33 ⇒

B

1 word = 4 bytes = 2^2 bytes

Page size = 8KB = 2^{13} bytes

No of words in 1 page = $2^{13}/2^2 = 2^{11}$

TLB can hold 128 valid entries.

TLB miss = 128×2^{11}

= ~~128 ×~~

= $\boxed{256 \times 2^{10}}$ Ans

(34)

Sets :-

S1 : set of all recursively enumerable languages over the alphabet $\{0,1\}$

(b)

S2 : Set of all syntactically valid C program

S3 : Set of all languages over the alphabet $\{0,1\}$

S4 : Set of all non-regular languages over the alphabet $\{0,1\}$.

Set are uncountable -}

$\rightarrow$ S_3 & S_4

Q :-

(35) $\forall_x [\forall_z \; z|x \Rightarrow ((z=x) \vee (z=1))) \Rightarrow \exists_w (w>x) \wedge \forall_z \; z|w$
$\Rightarrow ((w=z) \vee (z=1)))]$.

Sets:

(c)

S1 : $\{1, 2, - - 100\}$

S2 : set of all +ve integers

S3 : set of all integers.

satisfy ϕ :

$\rightarrow$ S_2 & S_3

PAGE

36)

a)

Production rule	Semantic ~~Rule~~ Action
$D \rightarrow TL$	$X_1.type = X_2.type$
$T \rightarrow int$	$T.type = int$
$T \rightarrow float$	$T.type = float$
$L \rightarrow L_1, id$	$X_3.type = X_4.type$ add type (id.entry, X_5.type)
$L \rightarrow id$	add type (id.entry, X_5.type

Solⁿ

$D \rightarrow TL$ { L.id type = T.style }

$T \rightarrow int$ { T.style = int }

$T \rightarrow float$ { T.style = float }

$L \rightarrow L_1, id$ { L_1.itype = L.itype }
add type (id.entry, L.itype }

$L \rightarrow id$ add type (id.entry, L.itype)

$X_1 = L$, $X_2 = T$, $X_3 = L_1$, $X_4 = L$

Ans

37)

c)

n unsorted arrays & odd : $A_1, A_2 -- A_n$
worst case time complexity of median of median of $A_1, A_2, ——— A_n$.

Solⁿ

$O(n) * O(n) + O(n)$

$O(n^2) + O(n)$

$= O(n^2)$ Ans

(C)

38 → G be any connected, weighted, undirected graph.

(I) → G has a unique minimum spanning tree, if no two edges of G have the same weight.

(II) → G has a unique minimum spanning tree if, for every cut of G there is a unique minimum weight edge crossing the cut.

True :-

Both True

39 →

40 → (I) → The smallest element in a max-heap is always at a leaf node.

(A) (II) → The second largest element in a max-heap is always a child of the root node.

(III) → The max heap can be constructed from a binary search tree in $\Theta(n)$ time.

(IV) → A binary search tree can be constructed from a max-heap in $\Theta(n)$ time.

True

I, II & III

4(

2

Process	P_1	P_2	P_3	P_4
Arrival Time	0	1	3	4
CPU Burst time	3	1	3	Z

Average waiting time = 1 mili second.

Z = ?.

Sol^n let Z = 2

P_1	P_2	P_1	P_1	P_4	P_3

0 1 2 3 4 6 9

	Arrival time	CPU time	Completion time	Waiting time
P_1	0	3	4	1
P_2	1	1	2	0
P_3	3	3	9	3
P_4	4	Z = 2	6	0

Average waiting time = $\frac{1+0+3+0}{4}$

= 1 mili second

So, Z = 2 Ans

42 ⇒

inden node — (12) direct

one single - indirect , one double - indirect

disk block size = 4 KB,

Address = 32 - bits -

max file size in GB = ?

Sol^n

$(2^{10})^2 \times 2^{12}$ B

$= 2^{32}$ B

4^{16} B

4 GB Ans

43 ⇒

$S' \to S$

$S \to \langle L \rangle \mid id$

$L \to L, S \mid S$

I_0 = CLOSURE({[S' → .S]})

GOTO (I_0, <) = ?

Sol^n

I_0

$S' \to \cdot S$

$S \to \cdot \langle L \rangle$

$S \to id$

$S \to \langle \cdot L \rangle$

$L \to \cdot L, S$

$L \to \cdot S$

$S \to \cdot \langle L \rangle$

$S \to \cdot id$

Total items = 5 Ans