S.Y.IT

S.Y.I.T.

Oct. 2024-25

Regular Exam.

Sem-III

S101024031M

SY.I.T
10/10/24

Duration: 2[1/2]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: **(15)**

a) How to declare variables in python? Explain it with an example.
b) Explain Membership operator in detail.
c) Define looping statements. Explain for loop with an example.
d) What is debugging? State and explain three basic types of error.
e) How do you give comments in python? Describe in detail.
f) Define python. Explain highlighting features of python.

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

a) Describe the idea behind function composition with an example.
b) Explain Default arguments with an example.
c) Write a short note on flow of execution.
d) List and explain any five python string methods with an example.
e) Write two approaches to use import statement in python.
f) How do you search over a given string? Explain it in detail.

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

a) Define python list. How do you access and delete the elements of list?
b) Is it possible to update a tuple? Explain with an example.
c) What is dictionary? Explain the two properties of dictionary key.
d) Explain the following file handling functions:
   1. open() 2. close()
e) Define python directory. Explain any one method to handle directory.
f) What is an Exception? Describe any four built-in exceptions .

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

a) Describe the terminology of Object Oriented Programming.
b) Explain the concept of constructor in python class.
c) What is method overloading? Explain with an example.
d) Write a short note on static method.
e) How do you create and import module by yourself? Give an example.
f) Explain the following REgex functions:
   1. findall() 2. Search()

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

a) Describe any one of the following with python code:
   1. spinbox 2. entry
b) Write a short note on widget radiobutton.
c) Describe relief style as a standard attribute of widget.
d) How do you enhance the look of GUI by using messagebox?
e) What is layout management? Explain place() layout manager.
f) Write a program to configure the widget canvas.

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SY I.T
11/10/24

S1110241 2M

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

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

A) Write a note on memory Allocation and Deallocation.
B) Explain splitting operation of two linked list.
C) Write a note on Header linked list.
D) With an diagram explain singly linked list.
E) Explain the deletion of a node at last operation of Doubly linked list.
F) Write a note on reversing a linked list.

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

A) Write a note on Recursion.
B) List out the applications of Queue and Priority Queue.
C) What is Circular Queue? Explain with an example.
D) Convert the following infix expression into postfix expression ((A+B)*(C+D))/E .
E) Write a note on memory representation of a Stack.
F) Explain Array representation of Queue.

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

A) Write a note on Huffman Algorithm.
B) With an example explain Merge Sort.
C) What is searching? Explain Binary search method.
D) Write a note on Tree Structure.
E) With an example explain Bubble Sort.
F) Explain the Preorder traversal operation performed by a Binary Tree.

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

A) Explain the properties of good hash function.
B) Consider the sequence 89, 18, 49, 58, 9. Solve it using linear probing for the given table size 10.
C) Explain the separate chaining collision resolution techniques of hashing.
D) Explain Breadth First Search (BFS) graph traversal technique wih an example.
E) Define the following
1) Node 2) Weighted graph 3) Cyclic graph 4) Path 5) Edge
F) Explain memory representation of graph.

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S1410242 2M

SY.I.T
14/10/24

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 OSI Model with the help of diagram.
B] Explain the terms. 1) Bridge 2) Modem
C] With the help of diagram explain TCP/IP protocol suite.
D] Write a short note on evolution of computer networks.
E] Write difference between LAN, MAN and WAN.
F] Explain different types of computer networks.

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

A] With a diagram explain error correction in block coding.
B] List and explain different issues of data link layer design.
C] Explain the terms. 1) Data 2) Signals
D] Write a short note on periodic analog signals.
E] Explain data rate limits.
F] Write a note on periodic digital signals.

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

A] Explain query in detail.
B] Explain generations of cellular telephony.
C] Write a note on Border Gateway Protocol.
D] Elaborate 'Mapping logical to physical address: ARP'.
E] Explain IPv6 in detail.
F] With diagram explain packet format of Address Resolution Protocol.

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

A] Write a note on TCP Connection.
B] Explain the concept of three way handshaking with diagram.
C] Write all uses of UDP.
D] Explain the concept of connection termination with diagram.
E] Write a short note on user datagram.
F] Explain the concept of data transfer with diagram.

