

Total No. of Questions : 4]

SEAT No. :

PE-1570

[Total No. of Pages : 2

[6505]-301
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) *All Questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw a neat labeled diagram wherever necessary to illustrate the answer.*

Q1) Attempt the following :

[5 × 1 = 5]

A) choose the correct option

- a) _____ data structure follows LIFO (Last In First Out).
 - i) Queue
 - ii) Stack
 - iii) Linked List
 - iv) Graph
- b) The time complexity of Binary Search in the worst case is _____.
 - i) $O(n)$
 - ii) $O(\log n)$
 - iii) $O(n^2)$
 - iv) $O(1)$
- c) In a sparse matrix, most of the elements are _____.
 - i) Non-zero
 - ii) Zero
 - iii) Negative
 - iv) Infinity
- d) _____ sorting algorithm is NOT based on comparison.
 - i) Merge Sort
 - ii) Quick Sort
 - iii) Counting Sort
 - iv) Insertion Sort
- e) _____ graph traversal algorithm uses recursion.
 - i) BFS
 - ii) DFS
 - iii) Selection Sort
 - iv) Quick Sort

B) Answer in one or two sentence

[5 × 1 = 5]

- a) Define Abstract Data Type (ADT).
- b) State any one advantage of using linked lists over arrays.
- c) Define time complexity.
- d) Define circular queue.
- e) State the main application of a Binary Search Tree (BST).

P.T.O.

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

- a) Difference between linear and non-linear data structures.
- b) Write an algorithm for binary search.
- c) List the difference types of linked lists? Explain any one.
- d) Explain row-major and column-major representation of a matrix.
- e) Discuss the application of stacks in real life.
- f) Define priority queue. How is it different from a normal queue?

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

- a) Explain Big-O, Omega (Ω), and Theta (Θ) notations with examples.
- b) Write and explain the algorithm for Quick Sort.
- c) Describe how a stack can be implemented using an array.
- d) Explain the adjacency list and adjacency matrix representation of a graph.
- e) Sort the following numbers using Bubble sort method. 108, 3, 97, 65, 71, 23, 57, 93, 100
- f) Discuss Depth-First Search (DFS) with suitable example.
- g) Write a 'C' function to count leaf nodes in a binary tree.

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

- a) Write a 'C' function to insert node at middle into singly linked list.
- b) Write a 'C' function to implement following operations on stack.
 - i) Push
 - ii) Pop
- c) Enlist types of tree. Explain any two types of tree.
- d) Construct BST for the following data. 11, 7, 15, 25, 18, 5, 12, 20.
- e) Convert the following Infix expression to Postfix:
 - i) $(A + B) * C + (D - E) / F + G$
 - ii) $A - B / C * A / K - L$
- f) Define Graph traversal. Explain with its techniques.
- g) Write 'C' function for dequeue operation.



Total No. of Questions : 4]

SEAT No. :

PE1571

[Total No. of Pages : 4

[6505]-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) *All questions are compulsory.*
- 2) *Figure to the right indicate full marks.*
- 3) *Draw neat sketches wherever necessary to illustrate the answer.*

Q1) Attempt the following.

[5×1=5]

A) Choose the correct options

- a) Which of the following feature is provided by the PL/SQL to handle exception occur in PL/SQL block?
 - i) Error handling block
 - ii) Error removing block
 - iii) Exception handling block
 - iv) Exception removing block
- b) A_____consists of a sequence of query and/or update statement.
 - i) Transaction
 - ii) Commit
 - iii) Roll back
 - iv) Flash black
- c) Which of the following is a common technique used for concurrency control?
 - i) Deadlock Detection
 - ii) Checkpoint
 - iii) Two phase commit
 - iv) Data Encryption
- d) The log is a sequence of _____ recording all the update activation in the database.
 - i) Log record
 - ii) Record
 - iii) Entries
 - iv) Redo

P.T.O.

- e) Grant privileges on SQL authorization mechanism _____.
i) Entry Relation ii) Specified tuples
iii) Specified Attributes iv) Both (i) and (ii)

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

- a) Define Redundancy.
- b) What is transaction?
- c) What are different types of Locks?
- d) Define Deadlock.
- e) Write the names of two techniques for using log to achieve the recovery.

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

- a) Differentiate Parallel and distributed databases.
- b) Write advantages and disadvantages of trigger.
- c) Write any three role of DBA with respect to security.
- d) What do you understand by concurrency control?
- e) Define
 - i) Client
 - ii) Thin Client
 - iii) Fat Client
- f) List advantages of shadow paging.

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

- a) What is view? Write syntax to create a view with example.
- b) List the ACID properties. Explain the use of each property.
- c) Define a schedule. Explain types of schedule.
- d) Explain deadlock prevention.
- e) Write note on polyinstantiation.
- f) Discuss different types of failure classification.
- g) Describe role of cryptography in database for encryption and decryption.

Q4) Answer the following (any five).

[5×5=25]

- a) Consider following entities and their relationship as, Employee (Eno integer, E-name char(30), E-address char(10) city char (50)), Dept_name varchar(15)).

Project (pno integer, status char(20), start_date date).

Project_Employee(Eno integer, pno integer, no_of_days integer).

The relationship Employee - Project is many-many with descriptive attribute No_of_Days.

Using above relationship,

Write a PL/SQL block to list all project whose status is 'incomplete'.

