [5];
   ii) int f1 (int * p [])
   iii) int * f2 (int * p [])
e) What is union? How to declare it? Explain with example.
f) Write the syntax and give the use of the following.
   i) fflush()
   ii) remove ()
   iii) fseek()

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

a) Write a 'C' program using structure to store information of players with the following attributes (name, no·of-innings, total-score, avg). Calculate the average score of each player and display information of all players in descending order of their average runs:
b) Write a C program that accepts 'n' words and display the longest word.
c) What is "Pointer to function"? Explain the concept with a program to find sum of two numbers.
d) Wrtie a C program for finding the largest of 2 numbers using macro.
e) Discuss file opening mode in details.
f) Explain Enumerated data type with example.
g) What is command line argument? Give advantages of command line argument.

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

a) Write difference between structure and union with example.
b) Write user define function to copy one string into another string and reverse the string with out using standard library functions.
c) Write a C program which declare a structure students (roll no, name m1, m2 m3 per). Accept details of 'n' students and find percentage of each student.

d) Write a program using pointer to array concept to add two 1D arrays and store their addition in third array.

e) List and explain standard library function for file handling.

f) Explain the following with example.

i) Structure within union.

ii) Union within structures.

g) Trace the output and justify.

i)
```
# include <stdio.h>
void main ()
{
    struct rectangle
    {
        int roll no;
        char name [10];
    }   R1, * P, R [5];
    printf C "The size of Rectangle is : %d%d%d\n", sizeof (R1),
    sizeof (P), sizeof (R) );
}
```

ii)
```
# include <stdio.h>
int main ()
{
    int a [10];
    printf ("% d", * a+1–* a+3);
    return 0;
}
```

Total No. of Questions : 4]

SEAT No. : ____

P5249

[Total No. of Pages : 3

[5826]-203

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

BCA - 123 : OPERATING SYSTEMS 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 diagrams wherever necessary.***

Q1) Attempt the following :

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

a) To run the script, we should make it executable first by using _____.

i) chmod + x

ii) chmod + r

iii) chmod + w

iv) chmod + rwx

b) Which of the following comes under secured Linux Based OS?

i) Ubuntu

ii) Fedora

iii) Kubuntu

iv) Tails

P.T.O.

c) For navigation purposes, the mode should be _____ mode.

i) command

ii) input

iii) insert

iv) ex

d) Command to create a file in Linux

i) cat

ii) echo

iii) touch

iv) All of the above

e) The 'logout' built in command is used to _____.

i) Shutdown the computer

ii) Logoff the computer

iii) Logout the current user

iv) To exit the current shell

B) Answer the following : **[5×1=5]**

a) What is file structure?

b) Define parent and child processes.

c) What is the difference between dot (.) and double dot (..)?

d) What is the use of grep command?

e) What is root?

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

a) Explain different types of test used in shell script with an example.

b) What is DNS? Explain need of DNS in brief.

c) What is vi Editor? Explain its different modes.

d) Explain Linux directory commands.

e) Write short note on kill command.

f) Write short note on user interface.

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

a) Explain PS command with different options.

b) Explain features of Linux.

c) Explain the following commands with example :

i) pwd

ii) mkdir

iii) cd

iv) rmdir

d) Explain shell interpretive cycle.

e) Write a short note on FTP protocol.

f) Write the syntax of if-then-else-if statement with an example.

g) Explain simple operating system structure.

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

a) Explain Arithmetic and Relational operators.

b) Explain TYPE command with different options.

c) Explain Relative and Absolute path names.

d) Write a shell program to exchange the values of two variables.

e) Explain how passwords are stored in Linux.

f) What is pipe? Explain with example.

g) Write a short note on manual pages.

Total No. of Questions : 4]

SEAT No. :

P5250

[Total No. of Pages : 3

[5826] - 204
F.Y.B.C.A. - (SCIENCE)
BCA124 : 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]**

i) A function that has no partial functional dependencies is in _____ form.

a) INF b) 2NF

c) BCNF d) 4NF

ii) Which operator performs pattern matching?

a) Between b) Exists

c) Like d) None of the mentioned

iii) In E-R diagram derived attributes represented by

a) Diamonds b) Ellipses

c) Dashed ellipses d) Double ellipses

iv) Which level of abstraction describes what data are stored in the database.

a) Physical level b) View level

c) Abstraction level d) Logical level

v) Hierarchical model is also called

a) Tree structure b) Plex structure

c) Normalize structure d) Table structure

P.T.O.

b) Answer the following. **[5×1=5]**

i) Enlist different operations performed on file

ii) What is data independence?

iii) What is entity?

iv) Define Normalization

v) What is first normal form (1NF)

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

a) Car insurance company has a set of customers, each of whom owns one or more cars. Each car is associated with zero to any number of recorded accidents: Draw Entity Relationship diagram.

b) Define :

i) Composite key

ii) Primary key

iii) Candidate key

c) Explain the generalization

d) Short note on tuple in a relational database.

e) Explain heap file organization

f) What do you mean by simple and composite attribute.

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

a) 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 and super keys for R.

b) Write a short note on Hierarchical data model

c) What is specialization? Explain with the example.

d) Write a difference between inner joins and outer joins.

e) Write a note on aggregate functions used in SQL with examples

f) Write a syntax of Select, update and insert commands in sql with examples.

g) Explain the lossless join in relational database design.

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

a) Consider relations:

R (A, B, C, D, G, H, I) and set of FDs defined on F as

$$\{A \rightarrow B, A \rightarrow C, CG \rightarrow H, CG \rightarrow I, B \rightarrow H\}$$

Compute closure of f, i.e. F+

b) Give difference between indexed and hashed file organization.

c) Explain with example how nested subquery can be written for set comparision.

d) What are mapping cardinalities? Explain any two in detail.

e) Write note on structure of Relational Databases.

f) Consider the following relations.

Machine (m-no,m-name, m-type, m-cost)

Part (p-no, p-name, description)

Machine and part are related with 1 : M relationship.

