M181023503

SYBSC IT
18/10/23

Duration: 2½ hrs. Max. Marks: 75

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:

a) Define python. Explain highlighting features of python. (5)
b) Explain any one of the following: (5)
1. Identity operator 2. Membership operator
c) Which statements are used as loop controlling statements? Explain any one of them. (5)
d) What is type conversion? Explain with an example. (5)
e) How do you give comments in python? Describe in detail. (5)
f) Describe while as infinite loop with an example (5)

Q.2. Attempt any THREE of the following:

a) Explain any one of the following: (5)
1. Default arguments 2. Required arguments
b) What is function? How do you call the function? Explain with an example. (5)
c) Write a short note on recursive function in python. (5)
d) Define python module. Write two ways to use import statement in python (5)
e) List and explain python string methods. (5)
f) How do you traverse over the string using while loop? Explain with an example. (5)

Q.3. Attempt any THREE of the following:

a) Which operations are performed with a list? Explain with an example. (5)
b) What is tuple? Explain tuple methods. (5)
c) What is python dictionary? Explain the two properties of dictionary key. (5)
d) Define file. Explain types of file modes. (5)
e) Define python directory. Explain any one method to handle directory. (5)
f) What is an Exception? Describe any four built-in exceptions in python. (5)

Q.4. Attempt any THREE of the following:

a) Describe the terminology of Object Oriented Programming. (5)
b) Explain the concept of constructor in python class. (5)
c) Define multiple inheritance with an example. (5)
d) Write a short note on data encapsulation in python (5)
e) What is method overloading? Give an exmaple. (5)
f) Describe any one of the following: (5)
1. findall() 2. split()

Q.5. Attempt any THREE of the following:

a) Describe any one of the following with python code: (5)
1. spinbox 2. entry
b) Write a short note on widget radiobutton. (5)
c) Describe relief style as a standard attribute of widget. (5)
d) How the look of GUI car be enhanced by changing default icon of parent window? Elaborate with an example. (5)
e) What is layout management? Explain place() layout manager. (5)
f) Write a program to configure the widget canvas. (5)

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SY I:T
19/10/23

M191023S12

Duration: 2.30 Hrs. **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 any three of the following:** **15**

A) Explain insertion operation for array.
B) What is time and space complexity? Explain Big Omega Notation with example.
C) Explain memory representation of two dimensional arrays.
D) List and explain different types of data structure.
E) What is time and space complexity? Explain Big Theta Notation with example.
F) What is sparse array? Explain it with example.

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

A) Explain how to insert a node in a linked list.
B) Write a note on reversing a linked list.
C) With a diagram explain Circular linked list.
D) Write a note on memory Allocation and Deallocation.
E) Write a note on traversing of a Circular linked list.
F) Explain the deletion of a node at last operation of Doubly linked list.

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

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

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

A) With an example explain Selection Sort.
B) Explain the Inorder traversal operation performed by a Binary Tree.
C) What is searching? Explain Binary search method.
D) List and explain the properties of Binary Tree.
E) With an example explain Merge Sort.
F) Write the steps to find numbers of internal and external nodes in binary search.

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

A) Write a note on Hashing.
B) Explain the properties of good hash function.
C) List and explain the common hash functions.
D) Consider the sequence 89, 18, 49, 58, 9. Solve it using linear probing for the given table size 10.
E) Write a note on bucket hashing.
F) Using linear probing draw the result of hashing for keys 19, 50, 89, 40 if H(X) = X mod 5.

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Duration: 2½hrs | M201023S21 | Max.Marks: 75

SYBSc IT 20/10/23

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:

a) Explain handshaking process of connection establishment. (5)
b) Write a short note on transmission impairment. (5)
c) What is data representation? Explain its types. (5)
d) List and explain the standard organizations in the world. (5)
e) Write a short note on components of data communication. (5)
f) What is layered task? Describe the design issues of the layers. (5)

Q.2. Attempt any THREE of the following:

a) Explain frequency Division Multiplexing technique. (5)
b) Differentiate between twisted pair cable and optical fiber cable. (5)
c) Describe service primitives in tabular format. (5)
d) Write a short note on types of channels. (5)
e) Explain the concept of microwave transmission. (5)
f) Write a short note on satellite system for data communication. (5)

Q.3. Attempt any THREE of the following:

a) Explain the concept of telegram network. (5)
b) Write a short note on MEO. (5)
c) Differentiate between message switching and packet switching. (5)
d) Explain design issues of wireless network. (5)
e) Explain the concept of cellular telephone network. (5)
f) Write a short note on IEEE 802.11 architecture. (5)

