S.Y. IT - Sem - III
Regular & ATKT - Oct - 2019

S.K.M's J. M. Patel College of Commerce, Goregaon (W), Mumbai – 90
Regular Examination – October – 2019

Time : 2.30 hrs **Marks: 75**

Program :SYBScIT **Sem : III**

Course :Python

N. B.: (1) **All** questions are **compulsory**.
(2) Answers to the **same question** must be **written together**.
(3) Numbers to the **right** indicate **marks**.

Q.1. Attempt any three of following: **15**

a. Explain the different execution modes of python program.
b. Explain the if else structure with example.
c. Explain the use of logical operators and membership operators in Python.
d. Write a recursive function to print factorial of given number.
e. Write a program that asks the user to enter their name and age. Print a message addressed to them that tells the year when they will turn 100 years old.
f. Write a program to demonstrate the use of break , continue and pass.

Q.2. Attempt any three of following: **15**

a. What are fruitful functions and void functions? Explain with example.
b. How can string be traversed with a loop? Give suitable example.
c. What are local and global variables?
d. Write a short note on : Stack Diagram.
e. Write a program to print the sum of natural numbers using recursive function.
f. Write a function that computes length of string.(without using inbuilt function).

Q.3. Attempt any three of following: **15**

a. What is list? How to define and access elements of list?
b. What is dictionary? Explain the properties of dictionary keys.
c. How to raise exception?
d. Write a short note on tuple assignment and returning value.
e. Write a program to catch ValueError and ZeroDivisionError exceptions.
f. Explain the purpose of following functions:
   i. remove()
   ii. pop()
   iii. seek()
   iv. mkdir()
   v. listdir()

Q.4. Attempt any three of following: 15

a. What is the difference between method overloading and method overriding.
b. Explain the purpose of following:
    i. activeCount()
    ii. currentThread()
    iii. enumerate()
    iv. qSize()
    v. join()
c. What is inheritance? Explain different types of it.
d. Explain the life cycle of thread.
e. What are static methods? Explain with example.
f. Create class to store Employee information and display it.

Q.5. Attempt any three of following: 15

a. Explain the process of creating GUI in python with tkinter.
b. What is message box? What are its types?
c. Explain the steps to connect with database from python.
d. Write a detail note on canvas widget.
e. Write a short note on Scrollbar widget.
f. Build GUI for calculating result.

*** THE END ***

SKM's J. M. PATEL COLLEGE OF COMMERCE, GOREGAON (W), MUMBAI-90

REGULAR EXAMINATION – OCTOBER, 2019

TIME: 2 ½ Hr MARKS: 75

PROGRAMME: S.Y.BSc.IT / SEM – III

COURSE: **Data Structure**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw neat **labelled diagrams** wherever **necessary**.

Q 1. Attempt ***any three*** of the following. **15 M**

a) What is array? Write applications, advantages and limitations of array.
b) What is Sparse matrix? Explain different ways of representing Sparse matrix into memory.
c) What is data structure? Explain the different operation that are performed on data structure.
d) Consider a two dimensional array M [4:7,-2:8]. If the base address of M is 4082 and each element takes 2 memory cells then find the address of M 5,3 element assuming that:
   i) Array M is sorted in column major order.
   ii) Array M is sorted in row major order.
e) What is an algorithm? What are the characteristics of an algorithm?
f) Write algorithm for searching an element in array.

Q 2. Attempt ***any three*** of the following. **15 M**

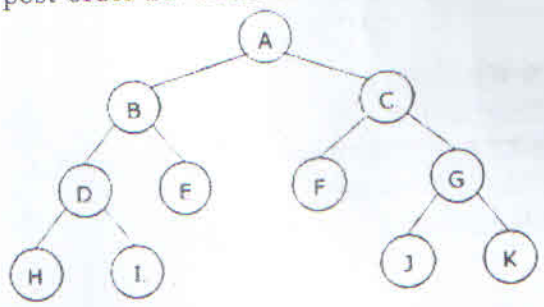
a) What is linked list? Write and explain an algorithm to insert an element at the specified position of the singly linked list.
b) Explain how to represent a sparse array using an array and a linked list with an example.
c) Write and explain an algorithm for deleting a node containing value in doubly linked list.
d) Explain how the memory is allocated and deallocated for linked list.
e) Write an algorithm for inserting a node at first and last position in circular linked list.
f) Write and explain an algorithm to split a link list into two linked lists.

