Computer Science Engineering   Sample Paper-2

Q1. What does the following Fragment of C-Program print?

```
Char c [] = "GATE 2014"
Char *p= c;
Printf ("%s", p + p [3]-p[1];
```

(a) GATE 2014   (b) E2014   (c) 2014   (d) 014

Q2. Which one of the following uses UDP as the transport protocol?
(a) HTTP   (b) TELNET   (C) DNS   (d) SMTP

Q3. What is the return of the function foo, when it is called as foo (513, 2)?
(a) 9   (b) 8   (c) 5   (d) 2

Q4. Which statement inserts an element X after position P.
(a) P = Newnode(X,P);
(b) P = Newnode(X,P→link);
(c) P→link = Newnode(X,P);
(d) P→ link = Newnode(X,P→link);

Q5. Which of the following statement is incorrect?
(a) Session layer might be used to allow a user to log into remote timesharing system.
(b) The OSI reference model devised before the protocols were invented.
(c) The OSI model does not specify the exact services and protocol to be used in each layer.
(d) The OSI model supports both connectionless and connection –oriented communication in transport layer.

Q6. Let T and T' be two spanning trees of a connected graph G. Suppose that an edge E is in T but not in T' and an edge E' is in T' but not in T. Then after performing the following two operations which one of the following true.
1. T- {E} U E'   2. T'- {E'} U {E}
(a) Both T and T' are not spanning trees.
(b) T is spanning tree But not T'
(c) T is not Spanning tree but T' is spanning tree.
(d) Both T and T' are spanning trees.

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Q7. We are given 9 jobs J1,J2…………..J9.The execution time for each job requires one unit of time we can execute one job at a time. Each job J_i has a profit P_i with dead line D_i we will get profit P_i. If the job J_i is completed before a dead line D_i.

Job	J1	J2	J3	J4	J5	J6	J7	J8	J9
Dead lines	7	2	5	3	4	5	2	7	3
Profits	15	20	30	18	18	10	23	16	25

What is a maximum profit we are getting?

(a) 167   (b) 157   (c) 147   (d) 150

Q8. A priority queue Q is used to implement a stack that stores characters. PUSH (C) is implemented INSERT (Q,C, K) where K is an appropriate integer key chosen by the implementation. POP is implemented as DELETEMIN(Q). For a sequence of operations, the keys chosen are in

(a) non-increasing order   (b) non-decreasing order

(c) strictly increasing order   (d) strictly decreasing order

Q9. An application loads 100 libraries at startup. Loading each library requires exactly one disk access. The seek time of the disk to a random location is given as 10 ms. Rotational speed of disk is 6000rpm. If all 100 Libraries are loaded from random location on the disk, how long does it take to load all libraries?(The time to transfer data from the disk block once the head has been positioned at the start of the block may be neglected).

(a) 0.50 s   (b) 1.50s   (c) 1.25s   (d) 1.00s

Q10. Which one of the following statement about normal forms is false?

(a) BCNF is stricter than 3NF

(b) Lossless, dependency-preserving decomposition into 3NF is always possible

(c) Lossless, dependency-preserving decomposition into BCNF is always possible

(d) Any relation with two attributes is in BCNF

Q11. The distance between two stations m and N is kilometers. All frames are k bits long. The propagation delay per kilometers is t seconds. Let R bits/seconds be the channel capacity. Assuming that processing delay is negligible, the minimum number of bits for the sequence number field in a frame for maximum utilization when the sliding window protocol is used is:

(a) $\left\lceil \log_2 \dfrac{2LtR + 2K}{K} \right\rceil$ (b) $\left\lceil \log_2 \dfrac{2LtR}{K} \right\rceil$

(c) $\left\lceil \log_2 \dfrac{2LtR + K}{K} \right\rceil$ (d) $\left\lceil \log_2 \dfrac{2LtR + K}{2K} \right\rceil$

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Q12. The following key values are inserted into a B+ tree in which order of the internal nodes is 3, and that of the leaf nodes is 2, in the sequence given below. The order of internal nodes is the maximum number of tree pointers in each node, and the order of leaf nodes is the maximum number of data items that can be stored in it. The B+ tree is initially empty.10, 3, 6, 8, 4, 2 and 1.The maximum number of times leaf nodes would get split up as a result of these insertions is

   (a) 2   (b) 3   (c) 4   (d)5

Q13. The eccentricity of node labeled 5 in the graph in
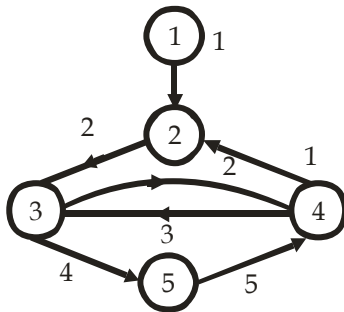
   (a) 6   (b) 7   (c) 3   (d) 4

Q14. Binary simaphores S and T.

Process P	Process Q
While(1)	While(1)
{	{
W_____	Y_____
Print 0	Print 1
Print 0	Print 1
X_____	Z_____
}	}

We want output as 0011 0011 0011 0011……………….
Which of the following is true for W, X, Y, Z.

   (a) P(s), V(s), P(T), V(T)   S=1, T=1   (b) P(s), V(T), P(T), V(s)   T=1
   (c) P(s), V(s), P(T), V(T) S=1, T=0   (d) P(s), V(s), P(T), V(T)   S=1

Q15. Subnet mask for particular network is 255.255.31.0.
Which of the following pairs of the IP address could belong to this network.
   (a) 172.57.88.62 and 172.56.87.23.
   (b) 10.35.28.2 and 10.35.29.4
   (c) 191.203.31.87 and 191.234.31.88.
   (d) 128.8.129.43 and 128.8.161.55.

