

GATE 2024 Question Paper Feb 10 (CSE - Slot 1)

Ques 1. TCP client 'P' successfully established a connection to TCP server Q, let N_p denotes the sequence number in the Syn sent from P to Q. Let N_Q denotes the acknowledgement number in the Syn acknowledgement from Q to P. Which of the following statement is/are correct?

- A. The acknowledgement number N_q is equal to $N_p + 1$
- B. The sequence number N_p is chosen randomly by P
- C. Sequence number N_p is always 0 for new connection
- D. The acknowledgement number N_q is equal to N_p

Ans. A and B are correct.

Ques 2. $a \square b = a+2b$

$a \square b = ab$

- A. Operator \square obeys the associative law
- B. Operator \square over \square obey distributive law
- C. Operator \square over \square obey distributive law
- D. Operator \square obeys the associative law

Ans. B and D are correct.

Ques 3. The number of spanning tree in a complete graph of 4 vertices is labeled as A, B, C, D.

Ans. 16

Ques 4. $\log(P^2 + Q^2) = \log P + \log Q + 2 \log 3$. Find the value of $(P^4 + Q^4) / P^2 Q^2$.

- A. 9**
- B. 79**
- C. 80**
- D. 85**

Ans. B

Ques 5. Consider the min-heap, there are 105 distinct elements. Let K be the indexed of the maximum element.

Ans. 53

Ques 6. Consider a memory management system, which uses page size of 2 kb. Physical address space and logical or virtual address space begins @ 0. Pages 0, 1, 2, 3 are stored in frame 1, 3, 2, 0, 4 respectively. What is the physical address corresponding to the virtual address of 2500?

Ans. 6596

Ques 7. Which of the following is/ are true?

- A. Threads belonging to a process are by default not protected by each other.**
- B. Each thread has its own file descriptor**
- C. Threads can only be implemented in kernel space**
- D. All threads belong to a process has its own stack**

Ans. A and D are correct

Ques 8. Consider an array of size 'n', we wish to check whether array is sorted or not in only one pass and by comparing one element with next (adjacent element). The worst-case time to check this?

Ans. $\theta(n)$

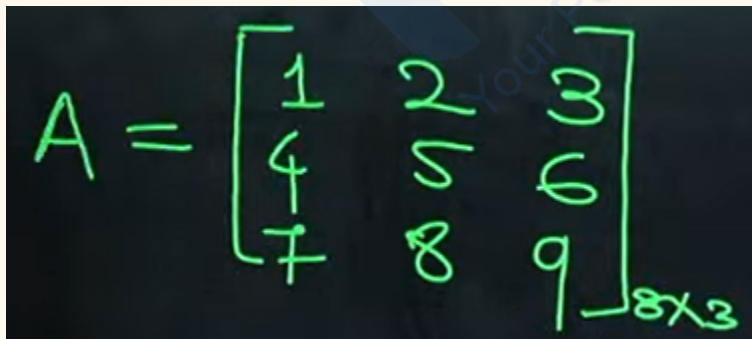
Ques 9. There are 10 red balls and 15 blue balls. If the first ball is red, what is the probability that second ball is also red?

Ans. 0.375

Ques 10. The capacity of hard disk is 512 GB, surface is 32, sectors are 4096 and each sector capacity is 1024 byte. Find the number of cylinders?

Ans. 4096

Ques 11. Product of all Eigen value



$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}_{3 \times 3}$$

- A. -1
- B. 0
- C. 1
- D. 2

Ans. B

Ques 12. Which of the following field in IPv4 header is/ are modified?

- A. Header checksum**
- B. Total length**
- C. Source IP**
- D. Destination IP**

Ans. A and B are correct