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

T1	T2	T3
Read (A)	Read (C)	Read (B)
A=A+100	Read (B)	B=B+200
Write (A)	B=B+C	Write (B)
Read (B)	Write (B)	Read (C)
B=B+100	Read (A)	C=C+200
Write (B)	A=A-C	Write (C)
	Write (A)	

- 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 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) Differentiate between discretionary and mandatory access control methods.
- e) Consider the following relational schema.

Student (Sno int, Sname varchar)

Teacher (Tno int, Tname varchar, Qualification varchar)

Student - teacher are related with M-M Relationship. Write a cursor to list details of students who have taken DBMS as a subject.

- f) Describe Commit and rollback with syntax and Example.
- g) Consider the following log entries at the time of system crash.

[start - transaction, T1]

[Write - item, T1, A, 100]

[Write - item, T1, B, 100]

[Commit T1]

[Checkpoint]

[Start - transaction, T3]

[Write - item T3, D, 500]

[Commit T3]

[start - transaction, T4]

[Write - item T4, E, 400]

[Start - transaction, T2]

[Write - item T2, C, 300]

System crash

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



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SEAT No. :

PE1572

[Total No. of Pages : 2

[6505]-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 diagrams whenever necessary.*

Q1) Attempt the following:

[5×1=5]

A) Choose the correct option from the following:

- a) Components of data communication includes_____
 - i) Sender and message
 - ii) Protocol and receiver
 - iii) Transmission medium
 - iv) All of these
- b) A_____operates in the network, data link, and physical layers of the OSI model.
 - i) Hub
 - ii) Router
 - iii) Switch
 - iv) Repeater
- c) A link layer address is sometimes called as_____
 - i) Link address
 - ii) Physical address
 - iii) MAC address
 - iv) All of these
- d) _____is a standardized system for connecting computers to a LAN
 - i) Twisted Pair
 - ii) Coaxial cable
 - iii) Ethernet
 - iv) None of these
- e) The part of an IP are_____.
 - i) Network ID
 - ii) Host ID
 - iii) Both (i) & (ii)
 - iv) MAC

B) Answer the following in one or two sentences:

[5×1=5]

- a) Write address mask for 124.
- b) What is multiplexing?
- c) What are different frame types in HDLC?
- d) Define De-encapsulation.
- e) What is maximum size of TCP Header?

P.T.O.

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

- a) Write a short note on Point-to-Point network.
- b) Explain the types of dataflow with examples.
- c) Explain Domain Namespace.
- d) Explain difference between LAN and WAN?
- e) Write note on UDP Datagram Format.
- f) Explain the types of DNS server.

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

- a) Explain OSI model.
- b) Write a short note on transmission modes.
- c) Explain the criteria for measuring network performance.
- d) Given a 12bit sequence 100111010000 and divisor of 1001 find CRC.
- e) Draw the structure of IPV4 datagram and explain its field.
- f) Write note on ERROR Detecting code.
- g) Draw graph for manchester and differential manchester for following data
 - i) 00000000
 - ii) 01011010
 - iii) 10101010
 - iv) 11111111

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

- a) Define Topology. Explain any two topology with its advantages and disadvantages.
- b) Explain classful addressing?
- c) Differentiate between FDMA, TDMA and CDMA.
- d) Explain the Go-back-N protocol with advantages & disadvantages.
- e) Explain HTTP request and response message with diagram.
- f) Write a short note on Email architecture.
- g) Explain features of TCP.



Total No. of Questions : 4]

SEAT No. :

PE-1573

[Total No. of Pages : 3

[6505]-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.*
- 3) *Draw neat diagram whenever necessary.*

Q1) A) Choose the correct option :

[5 × 1 = 5]

- i) Which of the following feature provides data hiding in C++?
 - a) Inheritance
 - b) Encapsulation
 - c) Polymorphism
 - d) Constructor
- ii) Constructor is used to _____ an object
 - a) Delete
 - b) Initialize
 - c) Destory
 - d) Copy
- iii) Which operator is used for dynamic memory allocation?
 - a) Malloc
 - b) Alloc
 - c) New
 - d) Create
- iv) Which class is used to read from a file?
 - a) ifstream
 - b) ofstream
 - c) fstream
 - d) istream
- v) Which of the following cannot be overloaded?
 - a) =
 - b) ::
 - c) +
 - d) +=

B) Answer the following :

[5 × 1 = 5]

- i) Define Encapsulation.
- ii) List any two types of inheritance.
- iii) What is the purpose of the this pointer?
- iv) Write syntax for a reference variable.
- v) Name any two file modes in C++.

P.T.O.

Q2) Attempt any five of the following :

[5 × 3 = 15]

- a) What is a manipulator? Give any two examples with syntax.
- b) Explain inline function with syntax and one advantage.
- c) Write a program to find sum of 1 to n using constructor.
- d) Explain the usage of scope resolution operator with example.
- e) What is the difference between constructor and destructor?
- f) Write a program to display the largest of two numbers using a friend Function.

Q3) Attempt any five of the following :

[5 × 4 = 20]

- a) Explain function overloading with example.
- b) Define friend function. What are its characteristics?
- c) Write a program to overload '+' operator.
- d) What are the two ways of defining member functions? Explain with example.
- e) What is inheritance? Explain hybrid inheritance with diagram and example.
- f) Write a C++ Program to read a file and count uppercase and lowercase characters from it.
- g) Explain copy constructor with an example.

Q4) Attempt any five of the following :

[5 × 5 = 25]

- a) Write a program to demonstrate virtual function using class shape and derived class circle, Rectangle.
- b) Explain virtual base class with example.
- c) Write a program using array of objects to store and display student information.
- d) Discuss the rules and syntax of operator overloading.
- e) Explain the concept of object class and reference variable with example.

