GATE SOLVED PAPER
Computer Science Engineering
2014-1

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General Aptitude

Q.1 - Q.5 Carry one mark each.

Q. 1 Which of the following options is the closest in meaning to the phrase underlined in the sentence below?

It is fascinating to see life forms <u>cope with</u> varied environmental conditions.

(A) adopt to   (B) adapt to

(C) adept in   (D) accept with

Q. 2 Choose the most appropriate word from the options given below to complete the following sentence.

He could not understand the judges awarding her the first prize, because he thought that her performance was quite _____.

(A) superb   (B) medium

(C) mediocre   (D) exhilarating

Q. 3 In a press meet on the recent scam, the minister said, "The buck stops here". What did the minister convey by the statement?

(A) He wants all the money   (B) He will return the money

(C) He will assume final responsibility   (D) He will resist all enquiries

Q. 4 If $(z + 1/z)^2 = 98$, compute $(z^2 + 1/z^2)$.

Q. 5 The roots of $ax^2 + bx + c = 0$ are real and positive. a, b and c are real. Then $ax^2 + b|x| + c = 0$ has

(A) no roots   (B) 2 real roots

(C) 3 real roots   (D) 4 real roots

Q.6 - Q.10 Carry two mark each.

Q. 6 The Palghat Gap (or Palakkad Gap), a region about 30 km wide in the southern part of the Westem Ghats in India, is lower than the hilly terrain to its north and south. The exact reasons for the formation of this gap are not clear. It results in the neighbouring regions of Tamil Nadu getting more rainfall from the South West monsoon and the neighbouring regions of Kerala having higher summer temperatures.

What can be inferred from this passage?

(A) The Palghat gap is caused by high rainfall and high temperatures in southern Tamil Nadu and Kerala

(B) The regions in Tamil Nadu and Kerala that are near the Palghat Gap are low-lying

(C) The low terrain of the Palghat Gap has a significant impact on weather patterns in neighbouring parts of Tamil Nadu and Kerala

(D) Higher summer temperatures result in higher rainfall near the Palghat Gap area.

Q. 7   Geneticists say that they are very close to confirming the genetic roots of psychiatric illnesses such as depression and schizophrenia, and consequently, that doctors will be able to eradicate these diseases through early identification and gene therapy.
On which of the following assumptions does the statement above rely?
(A) strategies are now available for eliminating psychiatric illnesses

(B) Certain psychiatric illnesses have a genetic basis

(C) All human diseases can be traced back to genes and how they are expressed

(D) In the future, genetics will become the only relevant field for identifying psychiatric illnesses

Q. 8   Round-trip tickets to a tourist destination are eligible for a discount of 10% on the total fare. In addition, groups of 4 or more get a discount of 5% on the total fare. If the one way single person fare is ` 100, a group of 5 tourists purchasing round-trip tickets will be charged ` _____ .

Q. 9   Round-trip tickets to a tourist destination are eligible for a discount of 10% on the total fare. In addition, groups of 4 or more get a discount of 5% on the total fare. If the one way single person fare is ` 100, a group of 5 tourists purchasing round-trip tickets will be charged ` _____ .

		Men	Women
Own vehicle	Car	40	34
	Scooter	30	20
	Both	60	46
Do not own vehicle		20	50

Q. 10   When a point inside of a tetrahedron (a solid with four triangular surfaces) is connected by straight lines to its corners, how many (new) internal planes are created with these lines? _____ .

END OF THE QUESTION PAPER

Computer Science

Q.1 - Q.25 Carry one mark each.

Q. 1   Consider the statement

"Not all that glitters is gold"

Predicate *glitters*(x) is true if x glitters and predicate *gold*(x) is true if x is gold. Which one of the following logical formulae represents the above statement?

(A) $\forall x : glitters(x) \Rightarrow \neg gold(x)$ (B) $\forall x : gold(x) \Rightarrow glitters(x)$

(C) $\exists x : gold(x) \wedge \neg glitters(x)$ (D) $\exists x : glitters(x) \wedge \neg gold(x)$

Q. 2   Suppose you break a stick of unit length at a point chosen uniformly at random. Then the expected length of the shorter stick is _ _ _ _ _ _ _.

