GATEFORUM
Engineering Success | CS | **Test ID: 2227**   **TarGATE'14**   *www.gateforum.com*

Q. No. 1 – 25 Carry One Mark Each

1. For which of the following probability distribution three measures of Central Tendency i.e., Mean, Median and Mode coincide?
    (A) Binomial   (B) Poisson   (C) Normal   (D) None of these

2. Which of the following is true?

    $(i) \exists x (p(x) \rightarrow Q(x)) \equiv \forall x \ p(x) \rightarrow \exists x Q(x)$

    $(ii) \exists x (p(x) \lor Q(x)) \equiv \exists x \ p(x) \lor \exists x \ Q(x)$

    $(iii) \forall x (p(x) \land Q(x)) \equiv \forall x \ p(x) \land \forall x \ Q(x)$

    $(iv) \exists x (p(x) \land Q(x)) \rightarrow \exists x \ p(x) \land \exists x \ Q(x)$

    (A) (i), (ii) and (iii) only   (B) (i), (ii) and (iv) only
    (C) (i) and (ii) only   (D) All of these

3. The complete graph k_6 contains how may different Hamiltonian circuits?
    (A) 6   (B) 720   (C) 120   (D) 60

4. Number of reflexive relations on a set A={1, 7, 9, 13, 15} is
    (A) 25   (B) 2^{25} (C) 2^{20} (D) 2^{30}

5. Let $a_n = \left(\dfrac{n+2}{n+1}\right)^{2n+3}$. Determine $\lim\limits_{n \to \infty} a_n$.

    (A) 1   (B) e   (C) e^2 (D) e^3

6. Consider a pipelined system with four phases

    FI – Fetch instruction
    DA – Decode and calculate address
    FO – Fetch Operand
    EX- Execute instruction

    Each phase requires one clock cycle. There were four instructions in the following program

    Load $R_1 \leftarrow M[312]$

    ADD $R_2 \leftarrow R_1 + M[313]$

    INC $R_3 \leftarrow R_2 + 1$

    Store $M[314] \leftarrow R_3$

    What is the number of clock cycles required to finish the above program (Assume that no measures were taken to avoid any type of pipeline hazards)
    (A) 7   (B) 8   (C) 9   (D) 10

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7. Consider the following instructions

Push R_1

ADD R_1 , 4

POP R_2

MOV R_3, R_1

Push R_2

Pop R_1

What is the effect of the above instructions on the register R_1 ?

(A) It will be doubled　　　　　　　(B) It will be cleared

(C) It adds '4' to it　　　　　　　　(D) Leave it with its original value

8. Which of the following is false?

(A) NP = CO-NP if there exists problem X such that X is NP – complete and its complement is NP

(B) Suppose problem X is NP complete, if X is in P then NP = P

(C) A problem is NP complete iff it is NP hard and P problem

(D) None of these

9. Which of the following is correct?

(A) $(01)^* \cap (10)^* = \phi$

(B) $(a+b+c)^* = a^*b^*c^* + a^*b^* + c^* + c^*a^*b^*$

(C) $(a+b)^* a + (a+b)^* b+ \in= \left(a^*b^*\right)^*$

(D) $(a+b)^* \cap (a+b)^* ab \ne (a+b)^* ab$

10. Match the following statements with True (T) / False (F)

S_1 : $ALL_{CFG} = \left\{ \langle G \rangle \middle| G \text{ is a CFG and } L(G) = \Sigma^* \right\}$ is undecidable

S_2 : $A = \left\{ \langle G \rangle \middle| G \text{ is a CFG over } \{0, 1\}^*, 1 * \cap L(G) \ne \phi \right\}$ is undecidable

S_3 : $E_{CFG} = \left\{ \langle G, G' \rangle \middle| G, G' \text{are CFG's and } L(G) = L(G') \right\}$ is undecidable

S_4 : $EM_{CFG} = \left\{ \langle G \rangle \middle| G \text{ is a CFG and } L(G) = \phi \right\}$ is decidable

(A) $S_1 - T$, $S_2 - F$, $S_3 - T$, $S_4 - T$　　　(B) $S - T$, $S_2 - T$, $S_3 - T$, $S_4 - T$

(C) $S_1 - F$, $S_2 - F$, $S_3 - T$, $S_4 - T$　　　(D) $S_1 - F$, $S_2 - T$, $S_3 - T$, $S_4 - T$

11. Which of the following statements is true?

(A) Every LR(0) grammar is also SLR(1)

(B) An ambiguous grammar can never be LR grammar

(C) Every LL(1) grammar is also an LALR(1)

(D) All of these

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12.   Which of the following statements is true?

