58456/435E1C

OPERATING SYSTEMS

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. Define the term— Operating system.

2. Mention any two Operations of Operating systems.

3. What is Deadlock?

4. Define the term — Process.

5. What are the different Process states?

6. Define the term — Swapping in memory management.

7. What is Demand-paging in memory management?

8. What is Segmentation in memory management?

9. Mention the name of various Disk scheduling algorithms.

10. What is meant by Free space management?

11. What is 'grep' command in Unix?

12. How to execute a Shell script?

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Discuss on System programs and Operating system structure.

14. Explain the basic concepts of Process scheduling and Scheduling criteria.

15. Describe about Deadlock detection and recovery.

16. Discuss on Contiguous Memory allocation in memory management.

17. Explain the structure of Page table in memory management.

18. Describe about the various Allocation methods in File systems

19. Discuss on Shell variables, Input-Output commands and command substitution.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Describe about the Operating system services and System calls.

21. Explain the various Process scheduling algorithms.

22. Discuss on the basics of Semaphore and the Classical problems of Synchronization

23. Describe the different kinds of Page replacement algorithms.

24. Explain the concept of Files and Access methods.

25. Discuss on Branching control structure in Shell programming.

——————

22. Show that $R \to S$ can be derived from the premises $P \to (Q \to S)$, $\neg R \vee P$ and Q.

23. Use generating functions to solve the recurrence relation $a_n = 3a_{n-1} + 2$ with the initial condition $a_n = 1$.

24. Find the Eigen values and Eigen vectors of the matrix $A = \begin{pmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{pmatrix}$.

25. Define Isomorphism of two graphs and discuss with examples.

DISCRETE MATHEMATICS.

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. Define binary relation.

2. Give an example of one-one function.

3. Show that the proposition $P \vee (\neg P \vee Q)$ is tautology.

4. Define disjunctive normal form.

5. Write the symbolic form of the sentence:

   "If any one is good then John is good".

6. Find the first three terms of the sequence defined by the recurrence relation:

   $a_n = 6a_{n-1}$ given $a_0 = 2$

7. Define cyclic permutation.

8. Find the value of $8C_3$.

9. Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$.

10. State Cayley-Hamilton theorem.

11. Define bipartite graph.

12. Give an example of a connected graph.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Draw the directed graph representing each of the relations from

(a) $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

14. Show that $\left(\neg (\neg (P \vee Q) \wedge R) \vee \neg Q \right) \Rightarrow Q \wedge R$.

15. Prove that
$(\exists x)(P(x) \wedge Q(x)) \Rightarrow (\exists x)P(x) \wedge (\exists x)Q(x)$

16. How many permutations of $\{a, b, c, d, e, f, g\}$

(a) End with a?

(b) Begin with c?

(c) Begin with c and end with a?

17. Let A and B be symmetric matrices of order n. Then prove the following :

(a) $A + B$ is symmetric.

(b) AB is symmetric iff AB = BA.

18. Verify Cayley–Hamilton theorem for the matrix $A = \begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$.

19. Prove that the number of odd degree vertices is always even.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. If $f : A \to B$ is one-one and onto then prove that f^{-1} is also one-one and onto.

21. Obtain the PCNF and PDNF of $\left(\neg P \to R \right) \wedge (Q \leftrightarrow P)$.

WEB DEVELOPMENT

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. What is meant by dynamic web content?

2. Write any two structural elements tags of HTML.

3. What is the use of stylesheet on web pages?

4. How do you declare a variable and assign value to it in Javascript? Give an example.

5. What is the purpose of PHP?

6. What is the job of cookie?

7. Expand and write a note on the term MVC.

8. Name any two directives in Angular JS.

9. Expand and write a note on the term DOM is HTML.

10. What is the purpose of AJAX?

11. Write a note on PHP server and its purpose.

12. How to comment to MySQL database? Write connection string.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. How do you embed audio and video on web pages? Give an example for each.

14. Describe control flow statement in JavaScript.

15. How do you define and call a function in JavaScript. Illustrate with an example.

16. Explain array handling and its associated function in JavaScript.

17. Illustrate control flow features in PHP.

18. Explain the use of built-in objects in PHP/

19. What are custom directives in AJAX? Explain their use.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Describe the three-tier architecture of client server application.