Q. 3   Let $G = (V, E)$ be a directed graph where V is the set of vertices and E the set of edges. Then which one of the following graphs has the same strongly connected components as G?

(A) $G_1 = (V, E_1)$ where $E_1 = \{(u, v) | (u, v) \notin E\}$

(B) $G_2 = (V, E_2)$ where $E_2 = \{(u, v) | (v, u) \in E\}$

(C) $G_3 = (V, E_3)$ where $E_3 = \{(u, v) | \text{there is a path of length} \leq 2 \text{ from } u \text{ to } v \text{ in } E\}$

(D) $G_4 = (V_4, E)$ where V_4 is the set of vertices in G which are not isolated

Q. 4   Consider the following system of equations:

```
3x + 2y = 1
4x + 7z = 1
x + y + z = 3
x – 2y + 7z = 0
```

The number of solutions for this system is _ _ _ _ _ _ _.

Q. 5   The value of the dot product of the eigenvectors corresponding to any pair of different eigenvalues of a 4-by-4 symmetric positive definite matrix is _ _ _ _ _.

Q. 6   Let the function

$$f(\theta) = \begin{vmatrix} \sin\theta & \cos\theta & \tan\theta \\ \sin(\pi/6) & \cos(\pi/6) & \tan(\pi/6) \\ \sin(\pi/3) & \cos(\pi/3) & \tan(\pi/3) \end{vmatrix}$$

where $\theta \in \left[\frac{\pi}{6}, \frac{\pi}{3}\right]$ and $f'(\theta)$ denote the derivative of f with respect to θ. Which of the following statements is/are TRUE?

(I) There exists $\theta \in \left(\frac{\pi}{6}, \frac{\pi}{3}\right)$ such that $f'(\theta) = 0$

(II) There exists $\theta \in \left(\frac{\pi}{6}, \frac{\pi}{3}\right)$ such that $f'(\theta) \neq 0$.

(A) I only   (B) II only

(C) Both I and II   (D) Neither I nor II

Q. 7   Consider the following Boolean expression for F:

$$F(P, Q, R, S) = PQ + \overline{P}QR + \overline{P}Q\overline{R}S$$

The minimal sum-of-products form of F is

(A) $PQ + QR + QS$ (B) $P + Q + R + S$

(C) $\overline{P} + \overline{Q} + \overline{R} + \overline{S}$ (D) $\overline{PR} + \overline{PRS} + P$

Q. 8   The base (or radix) of the number system such that the following equation holds is _ _ _ _ _ _ _ _ .

$$\frac{312}{20} = 13.1$$

Q. 9   A machine has a 32-bit architecture, with 1-word long instructions. It has 64 registers, each of which is 32 bits long. It needs to support 45 instructions, which have an immediate operand in addition to two register operands. Assuming that the immediate operand is an unsigned integer, the maximum value of the immediate operand is _ _ _ _ _ _ _ _ .

Q. 10   Consider the following program is C language:

```
#include <stdio.h>
main()
{
    int i;
    int *p1 = &1;
    scanf("%d",p1);
    printf("%d\n", 1 + 5);
}
```

Which one of the following statements is TRUE?

(A) Compilation fails

(B) Execution results in a run-time error

(C) On execution, the value printed is 5 more than the address of variable 1

(D) On execution, the value printed in 5 more than the integer value entered

Q. 11   Let G be a graph with n vertices and m edges. What is the tightest upper bound on the running time of Depth First Search on G, when G is represented as an adjacency matrix?

(A) $\Theta(n)$ (B) $\Theta(n + m)$

(C) $\Theta(n^2)$ (D) $\Theta(m^2)$

Q. 12   Consider a rooted n note binary tree represented using pointers. The best upper bound on the time required to determine the number of subtrees having exactly 4 nodes is $O(n^a \log^b n)$. Then the value of $a + 10b$ is _ _ _ _ _ _ _ _ _ _ .

Q. 13   Consider the directed graph given below.
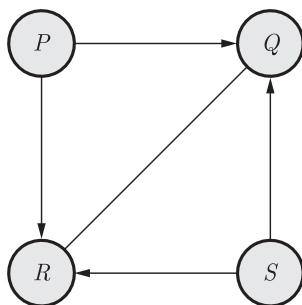
Which one of the following is TRUE?