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

A] Explain FTP with its command.
B] How can we use SSH for cryptography? Explain in detail.
C] What is TELNET? Explain in detail.
D] List and explain importance of HTTP in computer networks.
E] Write a short note on DNS.
F] What is WWW? Explain in detail.

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(2 1/2 Hours) S15102430M Total Marks: 75 SY·IT 15/10/24

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] List and explain the functions of operating system.
B] Write a note on Batch operating systems.
C] Explain information security and protection advances in the development of operating system.
D] With a diagram explain process state.
E] Write a note on swapping memory management technique in operating system.
F] List and explain the three basic measures related to fault tolerance.

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

A] With a diagram explain user level and kernel level threads.
B] Explain three control problems must be faced by competing processes.
C] With an example explain semaphore.
D] Explain producer/consumer problem for critical section.
E] Write a note on race condition.
F] Explain adobe page maker as a multithreading application.

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

A] Consider below string and calculate the total page faults using optimal page replacement (OPT) algorithm.
6 0 1 2 0 4 3 0 2 6 3 2 0 1 6
B] Write a note on deadlock prevention.
C] Explain relocation requirement for memory management.
D] With a diagram explain dynamic partition memory management scheme.
E] What is virtual memory? State its advantages.
F] List and explain two general categories of resources that can be distinguished.

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

A] With a diagram explain page faults.
B] Consider a memory using page size of 4 bytes and a physical memory is of 32 bytes, show how the user's view of the memory can be mapped into physical memory.
C] What is scheduling? Explain different types of processor scheduling.
D] Write a note on segmentation.
E] Using Pre-emptive Shortest Job First algorithm (P-SJF) draw the Gantt chart for below table and calculate,
1) Average turnaround time
2) Average waiting time

Process	Burst Time	Arrival Time
P1	8	0
P2	4	1
P3	9	2
P4	5	3

F] Write a note on Multiprocessor Scheduling.

P.T.O.

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

A] With a diagram explain file system architecture.

B] Explain different file access methods.

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

D] Write a note on Redundant Array of Independent Disk (RAID).

E] What is File? Explain the properties of file.

F] List and explain the file structure.

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S161024371M

SYBSC Sem I
16/10/24

Time: 2.30 Hrs. **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 any three of the following **(15)**

a) Express in polar form $-1+i$

b) Show that $(1+i)^8+(1-i)^8=32$.

c) Verify cayley - Hamilton Theorem for the matrix $A=\begin{bmatrix}1 & 2 & -2\\ -1 & 3 & 0\\ 0 & -2 & 1\end{bmatrix}$

d) Find rank of matrix A
$A=\begin{bmatrix}1 & 2 & 3\\ 2 & 1 & 4\\ 3 & 0 & 5\end{bmatrix}$

e) Using euler's formula prove that : $\sin^2\theta+\cos^2\theta=1$

f) If $z_1=-2+4i$ and $z_2=1-3i$ find i) $|z_1.z_2|$ ii) $|z_1+z_2|$

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

a) If given equation is solvable for p, find the general solution of the equation $(p-3x)(p-2y)=0$.

b) Solve $\frac{dy}{dx}=xy+x+y+1$ by separation of variable

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

d) If given equation is solvable for x, find the general solution of the equation $xp^3-12p-8=0$.

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

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

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

a) Find Laplace transform of $\frac{\sin 3t}{2}+\frac{\sin t}{2}$

b) Evaluate inverse Laplace transform of $\frac{s}{(s^2-2)^4}$

c) Find inverse Laplace transform of $log\left(\frac{s+4}{s+8}\right)$

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

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

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

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

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

b) Change the order of integration and evaluate $\int_0^1 \int_{x^2}^x xy\, dxdy$

c) Evaluate $\int_0^1 \int_0^z \int_0^{x+z} 6xz\, dydxdz$

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

e) Find $\int_0^3 \int_1^2 (x^2y)\, dydx$

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

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

a) Evaluate $\int_0^\infty 5^{-4x^2} dx$

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

c) Simplify $\int_0^\infty e^{-ax} x^{n-1} dx$

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

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

f) Find $\int_0^\infty \sqrt[4]{x}\, e^{-\sqrt{x}} dx$

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