

**M.Sc. (Part-II) Semester-IV (CBCS Pattern) Examination
COMPUTER SCIENCE**

4MCS1 : Artificial Intelligence and Expert Systems

Time : 3 Hours]

[Maximum Marks : 80

Note :— (1) Illustrate your answers with the help of neat sketches wherever necessary.

(2) Assume suitable data wherever necessary.

1. (a) Write a program in Prolog to find sum of all elements of an integer list. 7
(b) State and explain features of Prolog language. 7

OR

2. (a) Explain any four list operations in Prolog. 8
(b) Explain with example the fail predicate. 6
3. (a) What is problem decomposition ? Explain. 7
(b) What is AI ? Describe the areas where AI techniques can be applied. 7

OR

4. (a) Describe various control strategies with respect to production systems. 8
(b) What is water jug problem ? Explain. 6
5. (a) Explain various properties of good knowledge representation system. 7
(b) Describe the issues in knowledge representation. 6

OR

6. (a) Explain in brief :
(i) Simple relational knowledge
(ii) Inferential knowledge. 8
(b) What are heuristic functions ? State their role in problem solving. 5
7. (a) What is 'waiting for quiescence'? Explain. 5
(b) Explain Minmax search procedure. 8

OR

8. Describe the additional refinements that can be used to improve the performance of minmax procedure. 13
9. (a) Explain how to represent facts in logic. Give suitable examples. 6
(b) Explain types of schemes in structured knowledge representation system. 7

OR

10. (a) Explain with example, 'well-formed formulas.' 7
(b) Explain declarative knowledge. Give suitable examples. 6
11. (a) Explain supervised and unsupervised learning. 6
(b) Explain the architecture of multi-layer neural network. 7

OR

12. (a) What is pattern recognition ? Explain its applications. 7
(b) Explain in brief semantic nets. 6

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4MCS2 : Design and Analysis of Algorithms

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) ALL questions are compulsory.

(2) Assume suitable data wherever necessary.

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|-----------|---|---|
| 1. | (a) What is Divide and Conquer ? Explain. | 6 |
| | (b) Explain : | |
| | (i) Pseudocode | |
| | (ii) Recursive Algorithm | 8 |
| OR | | |
| 2. | (a) How to evaluate the performance of an algorithm ? Explain. | 7 |
| | (b) Write an algorithm for merge sort. | 7 |
| 3. | (a) What is dynamic programming ? Explain. | 6 |
| | (b) Explain : | |
| | (i) Optimal merge pattern | |
| | (ii) Optimal storage on tape. | 8 |
| OR | | |
| 4. | (a) State and explain Kruskal's algorithm. | 7 |
| | (b) What is Greedy Method ? Explain. | 7 |
| 5. | (a) What is breadth first search ? Explain. | 7 |
| | (b) State and explain 8 Queens problem. | 6 |
| OR | | |
| 6. | (a) What is Depth First Search ? Explain. | 7 |
| | (b) Explain : | |
| | (i) Graph Coloring | |
| | (ii) Hamiltonian cycle. | 6 |
| 7. | (a) What is branch and bound method ? Explain. | 7 |
| | (b) Explain FIFO branch and bound solution for 0/1 Knapsack problem. | 6 |
| OR | | |
| 8. | (a) What is FFT ? Explain. | 7 |
| | (b) What is control abstraction for LC-Search ? | 6 |
| 9. | (a) What are comparison trees ? Explain. | 7 |
| | (b) What is parallel computation ? Explain. | 6 |
| OR | | |
| 10. | (a) What is ordered searching ? Explain. | 7 |
| | (b) How Oracle is useful to solve Largest and Second Largest problem ? Explain. | 6 |
| 11. | (a) What is NP-hard and NP-complete problem ? Explain. | 7 |
| | (b) State and explain Cook's theorem. | 6 |
| OR | | |
| 12. | (a) Explain NP-Hard Graph problems. | 7 |
| | (b) What is DHC ? Explain. | 6 |

M.Sc. (Part-II) Semester-IV (CBCS Pattern) Examination
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4MCS4(1) : Mobile Communications

Time : 3 Hours]

[Maximum Marks : 80

Note :— (1) Illustrate your answer with the help of suitable example/diagram wherever necessary.