(A) The graph does not have any topological ordering

(B) Both PQRS and SRQP are topological orderings

(C) Both PSRQ and SPRQ are topological orderings

(D) PSRQ is the only topological ordering

Q. 14   Let P be a quicksort program to sort numbers in ascending order using the first element as the pivot. Let t_1 and t_2 be the number of comparisons made by P for the inputs [1 2 3 4 5] and [4 1 5 3 2] respectively. Which one of the following holds?

(A) $t_1 = 5$ (B) $t_1 < t_2$

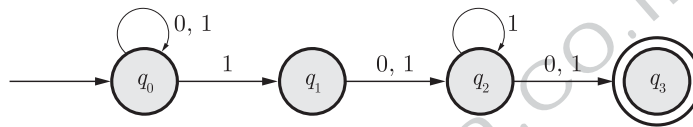(C) $t_1 > t_2$ (D) $t_1 = t_2$

Q. 15   Which one of the following is TRUE?

(A) The language $L = \{a^n b^n \mid n \geq 0\}$ is regular.

(B) The language $L = \{a^n \mid n \text{ is prime}\}$ is regular

(C) The   language $L = \{w \mid w \text{ has } 3k + 1 \text{ } b's \text{ for some } k \in \mathbb{N} \text{ with } \Sigma = \{a, b\}\}$ is regular

(D) The language $L = \{ww \mid w \in \Sigma * \text{ with } \Sigma = \{0, 1\}\}$ is regular.

Q. 16   Consider the finite automation in the following figure.

What is the set of reachable states for the input string 0011?

(A) $\{q_0, q_1, q_2\}$ (B) $\{q_0, q_1\}$

(C) $\{q_0, q_1, q_2, q_3\}$ (D) $\{q_3\}$

Q. 17   Which one of the following is FALSE?

(A) A basic block is a sequence of instructions where control enters the sequence at the beginning and exits at the end

(B) Available expression analysis can be used for common subexpression elimination

(C) Live variable analysis can be used for dead code elimination

(D) $x = 4 * 5 \Rightarrow x = 20$ is an example of common subexpression elimination.

Q. 18   Match the following:

(1)	Waterfall model	(a)	Specifications can be developed incrementally
(2)	Evolutionary model	(b)	Requirements compromises are inevitable
(3)	Component-based software engineering	(c)	Explicit recognition of risk
(4)	Spiral development	(d)	Inflexible partitioning of the project into stages

(A) 1-a, 2-b, 3-c, 4-d   (B) 1-d, 2-a, 3-b- 4-c

(C) 1-d, 2-b, 3-a, 4-c   (D) 1-c, 2-a, 3-b, 4-d

Q. 19   Suppose a disk has 201 cylinders, numbered from 0 to 200. At some time the disk arm is at cylinder 100, and there is a queue of disk access requests for cylinders

30, 85, 90, 100, 105, 110, 135 and 145. If Shortest-Seek Time First (SSTF) is being used for scheduling the disk access, the request for cylinder 90 is serviced after servicing _ _ _ _ _ number of requests.

Q. 20   Which one of the following is FALSE?
(A) User level threads are not scheduled by the kernel
(B) When a user level thread is blocked, all other threads of its process are blocked
(C) Context switching between user level threads is faster than context switching between kernel level threads.
(D) Kernel level threads cannot share the code segment.

Q. 21   Consider the relation scheme $R = (E, F, G, H, I, J, K, L, M, N)$
and the set of functional dependencies
$\{\{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}\{E, H\} \rightarrow \{K, L\}, \{K\} \rightarrow \{M\}, \{L\} \rightarrow \{N\}\}$ on R.
What is the key for R?
(A) $\{E, F\}$ (B) $\{E, F, H\}$
(C) $\{E, F, H, K, L\}$ (D) $\{E\}$

Q. 22   Given the following statements:
S1: A foreign key declaration can always be replaced by an equivalent check assertion in SQL.
S2: Given the table $R(a, b, c)$ where a and b together form the primary key, the following is a valid table definition.

```
CREATE TABLE S (
    a INTEGER,
    d INTEGER,
    e INTEGER,
    PRIMARY KEY (d),
    FOREIGN KEY (a) references R)
```