Q 3. Attempt ***any three*** of the following. **15 M**

a) Define stack. Discuss the basic operations performed on the stack. Also explain overflow and underflow conditions of the stack.
b) Convert the following expressions in postfix and prefix notations using stack.
   (a * b * c ^ d) + e – (f / g + h)
c) Evaluate the following expression using Stack
   (3^2*5) / (4*5-3) + 8
d) Write the difference between Stack and Queue.
e) What is recursion? What are advantages and disadvantage of recursion?
f) Define Queue. Explain different types of queue.

Q 4. Attempt ***any three*** of the following. **15 M**

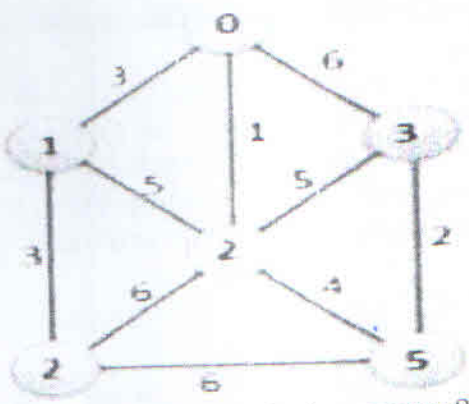
a) Sort the following data elements using selection sort algorithm. 29, 32, 18, 8, 43, 64, 6, 22, 11,37
b) What are 2-3 trees? How to delete a key value from 2-3 trees?
c) Write an algorithm for Binary Search and explain with example.
d) Write in-order, pre-order, post-order traversals for following tree:



e) Draw max and min heap with the following elements:
80 59 25 30 100 45 62 89 51 23 11 27 323
f) Sort the following data elements using bubble sort algorithm.
48, 23, 75, 53, 33, 66, 10, 44, 12, 18, 50

Q 5. Attempt ***any three*** of the following. **15 M**

a) Consider the sequence 10,20,30,40,50,60,70. Solve it using linear probing for given table size 10. use hash function h(k) = k mod 10.
b) Write a short note on Rehashing.
c) Define the following terms.
1. Graph 2. Node and Edges 3.Cyclic Graph 4. Path 5. Directed Graph
d) Find the minimum spanning tree for the following graph using Prim's algorithm and the source vertex 'S'.



e) What are the different ways to represent graphs in memory?
f) Explain Warshall's algorithm of finding path matrix of a graph.

********** **All the Best** **********

SKM's J. M. PATEL COLLEGE OF COMMERCE, GOREGAON (W), MUMBAI-90

REGULAR EXAMINATION – OCTOBER, 2019

TIME: 2 ½ Hr MARKS: 75

PROGRAMME: S.Y.BSc.IT / SEM – III

COURSE: **Computer Network**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw neat **labelled diagrams** wherever **necessary**.

Q 1. Attempt ***any three*** of the following: **15 M**

a) What is Data communication? Explain different modes of data flow between devices.
b) Write a short note on Phase Modulation.
c) Draw the layered architecture of TCP/IP model. Explain functions of all the layers.
d) Explain in detail any two types of Line coding scheme for Digital to digital signal conversion.
e) Explain following terms with respect to Sin wave: Wavelength, Amplitude, Phase, and Frequency, Period.
f) State and explain various types of networks. What are the different ways to access the Internet?

Q 2. Attempt ***any three*** of the following: **15 M**

a) Discuss the major classification of transmission media.
b) Differentiate between Frequency Division Multiplexing (FDM) and Time Division Multiplexing (TDM).
c) Define Error under scope of Networking and explain its types.
d) Draw and explain the packet format of ARP protocol.
e) Write a short note on Cyclic Codes.
f) Define the following terms: Error, Humming distance, Unicast address, Broadcast address, Multicast address.