Create a relational database in 3NF and solve the following queries.

i) Increase the cost of machine by 35%.

ii) List all machine whose cost >25000.

iii) Display machine name and cost having parts gear box and stearing.

g) With an example, explain the concept of view in SQL.

Total No. of Questions : 4]

SEAT No. :

P5251

[Total No. of Pages : 3

[5826]-301

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

BCA - 231 : DATA STRUCTURES

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

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

Instructions to the candidates:

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

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

a) A queue follows_____ principle.

i) LIFO ii) FIFO

iii) FILO iv) LFIO

b) _____is a postfix expression.

i) a+b–c ii) +ab

iii) abc∗+de–+ iv) a∗b(c+d)

c) In worst case, the number of comparisions needed to search a singly linked list of length n for given element is _____

i) $\log_2 n$ ii) n/2

iii) $\log_2 n–1$ iv) n

d) The maximum number of children that binary tree node can have____

i) 0 ii) 1

iii) 2 iv) 3

e) _____is the number of edges present in a complete graph having n vertices.

i) (n∗(n+1))/2 ii) (n∗(n–1))/2

iii) n iv) n/2

P.T.O.

B) Answer in one or two sentences. **[1×5=5]**

a) Define abstract type (ADT).

b) List types of linked list.

c) Which data structure is used in Depth First Search?

d) Give two applications of queue.

e) Define strictly binary tree.

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

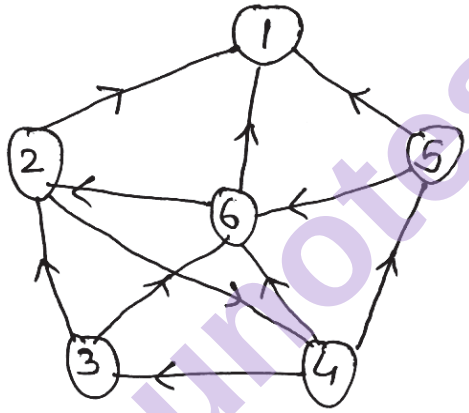
a) Discuss different asymptotic notations.

b) Write C function to delete last node from singly linked list.

c) What is sparse matrix and how it is represented?

d) Differentiate between stack and queue.

e) Define Graph. Calculate in degree and out-degree for the following graph.



f) Write short note on priority queue.

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

a) Write an algorithm for insertion sort.

b) Define an array. Discuss memory represention of an array.

c) Write C function to reverse singly linked list.

d) What is queue? Discuss different queue operations.

e) Discuss different graph representations.

f) Convert the following expression into postfix using stack.

((A+B)∗(C–D))/E

g) What is binary search tree? Show stepwise creation of binary search tree for the data

10, 20, 15, 5, 1, 7, 13

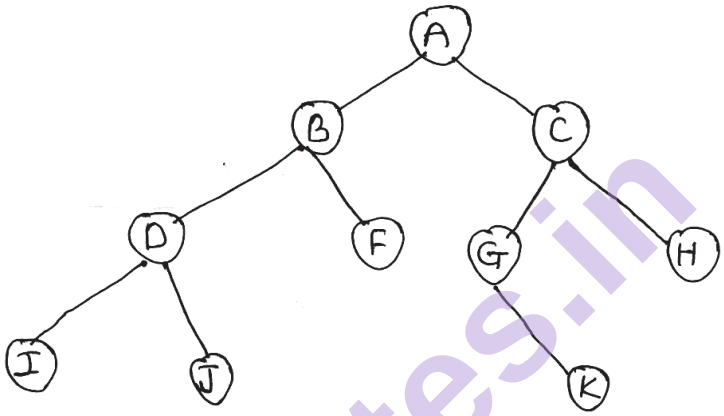
Q4) Answer the following (Any five): **[5×5=25]**

a) What is topological sort? Explain how to find topological ordering for graph using suitable example.

b) What is circular queue? Discuss operations on circular queue.

c) Write C function to search element using binary search method.

d) Define binary tree. Write C structure for binary tree. Find in-order, pre-order, post-order for following tree.



e) Write an algorithm for evaluating postfix expression and implement it on following expression

AB+CD−∗ [A=5, B=4, C=6, D=2]

f) Show pass wise sorting of data using bubble sort and discuss its time complexity.

25, 37, 12, 48, 57, 33

g) Write C function to insert and delete node in doubly linked list.

❖ ❖ ❖

Total No. of Questions : 04]

SEAT No. : ____

P5252

[Total No. of Pages :4

[5826]-302
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) ***Figure to the right indicate full marks.***
2) ***All questions are compulsory.***
3) ***Draw neat sketches wherever necessary to illustrate the answer***
4) ***Each question carries equal marks.***

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

a) Collection of operations that form a single logical unit of work is called_____.

i) View ii) Network

iii) Structure iv) Transaction

b) If a transaction may obtain locks but moy not release any locks then it is in____phase.

i) Growing ii) Shrinking

iii) Deadlock iv) Starved

c) A _____is a special kind of a store procedure that executes in response to certain action on table like insertion, deletion or updating of data.

i) Procedure ii) Trigger

iii) Function iv) View

B) Answer in one or two sentences. **[5×1=5]**

a) Define view

b) List the properties of transaction

c) What is cascading rollback of transaction?

d) What is use of GRANT command?

e) List different types of database sysem architecture

P.T.O.

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

a) What is exception? How to handle exception in Postgressql?

b) Explain wound - wait beadlock prevention algorithm.

c) Explain the states of transaction using state diagram.

d) What is shadow paging?

e) What is simple and star security property?

f) Write short note on parallel systems.

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

a) What is cursor? Explain types of cursor with example.

b) What is Serializability? Explain view Serializability with example

c) What is checkpoint? consider the following log entries at the time of system crash.