Which one of the following statements is CORRECT?
(A) S1 is TRUE and S2 is FALSE   (B) Both S1 and S2 are TRUE
(C) S1 is FALSE and S2 is TRUE   (D) Both S1 and S2 are FALSE

Q. 23   Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links.
[S1] The computational overhead in link state protocols is higher than in distance vector protocols.
[S2] A distance vector protocol (with split horizon) avoids persistent routing loops, but not a link state protocol.
[S3] After a topology change, a link state protocol will converge faster than a distance vector protocol.
Which one of the following is correct about S1, S2 and S3?
(A) S1, S2 and S3 are all true   (B) S1, S2 and S3 are all false
(C) S1 and S2 are true, but S3 is false   (D) S1 and S3 are ture, but S2 is false

Q. 24   Which of the following are used to generate a message digest by the network security protocols?
(P) RSA   (Q) SHA-1   (R) DES   (S) MD5
(A) P and R only   (B) Q and R only

(C) Q and S only   (D) R and S only

Q. 25   Identify the correct order in which the following actions take place in an interaction between a web browser and a web server.
1. The web browser requests a webpage using HTTP
2. The web browser establishes a TCP connection with the web server.
3. The web server sends the requested webpage using HTTP.
4. The web browser resolves the domain name using DNS.
(A) 4, 2, 1, 3   (B) 1, 2, 3, 4
(C) 4, 1, 2, 3   (D) 2, 4, 1, 3

Q.26 - Q.55 Carry two mark each.

Q. 26   Consider a token ring network with a length of 2 km having 10 stations including a monitoring station. The propagation speed of the signal is 2×10^8 m/s and the token transmission time is ignored. If each station is allowed to hold the token for $2\,\mu$ sec, the minimum time for which the monitoring station should wait (in μ sec) before assuming that the token is lost is _____.

Q. 27   Let the size of congestion window of a TCP connection be 32 KB when a timeout occurs. The round trip time of the connection is 100 m sec and the maximum segment size used is 2 KB. The time taken (in msec) by the TCP connection to get back to 32 KB congestion window is _____.

Q. 28   Consider a selective repeat sliding window protocol that uses a frame size of 1 KB to send data on a 1.5 Mb/sec link with a one-way latency of 50 m/sec. To achieve a link utilization of 60%, the minimum number of bits required to represent the sequence number field is _____.

Q. 29   Consider the following four schedules due to three transactions (indicated by the subscript) using *read* and *write* on a data item x, denoted by $r(x)$ and $w(x)$ respectively. Which one of them is conflict serializable?
(A) $r_1(x); r_2(x); w_1(x); x_3(x); w_2(x)$ (B) $r_2(x); r_1(x); w_2(x); r_3(x); w_1(x)$
(C) $r_3(x); r_2(x); r_1(x); w_2(x); w_1(x)$ (D) $r_2(x); w_2(x); r_3(x); r_1(x); w_1(x)$

Q. 30   Given the following two statements:
S1: Every table with two single-valued attributes is in 1NF, 2NF, 3NF and BCNF.
S2: $AB \to C, D \to E, E \to C$ is a minimal cover for the set of functional dependencies $AB \to C, D \to E, AB \to E, E \to C$.

Which one of the following is CORRECT?
(A) S1 is TRUE and S2 is FALSE   (B) Both S1 and S2 are TRUE
(C) S1 is FALSE and S2 is TRUE   (D) Both S1 and S2 are FALSE

Q. 31   An operating system uses the *Banker's algorithm* for deadlock avoidance when managing the allocation of three resource type X, Y and Z to three processes P0, P1 and P2. The table given below presents the current system state. Here, the *Allocation* matrix shows the current number of resources of each type allocated to each process and the *Max* matrix shows the maximum number of resources of each type required by each process during its execution.