Q.4. Attempt any THREE of the following:

a) Generate CRC for data word 110010101 Divisor is 10101. (5)
b) Discuss the structure of IP frame header. (5)
c) Explain classful addressing and it's format. (5)
d) Write a short note on routing algorithm. (5)
e) List the advantages of IPv6. (5)
f) Write a short note on network layer duties. (5)

Q.5. Attempt any THREE of the following:

a) Differentiate between connection oriented and connectionless services. (5)
b) Write a short note on duties of transport layer. (5)
c) Compare UDP verses TCP. (5)
d) Draw the FDM system to combine 3 voice channels each voice channel occupies a bandwidth of 5 KHz. The common voice channel bandwidth has 15 KHz ranging from 501 KHz to 515 KHz. (5)
e) Write a short note on Wi-Max system. (5)
f) Explain the concept of Bluetooth. (5)

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(2½ Hours) M211023S30 Total Marks: 75

S4 I·T
21/10/23

N.B.: (1) All questions are compulsory.
(2) Numbers to the right indicate marks.
(3) Draw neat labeled diagrams wherever necessary.

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

A] Write a note on Batch operating systems.
B] Explain information security and protection advances in the development of operating system.
C] List and explain the three basic measures related to fault tolerance.
D] Write a note on swapping memory management technique in operating system.
E] Define operating system with Its objectives.
F] With a plot of tasks explain the multiprogramming system.

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

A] What design and management issues are raised by the existence of concurrency?
B] Explain adobe page maker as a multithreading application.
C] With a diagram explain user level and kernel level threads.
D] Write a note on race condition.
E] With an example explain competition among processes for resources.
F] List and explain the requirements for mutual exclusion.

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

A] List and explain two general categories of resources that can be distinguished.
B] Write a note on segmentation.
C] Explain how to detect deadlock.
D] What is virtual memory? State its advantages.
E] Consider below string and calculate the total page faults using optimal page replacement (OPT) algorithm.
7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
F] With a diagram explain page faults.

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

A] Using Shortest Job First algorithm (SJF) draw the Gantt chart for below table and calculate,
1) Average turnaround time
2) Average waiting time

Process	Burst Time	Arrival Time
P1	5	0
P2	2	0
P3	3	0

B] Write a note on Multiprocessor Scheduling.
C] With a diagram explain paging memory management.
D] List and explain the characteristics of Real-Time operating system.
E] What is scheduling? Explain different types of processor scheduling.
F] List and explain scheduling criteria.

P.T.O.

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

A] Write a note on I/O devices.

B] List and explain the operations on file or file system.

C] Write the objectives of file management system.

D] Explain different file access methods.

E] List and explain the attributes of file.

F] Write a note on Direct Memory Access (DMA).

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M2310235317

SYBSc IT
23/10/23

Time: 2.30 Hrs. **Full Marks: 75**

Instructions:
(1) All questions are compulsory.
(2) Numbers to the right indicate full marks.

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

a) Test the consistency of the following equations and solve them if they are consistent
x-y-z = 2, x+2y+z = 2, 4x-7y-5z = 2

b) Express $\sqrt{3}+i$ in polar form.

c) Show that $(1+i)^8+(1+i)^8 = 32$

d) If tanhx = ⅔, find the value of $\cosh^2 x$.

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

f) Using Euler's formula prove that $\sin^2\theta+\cos^2\theta=1$

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

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

b) Find the value of p in the equation $p^2+p(x+y)+xy=0$

c) Solve $\frac{d^2y}{dx^2}=\frac{36}{y^2}$ given that when x = 0, $\frac{dy}{dx}=0$, y = 8.

d) Find the value of y in the equation $p^3+p-e^y=0$

e) Find complete solution of the differential equation $(D^2+3D+2)y=e^{e^x}$

f) Cauchy linear differential equation is $x^2(\frac{d^2y}{dx^2})-x(\frac{dy}{dx})-3y=0$. Find the complete solution of this equation.