21. Explain the tags in HTML for web application development.

22. Explain in detail about CSS definition and application of style on web pages.

23. With code examples, explain the session and authentication management of PHP.

24. With code example explain about filters and tables in angular JS.

25. Explain the features of AJAX for server side coding.

_____

INTROD. TO COMPUTER
ARCHITECTURE

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. What is data in a digital system?

2. What are the examples of fixed point numbers?

3. What is the full form of gate?

4. What are the types of K Maps?

5. Is full adder a sequential circuit?

6. How do you write the product of sum form?

7. What is meant by synchronous counter?

8. What are T counters?

9. What are I/O devices?

10. Define cache memory

11. Expand the terms ROM and RAM and write the difference between them.

12. Write a note on optical disk storage volume.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Bring out the features of digital systems.

14. What is hexadecimal number system? Explain with an example.

15. Write a brief note on Boolean identities.

16. What is XNOR? Discuss in brief about its working procedure with a neat structure.

17. What are code converters? Discuss in brief about its functions and its types.

18. Write a brief note D Flip flop with a neat structure.

19. Discuss in brief about EEPROM with a neat structure.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Explain in detail about fixed and floating point representation of numbers with an example.

21. Elaborate in detail about error correcting codes with an example.

22. How do you find a K-Map for Product of Sums term? Explain in detail with a neat structure.

23. What are decoders? Describe in detail about its working with a neat structure.

24. What are shift registers? Elaborate in detail about its types with a neat architecture.

25. Describe in detail about Secondary memory devices and explain any three with its structure.

———————

MACHINE LEARING .

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions

1.   What are the advantages of machine learning? Explain.

2.   Differentiate between the testing and validating.

3.   What is supervised learning?

4.   Define: "Regression".

5.   Mention the basic concept of descriptive learning.

6.   Give the paths through the hypothesis space.

7.   What is the least-squares method? Explain.

8.   Write a note on descriptive rule learning.

9.   State the purpose of support vector machines.

10. What are the advantages of k-means algorithm?

11. How to interpret the results from machine learning ?

12. What are kinds of features identified for machine learning algorithm?

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions

13. Summarise the main challenges of machine learning.

14. Explain the end- to-end machine learning project.

15. What are the models of machine learning? Explain.

16. Describe the features of machine learning.

17. Elaborate the Decision tree learning as variance reduction.

18. Bring out the probabilistic models with hidden values

19. Describe the mapping the ensemble landscape with example.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions

20. Outline the steps to discover and visualize the data to gain insights.

21. Discuss the methods of class probability estimation.

22. Illustrate the learning unordered rule sets with example.

23. Demonstrate the implementation of first–order rule learning.

24. Examine the Naïve Bayes model for classification

25. Analyze the concepts of feature construction and selection.

—————

58107/IT22A/
MC22A

DATA STRUCTRES &
ALGORITHM.

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. How to measure execution time of algorithms?

2. Name the complexities involved in algorithm design.

3. List the factors which affect the execution time of an algorithm.

4. Name a divide and conquer algorithm.

5. Is merge sort a stable sorting method?

6. State the principle of Optimality.

7. Draw an example multistage graph.

8. Define Hamiltonian cycle.

9. Write any two applications of search techniques in graph.

10. What is a Minimum Cost Spanning tree?

11. State knapsack problem formally.

12. Define the chromatic number of a graph.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Write short notes on algorithmic problem solving.

14. Explain with example the concept of randomization.

15. List out the steps in mathematical analysis of recursive algorithm.

16. Derive worst case and average case complexities for quick sort.

17. Write an algorithm to determine GCD of two numbers using recursion.

18. Write an algorithm to for N queens problem and trace it for n = 6.

19. Write short notes on NP hard and NP completeness.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Explain the various criteria used for analyzing algorithms.

21. Apply greedy algorithm to generate single-source shortest path with an example graph. Mention its time complexity.

22. Apply the branch-and bound technique in solving the travelling salesman problem.

23. With example explain Selection Sort algorithm.

24. Use an algorithm for greedy strategies in the knapsack to find an optimal solution to the knapsack instance $n = 7$, $m = 15$,
$(p1, p2....., p7) = (10, 5, 15, 7, 6, 18, 3)$ and
$(w1, w2,.....w7) = (2, 3, 5, 7, 1, 4, 1)$

25. Derive time complexity of job sequencing with deadlines Obtain the optimal solution when $n = 5$,

$(p1, p2....) = (20, 15, 10, 5, 1)$ and

$(d1, d2,....) = (2, 2, 1, 3, 3)$.