	Allocation	Max

	X	Y	Z	X	Y	Z
P0	0	0	1	8	4	3
P1	3	2	0	6	2	0
P2	2	1	1	3	3	3

There are 3 units of type X, 2 units of type Y and 2 units of type Z still available. The system is currently in a safe state. Consider the following independent requests for additional resources in the current state:

REQ1: P0 requests 0 units of X, 0 units of Y and 2 units of Z
REQ2: P1 requests 2 units of X, 0 units of Y and 0 units of Z

Which one of the following is TRUE?
(A) Only REQ1 can be permitted

(B) Only REQ2 can be permitted

(C) Both REQ1 and REQ2 can be permitted

(D) Neither REQ1 nor REQ2 can be permitted

Q. 32   Consider the following set of processes that need to be scheduled on a single CPU. All the times are given in milliseconds.

Process Name	Arrival Time	Execution Time
A	0	6
B	3	2
C	5	4
D	7	6
E	10	3

Using the *shortest remaining time first* scheduling algorithm, the average process turnaround time (in msec) is _____.

Q. 33   Assume that there are 3 page frames which are initially empty. If the page reference string is 1, 2, 3, 4, 2, 1, 5, 3, 2, 4, 6 the number of page faults using the *optimal replacement policy* is _____.

Q. 34   A canonical set of items is given below
$$S \rightarrow L . > R$$
$$Q \rightarrow R .$$
On input symbol < the set has
(A) a shift-reduce conflict and a reduce-reduce conflict

(B) a shift-reduce conflict but not a reduce-reduce conflict

(C) a reduce-reduce conflict but not a shift-reduce conflict

(D) neither a shift-reduce nor a reduce-reduce conflict

Q. 35   Let L be a language and $\overline{L}$ be its complement. Which one of the following is NOT a viable possibility?
(A) Neither L nor $\overline{L}$ is recursively enumerable (r.e.)

(B) One of L and $\overline{L}$ is r.e. but not recursive; the other is not r.e.

(C) Both L and $\overline{L}$ are r.e. but not recursive

(D) Both L and $\overline{L}$ are recursive

Q. 36   Which of the regular expressions given below represent the following DFA?
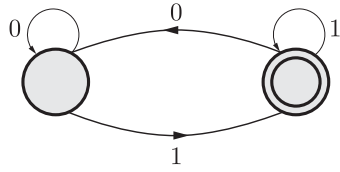
    (I) $0*1(1+00*1)*$
   (II) $0*1*1+11*0*1$
  (III) $(0+1)*1$

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

(C) II and III only   (D) I, II and III

Q. 37   There are 5 bags labeled 1 to 5. All the coins in a given bag have the same weight. Some bags have coins of weight $10\,\text{gm}$, other have coins of weight $11\,\text{gm}$. I pick 1, 2, 4, 8, 16 coins respectively from bags 1 to 5. Their total weight comes out to $323\,\text{gm}$. Then the product of the labels of the bags having $11\,\text{gm}$ coins is ___.

Q. 38   Suppose a polynomial time algorithm is discovered that correctly computes the largest clique in a given graph. In this scenario, which one of the following represents the correct Venn diagram of the complexity classes P, NP and NP Complete (NPC)?
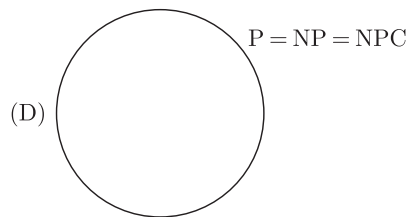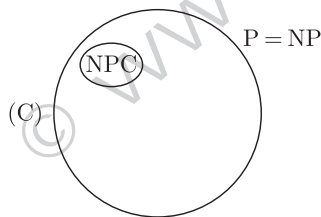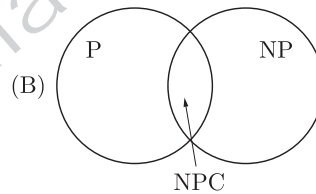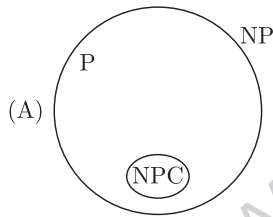
Q. 39   The minimum number of comparisons required to find the minimum and the maximum of 100 numbers is _____.