(A) Local variables of a procedure are allocated space on heap

(B) Activation record of a procedure doesn't contain its local data

(C) Access link field of activation record points to the activation record of caller

(D) None of these

13.   The function for finding the Fibonacci series is given as follows:

$$fib(n) = \begin{cases} 0 & \text{if } n = 0 \\ 1 & \text{if } n = 1 \\ fib(n-1) + fib(n-2) & \text{if } n > 1 \end{cases}$$

The number of additions taken in evaluating fib (5) is

(A) 7 　　　　　(B) 8 　　　　　(C) 4 　　　　　(D) None of these

14.   Which one of the following statement(s) is /are true?

S_1 :　The OSI model is an actual software Library that must be installed on a PC for it to connect to the internet

S_2 :　SNMP model is similar in nature to the OSI model

S_3 :　The OSI model is the only model that describes how internet based applications should work.

(A) Only S3 　　　(B) Only S1 & S3 　　(C) S1, S2, S3 　　　(D) None of these

15.   The arrival time, burst time and priorities of five processes are given as:

Process	Arrival time	Burst time (in mins)	Priority
P	0	2	3
Q	0	4	5
R	0	6	2
S	0	8	1 (highest priority)
T	0	10	4

For the priority scheduling algorithm determine the average response time. Ignore the context switching overhead.

(A) 12.8 mins 　　(B) 15.5 mins 　　(C) 20 mins 　　(D) 25 mins

16.   The virtual memory system uses the demand paging for its implementation. The probability of getting page faults is 0.25, the normal memory access time is 200 nanoseconds. If it takes 2 millseconds to service a page fault, then what is effective memory access time?

(A) 500000 ns 　　(B) 500075 ns 　　(C) 500150 ns 　　(D) 500250 ns

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17. Match the following lists

	List – A		List – B
P.	Access Matrix	1.	Additional reference bits
Q.	Aging	2.	Fragmentation
R.	LRU [least recently used]	3.	Priority
S.	Paging	4.	Protection

(A) P – 4, Q – 3, R – 2, S – 1   (B) P – 4, Q – 3, R – 1, S – 2
(C) P – 3, Q – 1, R – 4, S – 2   (D) P – 4, Q – 2, R – 3, S – 1

18. Consider a disk with size 40GB. The size of disk block is 4KB. Number of blocks needed to keep track of free space if the disk is initially empty by using Bit map method is _____
(A) 2560   (B) 5120   (C) 1280   (D) None of these

19. Consider relation R with attributes x, y, z and set of FD's as,
$xy \rightarrow z$

$z \rightarrow x$

The highest normal form of R is
(A) 1 NF   (B) 2 NF   (C) 3NF   (D) BCNF

20. Consider the relation schemas Rank (name, rank) and student (name, city), where name in student is a foreign key in table Rank. Which of the following TRC query displays all the student names from Hyderabad along with their ranks?

(A) $\{t/\exists p \in Rank\,(t[name] = p[name]$
$t[rank] = p[rank]$
$\wedge \exists q \in student\,(q[name] = p[name] \wedge q[city] = "Hyderabad")\}$

(B) $\{t/\exists p \in Rank\,(t[name] = p[name]$
$(t[rank] = p[rank]$
$\wedge \exists q \in student\,(P[name] = q[name] \wedge p[city] = "Hyderabad")\}$

(C) $\{t/\exists p \in Rank\,(p[name] = t[name]$
$p[rank] = q[rank]$
$\wedge \exists q \in student\,(q[name] = p[name] \wedge q[city] = "Hyderabad")\}$

(D) None of these

21. What is the meaning of the following declaration?
$int * p(char * a[\ \ ]);$

(A) P is a pointer to a function that accepts an argument which is a pointer to a character array and returns an integer quantity
(B) P is a function that accepts an argument which is an array of pointers to characters and returns a pointer to an integer quantity
(C) P is a function that accepts an argument which is an array of pointers to characters and returns an integer quantity
(D) P is a pointer to a function that accepts an argument which is an array of pointers to characters and returns a pointer to an integer quantity

