D.B.J. COLLEGE, CHIPLUN.

Semester III ~~Regular~~ Examination ~~October~~ March - 25 2024-25

Class: S.Y.B.Sc. (I.T.) Date: 01/03/2025

Subject: Python Programming (USIT 301) **Paper: I**

Duration: $2^{1/2}$ hours Max. **Marks: 75**

Time: - 9.00 AM to 11.30 A.M.

N.B. 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Assume the necessary data.

Q.1. Attempt any THREE of the following: (15)

a) Write the steps to install python and to run the python code.
b) What is type conversion? Explain explicit type conversion.
c) Explain Relational operator detail.
d) Describe the use of range() in python.
e) Which statements are used as loop controlling statements? Explain any one with an example.
f) Describe while as infinite loop with an example.

Q.2. Attempt any THREE of the following: (15)

a) What is function? How do you call the function? Explain with an example.
b) Write a short note on recursive function in python.
c) List and explain string operators.
d) How do you traverse over the string using while loop? Explain with an example.
e) Define python module. Write two ways to use import statement in python.
f) Explain incremental development in python.

Q.3. Attempt any THREE of the following: (15)

a) What is tuple? Explain any five tuple methods.
b) Define file. Write file handling attributes with an suitable example.
c) Write any five dictionary methods with an example.
d) Define python list. How do you access and delete the elements of list?
e) Write a note on exception handling mechanism.
f) Explain the following methods to deal with directory:
   1. os.mkdir() 2. os.chdir()

Q.4. Attempt any THREE of the following: (15)

a) Describe multiple inheritance with an example.
b) Define polymorphism. Explain method overriding with an example.
c) How class and object created in python? Explain in detail.
d) What is REgex? Write any two metacharacters with an example.
e) What is thread? Describe multithreading in python.
f) List and explain math module.

Q.5. Attempt any THREE of the following: (15)

a) What is tkinter? How do you create main window using tkinter?
b) Explain any one of the following widget:
   1.Button 2. Lable
c) Describe font as a standard attribute of widget.
d) How the look of GUI can be enhanced by changing default icon of parent window? Elaborate with an example.
e) What is layout management? Explain pack () layout manager.
f) Write a short note on Checkbutton widget .

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D.B.S. College, Chiplun

Semester- III ATKT Examination March-25

Class:- S.Y.I.T. Subject:- Data structures

Paper No:- 02 Date:- 05/03/2025

Duration: 2.30 Hrs. Time:- 9.00 AM To 11.30 AM **Max. Marks: 75**

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Instructions: (1) All questions are compulsory.

(2) Numbers to the right indicate marks.

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Q.1) **Attempt <u>any three</u> of the following:** **15**

A) What is time and space complexity?Explain Big O Notation with example.
B) Explain traversing operation for array.
C) What is data structure? Explain how information is different from data.
D) Explain insertion operation for array.
E) List out the advantages and limitations of arrays.
F) Explain memory representation of one dimentional array.

Q.2) **Attempt <u>any three</u> of the following:** **15**

A) Write a note on memory Allocation and Deallocation.
B) Explain merging operation of two linked list.
C) With an example explain deletion of a node at last of Circular linked list.
D) Write a note on insertion of a node at the Rear of the linked list.
E) Explain the deletion of a node at start of Doubly linked list.
F) With a diagram explain Circular linked list.

Q.3) **Attempt <u>any three</u> of the following:** **15**

A) Convert the following infix expression into postfix expression ((A+B)*(C+D))/E .
B) Write a note on Recursion.
C) Explain Linked List representation of Queue.
D) List and explain the operations performed on a Stack.
E) With an example explain whether the parenthesis are correctly matched or not.
F) Write a note on a Circular Queue.

Q.4) **Attempt <u>any three</u> of the following:** **15**

A) Explain Insertion operation perform by binary Search Tree.
B) With an example explain Selection Sort.
C) What is searching? Explain Binary search method.
D) Explain the Postorder traversal operation performed by a Binary Tree.
E) With an example explain Bubble Sort.
F) How to find numbers of Internal and External nodes in binary search.

Q.5) **Attempt <u>any three</u> of the following:** **15**

A) Consider the sequence 89, 18, 49, 58, 9. Solve it using linear probing for the given table size 10.
B) List and explain the common hash functions.
C) Explain the separate chaining collision resolution techniques of hashing.
D) Explain Breadth First Search (BFS) graph traversal technique wih an example.
E) What is Graph? Explain directed graph and undirected graph.
F) Explain memory representation of graph.

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D.B.J. College, Chiplun

Semester- III ATKT Examination March-25

Class:- S.Y.I.T. Subject:- Applied Mathematics

Date:- 05/03/2025 Paper No:- 04

Time: 2.30 Hrs. Time:- 9.00 to 11.30 a.m. **Full Marks: 75**

Instructions:

(1) All questions are compulsory.

(2) Numbers to the right indicate full marks.

(3) Use of any type of calculator is not allowed.

