Question Paper with Final (Revised) Answer Key for the Post of	**Programmer**	**held on 23-06-2019**

Itemcode : **PG1001**

Q1: The 10's complement of $(843)_{11}$ is?

A	$(157)_{11}$
B	$(267)_{11}$
C	$(156)_{11}$
D	$(268)_{11}$

Correct Ans: **B**

Itemcode : **PG1002**

Q2: Subtract 1001 from 1110

A	0010
B	0101
C	1011
D	1010

Correct Ans: **B**

Itemcode : **PG1003**

Q3: Which of the following is a positively weighted code?

A	8421
B	84-2-1
C	EXS-3
D	74-2-1

Correct Ans: **A**

Itemcode : **PG1004**

Q4: An OR gate has six inputs. How many words are there in its truth table?

A	6
B	36
C	32

D	64

Correct Ans: **D**

Itemcode : **PG1005**

Q5: The max-term corresponding to decimal 12 is

A	A' + B' + C + D
B	A + B + C' + D'
C	A'B'CD
D	ABC'D'

Correct Ans: **A**

Itemcode : **PG1006**

Q6: What is the minimum number of gates required to implement the Boolean function (AB + C), if we have to use only two-input NOR gates?

A	2
B	3
C	4
D	5

Correct Ans: **B**

Itemcode : **PG1007**

Q7: A full adder circuit can be changed to full sub tractor by adding a

A	NOR gate
B	NAND gate
C	Inverter
D	AND gate

Correct Ans: **C**

Itemcode : **PG1008**

Q8: N flip-flops can be used to divide the input clock frequency by

A	N
B	2N
C	2^N
D	2^{N-1}

Correct Ans: **C**

Itemcode : **PG1009**

Q9: One disadvantage of master-slave FF is ?

A	setup time becomes longer
B	it requires input to be held constant before clock transition
C	unpredictable output even if input held constant
D	hold time becomes longer

Correct Ans: **B**

Itemcode : **PG1010**

Q10: Simplify the following: F = ABCD + AB'CD + A'CB'D + A'BCD

A	CD
B	BC
C	AB
D	C' + D'

Correct Ans: **A**

Itemcode : **PG1011**

Q11: Microprocessor unit or central processor unit consist of

A	Control circuitry
B	ALU
C	memory
D	All of these.

Correct Ans: **D**

Itemcode : **PG1012**

Q12: The number of address lines required in a microprocessor which has to access 1K bytes of Memory is

A	6
B	4
C	10
D	8

Correct Ans: **C**

Itemcode : **PG1013**

Q13: Which of the following device is used to connect a peripheral to a bus?

A	control register
B	interface
C	communication protocol
D	none of the above
Correct Ans: **B**	

Itemcode : **PG1014**

Q14: In which of the following I/O, there is a single address space for memory locations and I/O
devices?

A	Isolated I/O
B	Memory mapped I/O
C	DMA
D	(Both) Isolated I/O and Memory mapped I/O
Correct Ans: **B**	

Itemcode : **PG1015**

Q15: What is the latency of each of the pipelined version of the processor with 2,4,8 and 16 stages?

A	10,11,12,14 ns
B	10,1011,11ns
C	11,12,14,18ns
D	None of the above
Correct Ans: **C**	

Itemcode : **PG1016**

Q16: Cache memory enhances

A	Memory capacity
B	Memory access time
C	Secondary storage capacity
D	Secondary storage access time
Correct Ans: **B**	

Itemcode : **PG1017**

Q17: Principle of locality justifies the use of

A	Cache
B	DMA
C	Disk
D	RAM
Correct Ans: **A**	

Itemcode : **PG1018**

Q18: Multiplying two numbers 010111 and 110110 using Booth's Algorithm is

A	-1242
B	1242
C	230
D	-23
Correct Ans: **D**	

Itemcode : **PG1019**

Q19: In IEEE floating point single precision representation, the number of bits in the fractional part is

A	24
B	23
C	32
D	Depend on architecture
Correct Ans: **B**	

Itemcode : **PG1020**

Q20: What is the output?

```
Main()
    {
        int a = 0;
        int b = 20;
        char x = 1;
        char y = 10;
    if (a,b,c,x,y);
    printf("hello");
```

A	Logical error

B	Garbage value
C	hello
D	20

Correct Ans: **C**

Itemcode : **PG1021**

Q21: What is the output

```
Void main ()
{
    Static int i = 5;
    if (--i)
    {
        main ( );
        printf("%d" ,i);
    }
}
```

A	5
B	5 5 5 5
C	0 0 0 0
D	1 1 1 1

Correct Ans: **C**

Itemcode : **PG1022**

Q22: Which of the following is used to aid in evaluating a prefix expression?

A	Queue
B	Heap
C	Stack
D	Hash

Correct Ans: **C**

Itemcode : **PG1023**

Q23: What is the in-order expression?

A	ABDGCEHIF
B	GDBHIEFCA

C	DGBAHEICF
D	ABHIEFCDG

Correct Ans: **S**   (**S Denotes question scrapped and no credit to Candidates.**)

Itemcode : **PG1024**

Q24: How many numbers of binary tree can be created with 3 nodes which when traversed in post-order gives the sequence C, B ,A ?