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22. A full m-ary tree is a m-ary tree in which all the nodes has either '0' or 'm' children. If a full m-ary tree contains 21 nodes in which 5 are internal nodes then the value of m is

(A) 4   (B) 5   (C) 3   (D) None of these

23. Express the following recurrence relation in the asymptotic notations

$$T(n) = 7T\left(n/3\right) + n^2$$

(A) $\theta(n^2 \log n)$ (B) $\theta(n^2)$ (C) $\theta(n^3)$ (D) None of these

24. What type of XML document is this?
```
<?xml version="1.0"?>
<to>James</to>
<from>Jackson</from>
<heading>Reminder</heading>
<body>Don't forget me this weekend!</body>
```
(A) well formed xml   (B) valid xml
(C) not a well formed xml   (D) None of these

25. Resolution of all ambiguous statements is in which of the following phase?

(A) Design   (B) Testing   (C) Analysis   (D) Coding

Q. No. 26 – 51 Carry Two Marks Each

26. How many integral solutions are there of $x_1 + x_2 + x_3 + x_4 + x_5 = 30$

where $x_i > i$ for $i = 1, 2, 3, 4, 5$?

(A) C(19, 15)   (B) C(14, 10)   (C) C(34, 10)   (D) None of these

27. If $A = \begin{pmatrix} 3 & 1 \\ -1 & -1 \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, which of the following matrix polynomial vanishes?

(A) $A^2 - 2A - 4I$ (B) $A^2 - 2A + 4I$ (C) $A^2 + A + 2I$ (D) $A^2 - 2A - 2I$

28. A random variable X follows normal distribution i.e., x follows $N(\mu, \sigma^2)$ and $p(9.6 \le x \le 13.8) = 0.7008$ and $p(x > 9.6) = 0.8159$

Given, $\sigma = 2$, $\phi(0.9) = 0.8159$

and $\phi(1.2) = 0.8849$

Find the value of μ.

(A) 2   (B) 4   (C) 11.4   (D) 13.2

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29. Trapezoidal rule of integration gives exact result if the function being integrated is
    (i) Constant   (ii) Linear   (iii) Quadratic   (iv) Cubic
    (A) (i) only   (B) (i) and (ii) only
    (C) (i), (ii) and (iii) only   (D) (i), (ii), (iii) and (iv)

30. Consider the following graph:
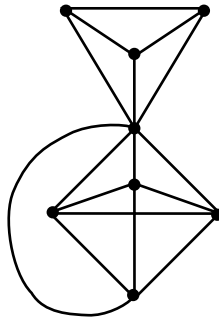
    The vertex connectivity and edge connectivity of the given graph are respectively
    (A) 1, 4   (B) 2, 3   (C) 0, 4   (D) 1, 3

31. In a n-bit carry look ahead adder (CLA) if t_p is the propagation delay of each gate and if all type of gates are available with multi-bit inputs, then for computing sum of two n bit numbers $a_{n-1} a_{n-2}\ldots\ldots a_0$ and $b_{n-1} b_{n-2}\ldots\ldots S_0$ together with carry (if any) will be available after how much delay?

    Assume all the ai's and bi's are available initially?
    (A) $(2n+1)t_p$ (B) $n\, t_p$ (C) $4\, t_p$ (D) $10\, t_p$

32. A sequence detector accepts string of 0 or 1 and outputs 0 or 1, depending on whether a particular pattern is detected or not. In matching a particular pattern overlap may or may not be allowed.

    Suppose input sequence is 1011011011 and target pattern is 1011.

    Then output sequence will be:

Input	1	0	1	1	0	1	1	0	1	1
o/p with overlap	0	0	0	1	0	0	1	0	0	1
o/p without overlap	0	0	0	1	0	0	0	0	0	1

    What will be minimum number of D-flip flops required to construct the above sequence detector with overlap and without overlap respectively?
    (A) 2,2   (B) 2,3   (C) 3,4   (D) 3,3

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33. Each occurrence of a variable and its complement is called a literal. For example in the expression $\overline{P} + P.Q + P.\overline{R} + \overline{P}.Q.R$ there are eight literals. Given is the truth table of a function f:

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

In the minimized SOP form of the function, how many literals are there?