Q.3) **Attempt any three of the following** **(15)**

a) Find the Laplace transform of $\frac{(\cos at-\cos bt)}{t}$

b) Find Laplace transform of following differential equation
$\frac{dy}{dt}+3y(t)+2\int_0^t y(t)dt = t$; given y(0)=0

c) Find inverse Laplace transform of $\frac{1}{s(s^2+4)}$

d) Find inverse Laplace transform of $\frac{3s+1}{(s-1)(s^2+1)}$

e) Find the Laplace transform of $\int_0^t \frac{\sin t}{t} dt$

f) Find inverse Laplace transform of $\frac{e^{-2s}}{\sqrt{s+5}}$

Q.4) **Attempt any three of the following** **(15)**

a) Evaluate $\iint_0^1 \frac{dxdy}{\sqrt{(1-x^2)(1-y^2)}}$

b) Change the order of integration and evaluate $\int_0^a \int_{y^2/a}^{y} \frac{ydxdy}{(a-x)\sqrt{ax-y^2}}$

c) Solve $I = \int_0^2 \int_0^x \int_0^{2x+2y} e^{x+y+z} . dxdydz$

d) Evaluate $\int_1^e \int_1^e \int_1^e \frac{1}{xyz} dxdydz$

e) Find $\int_1^9 \int_{\sqrt{y}}^3 \frac{e^{x^2-2x}}{x+1} dxdy$

f) Evaluate $\int_0^2 \int_0^{\sqrt{2x-x^2}} \sqrt{x^2+y^2} dxdy$

Q.5) **Attempt any three of the following** **(15)**

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

b) Solve $\int_0^\infty x^2 . e^{-h^2x^2} dx$

c) Find $\int_0^\infty x^{-4} e^{-\frac{1}{x}} dx$

d) Evaluate $\int_0^{\frac{1}{2}} x^3\sqrt{1-4x^2}\, dx$

e) Simplify $\int_0^1 x^5(1-x^3)^{10} dx$

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

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D.S.M. College, Chiplun
ATKT Exam, Oct. 2023
Sem III
S Y B Sc. (IT.)
Sub: Database Mgmnt. (old course)

SY I.T
25/10/23

Date: **Time: 2 1/2 Hrs.** **Total Marks: 75**

Note: **1) Figures to right indicate full marks.**
2) Assume necessary data required.
3) All questions are compulsory.

Que. 1 **Solve the following (any three)**

A) List and explain the advantages and disadvantages of the DBMS. **05**
B) What is data abstraction? Explain the different levels of data abstraction. **05**
C) List and explain main functions of the Database Administrator. **05**
D) Explain the importance of the data model. **05**
E) Explain Relational Model with an example. **05**
F) List and explain advantages and disadvantages of the hierarchical model. **05**

Que. 2 **Attempt the following (any three)**

A) What is relational algebra? Explain any four fundamental operations for relational algebra. **05**
B) What is Integrity Constraints? List and explain its basic types. **05**
C) Explain the rules used for implementing relational Integrity. **05**
D) Explain outer join with an example. **05**
E) What is Normalization? Explain its forms with an example. **05**
F) What are the advantages and disadvantages of Normalization? **05**

Que. 3 **Solve the following (any three)**

A) Explain the use of aggregate functions with an example. **05**
B) What is a View? List and explain its advantages. **05**
C) What is a privilege? Explain the instructions used for granting and revoking privilege. **05**
D) Explain the use of group by and order by with an example. **05**
E) Explain set operators with an example. **05**
F) The **ACCOUNT** table have following structure. **05**

ACCOUNT

Attribute	Data type	Constraints
AccNo	Integer	Primary Key
CustName	Varchar	Not null
City	Varchar	Not null
Bdate	Date	
Balance	Integer	
Email	varchar	
AccType	char	'S' or 'C'

Write the query in a SQL for the following

1. For creating ACCOUNT table
2. To display Customer details who live in 'Chiplun' city.
3. To display a customer list whose balance is below 5000/-
4. To display City wise average balance.
5. To sort the list on AccNo.

Que. 4 **Attempt the following (any three)**

A) What is transaction? List and explain its properties. **05**
B) Explain concurrency control with locking methods. **05**
C) What are dead locks? What are basic techniques to control deadlocks? **05**
D) Explain different problems of concurrency control. **05**
E) List and explain various stages of transaction. **05**
F) Explain Database recovery management. **05**

Que.5 **Attempt the following (any three)**

A) What is a PLSQL? Explain the structure of a PLSQL block. **05**
B) What is a cursor for loop? Explain it with an example. **05**
C) Explain for loop with an example. **05**
D) How to create a Function and Procedure in a PLSQL? **05**
E) What is a trigger? Explain its types. **05**
F) What is a Package? Explain its components. **05**