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Q16. The three way handshake for TCP connection establishment is shown below
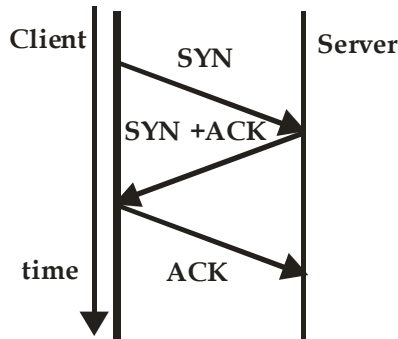
Which of the following statements are TRUE?

S1: Loss of SYN + ACK from the server will not establish a connection

S2: Loss of ACK from the client cannot establish the connection

S3: The server moves LISTEN $\rightarrow$ SYN_RCVD $\rightarrow$ SYN_SENT $\rightarrow$ ESTABLISHED in the state machine on no packet loss

S4: The server moves LISTEN $\rightarrow$ SYN_RCVD $\rightarrow$ ESTABLISHED in the state machine on no packet loss

    (a) S2 and S3 only   (b) S1 and S4 only   (c) S1 and S3 only   (d) S2 and S4 only

Q17. Suppose blocks are sized so that they can either hold 5 records of relation r be used as B^+ free node with 10 keys and 11 pointers of relation r. If relation has 100 records what is the smallest number of blocks that could be used to store r and a spares B^+ free index on the key of r.

a) 200   b) 210   c) 221   d) 223

Q18. Consider the following declaration

TransactionT$_5$	Transaction T$_6$
Lock (A)	Lock X (Sum)
Read (A)	sum = 0
A = A − 100	Lock (A)
Write (A)	Read (A)
Unlock (A)	Sum: = Sum + A
Lock X (B)	Unlock (A)
Read (B)	Lock (B)
B: = B + 100	Read (B)
Write (B)	Sum: = Sum + B
Unlock (B)	Write (Sum)
	Unlock (B)
	Unlock (Sum)

If the lock in this schedule is update or write lock then such locking is also called a -----------

    (a) Exclusive Locking   (b) Shared Locking
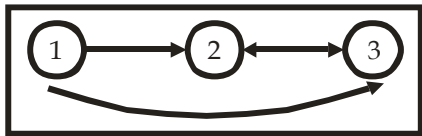
    (c) Both (a) and (b)   (d) None of the above

Q19. There are five records in a database.

Name	Age	Occupation	Category
Rama	27	CON	A
Abdul	22	ENG	A
Jeniffer	28	DOC	B
Maya	32	SER	D
Dev	24	MUS	C

There is an index file associated with this and it contains the values 1, 3, 2, 5 and 4. Which one of the index built from?

(a) Age (b) Name
(c) Occupation (d) Category

Q20. Consider the graph in Fig.

The third row in the transitive closure of the above graph is

(a) 1, 1, 1 (b) 1, 1, 0
(c) 1, 0, 0 (d) 0, 1, 1

Q21. The Integral

$$\frac{1}{2\pi}\int_{o}^{2\pi} \sin(t-\tau)\cos\tau \ d\tau \ equals$$

(a) sint cost (b) 0 (c) $\frac{1}{2}$cost (d) $\frac{1}{2}$sint

Q22. Let A $=\begin{matrix} 2 & -0.1 \\ 0 & 3 \end{matrix}$ and A $^{-1} =\begin{matrix} \frac{1}{2} & a \\ 0 & b \end{matrix}$ then a+b is equal to

(a) 7/20 (b) 3/20 (c) 19/60 (d) 11/20

Q23.The area in first quadrant under curve
$y = \frac{1}{x^2+6x+10}$ is

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ -tan^{-1} 3 (c) $\frac{\pi}{2}$ - tan^{-1} 3 (d) $\frac{\pi}{2}$ - tan^{-1} 3

Q24. The Newton Raphson method

$$X_{n+1} = \frac{X_n}{2} + \frac{3}{2x_n}$$

Can be used to solve the equal

(a) $x^2=3$ (b) $x^3=3$ (c) $x^2=3$ (d) $x^{-3}=3$

Q25. The solution of $x\frac{dy}{dx} + y = x^4$ with the condition

$Y(1) = \frac{6}{5}$ is

(a) $y = \frac{x^4}{5} + \frac{1}{x}$ (b) $y = \frac{4x^4}{5} + \frac{4}{5x}$ (c) $y = \frac{x^4}{5} + 1$ (d) $y = \frac{x^5}{5} + 1$

Q26. Mamta had no _____ about going the chairman's clerk and throwing her resignation letter to him.

(a) Apathy   (b) Penchant   (c) Compunction   (d) Juxtaposition

Q27. Make the correct word from the meaning given in the question:-

To speak in an indirect manner to evade a point, to mislead

(a) Prevaricate   (b) Concede   (c) Relegate   (d) Remonstrate

Q28. Three pipes of varying diameters can fill the vessels of 1,2, and 3 L in 4, 18, and 48 min respectively. What is the ratio of the diameters?

(a) 6:4:3   (b) 2:3:4   (c) 1:4:5   (d) 2:5:8

Q29. $125^x + 45^x = 2.(27)^x$ has..........

(a) No solution   (b) One solution   (c) Two solution   (d) More than two solution

Q30. If X follows binomial distribution with parameter n=8 and p=1/2 then p ($|x-4| \leq 2$) equals to

(a) $\frac{118}{128}$ (b) $\frac{119}{128}$ (c) $\frac{117}{128}$ (d) None of these