Information Technology   Sample Paper-1
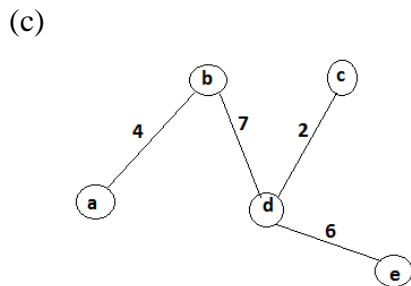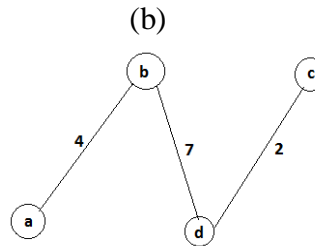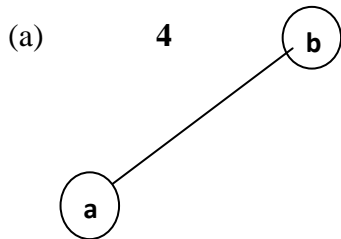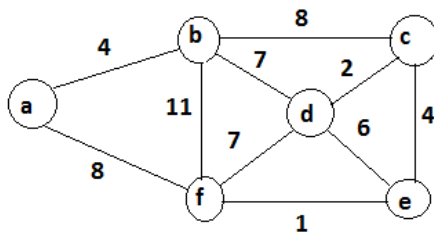
Q.1- Let T(n) be defined by T(1) = 11 and T(n+1) = 3n + T(n) for all integers n≥1 Which of the following represents the order of growth of T(n) as function of n ?

(a) Q (n)   (b) Q (n log n)   (c) Q (n^2)   (d) Q ($n^2 \log n$)

Q.2- Which of the following trees are not formed as an intermediate MST (starting with vertex a when applying Prim's algorithm?

(a)   (b)

(c)   (d)
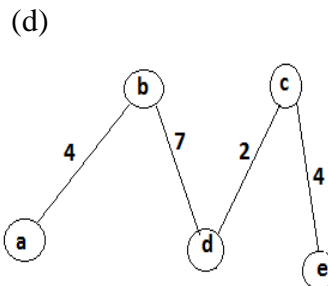
Q.3- The keys 1, 5, 28, 19, 15, 20, 33, 12, 17, 10 are inserted into a hash table in which collision re done by chaining. If the hash function h (k) = k What is the length of Longest chain:

(a) 1   (b) 2   (c) 3   (d) 4

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Q.4- Which of the following is not WP complete?

(a) Determining whether a Boolean proposition is satisfiable.

(b) Determining the clique of maximum size within graph.

(c) Determining whether a directed graph contains a Hamiltonian circuit.

(d) Determining whether an undirected graph contains an Evlerian circuit.

Q.5- Which of the set of shortest path estimates node is not obtained as an intermediate on applying Dijvstra's ago. On the following graph.
(S: source vertex).

	s	r	x	y	z
(a)	0	∞	∞	5	7
(b)	0	10	∞	5	∞
(c)	0	8	9	5	7
(d)	0	8	+3	5	7
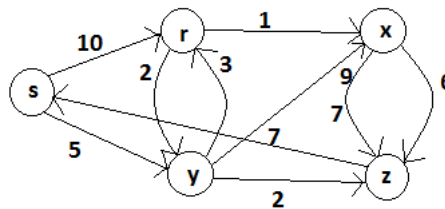
Q.6- If original data 1101011011 and generator 10011 then the stream will be sent as

(a) 11010110111111   (b) 1101000111001

(c) 11010110111110   (d) 11000110110101

Q.7- In go-back NARQ if next ACK arrives after time out then sender will.

(a) Sends next frame

(b) Sends only last frame

(c) Sends frame after last ACK arrived

(d) None

Q.8- A go back- N ARQ uses a window size of 15. How many bits are needed to define the sequence number?

(a) 4   (b) 5   (c) 15   (d) 16

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Q.9- Given an IP add- 201 . 14 . 78 . 65 and subnet mask 255 . 255 . 255 . 224 . What is subnet address?

(a) 201 . 14 . 78 . 64   (b) 201 . 14 . 78 . 65

(c) 201 . 14 . 77 . 64   (d) 201 . 14 . 77 . 66

Q.10- You are required to create a subnet that supports 16 hosts. What subnet mask should you use?

(a) 255 . 255 . 255 . 252   (b) 255 . 255 . 255 . 240

(c) 255 . 255 . 255 . 248   (d) 255 . 255 . 255 . 224

Q.11- Consider a system with logical address = 27 bits physical address = 21 bits and page size = 4k words. The no. of pages are

(a) 2^{15} , 5^{12} (b) 2^{20} , 256   (c) 2^{10} , 10^{24} (d) 2^{9} , 512

Q.12- Consider a system with (AS = 128M words and physical address = 24 bits. The Physical address is divided into 8k frames. How many pages are there in Logical Address Segment.

(a) 50 k   (b) 32 k   (c) 16 k   64 k

Q.13- A system with main memory access time = 100ns and TLB bit-ratio = 95% , then calculate Effective memory Access time with TLB and without TLB.

(a) 200 ns , 125 ns   (b) 150 ns , 125 ns

 (c) 125 ns , 200 ns   (d) 125 ns , 150 ns.

