

Roll No.

Total Pages : 04

BT-4/M-23

44151

DISCRETE MATHEMATICS

PC-CS-202A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (i) In a survey of 300 students, 64 had taken a Mathematics course, 94 had taken a English course and 58 had taken a Computer course. 28 had taken Mathematics and Computer course, 26 had taken English and Mathematics course and 22 had taken English and Computer course. 14 had taken all three courses :
- (a) Draw the Venn diagram for the same.
 - (b) How many students were surveyed who had taken none of the three courses ?
 - (c) How many had taken Computer only ?
 - (d) How many had taken Mathematics only ?
 - (e) How many had taken English course but not Mathematics course and Computer course ?

12

(ii) Prove that :

$$(B^c \cap U) \cap (A^c \cup \Phi) = (A \cup B)^c. \quad 3$$

2. (i) Differentiate Universal and Existential Quantifiers with suitable examples. show that $P \rightarrow (Q \rightarrow R)$ is equivalent to $(P \wedge Q) \rightarrow R$. 7.5
- (ii) Differentiate DNF and CNF with suitable examples. Obtain DNF of $(P \rightarrow Q) \wedge (\neg P \wedge Q)$. 7.5

Unit II

3. (i) Define Relations. Explain various properties of relations. 7.5
- (ii) Let $A = \{a, b, c, d\}$. Determine the types of the following relations : 7.5
- (a) $R_1 = \{(a, a), (b, b), (a, c), (c, c), (d, d), (c, a)\}$
- (b) $R_2 = \{(a, b), (b, a), (c, d), (d, c)\}$
- (c) Check whether R_1 is Equivalence relation or not.
4. Let $D_{100} = \{1, 2, 4, 5, 10, 20, 25, 50, 100\}$ and let the relation \leq be the relation (divides) be a partial ordering on D_{100} (a) Determine GLB and LUB, maximal element and minimal element of B, where $B = \{10, 20\}$,
(b) Determine GLB and LUB, maximal element and

minimal element of $B = \{5, 10, 20, 25\}$. (c) Also draw hasse diagram for D_{100} . (d) Define Lattice and Check D_{100} forms lattice or not justify your answer. 15

Unit III

5. (i) A box contains 6 white balls and 5 red balls. In how many ways, 4 balls can be drawn from the box if (a) They can be of any color (b) Two balls are white and two are red. (c) All balls are of same color ? 9
- (ii) Differentiate Injective and Surjective functions with suitable examples. 6
6. (i) Find the particular solution of the difference equation $a_{r+2} - 2a_{r+1} + a_r = 3r + 5$. 7.5
- (ii) State Pigeon Hole Principle. Explain with suitable examples. 7.5

Unit IV

7. Define Group. Write various properties of a Group. Consider $(G, *)$ be an algebraic system. G is set of non-zero real numbers, where $*$ is defined by $a*b = ab/4$. Show that $(G, *)$ is a Group. 15

8. Define Semigroup. Write properties of semigroup. Consider the set N of positive integers, and $*$ be the operation of l.c.m (least common multiple) on N . (a) find $4*6$, $3*5$, $9*18$, $1*6$ (b) Is $(N, *)$ a semigroup? Justify your answer. (c) Find identity element of $*$.

15

Roll No.

Total Pages : 03

BT-4/M-23

44152

INTERNET TECHNOLOGY AND
MANAGEMENT
PC-CS204A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss various modes of connecting to internet. 7
(b) Explain the IP addressing scheme used in internet.
How are these addresses assigned and what are its
various classes ? 8
2. Discuss the following terms : 15
 - (a) DNS
 - (b) Internet culture and Internet business culture
 - (c) Internet congestion
 - (d) Collaborative computing
 - (e) ISP.

Unit II

3. What do you understand by FTP, HTTP and Gopher Command ? Explain the techniques of FTP. 15
4. Write short notes on the following : 15
 - (a) Directory search engine
 - (b) Meta search engine.