- f) Explain Exception handling with suitable example.
g) Trace the output and explain :

```
#include <iostream>
using namespace std;
Class Animal
{
    Public :
    Animal ()
    {
        Cout << "Animal is born!" <<endl;
    }
    ~Animal ( )
    {
        Cout << "Animal is gone !" <<endl;
    }
};
Class Dog : public Animal
{
    Public :
    Dog ( )
    {
        Cout <<"Dog is wagging tail !" << endl;
    }
    ~ Dog ( )
    {
        Cout <<"Dog is sleeping!"<<endl;
    }
};
int main ( )
{
    Dog my dog;
    return 0;
}
```



Total No. of Questions : 4]

SEAT No. :

PE1574

[Total No. of Pages : 3

[6505]-402

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) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams whenever necessary.

Q1) A) Choose the correct option.

[5×1=5]

- a) A PHP script starts with _____ and ends with _____.
 - i) `<? Phpand?>`
 - ii) `<Php>` and `</Php>`
 - iii) `<?php` and `/?php>`
 - iv) `</php` and `/>`
- b) Which one of the following PHP function is used to determine a file's last access time?
 - i) `filetime()`
 - ii) `fileatime()`
 - iii) `fileltime()`
 - iv) `filectime()`
- c) XML is designed to _____ and _____ data.
 - i) design, style
 - ii) design, send
 - iii) store, style
 - iv) store, transport
- d) Which HTTP method is commonly used for sending data to the server in AJAX requests?
 - i) Post
 - ii) Get
 - iii) Put
 - iv) Patch
- e) SAX in XML is used for _____.
 - i) Defining format of an XML document
 - ii) Validating the XML file
 - iii) Parsing XML documents
 - iv) Inspecting Documents

P.T.O.

- B) Attempt all of the following: [5×1=5]
- a) Define Cookies. Give Example.
 - b) What are the types of XML parser?
 - c) What is Introspection? Give one example.
 - d) What is the use of array-slice function?
 - e) What is the scope of variables in PHP functions?

- Q2)** Attempt any FIVE of the following: [5×3=15]
- a) What is Introspection? Explain any three functions of it.
 - b) Explain Self processing form concepts with example.
 - c) Explain what is HTTP authentication?
 - d) Write note on PEAR DB.
 - e) What is an array? Illustrate with suitable example how to use for each loop to display array elements?
 - f) Consider table Hall-Booking (b_id, date, time, duration, eventname) & customer (c_id, name, phno) with m-1 relationship. Write a PHP script to print report of all booking details of a given date.

- Q3)** Attempt any FIVE of the following. [5×4=20]
- a) How to connect PHP to MYSQL database? Give Example.
 - b) Write a PHP program to display the total no. of rows returned by a query containing employee working in computer department.
 - c) Differentiate between GET and POST method.
 - d) Write a PHP script to create session.
 - e) Write a PHP script to illustrate the concept of interface.
 - f) Write note on Iterator in PHP.
 - g) What is reference variable? Explain with suitable example how parameters are passed by reference.

Q4) Attempt any FIVE of the following:

[5×5=25]

- a) What is AJAX? Explain the architecture of AJAX.
- b) Create a applications that contain Author details. XML file into simple XML object. Display attributes and elements (Hint: use simple-XML-load-file()).
- c) Explain XML DOM?
- 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. Also declare array of objects and call member functions area () and volume ().
- e) What are the differences between AJAX and Java Script?
- f) Define the terms:
 - i) Serialization
 - ii) Abstract class
 - iii) Encapsulation
 - iv) Object
 - v) Class
- g) Write a PHP program to calculate area of Rectangle with Length=3.5, breath = 7.5.



Total No. of Questions : 4]

SEAT No. :

PE1575

[Total No. of Pages : 2

[6505]-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) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams whenever necessary.*

Q1) A) Choose the correct option.

[5×1=5]

- a) 'Level 0' DFD is also known as_____.
 - i) logical level
 - ii) context level
 - iii) physical level
 - iv) functional level
- b) Amongst which of the following model is the oldest model of system development life cycle?
 - i) spiral model
 - ii) waterfall model
 - iii) prototype model
 - iv) iterative model
- c) Maintenance is classified into how many categories?
 - i) two
 - ii) three
 - iii) five
 - iv) four
- d) Alpha testing is done at_____.
 - i) customer end
 - ii) client end
 - iii) developer end
 - iv) user end
- e) SDLC stands for_____.
 - i) Software Development Life Cycle
 - ii) System Development Life Cycle
 - iii) Software Design Life Cycle
 - iv) System Design Life Cycle

P.T.O.

- B) Answer the following (Any five) [5×1=5]
- a) Define sub-system.
 - b) What is software?
 - c) State True/False. “David Hooker has proposed seven general (core) principles.”
 - d) What is process model?
 - e) What is pair programming?

- Q2)** Answer the following (Any five) [5×3=15]
- a) Write a difference between structured and unstructured interview.
 - b) What are the human factors used for agile process?
 - c) Describe the advantages of decision table.
 - d) Write short note on unit testing.
 - e) Explain dynamic system development model.
 - f) Explain characteristics of software.

- Q3)** Answer the following (Any five) [5×4=20]
- a) Differentiate between black box testing and white box testing.
 - b) Describe XP process diagrammatically.
 - c) Explain spiral model with diagram.
 - d) What is decision tree? Explain with example.
 - e) Explain the types of software maintenance.
 - f) What is feasibility study? Explain the types of feasibility study.
 - g) Explain pseudocode.