Q 3. Attempt ***any three*** of the following: **15 M**

a) What is Virtual LAN? How are stations grouped into different VLANs? Explain.
b) Discuss GO BACK N ARQ in detail.
c) Explain CSMA with Collision Detection.
d) Write a short note on Satellite Networks.
e) What is HDLC? What are the different types of frames in HDLC? Explain the different fields in HDLC frames.
f) Explain ALOHA system with its two versions.

Q 4. Attempt ***any three*** of the following: **15 M** 2

a) Write a short note on OSPF protocol.

b) Explain the terms 1. Connection Oriented Network Services. 2. Connectionless NetworkServices.

c) Draw and explain the DHCP message format.

d) Write the difference between ICMPv4 and ICMPv6.

e) Draw and Explain IPv4 header structure.

f) Explain different transition strategies from IPv4 to IPv6.

Q 5. Attempt ***any three*** of the following: **15 M**

a) Write a short note on TCP.

b) With the help of a diagram, explain the Go-Back-N protocol.

c) What do you mean by Domain Name System? What is the use of the same.

d) Explain the persistent and non-persistent connection.

e) Explain the architecture of electronic mail.

f) Explain HTTP and FTP protocol in detail.

********** **All the Best** *********

S.K.M's J. M. Patel College of Commerce, Goregaon (W), Mumbai – 90
Regular Examination – October – 2019

Time : 2.30 hrs **Marks: 75**

Program : SYBScIT **Sem : III**

Course : DBMS

N. B.: (1) **All** questions are **compulsory**.
(2) Answers to the **same question** must be **written together**.
(3) Numbers to the **right** indicate **marks**.
(4) Consider following tables for answering queries.

Customers	
cid	int, primary key
c_name	varchar(25)
address	varchar(25)
phone	int
age	int

Members	
Mid	int, primary key
cid	int, reference from customer
discount	Int
fees_paid	Int
email-id	varchar(30)

Q.1. Attempt any three of following: **15**

a. Explain the advantages of DBMS.
b. Discuss any two applications where database management system can be used.
c. What are the basic building blocks of Data Model?
d. Explain the Behavioral things of UML in detail.
e. Draw ER diagram for online shopping application.
f. Explain following terms:
   i. Composite attribute ii. Entity iii. Integrity

Q.2. Attempt any three of following: **15**

a. Explain following terms:
   i. primary key ii. Foreign key
b. Explain why normalization is important in database management system.
c. State the difference between relational algebra and calculus.
d. Explain following operation for relational algebra:
   i. project ii. Rename iii. Intersection
e. Write following queries:
   i. Create table - Customer and Member. 3M
   ii. Insert 5 meaningful records in each table. 2M

f. Write following queries:
   i. Display the information of customers age more than 45years. 2M
   ii. Display the information of customers who are members. 3M

Q.3. Attempt any three of following: **15**

a. What is View? Compare view with table. How to delete view?
b. Explain different types of constraints.
c. Explain outer join with example.
d. Write a short note on: Triggers.
e. Write following queries:
   i. How many customers are members? 2M
   ii. Display name and phone number of members whose email id ends with - gmail.com 3M
f. Write following queries:
   i. Delete all records from customer table. 2M
   ii. Add column- offers varchar(25) to the customer table. 3M

Q.4. Attempt any three of following: **15**

a. What are concurrent transactions? Explain the problems arise during concurrent execution.
b. What is shared lock and exclusive lock.
c. Explain the timestamp based protocol.
d. Explain following:
   i.Rollback ii. Commit iii. Durability
e. Write following queries:
   i. Display the email-ids of members as per discount they have received in descending order. 2M
   ii. Display the name and address of customer who has paid highest fees 3M
f. Write following queries:
   i. Increase the discount of each member by 10%. 2M
   ii. Display the information of customers who are not members. 3M

Q.5. Attempt any three of following: **15**

a. What are the various data types of PL/SQL.
b. Explain various types of operators in PL/SQL.
c. Write a short note on sequences.
d. Explain for loop in PL/SQL with example.
e. Write short note on – Triggers.
f. Create stored procedure and display employee name by accepting employee number from user.