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

34. Let P and Q be logical propositions. Which of the following forms are tautologies?

I. $(P \vee Q) \wedge \neg(P \wedge Q)$

II. $(P \wedge \neg P) \rightarrow Q$

III. $(P \vee Q) \rightarrow \neg(Q \wedge P)$

(A) I and II only   (B) I and III only   (C) II and III only   (D) II only

35. Which of the following pairs of regular expressions define the same language over {a, b}?

(a) $(a * + b *) *$ and $(a + b) *$ (b) $(a * + b) *$ and $(a + b) *$

(c) $(ab) * a$ and $a(ba) *$ (d) $(a * b) * a *$ and $a * (ba *) *$

(A) a, c and d   (B) b, c, d   (C) a, b, and d   (D) a, b, c and d

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36.   Which of the following statement is TRUE about the given Turing Machine transitions below?

δ	0	1	B
q_0	$(q_1, 0, R)$	$(q_1, 1, R)$	Halt
q_1	$(q_0, 0, R)$	$(q_0, 1, R)$	(q_f, B, R)
q_f	Halt	Halt	Halt

Where

$\Gamma = \{0, 1, B\}$

$Q = \{q_0, q_1, q_f\}$

$F = \{q_f\}$

Initial $= q_0$

(A) TM does not halt on any string start with '1'

(B) TM halts on all strings of odd length and accept it

(C) TM does not halt on all strings in Σ^*

(D) None of these

37.   The language accepted by the following PDA transitions

$\delta\,(q_0\,,\in,z_0) \to (q_f,\ \in)$

$\delta\,(q_0\,,a,z_0) \to (q_1,\ z_0)$

$\delta\,(q_0,\ b,z_0) \to (q_1,\ z_0)$

$\delta\,(q_1\,,a,z_0) \to (q_0,\ z_0)$

$\delta\,(q_1,\ b,z_0) \to (q_0,\ z_0)$

Where $Q = \{q_0, q_1, q_f\}, \sum = \{a, b\}, \Gamma = \{z_0\}, F = \{q_f\}, q_0 = $ initial state

(A) Accepts all the strings containing even number of a's

(B) Accepts all the strings containing even number of b's

(C) Accepts all the strings of odd length over $\sum = \{a, b\}$

(D) None of these

38.   In the construction of LL(1) parsing table for the following grammar M[S,(] & M [W, $] are respectively

$S \to XY$

$X \to (S)\,/\,int\,W$

$Y \to +S\,/\in$

$W \to *X\,/\in$

(A) $X \to (S)$, $W \to\in$ (B) $S \to XY$, $W \to *x$

(C) $S \to XY$, $W \to\in$ (D) None of these

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39.   Suppose in a stop and wait ARQ, the system has set a time out value, which is equal to the half of the time required to receive an acknowledgement. When the station–A sends n-frames to station–B and no errors occur during transmission, how many duplicate frames the receiver–B will discard?

(A) (n-1)   (B) (n-2)   (C) n   (D) None

40.   Which one of the following statement is true about domain naming system (DNS) in application layer?

(A) TCP is a better choice than UDP for communication between DNS servers

(B) The resource records in the name server's database are maintained as ASCII files

(C) DNS resolves only host name to IP- Address

(D) None of these

41.   If the table R(ABCD) with the following FD set is decomposed into $D = \{(CA),(DB),(CD)\}$, then the decomposition is in

$AB \rightarrow CD$

$C \rightarrow A$

$D \rightarrow B$

(A) 1NF   (B) 2NF   (C) 3NF   (D) BCNF

42.   The numbers 32, 56, 87, 23, 65, 26, 93 are to be inserted into a hash table of size 7. The hash table implementation uses function as (mod 7) and linear probing to resolve collision. After inserting the given numbers into the hash table if you apply bubble sort on the final content of the table, then after one pass of bubble sort, the content of the table will be

(A) 56, 23, 87, 32, 65, 26, 93   (B) 23, 32, 56, 65, 26, 87, 93

(C) 56, 93, 23, 87, 32, 26, 65   (D) None of these

43.   Consider the following DAG:
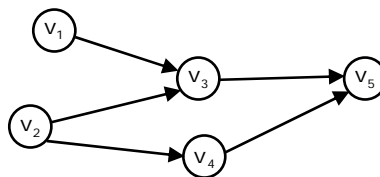
Which of the following sequence(s) represent topological sort of the given graph?