Q. 40   Consider a hash table with 9 slots. The hash function is $h(k) = k \bmod 9$. The collisions are resolved by chaining. The following 9 keys are inserted in the order: 5, 28, 19, 15, 20, 33, 12, 17, 10. The maximum, minimum, and average chain lengths in the hash table, respectively, are

(A) 3, 0 and 1   (B) 3, 3 and 3

(C) 4, 0 and 1   (D) 3, 0 and 2

Q. 41   Consider the following C function in which size in the number of elements in the array E:

```
int MyX(int *B, unsigned int size)
{
    int Y = 0;
```

```
        int Z;
        int i, j, k;
        for (i = 0; i < size; i++)
            Y = Y + E[i];
        for (i = 0; i < size; i++)
            for (j = i; J < size; j++)
            {
                Z = 0;
                for(k = i; k <= j; k++)
                    Z = Z + E[k];
                if (Z > Y)
                    Y = Z;
            }
        return Y;
}
```

The value returned by the function MyX is the

(A) maximum possible sum of elements in any sub-array of array E.

(B) maximum element in any sub-array of array E.

(C) sum of the maximum elements in all possible sub-arrays of array E.

(D) the sum of all the elements in the array E.

Q. 42   Consider the following pseudo code. What is the total number of multiplications to be performed?

```
D = 2
for i = 1 to n do
    for j = i to n do
        for k = j + 1 to n do
            D = D * 3
```

(A) Half of the product of the 3 consecutive integers

(B) One-third of the product of the 3 consecutive integers.

(C) One-sixth of the product of the 3 consecutive integers

(D) None of the above

Q. 43   Consider a 6-stage instruction pipeline, where all stages are perfectly balanced. Assume that there is no cycle-time overhead of pipelining. When an application is executing on this 6-stage pipeline, the speedup achieved with respect to non-pipelined if 25% of the instructions incur 2 pipeline stall cycles is _____.

Q. 44   An access sequence of cache block addresses is of length N and contains n unique block addresses. The number of unique block addresses between two consecutive accesses to the same block address is bounded above by k. What is the miss ratio if the access sequence is passed through a cache of associativity $A \geq k$ exercising least-recently-used replacement policy?

(A) n/N (B) $1/N$

(C) $1/A$ (D) k/n

Q. 45   Consider the 4-to-1 multiplexer with two select lines S_1 and S_0 given below.
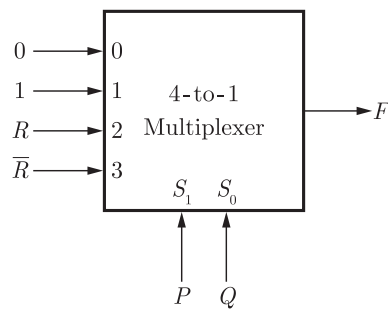
The minimal sum-of-products form of the Boolean expression for the output F of the multiplexer is

(A) $\overline{P}Q + Q\overline{R} + P\overline{Q}R$ (B) $\overline{P}Q + \overline{P}QR + PQ\overline{R} + P\overline{Q}R$

(C) $\overline{P}QR + \overline{P}\overline{Q}R + Q\overline{R} + P\overline{Q}R$ (D) PQR

Q. 46   The function $f(x) = x \sin x$ satisfies the following equation:
$f''(x) + f(x) + t \cos x = 0$. The value of t is _ _ _ _ _ _ .

Q. 47   A function $f(x)$ is continuous in the interval $[0, 2]$. It is known that $f(0) = f(2) = -1$ and $f(1) = 1$. Which one of the following statements must be true?

(A) There exists a y in the interval $(0, 1)$ such that $f(y) = f(y + 1)$

(B) For every y in the interval $(0, 1)$, $f(y) = f(2 - y)$

(C) The maximum value of the function in the interval $(0, 2)$ is 1

(D) There exists a y in the interval $(0, 1)$ such that $f(y) = -f(2 - y)$

Q. 48   Four fair six-sided dice are rolled. The probability that the sum of the results being 22 is $\dfrac{X}{1296}$. The value of X is _ _ _ _ _ _ _ _ _ _ _ .

Q. 49   A pennant is a sequence of numbers, each number being 1 or 2. An n-pennant is a sequence of numbers with sum equal to n. For example, $(1, 1, 2)$ is a 4-pennant. The set of all possible 1-pennants is $\{(1)\}$, the set of all possible 2-pennants is $\{(2), (1, 1)\}$ and the set of all 3-pennants is $\{(2, 1), (1, 1, 1), (1, 2)\}$. Note that the pennant $(1, 2)$ is not the same as the pennant $(2, 1)$. The number of 10-pennants is _ _ _ _ _ _ .