Unit III

5. Explain various concepts of scripting language. Also explain in detail server side programming in java script. 15
6. Write short notes on the following : 15
 - (a) Mailer features and e-Mail inner working
 - (b) Message components and Message Composition.

Unit IV

7. Explain the following : 15
 - (a) Digital signature
 - (b) Firewalls
 - (c) Intrusion Detection System.

8. Write short notes on the following :

15

(a) PWS

(b) IIS

(c) Apache Webserver.

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Total Pages : 03

BT-4/M-23

44153

OPERATING SYSTEMS

PC-CS-206A

Time : Three Hours]

[Maximum Marks : 75

Note: Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Enumerate the different operating system structure and explain with neat sketch. 10
- (b) What is the need of protection of a system ? How can it be achieved ? 5
2. (a) Explain the purpose of system calls and discuss the calls related to device management and communication. 10
- (b) List the services provided by an operating system. 5

Unit II

3. (a) What is dining philosopher problem ? Explain its solution with semaphore. 10
- (b) Define thread and explain advantages of using threads. 5

4. Consider the following set of processes with CPU burst in milliseconds :

15

| Process ID | Burst time | Priority |
|------------|------------|----------|
| P1 | 6 | 2 |
| P2 | 12 | 4 |
| P3 | 1 | 5 |
| P4 | 3 | 1 |
| P5 | 4 | 3 |

- (i) Assume all processes arrived in order P1,P2,P3,P4,P5 all at time 0. Draw Gantt Chart using FCFS, SJF, priority scheduling(smaller number implies higher priority) and round robin scheduling (time quantum = 2).
- (ii) For pre-emptive mode of shortest job first consider the arrival time P1(3), P2(1), P3(4), P4(0), P5(2). Using this draw Gantt chart.
- (iii) Find the waiting time and turn around time for each process using the above scheduling algorithms in (i) and (ii) point. Also find which of the above algorithms results in minimal average waiting time.

15

Unit III

5. Define deadlock. State and explain conditions that are necessary for deadlock to occur. Explain the use of Banker's algorithm for deadlock avoidance with example.

15

6. (a) For the page reference string :
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2,
3, 6.
Calculate the Page Faults applying (i) FIFO
(ii) Optimal (iii) LRU Page replacement algorithms
for a memory with three frames. 8
- (b) Explain the concept of segmentation for memory
management. Explain, why combined paged
segmentation is used with illustration. 7

Unit IV

7. (a) Consider disk having 200 tracks (0-199). The request
sequence {82, 170, 43, 140, 24, 16, 190} of disk
and the head start is at request 50, find the total
head movement to satisfy all the requests for each
of the following disk scheduling algorithms-FCFS,
SSTF, SCAN, CSCAN. 10
- (b) Write a short note on DMA. 5
8. Discuss in detail about different file allocation methods.
Also give advantages and disadvantages of each of them.
15

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Total Pages : 02

BT-4/M-23

44154

DESIGN AND ANALYSIS OF ALGORITHMS
PC-CS-208A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What are Asymptotic Notations ? Explain all notations in detail. 10
- (b) Explain the concept of Strassen Multiplication. 5
2. What do you mean by Recurrence ? Write Master Theorem for solving Recurrence. 15

Unit II

3. Write Algorithm for Matrix Chain multiplication and explain it with the help of example. 15
4. What are Red-Black trees ? Write algorithms for insertion and deletion in Red-Black trees. 15

Unit III

5. (a) What are strongly connected components ? Explain. 7.5
- (b) Differentiate between Breadth first search and Depth first search. 7.5
6. (a) Illustrate the concept of NP-hard and NP-complete classes. 5
- (b) Explain the concept of Relaxation and write Bellman Ford algorithm. 10

Unit IV

7. Explain the terms Residual networks, Augmenting paths and Cuts and write Ford Fulkerson Algorithm. 15
8. Explain the following : 15
- (i) Zero-one principle
 - (ii) Comparison network
 - (iii) Bitonic sorting network.

