

Computer Science Engineering Sample Papers

1 The problems 3-SAT and 2-SAT are

- A) both in P
- B) both NP-complete
- C) NP-complete and in P respectively
- D) undecidable and NP-complete respectively

Answer : (C)

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2 Consider the following relation schema pertaining to a students database:

Student (rollno, name, address)

Enroll (rollno, courseno, coursename)

where the primary keys are shown underlined. The number of tuples in the Student and Enroll tables are 120 and 8 respectively. What are the maximum and minimum number of tuples that can be present in (Student * Enroll), where "*" denotes natural join?

- A) 8, 8
- B) 120, 8
- C) 960, 8
- D) 960, 120

Answer : (C)

3 Consider a relation scheme $R = (A, B, C, D, E, H)$ on which the following functional dependencies hold : $(A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A)$. What are the candidate keys of R?

- A) AE, BE
- B) AE, BE, DE
- C) AEH, BEH, BCH
- D) AEH, BEH, DEH

Answer : (D)

4 The goal of structured programming is to

- A) have well indented programs
- B) be able to infer the flow of control from the compiled code
- C) be able to infer the flow of control from the program text
- D) avoid the use of GOTO statements

Answer : (C)

5 The tightest lower bound on the number of comparisons, in the worst case, for comparison-based sorting is of the order of

- A) n
- B) n^2
- C) $n \log n$
- D) $n \log^2 n$

Answer : (B)

6 A circuit outputs a digit in the form of 4 bits. 0 is represented by 0000, 1 by 0001, ...,

9 by 1001. A combinational circuit is to be designed which takes these 4 bits as input and outputs 1 if the digit ≥ 5 , and 0 otherwise. If only AND, OR and NOT gates may be used, what is the minimum number of gates required

- A) 2
- B) 3
- C) 4
- D) 5

Answer : (C)

7 WA and B are the only two stations on an Ethernet. Each has a steady queue of frames to send. Both A and B attempt to transmit a frame, collide, and A wins the first backoff race. At the end of this successful transmission by A, both A and B attempt to transmit and collide. The probability that A wins the second backoff race is

- A) 0.5
- B) 0.625
- C) 0.75
- D) 1.0

Answer : (A)

8 If 73_x (in base-x number system) is equal to 54_y (in base-y number system), the possible values of x and y are

- A) 8, 16
- B) 10, 12
- C) 9, 13
- D) 8, 11

Answer : (D)

9 In a packet switching network, packets are routed from source to destination along a single path having two intermediate nodes. If the message size is 24 bytes and each packet contains a header of 3 bytes, then the optimum packet size is

- A) 4
- B) 6
- C) 7
- D) 9

Answer : (D)

10 A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given below: 10, 8, 5, 3, 2 Two new elements 1 and 7 are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is

- A) 10, 8, 7, 5, 3, 2, 1
- B) 10, 8, 7, 2, 3, 1, 5
- C) 10, 8, 7, 1, 2, 3, 5
- D) 10, 8, 7, 3, 2, 1, 5

Answer : (D)

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11 Consider an operating system capable of loading and executing a single sequential user process at a time. The disk head scheduling algorithm used is First Come First Served (FCFS). If FCFS is replaced by Shortest Seek Time First (SSTF), claimed by the vendor to give 50% better benchmark results, what is the expected improvement in the I/O performance of user programs ?

- A) 50%
- B) 40%
- C) 25%
D) 0%

Answer : (D)

12 How many distinct binary search trees can be created out of 4 distinct keys?

- A) 5
- B) 14
- C) 24
- D) 42

Answer : (B)