Q.1) **Attempt <u>any three</u> of the following** **(15)**

a) Express $\frac{-1}{2}+\frac{\sqrt{3}}{2}i$ in polar form.

b) Prove that $(1+i\sqrt{3})^8+(1-i\sqrt{3})^8 = -2^8$

c) Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$

d) Find rank of matrix A

$A=\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 5 & 7 \end{bmatrix}$

e) If sinhx - coshx = 5 then find tanhx.

f) If $z_1 = 2-3i$ and $z_2 = 4+6i$ find i) $|z_1+z_2|$ ii) $|z_1-z_2|$

Q.2) **Attempt <u>any three</u> of the following** **(15)**

a) If given equation is solvable for p, find the general solution of the equation $(p-x)(p-3y)=0$.

b) Solve $\frac{dy}{dx}=\frac{x^3+3}{y^2+1}$ by separation of variable.

c) Solve $(2xy-3x^2)dx+(x^2-2y)dy=0$.

d) If given equation is solvable for y, find the general solution of the equation, solve $p^3+p-e^y=0$.

e) If given equation is solvable for x, find the general solution of the equation $xp^2-12=0$.

f) Solve $x^2+3y\frac{dy}{dx}=0$ by separation of variable.

Q.3) **Attempt <u>any three</u> of the following** **(15)**

a) Find Laplace transform of $cos^2 t$.

b) Evaluate inverse Laplace transform of $\frac{1}{s^2+6s+5}$

c) Find inverse Laplace transform of $\log\left(\frac{s^2+1}{s(s+1)}\right)$

d) Evaluate inverse Laplace transform of $\frac{1}{s^2(s^2+1)}$

e) Find Laplace transform of $\frac{e^{-at}-e^{-bt}}{2}$

f) Evaluate Laplace transform of $\frac{\cos at-\cos bt}{2}$

Q.4) Attempt <u>any three</u> of the following (15

a) Evaluate $\int_0^1 \int_0^x \int_0^{1+x+y} dz\, dy\, dx.$

b) Find $\int_0^1 \int_0^x x(x^2+y^2)dydx$

c) Evaluate $\int_1^2 \int_2^3 \int_0^1 8xyz\, dz\, dx\, dy$

d) $\iint dA$where S is the annulus between the circles $x^2+y^2=4$ and $x^2+y^2=16$.

e) Find $\int_0^1 \int_{-y}^{y} 3y\, dxdy$

f) Evaluate I=$\iint xy\, dxdy$ over the area bounded by the parabolas $x^2 = y, y^2 = x.$

Q.5) Attempt <u>any three</u> of the following (15

a) evaluate $\int_0^1 \left[log\frac{1}{x}\right]^{10} dx$

b) Simplify $\int_0^\infty e^{-x^m}x^n dx$

c) Evaluate $\int_0^\infty \sqrt[8]{x}e^{-\sqrt{x}}dx$

d) Solve $\int_0^1 (x.logx)^6 dx$

e) Simplify $\int_0^1 (x^m.(logx)^n dx$

f) Evaluate $\int_0^\infty \sqrt{x}\, e^{-x^3} dx$

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D.B.J. COLLEGE, CHIPLUN.

Semester III Regular Examination ~~Oct. 2024-25~~ APKT March-25

Class: S.Y.B.Sc. (I.T.)

Subject: Computer Networks (USIT303) **Paper: III**

Duration: $2^{1/2}$ Hrs. **Marks: 75**

Date:- 06/03/2025 Time:- 9.00am to 11.30am

Instructions: (1) All questions are compulsory.

(2) Numbers to the right indicate marks.

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Q.1 **Attempt <u>any three</u> of the following:** (15)

A] Explain the terms. 1) Gateway 2) Network interface card

B] With the help of diagram explain TCP/IP protocol suite.

C] Write a short note on evolution of computer networks.

D] Explain different types of computer networks.

E] Explain OSI Model with the help of diagram.

F] Write comparison between switch and hub.

Q.2 **Attempt <u>any three</u> of the following:** (15)

A] Explain generations of cellular telephony.

B] With a diagram explain the different types of orbits.

C] List and explain different types of error detection and correction.

D] Error detection in block coding with diagram.

E] Explain the concept of link layer addressing.

F] Explain the terms. 1) Bandwidth 2) Noise

Q.3 **Attempt <u>any three</u> of the following:** (15)

A] Explain error reporting in detail.

B] Explain the concept of Routing Information Protocol.

C] Explain query in detail.

D] Elaborate 'Mapping logical to physical address: ARP'.

E] Write a short note on Open Shortest Path First.

F] Explain the two types of IPv4 with an example.

Q.4 **Attempt <u>any three</u> of the following:** (15)

A] Write and explain all operations of UDP.

B] Explain the concept of three way handshaking with diagram.

C] List and explain all services of TCP.

D] Write a note on TCP Connection.

E] Explain the concept of data transfer with diagram.

F] Write all uses of UDP.

Q.5 **Attempt <u>any three</u> of the following:** (15)

A] What is WWW? Explain in detail.

B] List and explain importance of HTTP in computer networks.

C] Write a short note on DNS.

D] Explain the concept of SMTP in network communication.

E] Explain POP3 protocol in detail.

F] What is MIME? How can we use for different data formats.

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