- Q4)** Answer the following (Any five) [5×5=25]
- a) Explain McCall's quality factors.
 - b) What is adaptive software development? Explain ASD with diagram.
 - c) Explain SDLC in detail.
 - d) Draw DFD Level 0,1,2 for College Management System.
 - e) Explain data dictionary.
 - f) Write a difference between alpha testing and beta testing.
 - g) Describe requirement engineering process with the help of diagram.



Total No. of Questions : 4]

SEAT No. :

PE1576

[Total No. of Pages : 2

[6505]-501

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

BCA351 - DSE - I : PROGRAMMING IN JAVA

(2019 Pattern) (Semester - V)

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 diagrams whenever necessary.

Q1) Attempt the following.

[5×1=5]

A) Choose the correct option :

- a) _____ is the correct way of inheriting class A by class B.
 - i) class B : class A { }
 - ii) class B inherits class A { }
 - iii) class B extends A { }
 - iv) class B extends class A { }
- b) _____ interface provides methods to get meta data up a database.
 - i) Database Meta Data
 - ii) Result set Meta Data
 - iii) Data Meta Data
 - iv) DB Meta Data
- c) _____ keyword is used to handle exception.
 - i) finally
 - ii) thrown
 - iii) catch
 - iv) try
- d) _____ stores element as key value pair.
 - i) Tree set
 - ii) Array list
 - iii) Linked Hash set
 - iv) Tree Map
- e) A _____ is a small piece of information that exist between the multiple client requests.
 - i) Cookie
 - ii) HttpSession
 - iii) Session
 - iv) Servlet

B) Attempt the following.

[5×1=5]

- a) What is the use of finalize ()?
- b) List any two types of inheritance.
- c) Write, how collection is different from Array.
- d) Name the swing classes used to create menu.
- e) What is JDBC.

P.T.O.

Q2) Answer the following (any five).

[5×3=15]

- a) Write a note on garbage collection.
- b) Explain uses of super keyword with example.
- c) Differentiate between Iterator and ListIterator.
- d) Explain keyboard events with the help of program.
- e) Explain types of jdbc driver.
- f) Explain JSP life cycle.

Q3) Answer the following : (any five)

[5×4=20]

- a) Explain access specifies in java.
- b) Differentiate between Abstract class and interface.
- c) What is exception? Explain try, catch, finally.
- d) Describe various components of swing (any two).
- e) Differentiate between JSP and servlet.
- f) Define a class my number having one private integer data member. Write a default constructor initialize it to 0 (zero) and another constructor to initialize it to a value. Write methods is Positive () & in Negative (). Use command line argument to pass a value to the object and perform the above operations.
- g) Write a Java program to accept doctor name from the user and check whether it is valid or not. (It should not contain digits and special symbols) If it is not valid then throw user defined exception - Name is invalid, otherwise display the name.

Q4) Answer the following : (any five).

[5×5=25]

- a) Explain the various ways used to accept input from console in java with proper syntax and example.
- b) Explain runtime polymorphism.
- c) Explain Hash table with example.
- d) What do you mean layout manager? Explain any two in detail.
- e) Write a note on Result set in Java.
- f) Write a java program to copy contents of one file into another file, replace the digits with '*' and also change the case.
- g) Write a java program to create following.

File	
New	
Open	



Total No. of Questions :4]

SEAT No. :

PE1577

[Total No. of Pages : 3

[6505]-502

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

BCA-352 : DSE-II : Data Mining and Data Science

(2019 Pattern) (Semester-V)

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 labelled diagram wherever necessary.*

Q1) Attempt the following.

[5×1=5]

A) Choose the correct options.

- a) Which of the following is a classification algorithm?
 - i) K-means
 - ii) Naive Bayes
 - iii) DBSCAN
 - iv) PCA
- b) What is the main goal of data mining?
 - i) To extract pattern from large datasets
 - ii) To organize data in databases
 - iii) To visualize data
 - iv) To clean data
- c) Which of the following algorithms is used for Association Rule Mining?
 - i) K-means
 - ii) Apriori
 - iii) Naive Bayes
 - iv) Decision Trees
- d) Which of the following is a supervised machine learning algorithm?
 - i) K-means
 - ii) Decision Trees
 - iii) DBSCAN
 - iv) PCA
- e) Which of the following is a key component of data science?
 - i) Data visualization
 - ii) Data collection
 - iii) Data analysis
 - iv) All of the above

P.T.O.

B) Attempt the following: [5×1=5]

- a) What is Data Mining?
- b) List any two disadvantages of decision tree.
- c) What is Data science?
- d) What is OLTP?
- e) List types of SVM.

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

- a) Define Data Mining. What are its major tasks?
- b) What is the difference between classification and regression?
- c) Describe the features of data warehouse.
- d) Write a note on SVM classifier.
- e) Describe Bayesian classification.
- f) Write applications of Data Science.

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

- a) Differentiate between OLAP and OLTP.
- b) Explain Data visualization techniques.
- c) Differentiate between Linear and Non-Linear Regression.
- d) What are steps in designing the data warehouse? Explain.
- e) Explain briefly data mining task.
- f) Describe the four stages of knowledge discovery (KDD)? Also Describe the multi-tiered data warehouse architecture?
- g) Explain types of Analytics.