————

AGILE SOFTWARE ENG.

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions

1. What is meant by requirement gathering?

2. What is Agile in software development?

3. When to use Agile model?

4. Mention the three pillars of scrum.

5. What is meant by scrum master?

6. Write about cyclic delivery.

7. Define distribution.

8. Define refinement.

9. What is meant by story card?

10. What is meant by process transparency?

11. How is abstraction expressed in software engineering?

12. What are the main advantages of global software development?

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions

13. Write about Agile documentation.

14. List out the capabilities of Agile.

15. How crystal method is used in Agile process? Explain.

16. What are all the roles and practices to be followed? Explain.

17. List out the challenges of migrating to Agile methodologies.

18. Survey about current Agile practices.

19. Summarize on Agile metrics.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions

20. Compare traditional model Vs Agile model.

21. How Agile methods are classified ? Explain.

22. Demonstrate the lifecycle of Agile model.

23. Discuss about the role of knowledge management in software engineering.

24. Elaborate on requirement management in Agile environment.

25. Elucidate on feature Driven Development(FDD)

_____

DBMS .

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1= 10 marks)

Answer any TEN questions.

1.   List out three levels of data abstraction.

2.   Give the reasons for introducing null value in database.

3.   What is an unsafe query? Give an example.

4.   In what ways transaction is different from an ordinary program.

5.   What is deadlock?

6.   Define JDBC.

7.   Why does prefetching be important?

8.   Distinguish between static hashing and dynamic hashing.

9.   Compare dense index with sparse index.

10.   What is type inheritance in object database?

11. Specify the information is stored in the system catalogs.

12. Write note on information retrieval.

PART B — (5 × 5= 25 marks)

Answer any FIVE questions.

13. Write note on following
    (a) Primary key
    (b) Super key
    (c) Candidate key
    (d) Foreign key

14. Does the relational model provide physical and logical data independence? Explain.

15. Define join? Explain different join operations.

16. Explain 5NF with an example.

17. When does a buffer manager write a page to disk? Explain.

18. Define these terms:
    (a) Conflict-serializable schedule
    (b) View-serializable schedule

19. Describe fragmentation and replication with respect to data storage.

PART C — (4 × 10= 40 marks)

Answer any FOUR questions.

20. Explain the working of selection, projection, union, intersection and except operations in SQL.

21. Explain ACID properties.

22. List out and explain levels of RAID.

23. Construct a B+-tree for the following set of key values:

    (2, 3, 5, 7, 11, 17, 19, 23, 29, 31)

    Assume that the tree is initially empty and values are added in ascending order. Construct B-trees for the cases where the number of pointers that will fit in one node is as follows:

    (a) Four
    (b) Six
    (c) Eight

24. Explain LAN, SAN and WAN.

25. Elaborate DDL and DML commands with an example.

_____

BIG DATA

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. What is Big data?

2. Define the term Data analytics.

3. Mention the classification of Analytics.

4. What is Hadoop?

5. What is YARN?

6. What is MapReduce?

7. What are Big data Serialization formats?

8. Define the terms — Mapper and Reducer in MapReduce.

9. What is Apache Hadoop Distributed File system?

10. Mention any two features of Hive.

11. Specify the Data types in Pig.

12. What is the use of Piggy Bank in Pig?

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Discuss on the evolution of Big data.

14. Describe about the characteristics of Big data analytics and the need for it.

15. Explain the basics of Hadoop and the need for Hadoop.

16. Discuss on the method of Interacting with Hadoop Ecosystem.

17. Describe about the Real-time applications using MapReduce.

18. Explain the data type in Hive.

19. Discuss on the Word count example using Pig.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Explain the basics of Business intelligence, Data science and Analytics.

21. Describe the Use case of Hadoop, Hadoop distributors and Hadoop Distributed File system.

22. Discuss on the method of Processing data, Managing resources and applications with Hadoop.

23. Explain the basics of Partitioner and the process of Searching, Sorting in MapReduce.

24. Describe about the Hive architecture.

25. Discuss on the Pig Philosophy, Use case for Pig, and ETL Processing.

————————

IOT

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions.