*** THE END ***

10/10/19

SKM's JASHBHAI MAGANBHAI PATEL COLLEGE OF COMMERCE, GOREGAON (WEST), MUMBAI: 90

REGULAR SEMESTER END EXAMINATION-OCTOBER-2019

DURATION: 2 ½ HOURS MARKS: 75

PROGRAMME: S. Y. B. Sc. (I.T.)-Sem-III COURSE: APPLIED MATHEMATICS

N.B.

1. All questions are compulsory.
2. Make suitable assumption wherever necessary and state the assumption made.
3. **Answer to the same question must be written together.**
4. Number to the right indicate marks.
5. Draw neat labelled diagrams wherever necessary.
6. Use of Non-programmable calculator is allowed.

Q.1 Attempt any three of the following. **15**

A. Reduce the matrix into its normal form $\begin{pmatrix} 1 & -1 & 3 & 6 \\ 1 & 3 & -3 & -4 \\ 5 & 3 & -3 & 11 \end{pmatrix}$

B. If $X=\begin{bmatrix} 2 & -1 \\ 3 & 0 \\ 0 & 1 \end{bmatrix}$, $Y=\begin{bmatrix} 0 & -1 & 4 \\ 3 & 0 & 1 \end{bmatrix}$, Is X.Y is singular?

C. Find Eigen value and Eigen vector of $A=\begin{bmatrix} 0 & 3 \\ -2 & 5 \end{bmatrix}$

D. Write the amplitude and magnitude of $\frac{(4+5i)^2}{-4i}$

E. Find the cube root of $x^3+ i =0$

F. find the log (3+2i) and Log(3-2i)(3+2i)

Q.2 Attempt any three of the following. **15**

A. Solve : $x\frac{dy}{dx} + \frac{y^2}{x} = y$

B. Solve : $x^2p^2 + xyp - 6y^2 = 0$

C. Solve : $x(x-1)\frac{dy}{dx} - y = x^2(x-1)^2$

D. Solve : $(D^3 + 4D)y = sin\ 2x$

E. Solve : $\frac{dx}{dt} + y = sin(t); \frac{dy}{dt} + 4x = cos(t), given\ that\ x = 0, y = 0$ at t=0

F. Solve : $(x^4 + y^4)\,dx - xy^3dy = 0$

15

Q.3 Attempt any three of the following.

A. Find the Laplace transformation of $\sin(pt)$

B. Find L $(\frac{sint}{t})$

C. If f(t)= t+1, $0 \leq t \leq 2$

= 3 , $t > 2$

Find L(f(t))

D. Find the inverse Laplace transformation of $\frac{24e^{-5s}}{s^2-9}$

E. Solve the Differential equation $y' + 2y = e^{3t}\,; y(0) = 0$

F. Find $L^{-1}\left(\frac{1}{(s-1)(s^2+1)}\right)$ by using convolution theorem.

15

Q.4 Attempt any three of the following.

A. Evaluate: $\int_0^1 \int_0^x (x^2 + y^2) dxdy$

B. Evaluate $\int_0^2 \int_0^{4-x^2} e^{x^2} dxdy$ by changing the order of integration.

C. Find the area of the region bounded by the $x = y^2$ *and* $y = x^2$

D. Evaluate: $\int_0^1 \int_{-1}^1 \int_1^2 e^{x+y}\, dxdydz$

E. Find the volume bounded by $y^2 = x\,, x^2 = y$ *&the planez* $= 0, x + y + z = 1$

F. Evaluate by using polar form: $\int_0^{\frac{a}{\sqrt{2}}} \int_x^{\sqrt{a^2-x^2}} \frac{xdydx}{\sqrt{x^2+y^2}}$

15

Q.5 Attempt any three of the following.

A. Evaluate : $\int_0^\infty \frac{x^3}{3^x}\, dx$

B. Show that : erf(0)=0 & $\text{erf}(\infty) = 1$

C. Show that : $x \frac{d}{dx} erfc\,(ax) + a \frac{d}{da} erf(ax) = 0$

D. Show that : $\int_0^\infty \frac{x^a - 1}{log(x)} dx = log(a + 1)$

E. Evaluate : $\int_0^1 \frac{x^8}{(1+x^6)^{\frac{3}{2}}}\, dx$

F. Evaluate : $\int_0^\infty \sqrt{x}\, e^{-\sqrt{x}} dx$