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Total Pages : 03

BT-4/M-23

44215

UNIVERSAL HUMAN VALUES II-
UNDERSTANDING HARMONY
HTM-901A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) 'For fulfillment of human being—physical facility, relationship and right understanding—all three are necessary'. Explain. 7½
- (b) Explain the role of Education-Sanskar in holistic development. 7½
2. (a) Explain the concept of Value Education. What are the basic guidelines for value education ? 7½
- (b) The proposal for happiness is "The state or situation, in which I live, if there is harmony/synergy in it, it is naturally acceptable to me to be in that state/situation". 7½

Unit II

3. (a) 'If your imagination is guided by your natural acceptance, you are sure to be in harmony and happiness within.' Explain it. 7½
- (b) 'Gross Misunderstanding—Assuming Human Being to be only the Body'. Explain. 7½
4. What is the responsibility of the Self towards the Body? How is it fulfilled? 'The human body is a self organized unit'. How? 15

Unit III

5. 'Trust—The Foundational Value in Relationship'. Explain. 15
6. What do you understand by 'Respect'? Describe the role of Physical Facility and Right understanding in the relationship. 15

Unit IV

7. (a) How does 'Justice' lead to mutual happiness? Explain the natural process of a child in an environment of relationship and in an environment of domination. 7½

(b) Write a short note on 'nature (units) submerged in space'. 7½

8. 'There is interconnectedness and mutual fulfillment among the four orders of nature.' Elaborate on this statement.

15

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Total Pages : 3

BT-6/M-23

46165

COMPILER DESIGN

Paper-PC-CS-302A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt any *five* questions, selecting at least *one* question from each unit.

UNIT-I

1. (a) What is Regular Expression ? Write an algorithm to convert regular expression into NFA. 9
 - (b) Draw NFA for the Regular Expression $a(a + b)^*ab$.
 - (c) Draw NFA for $a + b + ab$.
 - (d) Draw NFA corresponding to $(0 + 1)^*1(0 + 1)$.
(2+2+2)
2. What are different phases of compiler and explain the role of different phases. 15

UNIT-II

3. (a) What is parsing? Explain top, down and bottom up parsing with the help of example. 9
- (b) $E \rightarrow T$
 $T \rightarrow T * F$
 $T \rightarrow id$
 $F \rightarrow T$
 $F \rightarrow id$

Draw parse tree representation of above expression for $id * id$.

6

4. What is LALR(1) parsing ? Draw DFA and parsing table for the following equation :

$S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b.$

15

UNIT-III

5. (a) What is heap allocation and stack allocation? Prove it by taking an appropriate example. 10

(b) What are different issue is designing of code generator?

5

6. What is DAG and write its algorithm ? For the following statements :

1. $S1 := 4 * i$

2. $S2 := a[S1]$

3. $S3 := 4 * i$

4. $S4 := b[S3]$

5. $S5 := S2 * S4$

6. $S6 := \text{prod} * S5$

7. $S7 := i + 1$

$i := S7$

if $i \leq 20$ goto 1

15

UNIT-IV

7. What are different source of optimization ? Explain the following optimization in detail with example :
- (a) Machine independent optimization.
 - (b) Loop optimization.
 - (c) Peephole optimization. 15
8. What is Global data flow analysis ? Explain Storage organization, static storage management and heap storage management with the help of example. 15
-

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Total Pages : 2

BT-6/M-23
COMPUTER NETWORKS
Paper-PC-CS-304A

46166

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt any *five* questions, selecting at least *one* question from each unit.