(i) v_1, v_3, v_5, v_2, v_4 (ii) v_1, v_2, v_3, v_4, v_5

(iii) v_2, v_4, v_5, v_1, v_3 (iv) v_2, v_3, v_4, v_1, v_5 (v) v_2, v_1, v_3, v_4, v_5

(A) (ii) only   (B) (ii) and (v) only

(C) (i), (ii) and (v) only   (D) All of these

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44. Calculate the minimum – cost path from vertex A to K of the following multistage graph using forward approach.
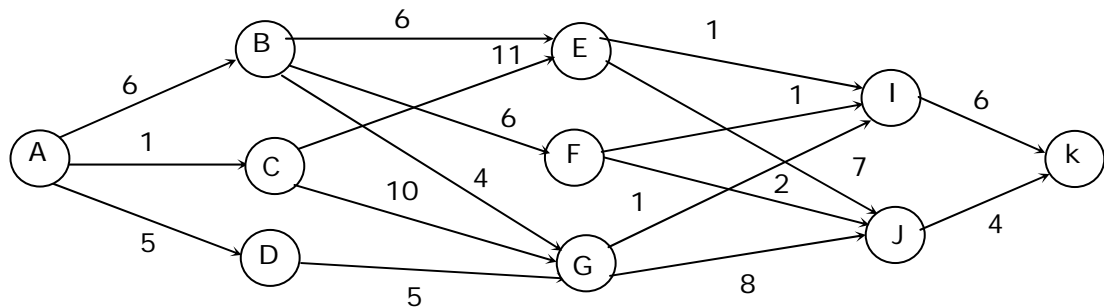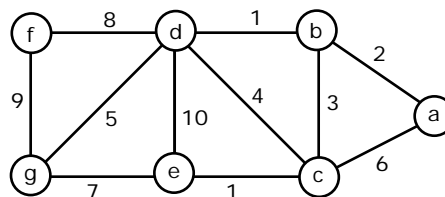

(A) 17   (B) 16   (C) 18   (D) 23

45. In the depth first search of the following graph starting at vertex A, the vertex which is pushed into the stack more than once is
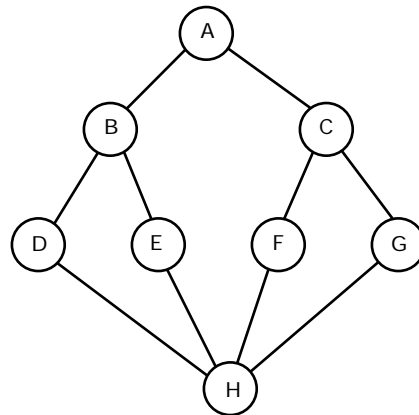
(A) E   (B) F   (C) H   (D) D

46. The number of record movements in optimal merge pattern for the ten files whose lengths are 35, 12, 28, 10, 6, 25, 8, 54, 23, 5 by using two way merge pattern is _____

47. Consider the following graph:

If you construct a depth first search tree on the given graph rooted at c, what will be the weight of the resulting tree? Given a choice between vertices, choose the vertex which comes first in lexicographical order.

(A) 20 units   (B) 35 units   (C) 23 units   (D) None of these

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Common Data Questions: 48 & 49

The following is a snapshot of a system at a particular time

Process	Allocation				Max			
	A	B	C	D	A	B	C	D
P_0	0	2	3	0	0	2	3	0
P_1	0	1	0	3	3	4	3	4
P_2	1	1	2	1	2	5	3	2
P_3	0	3	0	1	0	3	2	1
P_4	2	1	0	0	2	2	1	0

If the total number of resources of type (A B C D) = 3 8 5 5

48. Which of the following is correct about the above system?
(A) The system is in unsafe state
(B) The system is in safe state with sequence $< P_0 P_4 P_2 P_1 P_3 >$
(C) The system is in safe state with sequence $< P_0 P_4 P_2 P_3 P_1 >$
(D) The system is in safe state with sequence $< P_0 P_4 P_3 P_2 P_1 >$

The following is a snapshot of a system at a particular time

Process	Allocation				Max			
	A	B	C	D	A	B	C	D
P_0	0	2	3	0	0	2	3	0
P_1	0	1	0	3	3	4	3	4
P_2	1	1	2	1	2	5	3	2
P_3	0	3	0	1	0	3	2	1
P_4	2	1	0	0	2	2	1	0

If the total number of resources of type (A B C D) = 3 8 5 5

49. If P_0 puts maximum demand as $< 1\ 3\ 4\ 2 >$ instead of what is given, then how many more resources are needed minimum inorder to grant the request?
(A) $< 2\ 1\ 0\ 2 >$ (B) $< 1\ 1\ 1\ 2 >$ (C) $< 2\ 0\ 1\ 2 >$ (D) None of these