[start - transaction, T_1]

[write - item, T_1, A, 10]

[commit T_1]

[start - transaction, T_3]

[write -item T_3, B, 15]

[checkpoint]

[commit T_3]

[start - transaction T_2]

[write -item T_2, B, 20]

[start - transaction, T_4]

[write - item T_4, D, 25]

[write - item T_2, C, 30] ← System crash

If immediate update technique with checkpoint is used, what will be recovery procedure?

d) Explain statistical database security with suitable example.

e) Discuss the benefits of client server system.

f) What is need of concurrency control? Explain two phase locking protocol.

g) Consider student - teacher database

Student (Sno integer, s-name char(30), S-class char (10) S-addr char (50))

Teacher (tno integer, t-name char(20), qualification char (10) experience integer)

The relationship student - teacher is many-many with descriptive attribute subject name and marks.

i) Create a view containing details of all the teachers teaching the subject Mathematics.

ii) Create a view to list the details of all the students who are taught by a teacher having experience of more than 3 years.

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

a) What is database security? Discuss different encryption techniques for database security.

b) What is log based recovery? Explain deferred modification technique and immediate modification for log based recovery.

c) Consider the following list of events in an interleaved execution of set of transaction T_1, T_2, T_3 and T_4 assuming 2PL Is there a beadlock? If yes, which transactions are involved in beadlock?

Time	Transaction	Code
t_1	T_1	Lock (A, X)
t_2	T_2	Lock (A, S)
t_3	T_3	Lock (A, S)
t_4	T_4	Lock (B, S)
t_5	T_1	Lock (B, X)
t_6	T_2	Lock (C, X)
t_7	T_3	Lock (D, S)
t_8	T_4	Lock (D, X)

b) Explain conflict serializability. Check whether given schedule S is conflict serializable or not. If yes, then determine all possible serialized schedules.

T_1	T_2	T_3	T_4
			R(A)
	R(A)		
		R(A)	
W(B)			
	W(A)		
		R(B)	
	W(B)		

e) Explain timestamp based protocol for concurrency control.

f) Explain classification of client server architecture.

g) Consider student - teacher database

student (Sno integer, s-name char (30), S-Class (10), S-addr char (50)).

Teacher (tno integer, t-name char (20), qualification char (15), experience integer)

The relationship student - teacher is many - many with descriptive attribute as subject name and marks.

Write a function to accept name of subject and count the number of teachers who teach that subject.

Total No. of Questions : 4]

SEAT No. :

P5253

[Total No. of Pages : 3

[5826] - 303
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 indicate full marks.***
3) ***Draw neat sketches whenever necessary to illustrate the answer.***
4) ***Each question carries equal marks.***

Q1) Answer the following.

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

i) Header size of UDP is _____.

a) 8 bytes b) 8 bits

c) 16 bytes d) 124 bytes

ii) CIDR stands for _____.

a) Classful internet domain routing

b) Classless internet dynamic routing

c) Classless inter domain routing

d)Classful inter dynamic routing

iii) A MAC address is of _____ bits.

a) 48 b) 32

c) 16 d) 64

iv) When a data packet is transmitted to a subset of the network, it is _____.

a) Broadcasting b) Multicasting

c) Subcasting d) Unicasting

v) Which of the following method divides channel into separate bands?

a) TDMA b) FDMA

c) CDMA d) WDMA

P.T.O.

B) Answer the following. **[5×1=5]**

i) What is unit of SNR?

ii) List the layers of TCP/IP.

iii) What is meant by internetwork?

iv) Write address mask for 124.

v) What are port number ranges for well-known ports?

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

a) What are the different types of services provided by physical layer?

b) Explain HDLC frame format.

c) What is mean by fragmentation? Which fields in datagram header related with fragmentation?

d) Write note on NAT.

e) Explain transmission modes.

f) Explain advantage and disadvantage of OSI - ISO model.

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

a) Explain TCP services.

b) Describe IPv6 packet format.

c) Draw graph for manchester and differential manchester for following data.

i) 00000000

ii) 01011010

iii) 10101010

iv) 11111111

d) Explain difference between LAN, MAN, WAN.

e) Explain different techniques used by data link layer for framing.

f) State difference between IPv4 and IPv6.

g) Explain in brief function of TCP/IP model.

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

a) Define topology. Explain any two with its advantage and disadvantage.

b) Differentiate between TCP/IP and OSI - ISO model.

c) Which are the different criteria used to measure performance of network? Explain.

d) Write a note on CSMA/CA.

e) Identify address classes for following IP address with reason.

i) 192.168.10.5

ii) 71.224.183.10

iii) 142.25.1.100

iv) 10010111 11001101 10101010 11010111

v) 00111111 11010110 10110111 10101111

f) Explain HTTP request and response message with diagram.

g) Differentiate between TCP and UDP.

Total No. of Questions : 4]

SEAT No. : ____

P5254

[Total No. of Pages : 4

[5826]-401
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.***

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

i) _____ are basic run time entities.

a) Data b) Classes
c) Objects d) None

ii) The Dynamic Memory allocation can be done through_____ operator.

a) new b) delete
c) pointer d) break

iii) Constructor are used to _____ the object.

a) Increment b) Initialize
c) Destroy d) Decrement

iv) An exception is _____ error.

a) syntax b) logical
c) runtime d) physical

v) When the object of derived class is created then the order of constructor execution is

a) base to derived b) derived to base
c) intermediate to base d) bottom to top

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

i) List different types of polymorphism.
ii) What is the purpose of scope resolution operator.
iii) Enlist any two fill operations.
iv) Write syntax of reference variable.
v) List any two operator which should be overloaded as a member function.

P.T.O.

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

a) What is Manipulator? Enlist them with example.

b) Write advantage and Disadvantage of Inline function.

c) How to handle an exception in C++.

d) Explain difference of constructor and destructor.

e) Explain the usage of 'this' pointer with example.

f) Read the code carefully and answer the question.

```
Class A
{     int a,b,
      public :
      A ( )
{        a = 0;
         b = 0;
      }
A (int x , int y)
{     a = x;
      b = y;
}
Void display ( )
{
  cout <<a<<b<<end l,
}
};
main ( )
{
      A a;
      ---------- statement 1;
      ---------- statement 2;
}
```

i) How many member functions are defined in the above code.

ii) How will you write statement 1 to invoke parametrized constructor.

iii) How will you write statement 2 to invoke display function.