A	3
B	5
C	8
D	15

Correct Ans: **B**

Itemcode : **PG1025**

Q25: The time complexity of heap sort algorithm is

A	n log n
B	log n
C	n^2
D	None of the above

Correct Ans: **A**

Itemcode : **PG1026**

Q26: If an array representations of a circular queue contains only one element then

A	front = rear
B	front = rear + 1
C	front = rear – 1
D	front = rear = NULL

Correct Ans: **A**

Itemcode : **PG1027**

Q27: A linear list in which elements can be added or removed at either end but not in the middle is

A	queue
B	dequeue
C	array

D	tree

Correct Ans: **B**

Itemcode : **PG1028**

Q28: A binary search tree contains the values 1,2,3,4,5,6,7,8. The tree is traversed in pre-order and the values are printed out. Which of the following is a valid output?

A	53124786
B	53126487
C	53241678
D	53124768

Correct Ans: **D**

Itemcode : **PG1029**

Q29: While inserting the elements 71,65,84,69,67,83 in an empty binary search tree (BST) in the sequence shown, the element in the lowest level is

A	65
B	67
C	69
D	83

Correct Ans: **B**

Itemcode : **PG1030**

Q30: The recurrence relation capturing the optimal time of the Tower of Hanoi problem with n discs is.

A	$T(n) = 2T(n - 2) + 2$
B	$T(n) = 2T(n - 1) + n$
C	$T(n) = 2T(n/2) + 1$
D	$T(n) = 2T(n - 1) + 1$

Correct Ans: **D**

Itemcode : **PG1031**

Q31: What will be the output if the lines labelled X and Y are changed as follows:

X : return 3 + f(P/2);

Y : return 2 + f(P/3);

A	4

B	6
C	8
D	10

Correct Ans: **D**

Itemcode : **PG1032**

Q32: Which one is the fundamental operation in the relational algebra?

A	Natural join
B	Division
C	Set intersection
D	Cartesian product

Correct Ans: **D**

Itemcode : **PG1033**

Q33: If a, b are terminals and S, A, B are three non-terminals, which of the following are regular grammars?

A	S→ɛ, A→aS|b
B	A→abB|aB
C	A→Ba|Bab
D	A→aB|a, B→bA|b

Correct Ans: **D**

Itemcode : **PG1034**

Q34: Two finite state machines are said to be equivalent if

A	They have the same number of states
B	They have the same number of edges
C	They have the same number of edges and states
D	They recognize the same set of tokens

Correct Ans: **D**

Itemcode : **PG1035**

Q35: In entity relationship diagram double lines indicate

A	Cardinality
B	Relationship
C	Partial participation

D	Total participation

Correct Ans: **D**

Itemcode : **PG1036**

Q36: Which one is not a query language?

A	SQL
B	QBE
C	Data log
D	MySQL

Correct Ans: **D**

Itemcode : **PG1037**

Q37: The graph depicting the inter-dependencies of the attributes of different nodes in a parse tree is called

A	Flow graph
B	Dependency graph
C	Karnaugh's graph
D	Steffi graph

Correct Ans: **B**

Itemcode : **PG1038**

Q38: Incremental-compiler is a compiler

A	Which is written in a language different from the source language
B	That generates object code for its host machine
C	Which is written in the same language as the source
D	That allows a modified portion of a program to be recompiled

Correct Ans: **D**

Itemcode : **PG1039**

Q39: The method of communication in which transmission takes place in both directions, but only in one direction at a time, is called

A	Simplex
B	Four wire circuit
C	Full Duplex
D	Half Duplex

Correct Ans: **D**

Itemcode : **PG1040**

Q40: In session layer, during data transfer, the data stream responsible for the *control* purpose

(i.e. control of session layer itself) is

A	Regular data
B	Typed data
C	Capability data
D	Expedited data

Correct Ans: **C**

Itemcode : **PG1041**

Q41: The correct order of AQL expression is

A	Select, group by, where, having
B	Select, where, group by, having
C	Select, group by, having, where
D	Select, having, where, group by

Correct Ans: **B**

Itemcode : **PG1042**

Q42: What is the purpose of project operation ?

A	It selects certain columns
B	It selects certain rows
C	It selects certain strings
D	It selects certain integers

Correct Ans: **A**

Itemcode : **PG1043**

Q43: A relation will be in 2NF, if we

A	remove repeating groups
B	remove partial dependency
C	remove transitive dependency
D	have overlapping candidate key

Correct Ans: **B**

Itemcode : **PG1044**

Q44: BCNF can be achieved from 3NF by removing

A	repeating groups
B	partial dependencies
C	transitive dependencies
D	overlapping dependencies

Correct Ans: **D**

Itemcode : **PG1045**

Q45: The number of possible schedules for a set of n transaction is

A	lesser than n!
B	much larger than n!
C	n!
D	None

Correct Ans: **C**

Itemcode : **PG1046**

Q46: Consider the following recurrence

$$T(n) = \begin{cases} 2, & \text{if } n = 2. \\ 2T(n/2) + n, & \text{if } n = 2^K, \text{ for } k > 1. \end{cases}$$

The solution of the recurrence, when n is an exact power of 2 is

A	T (n) = n,
B	T (n) = $n^2 \log n$,
C	T (n) = nlogn,
D	T (n) = n^2

Correct Ans: **C**

Itemcode : **PG1047**

Q47: A list integers is read in, one at a time, and a binary search tree is constructed. Next the tree is traversed would result in a printout which duplicates the original order of the list of integers?