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Common Data Questions: 50 & 51

Consider the following relation schema

passenger (<u>id</u>, name, age, gender)

ontrain (id, <u>trainno</u>, Date)

traininfo (<u>trainno</u>, fromcity, tocity, starttime, duration)

('id' in ontrain is foreign key in passenger)

50.   SQL query to retrieve names of passengers who boarded on train "2210" at least once

(A) Select P.name, P.id
      From passenger P, ontrain T
      where P. id = T.id
      And T.trainno = "2210"

(B) Select T. name
      From passenger P, ontrain T
      Where P.id = T.id
      And T.trainno = "2210"

(C) Select P.name
      From passenger P, ontrain T
      Where P.id = T.id
      And T.trainno = "2210"

(D) None of these

Consider the following relation schema

passenger (<u>id</u>, name, age, gender)

ontrain (id, <u>trainno</u>, Date)

traininfo (<u>trainno</u>, fromcity, tocity, starttime, duration)

('id' in ontrain is foreign key in passenger)

51.   SQL query which calculates number of passengers on train "2210" on 16/1/2011 is

(A) Select *, sum (name)
      from ontrain
      where trainno = "2210"

(B) Select sum (id)
      from ontrain
      where trainno = "2210"

(C) Select count(id)
      From ontrain
      Where trainno = "2210" And
      Date = "16/1/2011"

(D) None of these

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Linked Answer Questions: Q.52 to Q.55 Carry Two Marks Each

Statement for Linked Answer Questions: 52 & 53

A DMA controller transfers 16-bit word to memory using cycle stealing. The words assembled from a device that transmits characters at a rate of 2400 characters per second. The CPU is fetching and executing instructions at an average rate of 1 million instructions per second.
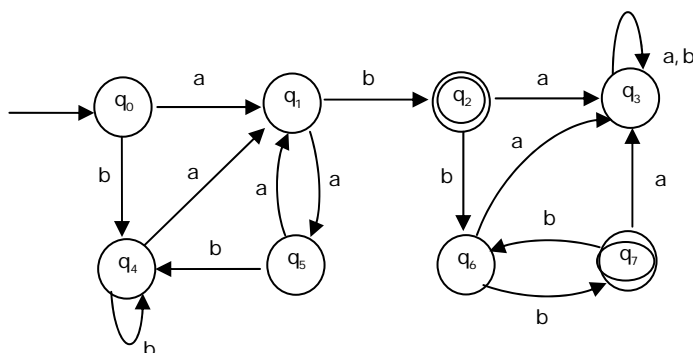
52. By how much will the CPU be slow down because of DMA transfer when the characters are represented with 8 bit ASCII?

    (A) 0.0833%　　　(B) 83%　　　(C) 17%　　　(D) 17.33%

A DMA controller transfers 16-bit word to memory using cycle stealing. The words assembled from a device that transmits characters at a rate of 2400 characters per second. The CPU is fetching and executing instructions at an average rate of 1 million instructions per second.

53. How much more percent the CPU slows down when 32 –bits words are transferred to memory using cycle stealing?
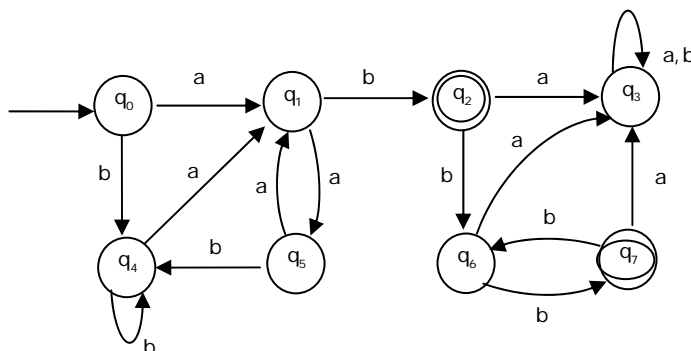
    (A) 83%　　　(B) 23%　　　(C) 0.0833%　　　(D) 17.33%

Statement for Linked Answer Questions: 54 & 55

Consider the following DFA

54. The number of equivalence classes with respect to the above DFA is
    (A) 4　　　(B) 5　　　(C) 6　　　(D) 7

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Consider the following DFA

55. What is the classification of equivalence classes corresponding to non final states and final states respectively? (Using the correct total number of equivalence classes above)

(A) 3 non final and 1 final
(B) 4 non final and 2 final
(C) 4 non final and 1 final
(D) 5 non final and 2 final

Q. No. 56 – 60 Carry One Mark Each

Directions for Question 56:- In the sentence given below, a word is printed in bold. Pick up the one option, which is most nearly the same in meaning as the word printed in bold, and can replace it without altering the meaning of the sentence.

