GATE 2023 CSE Question Paper PDF (Memory Based)

General Aptitude

Question. Two functions of time(t) , $f(t) = 0.01t^2$, $g(t) = 4t$, $0 < t < \infty$
   (1) For some t > 0 , g(t) > f(t)
   (2) There exists a T, such that f(t) > g(t) for T

   (A) Statement 1 is true
   (B) Statement 2 is true
   (C) Both statement 1 and statement 2 are true
   (D) Both statement 1 and statement 2 are false

Answer. C

Question. $F_{n+1} = F_n + F_{n-1}$
       $F_6 = 37$
       $F_7 = 60$
       $F_1 = ?$
   (A) 4
   (B) 5
   (C) 8
   (D) 9
Answer. (A)

Question. We reached station late, & _____ missed the train?
   (A) mostly
   (B) Nearly
   (C) Utterly
   (D) Near
Answer. B

Question. 2 coins tossed.
   (1) A be event HEAD on both toss
   (2) B be event HEAD on first toss
   (3) C be event HEAD on second toss
Which is /are true
   (1) A & C are independent
   (2) B & C are independent
   (3) A & B are independent
   (4) p(B/C) = p(B)

Answer. B and D

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Mathematics

Question. $f(x) = x^3 + 15x^2 - 30x - 36$

Answer. $-5 \pm \sqrt{35}$

Question. $\int_{-3}^{3} \int_{-2}^{2} \int_{-1}^{1} (4x^2y - z^3)\, dz\, dy\, dx$

Answer. 0

Question. $fx = x^3 + 15x^2 - 33x - 36$
   (A) Fx has local minima
   (B) Fx does not have local minima
   (C) Fx has local maxima
   (D) Fx does not have local maxima

Answer. A and C

Question.

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 2 & 3 \\ 3 & 4 & 1 & 2 \\ 2 & 3 & 4 & 1 \end{bmatrix} \qquad B = \begin{bmatrix} 3 & 4 & 1 & 2 \\ 4 & 1 & 2 & 3 \\ 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \end{bmatrix}$$

   (A) $|A| = |B|$
   (B) $|AB| = |A| + |B|$
   (C) $|B| = -|A|$
   (D) $|A| = 0$

Answer. C

Question.

$$L_n = L_{n-1} + L_n - 2, \quad L_1 = 1, \quad L_2 = 3$$

(A)

$$L_n = \left(\frac{1+\sqrt{5}}{2}\right)^n + \left(\frac{1-\sqrt{5}}{2}\right)^n$$

(B)

$$L_n = \left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n$$
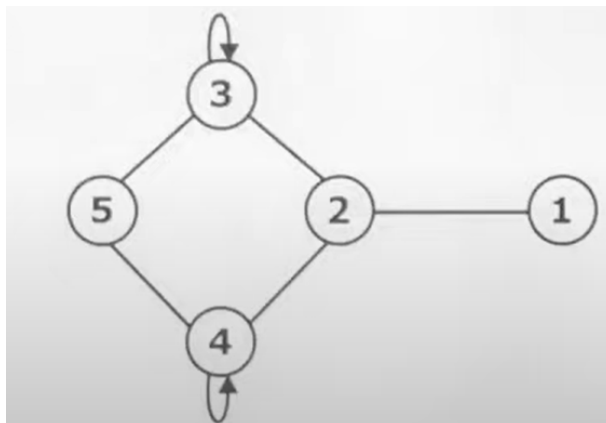
(C)

$$L_n = \left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{3}\right)^n$$

(D)

$$L_n = \left(\frac{1+\sqrt{5}}{2}\right)^n + \left(\frac{1-\sqrt{5}}{3}\right)^n$$

Answer. (A)

Question. A-adjacency matrix of $\lambda_1, \lambda_2 \ldots \lambda_5$ are eigen values of A. Then $\lambda_1 + \lambda_2 + \lambda_3 + \lambda_4 + \lambda_5$=?

Answer. 2

Question.

f: A - B is onto define equivalence relation $a_1 \sim a_2$ $\Leftrightarrow f(a_1) = f(a_2)$. Let E = {[x] x∈A} be the set of all equivalence classes. Define a new mapping F[[x]] = f(x). Then

(A) F is bijection
(B) F is onto
(C) F is not well defined
(D) F is injective

Answer. A, B and D

Question.