UNIT-I

1. (a) What are the advantages and disadvantages of wired and wireless networks? (6)
- (b) Explain layers of TCP/IP architecture. (9)

2. (a) What are different network topologies. (9)
- (b) Discuss various transmission impairments at physical layer. (6)

UNIT-II

3. (a) What are flow control protocols? Discuss with diagram working of sliding window protocol and selective repeat ARQ. (9)
- (b) What are the functions of switches and routers? At which layer of the OSI-RM do these operate? (6)

4. (a) Explain how error is detected and corrected in digital transmission. (9)

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- (b) Give the working of p-persistent, 1-persistent and non-persistent CSMA-CD. (6)

UNIT-III

5. (a) What does IEEE 802.x standard indicate? Give *five* different examples and their purpose under this series of IEEE standards. (9)
(b) Describe the working of IPv6 protocol. (6)
6. (a) Describe ICMP protocol and various messages in it. (9)
(b) Explain the unicast and multicast routing protocols. (6)

UNIT-IV

7. (a) Discuss various distinguishing features of TCP. (9)
(b) Explain the importance of user authentication, integrity and cryptography. (6)
8. (a) Explain the working of firewall. Describe different types of firewall configurations. (9)
(b) Describe the working of DNS protocol including chain of DNS servers. (6)
-

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Total Pages : 2

BT-6/M-23

46167

ADVANCED COMPUTER ARCHITECTURE

Paper-PE-CS-S302A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) Explain multilevel hierarchical framework with a neat diagram.
(b) Explore the relationship between programming languages and parallel architectures. (7+8=15)

2. (a) Explain the architecture of VLIW processors and its pipeline operation.
(b) Elaborate the level of parallelism in program execution on modern computers. (7+8=15)

UNIT-II

3. (a) Discuss the main tasks of super scalar processing. Also compare VLIW with super scalar processors.
(b) What are different approaches to branch handling? (7+8=15)

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4. (a) What are the Instruction issue policies of the superscalar processor?
(b) Explain the performance effects of branch penalty. How can we reduce branch penalties? (7+8=15)

UNIT-III

5. (a) Compare bandwidths of locked, pended and split transaction buses.
(b) Explain systolic array and its applications. (7+8=15)
6. (a) Write a brief note on distributed and shared memory architectures.
(b) Explain multistage networks with proper functionality. (7+8=15)

UNIT-IV

7. (a) Explore working process of virtual memory in computer architecture.
(b) Discuss memory hierarchy with the help of suitable diagram. (7+8=15)
8. (a) What is cache coherence problem?
(b) Discuss snoopy cache protocol by taking proper example. (7+8=15)
-

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Total Pages : 3

BT-6/M-23

46173

UNIX AND LINUX PROGRAMMING

Paper-PC-IT-207A (PE-CS-S314A)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting atleast *one* question from each Unit.

UNIT-I

1. (a) Write atleast *three* types of shells and how to change shell. (5)
- (b) Write a program to find largest of three numbers. (10)

2. Write the command and its syntax for following action :
 - (i) View name of files in descending order by time wise.
 - (ii) Create new user with shell specified.
 - (iii) View test.test files with permission and change permission from rw-r—rw- to rwxrw-r-- (15)

UNIT-II

3. (a) Explain the significance of single quote and double quote.
- (b) Define grep. Write a grep command to display the lines which does not matches all the given pattern and find names "Deepak" , "Dipak" and "Deepk". (15)

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4. (a) What is use of sed in linux and write commands to delete all lines in file and replace a Particular word in that file.
- (b) What do you mean by filter in linux and write commands for
- (i) Case insensitive search.
 - (ii) Displaying the count of number of matches.
 - (iii) Show line number while displaying the output.
- (15)

UNIT-III

5. (i) What are different options of gcc compiler options for :
- (a) create only object files from test.c files.
 - (b) create executable files from test.c files.
 - (c) create executable files from object files.
 - (d) Debug the program and show warning.
- (ii) Create makefile to execute and delete atleast two .c files. (15)
6. (a) Write the commands of vi-editor for deleting character and word, copy single lines and three lines, paste, cursor navigation and save.
- (b) What is format of du and df command. Write atleast two syntax format options of these commands and their uses. (15)

UNIT-IV

7. (a) What is process? Write command to view all the process in system including hidden process, stop a particular process, sending background to foreground and foreground to background process.