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

a) Write a C++ program to count number of vowels in a text file.

b) Write a program to find sum of numbers between 1 to n using constructor where value of n will be passed to the constructor.

c) What is copy constructor? Explain with the help of example.

d) Explain function overloading with example.

e) What is class? Explain access specifiers use in it with example.

f) What is friend function? Explain with properties and example.

g) What is pure virtual function? Explain with suitable example.

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

a) Write C++ program for how the unary minus operator is overloaded.

b) Explain hybrid Inheritanec with example.

c) Explain in short

i) Object and classes

ii) Data hiding

iii) Data Abstraction and Encapsulation

d) Differentiate between class and structure.

e) Define operator overloading. Give its syntax and write the rules for operator overloading.

f) Write a C++ program to accept student information as sno, sname, sub1 and sub2 for five students using array of objects calculate total marks and display students with maximum percentage

g) Trace the output and justify.

i)
```
#include <iostream>
 int & fun ( )
 {
      static int a = 10;
      return a;
 }
 int main ( )
{
 int & y = fun ( );
  y = y + 30;
  cout << fun ( );
  return 0;
}
```

ii)

```
# include <iostream>
using namespace std;
class p
{
   Public :
            void print ( )
            {
               cout <<"Inside p::";}
 };
  class Q : public p
 {
  public :
        Void print ( )
 {
  Cout<< "Inside Q";}
 };
 class R : public Q
 {          };
  int main (void)
 {
     Rr;
     r. print ( );
     return 0;
 }
```


Total No. of Questions : 4]

SEAT No. :

P5255

[Total No. of Pages : 3

[5826]-402

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

BCA - 242 : WEB TECHNOLOGY

(2019 Pattern) (Semester - IV)

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

Instruction to the candidates:

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

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

i) PHP uses reference counting and _____ to manage memory.

a) Variable Management
b) Copy-On-Write
c) Memory Management
d) None of these

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

a) $ Object → Method Name ( );
b) Object → Method Name ( );
c) Object → Method Name;
d) $ Object **: :** Method Name;

iii) What is use of $ isset ( ) function?

a) It is used to check whether variable is set or not
b) It is used to set variable
c) It is used to set new value
d) All of the above

iv) The Fetch Row ( ) method returns _____ if there is no more data.

a) DB _ ERROR
b) NULL
c) DB _ FAIL
d) None of these

P.T.O.

v) Which of the following is XML parser?

a) SAX Parser b) DOM Parser

c) CDATA Parser d) a) and b)

B. Answer the following (Any Five) : [5 × 1 = 5]

i) Write syntax for creating XML Http Request object.

ii) Define the term type juggling.

iii) What will be the output of following code

```
< ? php
$ alphabet = array ("A", "B", "C");
echo (next ($ alphabet));
? >
```

iv) Which function is used to check if class is exists or not?

v) What is DOM Document ( )?

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

a) Write a PHP program to demonstrate the concept of function parameters for factorial of a number.

b) Explain with suitable example:

range ( ), array - slice ( ), array - reverse ( ).

c) What is inheritance? Give it's syntax.

d) Describe following header's :

i) Content - type

ii) Redirection

iii) Expiration

e) Explain with example about pg_fetch_result ( ) function.

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

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

a) Explain web server in detail with it's types.

b) Explain different function's with syntax to examine characteristics of an object and a class

c) What are sequences? How are they useful?

d) Write a PHP code to generate XML ?

e) What is sticky form? Explain with suitable example.

f) Write a PHP script to destroy cookie which is created.

g) Consider a table book (book_id, isbn_no, author, publ, price).

Write a PHP script to display the top 3 costliest book written by user specified author name. (Use PEAR DB method.)

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

a) How GET and POST method's are used in AJAX? Explain in detail with Syntax & Example.

b) Write the PHP Script to display the details of first 3 students of a user specified class according to their roll numbers.

Consider the table stud (roll_no, name, class)

c) What are the steps to open and interact with a database in PHP?

d) 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.

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

f) Compare between for and foreach loop.

g) Write PHP script to create a class worker that has data members as Worker_Name, No_of_day's_Worked, Pay_Rate. Define parameterized constructor. Write necessary member function to calculate and display the salary of worker.

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Total No. of Questions : 4]

SEAT No. :

P5256

[Total No. of Pages : 3

[5826]-403

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

BCA-243 : SOFTWARE ENGINEERING

(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 wherever necessary to illustrate answer.***
4) ***Each question carries equal marks.***

Q1) Attempt the following :

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

i) A system is collection of components, that work together to achieve a _____.

a) Speed b) Collaboration

c) Common goal d) Limit

ii) Which of the following is not feature of legacy software?

a) Extensibility b) Flexibility

c) Complex code d) Poor documentation

iii) Which phase of SDLC requires more time to accomplish.

a) Planning b) Design

c) Analysis d) Implementation

iv) _____ is the final work product produced by the requirements engineer.

a) Negotiation b) Specification

c) Elicitation d) Inception

P.T.O.

v) Which is not activity of serum method?

a) Sprint b) Product master

c) User story d) Story points

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

i) What is Agility?

ii) What is pseudo code?

iii) Define Economical Feasibility.

iv) List two advantages of waterfall model.

v) What is a software?

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

a) Explain any three human factors used for Agile Process.

b) Explain the term : Data capture.

c) Define questionnaire. Give its types.

d) Explain any three activities involved in 'System Design' phase of SDLC model.

e) Short note : McCall's quality factors.

f) Explain any three characteristics of a system.

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

a) Define system and its elements.

b) Explain general principles of software engineering.

c) Differentiate between spiral model and prototype model.

d) Explain fact finding technique in detail.

e) Write any two advantages and disadvantages of DFD.

f) Write a short note on Extreme programming values.

g) What is feasibility study? Explain any one type in detail.