(2) Assume suitable data wherever necessary.

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|-----------|---|---|
| 1. | (a) Explain various applications of mobile communications. | 8 |
| | (b) What is modulation ? Explain amplitude and frequency modulation. | 6 |
| OR | | |
| 2. | (a) Draw network reference model for mobile communication. Explain function of each layer in the model. | 8 |
| | (b) Explain cellular system with its advantages and disadvantages. | 6 |
| 3. | (a) How multiple access is possible with collision avoidance ? Explain. | 8 |
| | (b) What are the various mobile services provided by GSM ? Explain. | 6 |
| OR | | |
| 4. | (a) Explain UMTS in detail. | 8 |
| | (b) Compare CDMA with FDMA. | 6 |
| 5. | (a) Write and explain four different types of satellite orbits. | 7 |
| | (b) Explain cyclical repetition of data. | 6 |
| OR | | |
| 6. | (a) Explain digital audio broadcasting system. | 7 |
| | (b) Explain : | |
| | (i) Localization | |
| | (ii) Handover. | 6 |
| 7. | (a) Explain : | |
| | (i) Protocol Architecture of IEEE 802.11. | 7 |
| | (ii) Infrastructure and ad-hoc network. | |
| | (b) What is WATM ? Explain WATM in detail. | 6 |
| OR | | |
| 8. | (a) Explain Infrared and radio transmission. Also write how they differ from each other. | 6 |
| | (b) Explain : | |
| | (i) Architecture of Bluetooth | |
| | (ii) BRAN | 7 |
| 9. | (a) Explain classical TCP improvement in mobile environment. | 6 |
| | (b) Explain TCP over 3G wireless network. | 7 |
| OR | | |
| 10. | (a) Explain dynamic host configuration protocol. | 6 |
| | (b) Explain concept of mobile ad-hoc network in detail. | 7 |
| 11. | (a) Explain : | |
| | (i) Wireless application protocol architecture | |
| | (ii) Wireless session protocol. | 7 |
| | (b) Explain different file systems with example. | 6 |
| OR | | |
| 12. | (a) What is WML ? Explain WML and WML script. | 7 |
| | (b) Explain WAP 2.0 in detail. | 6 |

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4MCS4 (3) : Software Testing (GIC)

Time : Three Hours]

[Maximum Marks : 80

Note :— (1) Illustrate your answers with the help of suitable examples/diagram wherever necessary.

(2) Assume suitable data wherever necessary.

1. (a) Explain the role of Software Tester in Software Testing environment. 8
 (b) What is need of Software Testing ? 6
- OR**
2. (a) Explain incremental testing approach. 8
 (b) What is evaluation ? Give its features. 6
 3. (a) Differentiate between software verification and software validation. 7
 (b) What is documentation short cuts ? Give its limitations. 7
- OR**
4. (a) Explain test outline. Give its features. 7
 (b) What is documentation test cases ? Explain with example. 7
 5. (a) Explain various types of tables in test cases. 6
 (b) What is decision table ? Give its advantages. 7
- OR**
6. (a) What are the applications used in complex data ? 7
 (b) What is System Testing ? Give its features. 6
 7. (a) What are the factors needed in testing Web Application ? 7
 (b) Explain configuration and compatibility testing. 6
- OR**
8. (a) Write a note on the following : 6
 (i) Reliability
 (ii) Availability. 7
 (b) What is database testing ? Explain, why it is needed in testing ? 7
 9. (a) What is Risk Analysis ? Give its advantages. 7
 (b) Explain priority category scheme. 6
- OR**
10. (a) What are combination schemes ? Give its example. 7
 (b) Explain the procedure for tracking selected test cases. 6
 11. (a) What is software quality development infrastructure ? 6
 (b) Explain software testing environment. 7
- OR**
12. (a) What are software testing tools ? Why it is needed in software testing ? 7
 (b) Write a note on the following : 6
 (i) Pareto Chart
 (ii) Run Chart