1. What is protocols?

2. Define multimedia.

3. What is meant by sensor networks?

4. Define M2M.

5. What is BAC Net?

6. Define KNX.

7. What is meant by Grid Computing?

8. Define Web.

9. Tell about WoT.

10. Short note on Integration of IoT.

11. Define smart Grid.

12. Write about software Agents.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

13. Write about the four pillars of IoT.

14. Explain the peer to peer Networks.

15. Describe the WSN protocols.

16. Explain the unified data standard.

17. Describe the two pillars of the web.

18. Discuss about population model.

19. Explain the electrical vehicle charging.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

20. Explain the layers of Internet.

21. Discuss about the middleware for IoT.

22. Write about the following:

(a) Zigbee Architecture

(b) ASP Layer

23. Describe the unified multitier WoT Architecture.

24. Explain the Business model for IoT.

25. Describe the role of IoT in production Environments.

_____

Cloud Computing

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer any TEN questions

1.   What is meant by cloud computing?

2.   Give the cloud Platform.

3.   What is storage virtualization?

4.   Define IaaS.

5.   What is Private cloud?

6.   Tell about SLA.

7.   What is Hypervisors?

8.   Short note on virtual machine.

9.   What are the cloud Resource?

10.   Tell about Image management in UM.

11. What is Google AppEngine?

12. List out the facebook API.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions

13. Write about the Business benefits of cloud.

14. Describe the cloud computing stack.

15. Explain the service models (XaaS) of cloud computing.

16. Discuss the types of cloud in deployment model.

17. Describe the understanding machine Image.

18. Explain the Mechanisms for Resource management in cloud.

19. Explain the google app engine API.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions

20. Explain the fundamental cloud Architectures.

21. Illustrate the platform as a Service (PaaS).

22. Describe the Lifecycle of SLA.

23. Explain the Architectural styles for cloud Applications.

24. Describe the stability Two–level Resource Allocation Architecture.

25. Explain the microsoft Azure architecture for compute and storage.

—————

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

1. Name any two applications of AI.

2. Differentiate: Agent and Program.

3. What is meta reasoning?

4. What are called non deterministic actions?

5. What is called local beam search?

6. Mention the rule for forward pruning

7. Give one example for constraint satisfaction problem.

8. What is called first order logic?

9. What is modal logic?

10. What is called uncertainty in reasoning?

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

11. Briefly explain the risks and benefits of AI.

12. Discuss about uninformed search strategies.

13. Explain Greedy Best first search method.

14. Illustrate the working of Hill climbing search with an example.

15. Discuss the limitations of Game search algorithm.

16. Define Constraint satisfaction problem and explain its working with an example.

17. Explain Inference using full joint distributions.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

18. Explain the nature of environments and structure of agents.

19. Explain the various Heuristic search strategies.

20. Illustrate the working of simulated annealing method.

21. Explain Alpha-Beta pruning algorithm.

22. Discuss on propositional logics.

23. Elucidate the algorithms for classical planning.

————

Cloud Computing.

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

1. Define the term Cloud Storage.

2. List down the types of Cloud Deployment models.

3. What are the pros and cons of Cloud Service Deployment?

4. Define On demand Computing.

5. How to create to-Do lists in Cloud?

6. How to collaborate for Group projects in Cloud?

7. What is the purpose of Cloud Calendar Application?

8. What are the tools available in Cloud for storing and sharing files?

9. How the Open Source platforms collaborate with Cloud Computing?

10. List the ways to collaborate via Blogs in Cloud.

PART B — (5 × 5 = 25 marks)

Answer any FIVE questions.

11. Elucidate on Cloud Architecture with neat sketch.

12. Describe the Pros and Cons of Cloud Computing paradigm.

13. Classify the various Cloud Deployment Models with neat Sketch.

14. How will the Cloud Services Collaborate on Group Projects and Events?

15. Analyze the working procedure for Cloud Contact Management with suitable illustration.

16. Give a brief account on Event Management.

17. Explain the ways to evaluate Web Mail Services.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions

18. Define the term Cloud Computing. Briefly review about the ways by which companies use Cloud at present, with suitable example.

19. Explain with neat sketch the various Cloud Development Services and Tools.

20. How the Cloud Computing can be used for Managing Community? Explain in detail.

21. Describe in detail the Event Management Applications available in Cloud with Neat Sketch.

22. With illustrations explain in detail about Web-Based Databases Management.

23. Recommend the planning strategies for collaborating via Social Networks and Groupware.

———————