G is simple finite undirected graph with $\{V_1, V_2, \ldots V_n\}$ N = {1, 2,....n} where $\Delta(G)$ is the minimum degree. Consider the greedy strategy for i = 1, 2......n color (Vi) = min{j∈N/no neighbour of Vi is colored j}

(A) Number of colors used is chromatic number
(B) Number of colors used is atmost $\triangle G + 1$
(C) Number of colors used is atmost $\triangle G$
(D) This procedure is result in proper vertex coloring

Answer. A, B and D

Question. Let f & g is function of natural number f(n) = n and g(n) = n² then which statement is true?

(A) f Ɛ O(g)
(B) f Ɛ Ω(g)
(C) f Ɛ Ө(g)
(D) f Ɛ o(g)

Answer. B

Question.

Let x be a set, 2^x = power 2k set of X. Define A binary operation Δ on 2^x as $A\Delta B = (A - B) \cup (B - A)$. Let $H = (2^x, \Delta)$, then

(A) H satisfies inverse prop. but not a group
(B) For every A ε 2^x , inverse of A is A
(C) For every A ε 2^x , inverse of A is Ā
(D) H is a group

Answer. B and D

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Computer Science and Information Technology

Question. Minimum number of states in DFA which do not accept 111 sequence.

Answer. 4 states

Question. 8-way set associative cache of bytes, 64 KB (1 KB = 1024 bytes) is used in a system with 32 bit address. The address is sub divided into TAG, INDEX and BLOCK OFFSET. No. of bits in TAG is?

Answer. 19

Question. Which of the following scheduling policies cause starvation?

    (1) FIFO
    (2) SJF
    (3) Priority
    (4) RR

Answer. B and C

Question. Consider a computer system with 57 bit virtual address using multilevel page tables with L levels for virtual to Physical address translation. The page size is 4 KB and page table entry at any of the levels occupy 8 bytes. What is the value of L?

Answer. 5

Question. What does arity means?

    (1) Number of entries in the table
    (2) Number of samples in the table
    (3) Number of attribute in the table
    (4) Number of records in the table

Answer. D

Question. Total number of tuples returned by blow query:
**Query: Select * from student where age > 65 and gender = 'F'**

Roll No	Name	Gender	Marks
1	A	M	65
2	B	F	70
3	C	F	80
4	D	M	-
5	E	F	65

Answer. 2

Question. 3 stage pipelined processor having a delay of 10 ns, 20 ns, 14 ns, for the 1st, 2nd and 3rd stage respectively. No other delay and no other hazards. Assume 1 instruction is fatched in every cycle. The total execution time for 100 instruction is?

Answer. 2040 ns

Question. Consider the DFA below
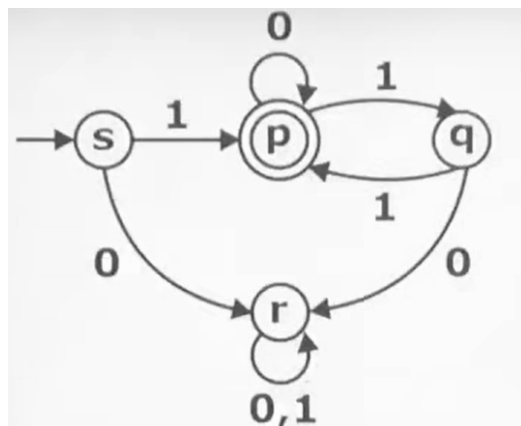
(A) 1 (0*11)*
(B) 1 (0 + 11)*
(C) 0 (0 + 1)*
(D) 1 (110*)*

Answer. B

Question. The utilization of stop and wait protocol will be low if?
    (A) If link length is high and transmission rate is low
    (B) If link length is low and transmission rate is low
    (C) If link length is high and transmission rate is high
    (D) If link length is low and transmission rate is high

Answer. C

Question. Which is true?
    (A) Rec ∩ Rec = Rec
    (B) Reg ∩ Reg = Rec
    (C) REL ∩ REL = REL
    (D) CFL ∩ CFL = CFL

Answer. A, B and C