Q. 50   Let S denote the set of all functions $f : \{0, 1\}^4 \to \{0, 1\}$. Denote by N the number of functions from S to the set $\{0, 1\}$. The value of $\log_2 \log_2 N$ is _ _ _ _ .

Q. 51   Consider an undirected graph G where self-loops are not allowed. The vertex set of G is $\{(i, j) : 1 \le i \le 12, 1 \le j \le 12\}$. There is an edge between (a, b) and (c, d) if $|a - c| \le 1$ and $|b - a| \le 1$. The number of edges in this graph is _ _ _ _ _ _ .

Q. 52   An ordered n-tuple $(d_1, d_2, ..., d_n)$ with $d_1 \ge d_2 \ge ... \ge d_n$ is called graphic if there exists a simple undirected graph with n vertices having degrees $d_1, d_2, ..., d_n$ respectively. Which of the following 6-tuples is NOT graphic?

(A) $(1, 1, 1, 1, 1, 1)$ (B) $(2, 2, 2, 2, 2, 2)$

(C) $(3, 3, 3, 1, 0, 0)$ (D) $(3, 2, 1, 1, 1, 0)$

Q. 53   Which one of the following propositional logic formulas is TRUE when exactly two of p, q and r are TRUE?

(A) $((p \leftrightarrow q) \vee (p \wedge q \wedge \sim r))$ (B) $(\sim (p \leftrightarrow q) \wedge r) \vee (p \wedge q \wedge \sim r)$

(C) $((p \to q) \wedge r) \vee (p \wedge q \wedge \sim r)$ (D) $(\sim (p \leftrightarrow q) \wedge r) \wedge (p \wedge q \wedge \sim r)$

Q. 54   Given the following schema:

```
employees (emp-id, first-name, last-name, hire-date, dept-
id, salary)
departments (dept-id, dept-name, manager-id, location-id)
```

You want to display the last names and hire dates of all latest hires in their respective departments in the location ID 1700. You issue the following query:

```
SQL > SELET last-name, hire-data
  FROM employees
  WHERE (dept-id, hire-date) IN
    (SELECT dept-id, MAX (hire-date)
  FROM employees JOIN departments USING (dept-id)
  WHERE location-id = 1700
  GROUP BY dept-id);
```

What is the outcome?

(A) It executes but does not give the correct result.

(B) It executes and gives the correct result

(C) It generates an error because of pairwise comparison

(D) It generates and error because the GROUP BY clause cannot be used with table joins in a sub-query.

Q. 55   Consider two processors P_1 and P_2 executing the same instruction set. Assume that under identical conditions, for the same input, a program running on P_2 takes 25% less time but incurs 20% more CPI (clock cycloes per instruction) as compared to the program running on P_1. If the clock frequency of P_1 is 1 GHz, then the clock frequency of P_2 (in GHz) is _____.

****

ANSWER KEY

General Aptitude									
1	2	3	4	5	6	7	8	9	10
(B)	(C)	(C)	(96)	(D)	(C)	(B)	(850)	(48)	(6)

Computer Science									
1	2	3	4	5	6	7	8	9	10
(D)	(0.24-0.27)	(B)	(1)	(0)	(C)	(A)	(5)	(16383)	(D)
11	12	13	14	15	16	17	18	19	20
(C)	(1)	(C)	(C)	(C)	(A)	(D)	(B)	(3)	(D)
21	22	23	24	25	26	27	28	29	30
(B)	(D)	(D)	(C)	(A)	(28-30)	(1100-1300)	(5)	(D)	(A)
31	32	33	34	35	36	37	38	39	40
(B)	(7.2)	(7)	(D)	(C)	(B)	(12)	(D)	(147.1-148.1)	(A)
41	42	43	44	45	46	47	48	49	50
(A)	(C)	(4)	(A)	(A)	(–2)	(A)	(10)	(88.9-89.1)	(16)
51	52	53	54	55					
(506)	(C)	(B)	(B)	(1.6)					