

Total No. of Questions : 5]

SEAT No. :

PE-13075

[Total No. of Pages : 3

[6523]-1001

M.Sc. Tech. (Information Technology)

IT-501 MJ : MODERN OPERATING SYSTEM

(2024 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Attempt any Eight of the following :

[8 × 2 = 16]

- a) Define peer to peer computing.
- b) List various types of system call.
- c) State the role of medium term scheduler.
- d) What is exit() system call?
- e) Define Response Time.
- f) What is synchronization?
- g) What is Logical Address?
- h) “Wait-for-graph is used for deadlock avoidance in system” comment True or false.
- i) List any 2 file attributes.

Q2) Attempt any Four of the following :

[4 × 4 = 16]

- a) Explain functions of operating system with suitable diagram.
- b) Compare preemptive and Non-preemptive scheduling.
- c) Explain Dining philosophers problem.
- d) Explain deadlock avoidance techniques.
- e) Explain file operations in detail.

P.T.O.

Q3) Attempt any Four of the following :

[4 × 4 = 16]

- a) Describe process state with suitable diagram.
- b) Explain CPU and I/O burst cycle.
- c) What are the types of semaphores? Explain its usage and implementation.
- d) Describe paging with diagram.
- e) Explain tree structure directory with advantages.

Q4) Attempt any Four of the following :

[4 × 4 = 16]

- a) Consider the following snapshot

Process	Burst Time	Arrival Time
P ₁	5	1
P ₂	3	0
P ₃	2	2
P ₄	4	3
P ₅	2	13

Compute average turn around time and average waiting time with Round Robin algorithm with time slice = 2.

- b) Explain critical section problem.
- c) What is memory Management & List its functions.
- d) Describe contiguous allocation method of file.
- e) Consider the page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2. How many page faults would occur for the LRU & Optimal page replacement algorithm? Assume 3 frames.

Q5) Attempt any One of the following :

[1 × 6 = 6]

- a) Consider a system with 5 processes $\{P_0, P_1, P_2, P_3, P_4\}$ and four resource types $\{A, B, C, D\}$. There are 3 instances of type A, 14 instances of type B, 12 instances of type C and 12 instances of type D. The allocation & Maximum demand matrices are as follows :

	Allocation					Max			
	A	B	C	D		A	B	C	D
P_0	0	6	3	2	P_0	0	6	5	2
P_1	0	0	1	2	P_1	0	0	1	2
P_2	1	0	0	0	P_2	0	7	5	0
P_3	1	3	5	4	P_3	2	3	5	6
P_4	0	0	1	4	P_4	0	6	5	6

Answer the following questions using Banker's algorithm.

- What are the contents of the need array?
 - Is a system in safe state?
 - If the request from process P_4 arrives for $(0, 0, 4, 1)$ can the request be immediately granted?
- b) Describe Internal Fragmentation.



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SEAT No. :

PE-13076

[Total No. of Pages : 2

[6523]-1002

M.Sc. Tech. (Information Technology)

IT-502 MJ : .NET PROGRAMMING

(2024 Pattern) (Semester - I)

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 the diagrams wherever necessary.*

Q1) Attempt any Eight of the following :

[8 × 2 = 16]

- a) What is ViewState in ASP.NET?
- b) What is a Master Page in ASP.NET?
- c) Explain the concept of State in ASP.NET applications.
- d) Differentiate between CheckBox and RadioButton controls.
- e) Explain abstraction in C# programming.
- f) What is an array? How is an array declared in C#?
- g) Differentiate between private and protected access modifiers in C#.
- h) What is a function in C#? Explain its declaration syntax.
- i) Define polymorphism in object-oriented programming.

Q2) Attempt any Four of the following :

[4 × 4 = 16]

- a) Describe exception handling in C# with a suitable example.
- b) Write a C# program to swap two numbers.
- c) Explain any five commonly used properties of ASP.NET web server controls.
- d) Describe the ASP.NET page life cycle in detail.
- e) Explain HTML events in ASP.NET with suitable examples.