Q4) Answer the following. (Any five)

[5×5=25]

- a) Discuss the different types of association rules.
- b) What is Data-mart? Explain its applications.
- c) What is data-discretization? Explain with suitable example.
- d) What is feature engineering? What are its steps?
- e) Write in brief about Data cleaning?
- f) Explain the basic decision tree induction algorithm.
- g) Explain in detail Naive Bayesian classification.



Total No. of Questions : 4]

SEAT No. :

PE1578

[Total No. of Pages : 3

[6505]-503

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

**BCA 353-DSE-III : PRINCIPLES OF OPERATING SYSTEMS
(2019 Pattern) (Semester-V)**

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 label diagrams whenever necessary.*

Q1) Attempt the following:

[5×1=5]

A) Choose the correct option.

- a) _____ is the module that gives the control of the CPU to the process selected by the short-term scheduler.
 - i) Loader
 - ii) Processor
 - iii) Dispatcher
 - iv) Throughput
- b) A problem encountered in multitasking when a process is perpetually denied necessary resources is called _____.
 - i) Deadlock
 - ii) Starvation
 - iii) Inversion
 - iv) Aging
- c) In memory mapping the _____ contains the value of the smallest physical address.
 - i) relocation register
 - ii) base register
 - iii) limit register
 - iv) a register
- d) In _____ writes, the data is stored in the cache.
 - i) asynchronous
 - ii) regular
 - iii) synchronous
 - iv) irregular
- e) The page table contains _____.
 - i) Base address of each page in physical memory
 - ii) Page offset
 - iii) Page size
 - iv) Program counter

B) Attempt the following:

[5×1=5]

- a) What is bit vector?
- b) What is the use of cache memory?
- c) Define safe state?
- d) What is race condition?
- e) List the advantages of multithreading.

P.T.O.

Q2) Answer the following: (Any five)

[5×3=15]

- a) What is semaphore? Discuss its type.
- b) Explain the benefits of distributed systems.
- c) Explain necessary conditions for a deadlock.
- d) Differentiate between external & internal fragmentation.
- e) Write short note on process control block.
- f) Explain first fit, best fit, & worst fit with example.

Q3) Answer the following: (Any five)

[5×4=20]

- a) How many pagefaults will occur with a reference string 0, 1, 7, 2, 3, 2, 7, 1, 0, 3? There are four frames which are initially empty. Use LRU page replacement algorithm.
- b) Difference between static and dynamic linking in operating system.
- c) Explain the dining philosophers problem.
- d) Consider the following snapshot.

Process	Burst time (ms)	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

Draw Gantt chart & compute average waiting time with priority scheduling algorithm.

- e) Explain different types of directories in operating system.
- f) Explain Banker's algorithm with example.
- g) Consider the given set of processes with CPU burst time (milliseconds). Illustrate the execution of these processes using FCFS. Calculate Average turn-around time & Average waiting time.

Process ID	Arrival time	Burst time
P1	2	2
P2	5	6
P3	0	4
P4	0	7
P5	7	4

Q4) Answer the following: (Any five)

[5×5=25]

- a) What is page fault? Explain the different steps in handling a page fault.
- b) Consider the following snapshot:

Process	Burst time (BT)	Arrival time (AT)
P1	5 ms	0 ms
P2	2 ms	4 ms
P3	4 ms	5 ms

Illustrate execution of these processes using Round Robin (RR) CPU scheduling algorithm (quantum = 2 millisec). Calculate average waiting time and average turnaround time.

- c) Differentiate interrupt & polling.
- d) Consider the disk queue with request for I/o to block on cylinders 98, 183, 41, 122, 14, 124, 65, 67 in that order. If the disk head is initially at cylinder 53. The cylinders are numbered from 0 to 199. Using:
 - i) SSTF
 - ii) CSCAN
- e) State spooling with it's advantages and disadvantages.
- f) Write a short note on Swapping.
- g) Define terms:
 - i) Critical section
 - ii) Bounded wait
 - iii) Hit ratio
 - iv) Virtual memory
 - v) A cyclic graph



Total No. of Questions : 5]

SEAT No. :

PE-1579

[Total No. of Pages : 3

[6505]-504

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

BCA-354 : ARTIFICIAL INTELLIGENCE

(SEC - I) (2019 Pattern) (Semester - V)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Attempt any eight of the following :

[8 × 1 = 8]

- a) Who is the inventor of Artificial Intelligence?
 - i) Geoffrey Hinton
 - ii) Andrew Ng
 - iii) John McCarthy
 - iv) Jurgen Schmid Huber
- b) Which of the following is a component of Artificial Intelligence?
 - i) Learning
 - ii) Training
 - iii) Designing
 - iv) Puzzling
- c) Which of the following is not an application of Artificial Intelligence?
 - i) Fare recognition system
 - ii) DBMS
 - iii) LIDAR
 - iv) Chatbots
- d) Which of the following is an example of Artificial Intelligent agent/agents?
 - i) Autonomous spacecraft
 - ii) Human
 - iii) Robot
 - iv) All of the mentioned
- e) What is state space?
 - i) The whole problem
 - ii) Your definition to a problem
 - iii) Problem you design
 - iv) Representing your problem with variable & parameter

P.T.O.