- (b) What is signal and write signal of rc, stopping the process and priority? (15)
8. (a) What is difference between linux OS and Windows OS? Why Linux is considered more advanced and secure than windows.
- (b) Write the uses of telnet and ftp server. Write the commands to start, stop and status to check the status of ftp server.
- (c) What is job scheduling and write the syntax to set job scheduling using at and crontab command to ceate directory after 10 minute and 10/5/2023 at 9:30 am.
-

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Total Pages : 2

BT-6/M-23

46175

SOFT SKILLS AND INTERPERSONAL COMMUNICATION

Paper-OE-CS-302A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting atleast *one* question from each unit.

UNIT-I

1. What is communication and define its types. (15)
2. Illustrate the flow and role of communication. (15)

UNIT-II

3. Define the different barriers of communications. (15)
4. Discuss the objectives and characteristics of communication. (15)

UNIT-III

5. What is personality? Discuss the different ways to develop the personality. (15)
6. Illustrate the basics principles of basic organization skills. (15)

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28/6

UNIT-IV

7. What is group discussion? Write the different forms and ways of discussion. (15)
 8. What is job interview? Write down different types and stages of interview. (15)
-

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Total Pages : 2

47244

BT-7/M-23

**SOFTWARE VERIFICATION & VALIDATION
AND TESTING**

Paper : PE-CS-D-403-A

Time : Three Hours]

[Maximum Marks : 75

Note: Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT-I

1. (a) What does the term 'Software Evolution' refer to? What reasons make software evolution necessary?
(b) Describe the steps included in the SDLC framework.

2. Answer the following questions in brief:
 - (a) How is Software Testing defined?
 - (b) What is the difference between verification and validation?
 - (c) What is the significance of test cases and test oracles in software testing?

UNIT-II

3. What is the goal of functional testing and what steps are followed in functional testing? List the different types of Functional testing and describe in brief any *two* of them.

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4. What are the advantages and disadvantages of structural testing? Bring out the distinction between Mutation testing and Data Flow testing. Also, describe the steps that should be followed in calculating cyclomatic complexity.

UNIT-III

5. Why is test case reduction important? Does regression testing reduce the number of test cases? Bring out the difference between regression testing and Slice-based testing.
6. Describe and highlight the distinction between Unit Testing, System Testing, and Integration Testing.

UNIT-IV

7.
 - (a) What is Software Quality and why is it important? How do we assess the quality of a software design using software quality guidelines and attributes?
 - (b) Describe Boehm's Software Quality Model and explain its levels of quality attributes.
 8. Answer the following questions in brief:
 - (a) What is Capability Maturity Model (CMM) used for?
 - (b) Distinguish between Stress testing and Ad hoc testing.
 - (c) What is the aim of Agile testing?
-

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Total Pages : 3

BT-7/M-23

47246

NEURAL NETWORKS AND DEEP LEARNING

Paper-PE-CS-D411A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting atleast *one* question from each Unit-I to Unit-IV. All questions carry equal marks.

UNIT-I

1. Show the mapping and structural view point of Artificial Neural Network (ANN). Distinguish between Biological neural network and artificial neural networks. (15)
2. Distinguish between Supervisory Learning and Unsupervisory Learning in Artificial Neural Network (ANN). Give a brief idea of neural network taxonomy and terminologies. (15)

UNIT-II

3. (a) Explain step by step procedure of Single Discrete Perception Training Algorithm (SDPTA).
(b) With suitable diagram explain the concept of back propagation. Derive update equations for weight elements of multi-layer feed forward neural network.
(7+8=15)

4. (a) A Hopfield network made up of 5 neurons, which is required to store the following three fundamental memories.

$$E_1 = \{+1, +1, +1, +1, +1\}^T$$

$$E_2 = \{+1, -1, -1, +1, -1\}^T$$

$$E_3 = \{-1, +1, -1, +1, +1\}^T$$

Evaluate the 5-by-5 synaptic weight matrix of the network.

- (b) Write a detailed note on adaptive resonance theory networks architecture and training algorithms.