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

a) Consider a generalized student Information system. When a student want to take his / her admission, personal information is recorded and then according to the previously passed exam a class is allotted. Layout output design.

b) A Co-operative bank XYZ will grant loans under the following conditions :

i) If a customer has an account with the bank and has no loan outstanding, loan will be granted.

ii) If a customer has an account with the bank but some amount outstanding from previous loans, then loan will be granted if special management approval is obtained.

iii) Reject loan applications in all other cases.

Draw decision tree for the above case study.

c) Draw context level and 1st level DFD for 'Airline Reservation System'.

d) Explain any five principles of Agile process.

e) Compare structured interview with unstructured interview.

f) Explain the generic process model.

g) Explain any 5 components of a system.

Total No. of Questions : 4]

SEAT No. :

P5257

[Total No. of Pages : 2

[5826]-501

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 :

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

i) The Java _____ specifications defines an application programming interface for communication between the web server and the application program.

a) Servlet b) Server

c) Program d) Randomize

ii) The JDBC - ODBC bridge is _____.

a) Three tiered b) Multithreaded

c) Any platform d) Interim

iii) A _____ is a base class for all swing UI components.

a) J Menu b) J Component

c) J Panel d) J File

iv) _____ class write primitive Java data types to an output stream in a portable way.

a) Data Input Stream b) File Input Stream

c) Final d) Data Output Stream

v) A _____ is a collection of classes and interfaces.

a) Object b) Package

c) Inheritance d) Method

P.T.O.

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

i) Why Java is platform - neutral language?
ii) What is final class?
iii) Name the classes which implement the list interface.
iv) What is a listener?
v) Write any two implicit object in JSP?

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

a) Explain types of JDBC?
b) Differentiate between session & cookie.
c) Explain at least any five Features of Java.
d) What is Exception? Explain try, catch & finally block.
e) Explain in brief the fundamental idea behind MVC architecture?
f) Write a short note on built in package and user define package.

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

a) Write a java program to display last access and current date using session.
b) Explain life cycle of a servlet.
c) Explain types of Result Sets.
d) Explain features of swing any 5.
e) Explain any four methods of string Buffer class with proper syntax.
f) How to intending Interface? Explain with example.
g) What is a constructors? How many types of constructors are present in Java?

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

a) Write a Java program that accept array elements print the average of all elements.
b) Explain any five classes of collection framework?
c) What is event? How to handle events in AWT? Explain with example.
d) Explain various type of JDBC. Discuss advantages and disadvantages of each.
e) What is servlet? Explain the types of servlet in details.
f) Create a student table with fields (roll-no, name, percentage). Write JDBC program to insert, delete & display details.
g) Write a Java program that accept number from user and display factorial of It (use swing & Action Listener)

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Total No. of Questions : 4]

SEAT No. :

P5258

[Total No. of Pages : 3

[5826]-502

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 neat diagrams wherever necessary.***

Q1) **Attempt the following :**

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

i) _____ is the output of KDD

a) Query b) Data

c) Useful information d) Information

ii) _____ is a good alternative to the star schema.

a) Snowflake Schema b) Star-snowflake schema

c) Fact constellation d) Star-schema

iii) Support vector machine (SVM) can be used for _____.

a) Classification only

b) Regression only

c) Classification & Regression both

d) Clustering

iv) Which of the following clustering requires merging approach?

a) Partitional b) Hierarchical

c) Naive Bayes d) Divisive

v) Which of the following is structured data?

a) XML data b) Relational data

c) Word file d) pdf data

P.T.O.

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

i) List the different data visualization techniques.

ii) What are the two types of Data Mining tasks?

iii) Define Machine Learning.

iv) What is decision tree?

v) What do you understand by outliers. Define.

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

a) Explain the components of data science in brief.

b) Discuss the benefits of Data Visualization.

c) Differenciate between query processing and Data mining.

d) Write in brief about snowflake schema.

e) Write a short note on Bayesian Network.

f) Define clustering. List types of clustering.

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

a) Explain different types of data -

b) Discuss the advantages and disadvantages of EDA.

c) Discuss applications of data mining.

d) Write a note on pattern matching.

e) What do you understand by regression? What are its types?

f) Write a note on Market - basket analysis.

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

a) Describe the challenges of data science technology.

b) What is Data descretization? Discuss.

c) Differenciate between EDA and CDA.

d) Write a note on perceptron.

e) Consider database in following table where supmin = 2. Apply Apriori algorithm and find frequent itemset.

Tid	Items
10	A, B, E
20	B, E
30	B, C
40	A, B, D
50	A, C
60	B, C
70	A, C
80	A, B, C, E
90	A, B, C

f) Write a note on classification.

g) Discuss different OLAP operations.

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Total No. of Questions : 4]

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[5826]-503

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

BCA-353 : PRINCIPLES OF OPERATING SYSTEMS

(2019 Pattern) (Semester - V)

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

Instructions to the candidates:

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

Q1) Attempt the following :

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

i) In Unix _____ system call creates the new process.

a) new b) create

c) fork d) update

ii) _____ of the following is a synchronization tool.

a) thread b) socket

c) semaphore d) program

iii) _____ of the following is not necessary condition in deadlock.

a) Hold and wait b) Circular wait

c) mutual exclusion d) Safe state

iv) File type can be represented by _____.

a) file name b) file extension

c) file identifier d) file program

v) The set of tracks that are at one arm position make up a _____.

a) magnetic disks b) electrical disks

c) assemblies d) cylinders

P.T.O.

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

i) What is process scheduling?

ii) What is critical section problem?

iii) Define deadlock.

iv) Define demand paging.

v) Enlist attributes of files.

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

a) Explain scheduling queue in details.

b) Describe Peterson's solution to solve critical section problem.

c) Explain necessary conditions for a deadlock.

d) Explain many-to-one model of multithreading.

e) What are the drawbacks of critical section problem.

f) Describe paging diagrammatically.