- f) The data structure used in standard implementation of Depth first search is
- i) Stack
 - ii) Queue
 - iii) Linked List
 - iv) Tree
- g) A* algorithm is based on _____.
- i) Breadth First Search
 - ii) Depth First Search
 - iii) Best First Search
 - iv) Hill Climbing
- h) Which search use the problem specific knowledge beyond the definition of the problem?
- i) Depth First Search
 - ii) Breadth First Search
 - iii) Informed Search
 - iv) Uninformed Search
- i) _____ search method takes less memory.
- i) Depth First Search
 - ii) Breadth First Search
 - iii) Linear Search
 - iv) Optimal Search
- j) An algorithm is complete if _____.
- i) It has a loop
 - ii) It terminates with a solution when one exists
 - iii) It starts with a solution
 - iv) It does not terminate with a solution

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

- a) "A good control strategy is that it causes motion and should be systematic". Justify your answer.
- b) List the advantages of breadth first search.
- c) State any two approaches to knowledge representation
- d) What is uninformed search?
- e) What is resolution? Explain with an example.

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

- a) Explain depth first search algorithm in detail.
- b) What is machine learning? Explain its types in detail.
- c) Explain Mears-End Analysis with an example.

Q4) Attempt any two of the following :

[2 × 4 = 8]

- a) Explain AO* algorithm in detail.
- b) Explain Missionary Cannibal problem in detail.
- c) Explain predicate logic with an example.

Q5) Attempt any one of the following :

[1 × 3 = 3]

- a) Write a note on Intelligent Agents
- b) Write a note on frames.



Total No. of Questions : 5]

SEAT No. :

PE1580

[Total No. of Pages : 3

[6505]-505

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

BCA 355 SEC-II : CLOUD COMPUTING

(2019 Pattern) (Semester - V)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Attempt any eight of the following:

[8×1=8]

- i) _____ type of cloud service provides virtualized computing resources over the internet.
 - a) Laas
 - b) Paas
 - c) Saas
 - d) Daas
- ii) _____ is the main advantage of using load Balancing in Google cloud.
 - a) It helps increase physical server resources
 - b) It helps destribute traffic evenly across multiple servers.
 - c) It secure data from hackers
 - d) It allows for easy VM migration
- iii) _____ Programming language is supported by Google App Engine.
 - a) Only python
 - b) Python, Java & Go
 - c) Only Java
 - d) Javascript only
- iv) _____ of the following is NOT a step in the cloud migration process.
 - a) Migration
 - b) Planning
 - c) Data Encryption
 - d) Testing and optimization
- v) _____ of the following is an example of cloud AI services.
 - a) AWS lambda
 - b) AWS Sage Maker
 - c) Microsoft Azure
 - d) Google App Engine

P.T.O.

- vi) _____ of the following is key component of cloud security.
- a) Data loss
 - b) Data Encryption
 - c) SaaS application
 - d) Public cloud models
- vii) _____ of the following is NOT a feature of Microsoft Azure.
- a) Azure function
 - b) Azure Blob storage
 - c) Google App Engine
 - d) Azure SQL Database
- viii) _____ of the following technology does Blockchain help secure in cloud computing.
- a) Database management
 - b) Virtual machine
 - c) Cloud storage & Identity management
 - d) Network
- ix) _____ of the following AWS services is used to store large volumes of data in the cloud.
- a) AWS EC2
 - b) AWS lambda
 - c) AWS S3
 - d) AWS RDS
- x) _____ type of hypervisor runs directly on the physical hardware.
- a) Type 1 hypervisor
 - b) Type 2 Hypervisor
 - c) Hosted Hypervisor
 - d) Type 4 Hypervisor

Q2) Attempt any four of the following.

[4×2=8]

- a) Explain the advantage and disadvantage of cloud computing.
- b) Explain types of virtual Machine.
- c) List and explain two cloud application.
- d) Describe the feature of cloud and Grid platforms.
- e) Write a short note on Kubernetes.

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

- a) Explain the role of a hypervisor in virtualization.
- b) Describe the programming support of Google App Engine.
- c) Explain programming on Amazon AWS.

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

- a) Differentiate between multi-cloud and omni-cloud.
- b) Explain the types of cloud computing in detail.
- c) Explain security challenges and risk in detail.

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

- a) Describe Microsoft cloud services.
- b) Explain Exploring SaaS-Sales Force. com.

* * *

Total No. of Questions : 4]

SEAT No. :

PE1581

[Total No. of Pages : 3

[6505]-601

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

BCA 361 DSE - IV : ANDROID PROGRAMMING

(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 neat diagrams wherever necessary.*

Q1) Attempt of the following:

[5×1=5]

A) Choose the correct option

- a) Which file is used to define permissions for an Android application?
 - i) activity.xml
 - ii) manifest.xml
 - iii) android.xml
 - iv) permission.xml
- b) What is the purpose of the onCreate() method in an Activity?
 - i) To initialize the activity's UI
 - ii) To handle background operations
 - iii) To pause the activity
 - iv) To stop the activity
- c) What is the primary purpose of an Intent in Android?
 - i) To start a new activity
 - ii) To bind an activity to a service
 - iii) To send data between components
 - iv) All of the above
- d) Which of the following classes is used to perform CRUD operations in SQLite in Android?
 - i) ContentProvider
 - ii) Cursor
 - iii) SQLiteDatabase
 - iv) SQLiteStatement

P.T.O.

- e) To use Google Maps in an Android application, which service must be enabled in the Google Cloud Console?
- i) Firebase ii) Google Maps API
- iii) Google Places API iv) Google Ads API
- B) Answer the following: [5×1=5]
- a) What is View?
- b) Which method is used to start an activity in Android?
- c) Which layout is used to arrange UI components in a linear fashion, either horizontally or vertically?
- d) Which method in SQLiteDatabase is used to execute a raw SQL query?
- e) What is meant by google map?