56. Being a member of this club, he has certain **rights**.

(A) status   (B) truth   (C) virtues   (D) privileges

Directions for Question 57:- In the following question, choose the word which is the exact OPPOSITE of the given words.

57. NIGGARDLY

(A) Frugal   (B) Thrifty   (C) Stingy   (D) Generous

Directions for Question 58:- In question below, there is a sentence of which some parts have been jumbled up. Rearrange these parts, which are labelled P, Q, R, and S to produce the correct sentence. Choose the proper sequence.

58. It would

(P) appear from his statement

(Q) about the policy of management

(R) in dealing with the strike

(S) that he was quite in the dark

The proper sequence should be:

(A) RPSQ   (B) PSQR   (C) RQPS   (D) PRQS

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Directions for Question 59:- Pick out the most effective word from the given words to fill in the blank to make the sentence meaningfully complete.

59. If negotiations are to prove fruitful, there must not only be sincerity on each side, but there must also be ……….. in the sincerity of the other side.

   (A) Faith   (B) Belief   (C) Substance   (D) Certainty

60. The traffic lights at three different road crossings change every 16,24 and 54 seconds respectively. If they have changed simultaneously at 5 AM, how many more times will they have changed simultaneously by 5:37 AM?

   (A) 5   (B) 6   (C) 8   (D) 10

Q. No. 61 – 65 Carry Two Marks Each

61. A leak in the bottom of a tank can empty the full tank in 16 hrs. An inlet pipe fills water at the rate of 4 litres a minute. When the tank is full, the inlet is opened and due to the leak, the tank is empty in 24 hrs. How many litres does the cistern hold?

   (A) 7960   (B) 17280   (C) 11520   (D) 16880

62. Among $P, Q, R, S,$ and T each having a different age, Q is 5 yrs younger than T and S is 10 and 8 years younger than P and Q respectively. If T age is 20 yrs, then what will be the age of R?

   (A) 28   (B) 38   (C) 20   (D) Data Inadequate

Data for Question: 63

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The following line graph gives the ratio of the imports of a company to the exports from that company over the period from 2001 to 2006
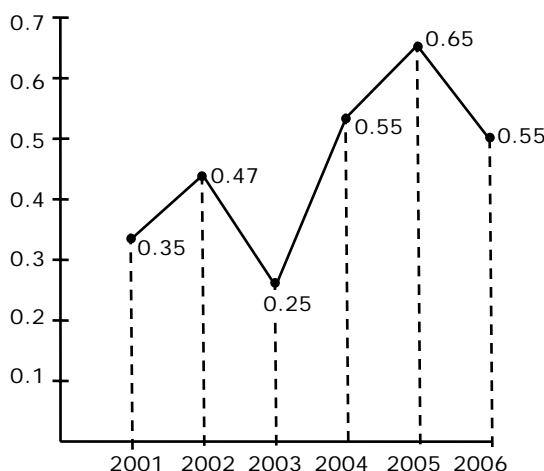
63.   If the imports of the company grew by 100% in 2005, over 2004, by what percentage did the exports change in the same period?

(A) 59% increase   (B) 69% decrease   (C) 69% increase   (D) Data Insufficient

64.   Find the missing letter in the following table:

N	126	R
T	100	Y
Y	50	P
K	12	L
G	13	?

(A) X   (B) Y   (C) Z   (D) Q

65.   According to the Sci-True Lab, the new micro-organism it discovered in certain lakes was identified once as spherical, once as cubical, and once as spiral, but has never been seen to assume the same shape twice.
Which of the following is implied in the above statement?
(A) The new micro-organism can be expected eventually to assume every possible shape.
(B) The new micro-organism is different from all organisms previously known.
(C) The Sci-True Lab is not a reliable source of inFORMation about the new micro-organism.
(D) The new micro-organism can be identified on the basis of some characteristic other than shape.

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