Q.14- What bit-ratio is required to reduce effective memory access time from 300 ns without TLB to 250 ns with TLB, The TLB access time is 60 ns

(a) 50%   (b) 60%   (c) 71.23%   (d) 73.3%

Q.15- A system with Logical Address = 34 bits, Physical Address = 29 bits and page-size = 16 kb Page Table entry size = 8 bytes. The size of page table in conventional and Inverted paging is

(a) 8 Mb , 256 kb   (b) 4 Mb , 256 kb

 (c) 8 Mb , 125 kb   (d) 4 Mb , 125 kb

Q.16- Relation R with n – Attributes A_1 , A_2 , $A_3 - A_N$. How many superkeys are possible with only candidates key A1 .

(a) 2^{n-1} (b) 2^{n} (c) 2^{n-2} (d) 2^{n-3}

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Q.17- A Relation R (A , B , C , D , E) with FD

$$AB \rightarrow C$$
$$C \rightarrow D$$
$$B \rightarrow E$$

(a) Then Relation is in 2nd Normal form
(b) Relation is in 3rd Normal form
(c) Relation is in 4th Normal form
(d) Name of these

Q.18- Consider the following program

    Main () {
    Int arr [ ] = {0 , 1 , 2 , 3 , 4};
    Int *ptr ;
    For (ptr = arr + 4 ; ptr ≥ arr ; ptr--)
    Printf (4% d^{n} , arr [ptr-arr]) ;
    } Which of the following is tone?

(a)Compiler error
(b) Infinite Loop
(c) 0 1 2 3 4
(d) 4 3 2 1 0

Q.19- Consider the following programe

    Void main () {
    Inta [3] [4] = {
                    3 , 6 , 9 , 10
                    2 , 3 , 5 , 1
                    5 , 6 , 7 , 18
                    } ;
    Printf (^{a}\n %4 %4^{n} , a+1 , s a+1) ;

    }

    Assume the array begins at address 65472

(a) 65480 , 65496
(b) 65496 , 65480
(c) 654876
(d) 65478 , 65480

Q.20- Void main () {

    Char a [ ] = "Brain Tree"

    Char *b = "Brain Tree"

    Printf " %d %d %d %d" , size of (a) , size of (b) , size of (*a) , size of (*b)) ;

    }

(a) 10 1 1 1
(b) 11 1 1 2
(c) 11 2 1 1
(d) 11 1 2 1

Q.21- If D_1, D_2 are two diagonal matrices, then

(a) $D_1 D_2 = D_2 D_1$

(b) $D_1 D_2$ is a Diagonal matrix

(c) Both of the above

(d) $D_1 D_2$ may or may not defined

Q.22- If $A = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix}$, then $A^2 + 4A - 5I$ equal to

(a) $\begin{bmatrix} 8 & 4 \\ 8 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} 0 & -4 \\ 8 & 8 \end{bmatrix}$

(c) $\begin{bmatrix} 2 & 1 \\ 2 & 0 \end{bmatrix}$

(d) $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$

Q.23- If tow square are chosen at random on a chess board the probability that they have side in common is

(a) 1/9
(b) 2/7
(c) 1/18
(d) none

Q.24- An I.F. of the differential equation $(1-x^2)\dfrac{dy}{dx} - xy = 1$ is

(a) $-x$
(b) $\dfrac{x}{1-x^2}$
(c) $\sqrt{1-x^2}$
(d) $\dfrac{1}{2}\log_e(1-x^2)$

Q.25- A garrison of 3000 men has provision for 25 days, when given at the rate of 900g per head. At the end of 11 days, a reinforcement arrives and it was found that now the provision will be last 10 days more, when given at the rate of 840 g per head. The strength of reinforcement is

(a) 1200 men
(b) 1500 men
(c) 1600 men
(d) 1800 men

Q.26- Out of the given alternatives, choose the one which can be substituted for the given words or sentences.
Too much official formality

(a) delayed
(b) officiousness
(c) formality
(d) red tapism

Q.27- The following questions comprise two word each that have a certain relationship between them, followed by four lettered pair of word. Select the lettered pair that has the relationship as the original pair of words.
i) shrub : prune

(a) beard : shave
(b) hair : trim

(c) lawn: mow
(d) wool : shear

Q.28- A group of labourers promise to do a piece of work in 12 days, but 5 of them do not turn up. If the rest of the group do the work in 18 days, find the original number of men.
(a) 15   (b) 25   (c) 35   (d) 45

Q.29- Hari (H), Gita(G), Irfan(I) and Saira(S) are siblings(i.e., brothers and sisters). All were born on Ist January. The are difference between any two successive siblings (that is born one after another) is less than 3 year. Given the following facts:
I. Hari's age + Gita's age > Irfan's age + Saira's age
II. The age difference between Gita ans Saira os 1 year. However, Gita is not the oldest and Saira is not the youngest.
III. There are no twins.
In what order were they born (oldest first)?
(a) HSIG   (b) SGHI   (c) IGSH   (d) IHSG

Q.30- Given digits 2,2,3,3,3,4,4,4,4 how many distinct 4 digit numbers greater than 3000 can be formed?
(a) 50   (b) 51   (c) 52   (d) 54

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