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

- Write any five features of android.
- Explain DVM.
- What is Toast? Give an example.
- Explain the difference between Button and ImageButton in Android.
- What is DatePicker Dialog?
- Explain Components of Android Application.

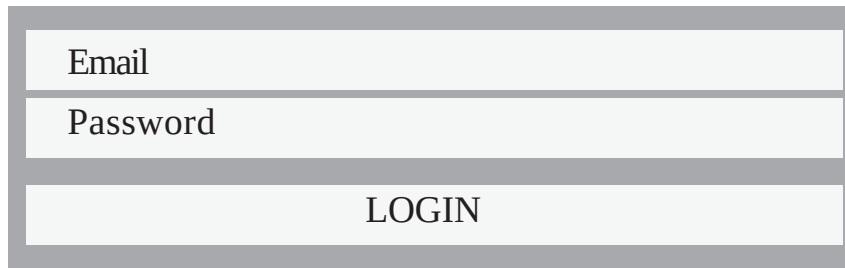
Q3) Attempt of the following: (Any five) [5×4=20]

- Write a short note on Android Activity Life Cycle.
- Explain any four layouts with examples.
- What is a spinner? How to create it? Explain with Example.
- Create a simple application which reads a number from the user and displays the reverse number in another activity.
- Explain how to send an SMS message programmatically in Android using SmsManager.
- Explain the steps required to create and open an SQLite database in Android.
- How to do navigation to a specific location.

Q4) Attempt of the following: (Any five)

[5×5=25]

- a) Create an application with Login Screen. On successful login, it gives the message to the next Activity (Without Using Database).



The image shows a login screen layout. It consists of three vertically stacked rectangular input fields. The first field is labeled 'Email', the second is labeled 'Password', and the third is a button labeled 'LOGIN'. The fields are separated by thin horizontal lines, and the entire set is enclosed in a light gray border.

- b) Explain Architecture of android.
- c) How do you implement an Options Menu in Android? Explain the process of creating menu items and handling their selection in an activity.
- d) Create an application for email sending.
- e) Differentiate between:
- i) Location based services & Google map
 - ii) Geocoding & reverse geocoding
- f) Explain ArrayAdapter? Explain with example.
- g) What is List view?How to use it in Android application.Explain with suitable example.



Total No. of Questions :4]

SEAT No. :

PE1582

[Total No. of Pages : 3

[6505]-602

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) *All questions are compulsory.*
- 2) *Figures to the right Indicate full marks.*
- 3) *Draw neat diagrams whenever necessary.*

Q1) Attempt of the following:

[5×1=5]

A) Choose the correct option.

- a) _____indexing cannot be used in an array.
 - i) Positive
 - ii) Up
 - iii) Down
 - iv) Negative
- b) What is another name for Go?
 - i) Golang
 - ii) GoL
 - iii) GooLang
 - iv) GoInt
- c) A Go function can return_____values.
 - i) Single
 - ii) Multiple
 - iii) Positive
 - iv) Negative
- d) A _____is a communication mechanism that allows Goroutines to exchange data.
 - i) Goroutine
 - ii) Package
 - iii) Channel
 - iv) Method
- e) _____is initial (zero value) value for interfaces, slice, pointers, channels and functions.
 - i) 0
 - ii) Nil
 - iii) " "
 - iv) False

P.T.O.

B) Answer the following: **[5×1=5]**

- a) What are nested structures?
- b) List different data types in GO programming
- c) What are timers?
- d) What are import paths?
- e) When compiler will throw unused import error message?

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

- a) What is the difference between print and println? Explain.
- b) How to iterate over arrays in GO?
- c) Compare concurrency and parallelism.
- d) Differentiate between function and method.
- e) Briefly explain how package names are imported.
- f) Explain variadic function in GO with example.

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

- a) Explain need of wait group and working of wait group?
- b) Write a note on type assertion and type switches.
- c) Write and explain structure of Go programming language.
- d) Write a program in Go to illustrate the concepts of returning multiple values from function.
- e) What is unit testing? How it is implemented in GO?
- f) Write a program in GO to store n employee information (empno. name, salary) and write a method to display employee information having minimum salary.
- g) Explain multidimensional arrays in Go.

Q4) Attempt of the following: (Any five)

[5×5=25]

- a) What is slice? Explain the various ways to create slice.
- b) What is channel? What are different types of channel? Explain send and receive operation on channel.
- c) Explain call by value and call by reference concept with example.
- d) Explain methods with non-struct type receiver with example.
- e) Write a program to print file information.
- f) Write a program in GO to create an interface shape that includes area and perimeter. Implement these methods in circle and rectangle type.
- g) What is string literal? Explain string functions for the following operations:
 - i) Converting string in lower case
 - ii) Counting occurrence of substring
 - iii) Check whether string contains a substring.
 - iv) Removing leading and trailing spaces in string



Total No. of Questions : 4]

SEAT No. :

PE1583

[Total No. of Pages : 2

[6505]-603

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

BCA 363-DSE VI : SOFTWARE PROJECT MANAGEMENT

(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 neat diagrams whenever necessary.*

Q1) A) Attempt of the following:

[5×1=5]

- a) _____ is used when you need to manage lots of tasks with different due dates.
 - i) Project chart
 - ii) Project calendar
 - iii) Project diagram
 - iv) Project timeline
- b) Activity in network diagram is represented by _____.
 - i) Arrows
 - ii) Circles
 - iii) Squares
 - iv) Rectangles
- c) _____ phases are there in scrum.
 - i) Four
 - ii) Three
 - iii) Two
 - iv) Five
- d) Networks usually indicate activity precedence constructed from _____.
 - i) Left to right
 - ii) Right to left
 - iii) Bottom to up
 - iv) Up to bottom
- e) _____ of the following activity is not the part of project planning.
 - i) Project estimation
 - ii) Project scheduling
 - iii) Project monitoring
 - iv) Risk management

P.T.O.