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

a) Consider snapshot of the system :

Job	Arrival time	Burst time
1	0	8
2	1	4
3	2	9
4	3	5

Compute average turnaround time using preemptive SJF and non-preemptive SJF.

b) Define the term semaphore. Enlist its types in details.

c) Explain Bankers algorithm with example.

d) What is thrashing? Explain causes of thrashing.

e) Explain file operations in details.

f) Consider a disk queue with requests for I/O to blocks on cylinders 82, 170, 43, 140, 24, 16, 190. The head is initially at cylinder number 50. Calculate total head movement using :

i) FCFS ii) SSTF

g) Discuss the requirements of critical problem solution.

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

a) What is meant by CPU scheduler? Explain the criteria of CPU scheduling.

b) Explain the role of wait ( ) and signal ( ) operations used in semaphores.

c) Explain resource allocation graph with the help of example.

d) Consider the following page reference string. 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 3. How many page Faults will occurs for following page replacement algorithm? Assuming 3 frames.

i) FIFO

ii) LRU

e) Describe single level directory diagrammatically.

f) Consider the following snapshot

Process	Burst time	Arrival time
P_1	5	1
P_2	3	0
P_3	2	2
P_4	4	3
P_5	2	13

Compute average turnaround time and average waiting time with RR algorithm with time slice = 2.

g) What is page fault? Explain the different steps in handling a page fault.

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Total No. of Questions : 5]

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[5826]-504

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

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

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

i) Representation Adequacy ii) Inferential Adequency
iii) Inferential efficiency vi) Acquisitional Efficiency

b) Which of the following is a type of unsupervised learning?

i) Classification ii) Regression
iii) Decision Tree vi) Association Rule

c) _____ search is complete and optimal when h(n) is consistent.

i) Depth-first search
ii) Best-first search
iii) Both Best - first and Dept first search
vi) A* search

d) _____ is not an application of AI?

i) Intelligent Robot ii) Speech Recognition
iii) Handwriting Recognition vi) Content mining

e) _____ is not a type of data.

i) Categorical ii) Cardinal
iii) Nominal vi) Ordinal

f) _____ is an extension of the semantic network?

i) Expert systems ii) Rule Based Expert Systems
iii) Partitioned Networks vi) Decision Tree Based networks

P.T.O.

g) _____ search method takes less memory.

i) Depth-first search ii) Breadth - first search

iii) Linear search vi) Optimal search

h) What is the other name of informed search strategy?

i) Simple search ii) Heuristic search

iii) Online search vi) Blind search

i) _____ is used to build complex sentences in knowledge representation?

i) Symbols ii) Connectives

iii) Quantifiers vi) Characters

j) "There exists two ways to infer using semantic networks in which knowledge is represented as frames"

i) Network search ii) Inheritance search

iii) Multi heritance search vi) Intersection search

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

a) What is Uninformed search?

b) Define the following.

i) First-order logic

ii) chatbot

c) List the steps for Resolution.

d) Write advantages of DFS.

e) What is weak slot?

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

a) Give state space representation for "Monkey Banana Problem"

b) Write down the algorithm of Generate and test.

c) Translate the following statements into First Order Predicate Logic (FOPL).

i) Jija likes all kind of food.

ii) Grapes and vegetables are food.

iii) Anything anyone eats and not killed is food.

iv) Neha eats Almonds and still alive.

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

a) Explain types of knowledge.

b) Explain A* Algorithm with example.

c) Write a script for Robbing a bank.

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

a) What is machine learning? Explain its type in brief.

b) Consider the following Axioms :

i) Any one whom Mary loves is a football star.

ii) Any student who does not pass does not play.

iii) John is a student.

iv) Any student who does not study does not pass.

v) Any one who does not play is not a football star.

(Conclusion) If John does not study, then mary does not love john.

Represent these axioms in predicate calculus; skolemize as necessary and convert each formula to clause form. Prove the unsatisfiability of the set of clauses by resolution.

Total No. of Questions : 5]

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T.Y. B.CA. (Science)

BCA - 355 : SEC II - CLOUD COMPUTING

(2019 Pattern) (Semester - V)

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

Instructions to the candidates:

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

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

a) What is hybrid cloud?

b) Which cloud platform is provided by Amazon?

c) Write the full form of IaaS.

d) Who is responsible to run virtual Machines?

e) What is load balancing?

f) What is EBS?

g) Define the term AWS.

h) Write the full form of GCP.

i) Define Multi-cloud.

j) Define the term CSA.

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

a) Write note on Azure AI & ML.

b) What are the benefits of omni-cloud?

c) Explain the term API server in Kubernetes Master.

d) Write a note on Open Nebula.

e) Explain the term SaaS cloud security architecture.

P.T.O.

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

a) What are the different types of virtualization?

b) Which services are provided by Force.com?

c) What are the advantages & disadvantages of IaaS Services?

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

a) List & define services offered by Microsoft Azure.

b) Explain the features of grid computing.

c) What is security governance? Explain its key objective to pursue governance model for security in cloud?

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

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

b) Explain the types of Blockchain Technology.

Total No. of Questions : 4]

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[5826]-601

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

DSE-IV : ANDROID PROGRAMMING

(2019 Pattern) (Semester -VI) (BCA361)

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:

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

i) The android_____ provides you the API libraries and developer tools necessary to build, test and debug apps for android

a) JDK b) SDK

c) ADT d) AVD

ii) An_____ object is a bundle of information which is used by the component that receives the intent as well as information.

a) Intent b) Fragment

c) Activity d) Request

iii) The table layout groups views into_____ and_____

a) rows b) Columns

c) Layouts d) Both (a) and (b)

iv) The _____ is a view that shows items (such as images) in center locked, horizontal scrolling list.

a) Gallery b) Grid view

c) Image view d) Image switcher

v) _____ menu displays information related to current activity.

a) Contexts b) Options

c) Popups d) Menus

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

i) What is meant by google map?

ii) define cursor in SQlite?

iii) What is context menu?

iv) Example of text view?

v) What is AVD

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

a) Write any five features of android.

b) What is scroll view? Explain with example.

c) With the help of example explain spinner.

d) Explain the term displaying google map in detail.

e) Explain life cycle of fragment?

f) What is video view? Explain with example.