P.T.O.

Q3) Attempt any Four of the following :

[4 × 4 = 16]

- a) Explain the concept of a static class in C# with a suitable example.
- b) Write a C# program to calculate the sum of two numbers.
- c) Write a short note on the Queue<T> collection in C#.
- d) Explain the server-side state management techniques used in ASP.NET.
- e) Explain the different types of inheritance C# with suitable examples.

Q4) Attempt any Four of the following :

[4 × 4 = 16]

- a) Describe the key features of ADO.NET.
- b) Write a C# program to perform factorial of given number.
- c) Explain the various validation controls available in ASP.NET.
- d) Describe the features of C# within the .NET Framework.
- e) Explain the main components of ADO.NET.

Q5) Attempt any One of the following :

[1 × 6 = 6]

- a) Write a C# program to accept 10 numbers from the user and display the minimum and maximum values from the array.
- b) Explain the ASP.NET MVC architecture with a suitable example.



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SEAT No. :

PE-13077

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[6523]-1003

F.Y. M.Sc. Tech. (Information Technology)

**IT - 503 - MJ : OBJECT ORIENTED SOFTWARE ENGINEERING
(2024 Pattern)(Semester - I)**

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Solve any Three questions from Q.2 to Q.5.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw the diagram wherever necessary.*

Q1) Attempt any Five of the following :

[5 × 1 = 5]

- a) What is object orientation?
- b) What is interaction?
- c) Define Forking.
- d) What is composition?
- e) What is the use of a state chart diagram?
- f) What is a lifeline?
- g) What is the symbol of dependency in UML?

Q2) Attempt the following :

[5 × 2 = 10]

- a) What is inheritance? Write types of inheritance.
- b) What is agile unified process?
- c) What are behavioural things?
- d) What is a requirement?
- e) What is use case? Explain with example.

P.T.O.

Q3) Attempt the following :

[2 + 4 + 4 = 10]

- a) Define thing. Explain the type of things in UML.
- b) Explain the importance of modeling.
- c) Draw Use Case Diagram for Hospital Management System.

Q4) Attempt the following :

[2 + 4 + 4 = 10]

- a) What is an object diagram? Explain it with notations.
- b) Explain which diagrams are called an interaction diagram. Explain with example.
- c) Draw a state chart diagram for an ATM.

Q5) Attempt the following :

[5 + 5 = 10]

- a) What are the different types of testing?
- b) What are the generic components of object oriented design?



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SEAT No. :

PE13078

[Total No. of Pages : 2

[6523]-1004

First Year M.Sc. Tech. (Information Technology)
IT-510-MJ : ADVANCE MOBILE TECHNOLOGY
(2024 Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5.*
- 3) *Figures to the right indicates full marks.*
- 4) *Draw the diagrams wherever necessary.*

Q1) Attempt any Five of the following.

[5×1=5]

- a) Define Intent. List types of Intent.
- b) What is Service in Android?
- c) What is Adapters in Android?
- d) What is String.xml?
- e) What is the use of ProgressBar?
- f) What is expo?
- g) What is context?

Q2) Attempt the following.

[2+4+4=10]

- a) Differentiate between ImageView and ImageButton.
- b) What is a Toast? Write its syntax.
- c) List the different types of Layouts in Android.

P.T.O.

Q3) Attempt the following.

[2+4+4=10]

- a) Explain the features of React Native? Explain.
- b) Explain Activity Life Cycle of Android.
- c) List and Explain methods of SQLiteOpenHelper.

Q4) Attempt the following.

[2+4+4=10]

- a) Explain Button with any five Property.
- b) Explain TimePicker and TimePickerDialog.
- c) Explain the concept of 'flexbox' and its role in React Native layout.

Q5) Attempt the following.

[5+5=10]

- a) Explain the architecture of a React Native app.
- b) What is Menu? List different types of Menu in Android.