- B) Answer the following: [5×1=5]
- a) What is project?
 - b) What is communication plan?
 - c) Define Milestone.
 - d) What is virtual team?
 - e) What are the types of Network diagram?

- Q2)** Attempt of the following: (Any five) [5×3=15]
- a) Explain cost control in project management.
 - b) Differentiate Non-agile and Agile project
 - c) Write a note on PMBOK.
 - d) Describe CPN (Constructing Precedence Networks) with an example
 - e) How to manage the contract in Project Management?
 - f) What is PERT? Explain with example.

- Q3)** Attempt of the following: (Any five) [5×4=20]
- a) Discuss the project life cycle.
 - b) What is stress, health and safety in software project management?
 - c) Explain the terms:
 - i) Critical path
 - ii) Start to finish Dependency.
 - d) Explain Software Configuration Management
 - e) What is Gantt chart? Explain with example.
 - f) What are the Roles and Responsibility of Software development team?
 - g) What do you understand by change control. How to use it?

- Q4)** Attempt of the following: (Any five) [5×5=25]
- a) Discuss the types of contracts.
 - b) Write a note on portfolio management.
 - c) What is an Oldham Hackman model explain with example.
 - d) Define WBS and explain its types with the help of diagram
 - e) List and explain the different activity relationships in details.
 - f) Write a note on ADM network diagram.
 - g) Discuss the organizational behaviour with an example.



Total No. of Questions :5]

SEAT No. :

PE1584

[Total No. of Pages : 2

[6505]-604

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

BCA-364-SEC-III : MANAGEMENT INFORMATION SYSTEM

(2019 Pattern) (Semester-VI)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Attempt any Eight of the following (Out of Ten)

[8×1=8]

- a) There are _____ components of ERP
 - i) One
 - ii) Two
 - iii) Three
 - iv) Seven
- b) Symbol in VSM is used for _____
 - i) Operator
 - ii) Data Box
 - iii) MRP
 - iv) Cell
- c) The most important step of ERP implementation is _____ phase
 - i) Installing
 - ii) Training
 - iii) Gap Analysis
 - iv) Testing
- d) _____ type knowledge resides in human brain
 - i) Tacit
 - ii) Explicit
 - iii) Programmable
 - iv) Non Programmable
- e) BI stands for _____
 - i) Business Intelligence
 - ii) Business Information
 - iii) Better Intelligence
 - iv) Better Information
- f) DSS can collect and analyse _____ time data
 - i) Execution
 - ii) Static
 - iii) Dynamic
 - iv) Real

P.T.O.

Total No. of Questions : 5]

SEAT No. :

PE1585

[Total No. of Pages : 3

[6505]-605

T.Y.B.C.A.

SCIENCE

**BCA-365, SEC-IV : Internet of Things
(2019 Pattern) (Semester - VI)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

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

Q1) Multiple choice questions. (Eight out of TEN)

[8×1=8]

- a) Which memory storage is widely used in Embedded systems?
 - i) Flash memory
 - ii) EEPROM
 - iii) SRAM
 - iv) DRAM
- b) ANSI stands for _____
 - i) American National Standards Institute
 - ii) American National Standard Interface
 - iii) American Network Security Interrupt
 - iv) American Network Standard Interfacing
- c) The components of a sensor node is _____
 - i) Radio Trans receiver
 - ii) Micro controller
 - iii) An electronic circuit
 - iv) All the above
- d) _____ is used to convert user application into web application.
 - i) Web services
 - ii) Java service
 - iii) Browser Action
 - iv) Struts services
- e) How many components do the RFID system consists of ?
 - i) One
 - ii) Two
 - iii) Three
 - iv) Four
- f) _____ of the IoT networks has very short range.
 - i) Short Network
 - ii) LPWAN
 - iii) Sig Fox
 - iv) Short range Wireless Network

P.T.O.

- g) API enables services portability between ____ .
- i) Systems
 - ii) Devices
 - iii) Networks
 - iv) Services
- h) Which of the following is not a type or source of threat?
- i) Operational threat
 - ii) Cultural threat
 - iii) Technical threat
 - iv) Social threat
- i) What is the full form of the MQTT?
- i) Multi-Queue Telemetry Things
 - ii) Multiple Queue Telemetry Things
 - iii) Message Queue Telemetry Things
 - iv) Message Queue Telemetry Transport
- j) Which of the following is not an application of IoT?
- i) BMP 280
 - ii) Smart home
 - iii) Smart city
 - iv) Self-driven cars

Q2) Attempt any four of the following. (Out of FIVE)

[4×2=8]

- a) List different Embedded system components.
- b) Define IoT devices with example.
- c) What is RFID protocol?
- d) Mention the four pillars of IoT.
- e) Enlist the challenges come to secure an IoT system.

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

- a) Explain trends in Adoption of IoT.
- b) Enlist the components of WSN in IoT. Explain in detail.
- c) Explain characteristics of IoT.

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

- a) Explain in details core elements of micro controller with the help of block diagram.
- b) Write difference between IoT Devices & computers.
- c) What is authentication? Why do we need it in IoT systems?

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

- a) Draw the architecture of ZigBee & explain in detail.
- b) Explain AWS for IoT in detail.