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

a) What is Toggle button? How to create it? Explain with example.

b) Explain life cycle of activity.

c) Create a simple application which read a number from the user and display factorial value in another activity.

d) How to create database in SQlite? Explain with example.

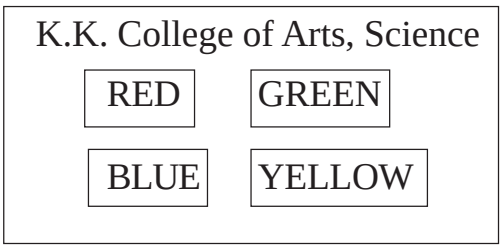
e) How to send message using intext?

f) Explain list view using adapter with the help of example.

g) Explain any four layouts with example.

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

a) Create an android application that will change color of the college name on click of button & change font size and color using xml.



b) How to do navigation to a specific location.

c) Differentiate between:

i) Location based services & Google map

ii) Geocoding & reverse geocoding.

d) Explain Architecture of android.

e) Create Android Application for performing the following operation on the table customer (id, name, address, phone)

(Use SQL database)

i) Insert new customer

ii) Display details on toast.

f) Explain the following with example.

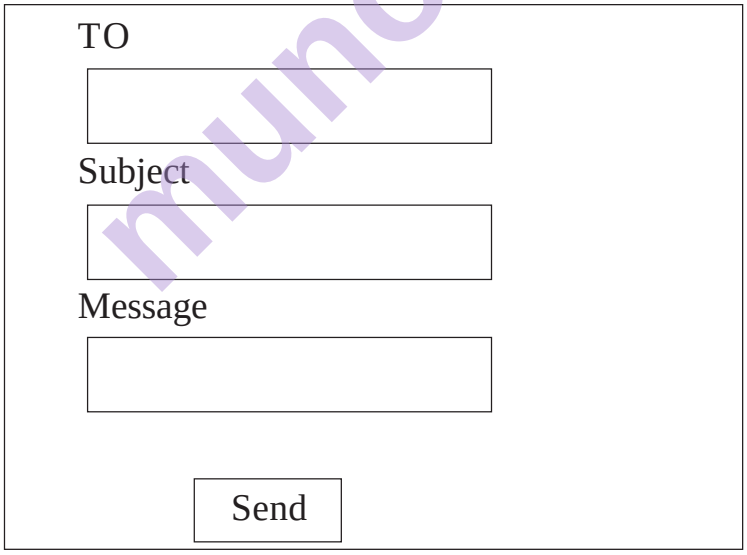
i) Progress Bar

ii) Toast

iii) Radio button

iv) Check box

g) Write an application to send Email (using to, subject & message) with following view.



Total No. of Questions : 4]

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

DSE-VI, BCA - 362 : PROGRAMMING IN GO

(2019 Pattern) (Semester - VI)

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. **[5×1=5]**

A) Choose the correct option.

a) In Golang, which of the following transfers control to the labelled statement?

i) enum ii) goto
iii) jump iv) return

b) func is a _____ in Go language.

i) identifier ii) keyword
iii) constant iv) parameter

c) _____indexing cannot be used in an array.

i) Positive ii) Up
iii) Down iv) Negative

d) _____can be defined inline without the need for a name.

i) Array ii) Package
iii) Class iv) Anonymous function

e) A_____is a communication mechanism that allows Goroutines to exchange data.

i) Channel ii) Pipe
iii) Subroutine iv) None of these

B) Attempt the following. **[5×1=5]**

a) What are nested structures?
b) What is a method in Go programming?
c) What is the use of wait Groups?
d) Define a package.
e) What are blank imports?

P.T.O.

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

a) Give any three advantages of Go programming language.

b) Briefly explain the concept of function returning multiple values.

c) Which are the different types of arrays in Go language?

d) Describe an Interface in Go?

e) Compare concurrency and parallelism.

f) Briefly explain how package names are imported.

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

a) Write a note on the use of 'defer' statement with an example program.

b) What are filtering array values? Which are its three cases?

c) What is a Method and Function? Give any three points of difference.

d) Write a note on Regular expressions and pattern matching.

e) Discuss the concept of type assertions.

f) Write a program in Go language to swap a number without using temporary variable.

g) Write a program in Go language to accpet 'n' records of employee information (eno, ename, salary) and display record of employees having maximum salary.

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

a) Write a note on Goroutine functions and lambdas.

b) Explain buffered and unbuffered channels.

c) Explain Timer with an example.

d) Write a note on Embedded Interfaces.

e) Write a note on Table Tests and Random Tests.

f) Write a program in Go language to sort array elements in ascending order.

g) Write a program in Go language to create a channel and close a channel.

Total No. of Questions : 4]

SEAT No. :

P5264

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[5826]-603

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

BCA, DSE - VI - 363 : SOFTWARE PROJECT MANAGEMENT

(2019 Pattern) (Semester - VI)

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

Instructions to the candidates:

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

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

A) Choose correct option

a) Which of the following is not a project management goal?

i) keeping overall cost within budget.

ii) Delivering the software to the customer at agreed time.

iii) Maintaining a happy and well-functioning development team.

iv) Avoiding customer complaints.

b) Activity in the network diagram is represented by

i) Rectangles

ii) Arrows

iii) Squares

iv) Circles

P.T.O.

c) CPM stands for _____.

i) Control path method

ii) Critical path method

iii) Critical path management

iv) Control path management

d) Configuration management is best described as -

i) Control in the implementation of changes to project schedules.

ii) An organization to review proposed changes to the project deliverables.

iii) Quality control of project deliverables and documentation.

iv) Creation, maintainance and controlled change of the project deliverables.

e) Agile _____ is based on simple, easily determined measures that are iterated and refined throughout the software development life cycle.

i) Management

ii) tracking

iii) estimation

iv) scheduling

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

a) Define activity scheduling.

b) List the attributes of the project.

c) What are the types of Network diagram?

d) What is cost estimation?

e) What is staffing in project management?