(7+8=15)

UNIT-III

5. (a) Consider a Kohonen network with two cluster units and five input units. The weight vectors for the cluster units are $w_1 = [0.1, 0.3, 0.5, 0.7, 0.9]$ and $w_2 = [0.9, 0.7, 0.5, 0.3, 0.1]$. Use the square of the Euclidean distance to find the winning cluster unit for the input pattern.

- (b) Write a note on learning vector quantization architecture and training algorithm.

(7+8=15)

6. (a) What is Boltzmann Machine? Mention the two different architectures of Boltzmann Machine. Discuss briefly the working concepts of Boltzmann Machine.

- (b) Why do we use optical networks? How does an optical neural network works? Discuss.

(7+8=15)

UNIT-IV

7. (a) What is the need and importance of machine learning? Discuss under-fitting and over-fitting challenges in machine learning.
- (b) Draw and explain the architecture of convolutional network. (7+8=15)
8. (a) What are the different machine learning types? Explore its potential applications in speech recognition.
- (b) Write a note on deep forward networks. (7+8=15)
-

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Total Pages : 2

47249

BT-7/M-23

CYBER LAW AND ETHICS

PAPER : OE-CS-401A

Time : Three Hours]

[Maximum Marks : 75

Note: Attempt any *five* questions by selecting at least *one* question from each unit.

UNIT-I

1. (i) Differentiate real approach and consensual approach with example. (8)
- (ii) Discuss the significance of domain name in controlling cyber crime. (7)
2. (i) Differentiate criminal jurisdiction and cyber jurisdiction with example. (8)
- (ii) Discuss various steps involved in web development agreement. (7)

UNIT-II

3. (i) Discuss the role of cyber regulations appellate tribunal. (7)
- (ii) What is IT Act 2000? What are its limitations? (8)

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228 [P.T.O.]

4. (i) Discuss various types of cryptography with example. (8)
(ii) Explain the working digital signature in detail. (7)

UNIT-III

5. (i) Discuss various methods to protect electronics database. (7)
(ii) What is a copyright dispute? Discuss various methods to resolve copyright disputes. (8)
6. Write short notes on :
(i) Banker Book Evidence Act.
(ii) Criminal Procedural Code. (2×7½=15)

UNIT-IV

7. (i) Discuss various ethics issues in AI. (7)
(ii) Discuss the significance of cyber ethics. (8)
8. (i) Define Block chain. Discuss the role of chain in cyber ethics. (8)
(ii) Discuss various Ethics used for information society. (7)
-

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Total Pages : 2

BT-8/M-23

48159

CLOUD COMPUTING

Paper : PE-CS-A402A / PE-IT-A404A / CSE-420N / IT-418N

Time Allowed : 3 Hours]

[Maximum Marks : 75

Note : Attempt five questions in all, selecting at least one question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) Discuss various characteristics of Cloud computing. Write various pros and cons of Cloud computing. 7
- (b) Differentiate utility and distributed computing with examples. 8
2. (a) Discuss on "History of Cloud computing". 7
- (b) Differentiate grid and Cloud computing with examples. 8

UNIT-II

3. (a) Discuss various types of Protocols used in Cloud computing. 7
- (b) Differentiate Data Security and Network Security. 8

4. (a) Differentiate Community and Hybrid cloud with suitable examples. 8
- (b) Discuss various Services offered by Cloud computing. 7

UNIT-III

5. (a) List different components involved in SLA. Discuss in detail the role of SLA in Cloud computing. 8
- (b) Discuss Case study on Eucalyptus. 7
6. (a) Differentiate CRM and ERP with examples. 7
- (b) How the data is stored in Cloud computing ? Discuss various techniques used to manage database in Cloud. 8

UNIT-IV

7. (a) Discuss Cloud contracting model in detail. 7
- (b) Differentiate Network Level and Application Level Security. 8
8. (a) Explain IAM model in detail. 8
- (b) Discuss various jurisdictional issues raised in Data location. 7

BT-8/M-23

48249

CYBER SECURITY

Paper-OE-CS-402A

Time Allowed : 3 Hours]

[Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT-I

- 1. (a) Discuss the nature and scope of Cybercrime. Write a detailed note on Cyberspionage. 7
- (b) What is Cyber Extortion ? How does it work ? Differentiate between Cyber extortion and Ransomware. 8
- 2. (a) Write the principles of Block cipher. How it is different from Stream Cipher ? 5
- (b) Give a note on Shannon's theory of Confusion and diffusion. 5
- (c) What are the strength of DES ? Differentiate between Linear Cryptanalysis and Differential Cryptanalysis. 5

UNIT-II

- 3. (a) What is a Secure Hashing Algorithm (SHA) ? Briefly explain Hashing functions. Differentiate between SHA1 and SHA2. 7

- (b) Elaborate about NIST standard for Digital signature. Write the proof of Digital signature algorithm. How it works ? 8
4. (a) What problem was Kerberos designed to address ? Explore the principal differences between Version 4 and Version 5 of Kerberos ? 7
- (b) Where is Pretty Good Privacy (PGP) widely used ? Which uses Pretty Good Privacy algorithm ? Discuss. 8

UNIT-III

5. (a) Differentiate between Active attacks and Passive attacks. What are key issues in Data security ? Explore Security considerations. 7
- (b) (i) Discuss the relationship between Firewall and VPN. Does Firewall affects VPN ?
- (ii) How do you ensure OS security ? Elaborate. 8
6. (a) What are the key features of Secure Electronic Transaction (SET) ? Who developed SET ? How does it works ? 7
- (b) Briefly explain different types of Viruses. Discuss about the web threats for Organizations. What is Firewall protection for ? 8

UNIT-IV

7. (a) Explain Digital Forensics lifecycle. Write about Chain to Custody with Example. 7

- (b) List the challenges in Digital Forensics. Briefly explain tools and techniques in Digital forensics. 8
8. (a) What is Cybercrime ? Who are Cybercriminal ? Explain about Cyber scenarios and challenges to Indian Cyber laws 7
- (b) (i) Who do we need cyber laws ? Explain about the Cybercrime and punishments over world.
- (ii) Discuss the modes and components of Encapsulating Security Payload. 8

Roll No.

Total Pages : 3

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WEB AND INTERNET TECHNOLOGY

Paper-OE-CS-410A

Time Allowed : 3 Hours]

[Maximum Marks : 75

Note : Attempt five questions in all, selecting at least one question from each Unit. All questions carry equal marks.

UNIT-I

1. What is Internet and who is its owner ? Sketch and describe the Anatomy of Internet along with its basic building blocks. Also describe the impact of Internet on Society.
2. Answer the following questions in brief :
 - (a) Give an overview of WWW along with its history.
 - (b) What is the role of the Information Architect ?
 - (c) Describe any three usability guidelines for designing the Search Interface.

UNIT-II

3. Give a brief description of the following in the context of Internet Services :
 - (a) Broadband Internet Connection and its Hardware requirements.

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- (b) Clients, Servers and Workstations.
 - (c) Network Security and Firewalls.
4. Describe in brief the following in the context of HTML :
- (a) HTML tags.
 - (b) Table and Forms.
 - (c) Text Styles and Style Sheets.

UNIT-III

5. Answer the following questions in brief :
- (a) List any three application areas where Python can be the most suitable language for development.
 - (b) List and describe the various standard data types defined in Python.
 - (c) Illustrate using an example the syntax and use of *if-else* statement in Python.
6. (a) How is a function defined ? How can we pass arguments in a function ? Write a program of your choice to illustrate the use of recursive function in Python.
- (b) What are Lists and Dictionaries ? How is a dictionary created and how elements are added and deleted in a Dictionary ?

UNIT-IV

7. Explain the concept of classes and objects using an example program in Python. Also explain the following in the context of Python :
 - (a) Inheritance and Encapsulation.
 - (b) Exception handling.
8.
 - (a) Describe the basic File handling Operations in Python.
 - (b) How are tables created and searched using SQL ?