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[Total No. of Pages : 2

PE13079

[6523]-1005

First Year M.Sc. Tech. (Information Technology)

IT-512-MJ : WEB TECHNOLOGY

(2024 Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw the diagrams wherever necessary.*

Q1) Attempt any Five of the following.

[5×1=5]

- a) Define jQuery.
- b) What is XML?
- c) Expand AJAX.
- d) What is SOAP?
- e) What is JSON?
- f) Define DOM.
- g) What is CodeIgniter?

Q2) Attempt the following.

[2+4+4=10]

- a) Explain jQuery fundamentals.
- b) Describe jQuery event model.
- c) Explain animations and effects in jQuery.

P.T.O.

Q3) Attempt the following.

[2+4+4=10]

- a) Explain structure of XML document.
- b) Explain AJAX-PHP framework.
- c) Explain SimpleXML extension in PHP.

Q4) Attempt the following.

[2+4+4=10]

- a) Define AJAX web application model.
- b) Describe XML parser.
- c) Describe AJAX validation process.

Q5) Attempt the following.

[5+5=10]

- a) Explain SOAP based web services.
- b) Explain JSON syntax and JSON vs XML.



Total No. of Questions : 5]

SEAT No. :

PE13080

[Total No. of Pages : 2

[6523]-1006

F.Y. M.Sc. Tech. (Information Technology)
IT-514-MJ : DATABASE TECHNOLOGY
(2024 Pattern) (Semester - I)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw the diagrams wherever necessary.*

Q1) Attempt any Five of the following.

[5×1=5]

- a) Define relational database.
- b) What is column-family store?
- c) What is version stamp?
- d) What is read consistency?
- e) What is materialized view?
- f) What is incremental MapReduce?
- g) Define graph database.

Q2) Attempt the following.

[2+4+4=10]

- a) Explain value of relational databases.
- b) Explain consequences of aggregate orientation.
- c) Explain distribution models in NoSQL.

P.T.O.

Q3) Attempt the following.

[2+4+4=10]

- a) What is a key-value database?
- b) Explain consistency in key-value stores.
- c) Write suitable use cases of column-family databases.

Q4) Attempt the following.

[2+4+4=10]

- a) What is MapReduce?
- b) Explain partitioning and combining in MapReduce.
- c) Explain CRUD operations in HBase.

Q5) Attempt the following.

[5+5=10]

- a) Explain features of document databases.
- b) Explain suitable use cases of graph databases.



Total No. of Questions : 4]

SEAT No. :

PE13081

[Total No. of Pages : 2

[6523]-1007

F.Y. M.Sc. Tech. (Information Technology)

RM IT-531-RM : RESEARCH METHODOLOGY

(2024 Pattern) (Semester - I)

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 the diagrams wherever necessary.*

Q1) Attempt any EIGHT of the following.

[8×2=16]

- a) State any two objectives of research.
- b) Define Research.
- c) What is plagiarism?
- d) Define publication ethics.
- e) What is a hypothesis?
- f) List any two characteristics of a good researcher.
- g) What is sampling?
- h) What is literature review?
- i) Define research design.

Q2) Attempt any FOUR of the following.

[4×4=16]

- a) What are the types of motivation in research?
- b) Distinguish between research methods and research methodology.
- c) Explain different types of plagiarism.
- d) What is the role of the internet in literature review?
- e) Explain the criteria of good research with suitable example.

P.T.O.

Q3) Attempt any FOUR of the following. **[4×4=16]**

- a) Explain the research process with suitable example.
- b) Explain exploratory and descriptive research.
- c) Explain the steps involved in defining a research problem.
- d) Discuss the features of a good research design.
- e) Explain methods of data collection for research.

Q4) Attempt any FOUR of the following. **[4×4=16]**

- a) What is the importance of interpretation?
- b) Explain types of hypothesis.
- c) Explain Chi-square test and its applications.
- d) What are the advantages and disadvantages of sampling method?
- e) What are the importance significance of research?

Q5) Attempt any ONE of the following. **[1×6=6]**

- a) What are the ethics of research integrity?
- b) What are the problems with publications in predatory journals and publishers?