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

a) Discuss the organizational behaviour with example.

b) Differentiate between predictive process and empirical process.

c) Explain cost control in project management.

d) Describe the importance of activity scheduling.

e) What is PERT? Explain with example.

f) Write a note on PMBOK.

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

a) Discuss the project life cycle.

b) Define the terms

i) Critical path

ii) Start to finish Dependency.

c) Write a note on ADM network diagram.

d) What do you understand by change control. How to use it?

e) Discuss the roles and responsibilities of an Agile team.

f) What is stress, health and safety in software project management?

g) Write a note on synchronous communication.

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

a) Write a note on portfolio management.

b) List and explain different activity relationships in detail.

c) What is Gantt chart? Explain with example.

d) Discuss the types of contracts.

e) Write a not on Agile and non-agile project.

f) Write in detail about causes of stress in project management.

g) Discuss backward pass technique in detail.

Total No. of Questions : 5]

SEAT No. :

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[5826] - 604
T.Y.B.C.A. (Science)
BCA364 : SEC-III : MANAGEMENT INFORMATION SYSTEMS
(2019 Pattern) (Semester - VI)

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

Instructions to the candidates:

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

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

a) Information systems that monitor the elementary activities and transactions of the organizations are _____.

i) management level system ii) operational level system

iii) knowledge level system iv) strategic level system

b) _____ is a combination of interviewing, surveying and observing.

i) Focus groups ii) Interviews

iii) Documents iv) Records

c) In VSM →symbol is used for

i) Computerized information flow

ii) Manual information flow

iii) Safety stock

iv) Shipment

d) Which of the following is not true of BPR?

i) Sometimes BPR is needed to lower costs.

ii) Sometimes BPR is needed to increase quality

iii) Sometimes BPR is needed for change

iv) BPR tends to focus on incremental and gradual improvement.

e) _____ is the first phase of CRM.

i) Acquire ii) Enhance

iii) Retain iv) Vanish

f) CMS stands for ____.

i) Critical Management System

ii) Call Management System

iii) Caution Management System

iv) Communication Management System

g) What is the heart of any ERP system?

i) Information ii) Employees

iii) Customers iv) Database

h) Which of the following is/are some of the main areas of operation of DSS?

i) Transaction Processing

ii) Production, finance and marketing

iii) Executive support system

iv) Sales

i) Expertise and experience of organizational members that has not been formally documented is known as-

i) knowledge sharing

ii) tacit knowledge

iii) organizational learning

iv) organizational memory

j) Critical information for top management is provided by _____ information system.

i) expert ii) executive

iii) decision iv) managerial

Q2) Attempt any Four of the following. **[4×2=8]**

a) State any two characteristics of MIS.

b) State the phases of decision making process.

c) Define CRM.

d) Define DSS.

e) How service is distinct from product?

Q3) Attempt any Two of the following. **[2×4=8]**

a) State and explain any two methods of data collection.

b) Explain business organization model of ERP with neat diagram.

c) Define knowledge. Explain various types of knowledge.

Q4) Attempt any Two of the following. **[2×4=8]**

a) Briefly explain information management.

b) Explain various phases of Business process reengineering.

c) What do you mean by requirement definition and description? State any two advantages of it.

Q5) Attempt any ONE of the following. **[1×3=3]**

a) Explain the various applications of value stream model of organization.

b) Differentiate between Business Intelligence and Business Analytics.

Total No. of Questions : 5]

SEAT No. :

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[5826]-605
T.Y. B.C.A. (Science)
BCA 365 : SEC - IV : INTERNET OF THINGS (IOT)
(2019 Pattern) (Semester - VI)

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

Instructions to the candidates:

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

Q1) Attempt any EIGHT of the following (out of TEN) **[8×1=8]**

a) Which of the following offers external chips for memory & peripheral interface circuits?

i) Embedded System ii) Peripheral system

iii) Microcontroller iv) Microprocesor

b) In real time operating system _____.

i) All processes have the same priority

ii) A task must serviced by its deadline

iii) Process scheduling can done

iv) Kernel is not required

c) _____ is not application of IoT?

i) BMP 280 ii) Smart home

iii) Smart city iv) Self driven cars

d) _____ is IoT?

i) Network of physical objects embedded

ii) Network of virtual objects

iii) Network of objects in the ring

iv) Network of sensors

P.T.O.

e) "Internet of things" coined in year _____.

i) 1998 ii) 1999

iii) 2000 iv) 2002

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

i) Memory ii) Output

iii) Peripherals iv) Input

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

i) Short network ii) LPWAN

iii) Sigfox iv) Short range WN

h) _____ of the following is the way in which an IoT device is associated with data.

i) Internet ii) Cloud

iii) Automata iv) Network

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

i) Security chip ii) Memory disk

iii) IPR iv) OTP

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

i) Two ii) Three

iii) Four iv) Seven

Q2) Attempt any FOUR of the following (out of FIVE): **[4×2=8]**

a) Enlist the characteristics of Embedded system.

b) Explain any two pillars of IoT.

c) Write Need of Analog/Digital conversion.

d) What is RFID protocol?

e) What are the challenges for secure IoT?

Q3) Attempt any TWO of the following. (out of THREE) **[2×4=8]**

a) Define IoT? Write a trends in Adoption of IoT.

b) Difference between General processors in computer and Embedded processors.

c) M2M and WSN protocols with example.

Q4) Attempt any TWO of the following. (out of THREE) **[2×4=8]**

a) Difference between Real time system and Embedded system.

b) Write a basic building Block of IoT.

c) Explain key elements of IoT security.

Q5) Attempt any ONE of the following. (out of TWO) **[1×3=3]**

a) Explain the zigbee Architecture with Modbus protocol.

b) What is RESTful web services? GRPC or SOAP explain.