A	Preorder
B	Postorder
C	Inorder

D	None of these

Correct Ans: **B**

Itemcode : **PG1048**

Q48: Property of locality of reference may fail, if a program has

A	Many conditional jumps
B	Many unconditional jumps
C	Many operands
D	Many Operators

Correct Ans: **C**

Itemcode : **PG1049**

Q49: An array of n numbers is given, where n is an even number. The maximum as well as the minimum of these n numbers needs to be determined. Which of the following is TRUE about the number of comparisons? needed?

A	At least 2n-c comparisons, for some constant c, are needed
B	At most 1.5n-2 comparisons are needed.
C	At least nlog2n comparisons are needed.
D	None of the above.

Correct Ans: **B**

Itemcode : **PG1050**

Q50: Which one of the following is not true for a view:

A	View is derived from other tables.
B	View is a virtual table
C	A view definition is permanently stored as part of the database.
D	View never contains derived columns.

Correct Ans: **C**

Itemcode : **PG1051**

Q51: Which one of the following statements is false?

A	Optimal binary search tree construction can be performed efficiently using dynamic programmmg.
B	Breadth-first search cannot be used to find connected components of a graph.
C	Given the prefix and postfix walks of a binary tree, the binary tree cannot be uniquely reconstructed.

D	(Both)Breadth-first search cannot be used to find connected components of a graph and Given the prefix and postfix walks of a binary tree, the binary tree cannot be uniquely reconstructed.

Correct Ans: **D**

Itemcode : **PG1052**

Q52: Correct hierarchical relationship among context- free, right-linear, and context-sensitive language is

A	context-free ⊂ right-linear ⊂ context-sensitive
B	context-free ⊂ context-sensitive ⊂ right-linear
C	context-sensitive ⊂ right-inear ⊂context-free
D	right-linear ⊂context-free ⊂context-sensitive

Correct Ans: **D**

Itemcode : **PG1053**

Q53: Which of the following model does not belong to database model?

A	Relational Model
B	Distributed Model
C	Hierarchical Model
D	Network Model

Correct Ans: **B**

Itemcode : **PG1054**

Q54: Two strings are defined as x = java, y = script. The concatenation (x,y) of two strings results in -----

A	scriptjava
B	javascropt
C	jascriptva
D	scrijavapt

Correct Ans: **S**   **(S Denotes question scrapped and no credit to Candidates.)**

Itemcode : **PG1055**

Q55: A string, x is defined as, x = butter. Then $(x^R)^R$ is -----

A	butter
B	rettub

C	butret
D	rebut

Correct Ans: **A**

Itemcode : **PG1056**

Q56: To convert the grammar E -> E + T into LL grammar

A	use left factor
B	CNF form
C	eliminate left recursion
D	(Both) CNF form and eliminate left recursion

Correct Ans: **C**

Itemcode : **PG1057**

Q57: A system program that combines separately compiled modules of a program into a form suitable for Execution is

A	Assembler
B	Linking loader
C	Cross compiler
D	None of above

Correct Ans: **B**

Itemcode : **PG1058**

Q58: YACC builds up

A	SLR parsing table
B	Canonical LR parsing table
C	LALR parsing table
D	None

Correct Ans: **C**

Itemcode : **PG1059**

Q59: Which of following is not a bottom up parser ?

A	LALR
B	Predictive parser
C	CLR
D	SLR

Correct Ans: **B**

Itemcode : **PG1060**

Q60: resolution of externally defined symbols is performed by a

A	Linker
B	Loader
C	Compiler
D	Interpreter

Correct Ans: **A**

Itemcode : **PG1061**

Q61: Convert the following expression into postfix notation:

a = (-a + 2*b)/a

A	aa − 2b*+a/=
B	a − 2ba*/+=
C	a2b*a/+
D	a2b - *a/+

Correct Ans: **A**

Itemcode : **PG1062**

Q62: Code generation can be done by

A	DAG
B	Labelled tree
C	(Both) DAG and Labelled tree
D	None

Correct Ans: **C**

Itemcode : **PG1063**

Q63: Live variables analysis is used as a technique for

A	Code generation
B	Code optimization
C	Type checking
D	Run time management

Correct Ans: **B**

Itemcode : **PG1064**

Q64: Consider the expression

((4 + 2* 3 + 7) + 8 *5). The polish postfix notation for this expression is

A	423* + 7 + 85*+
B	423* + 7 + 8 + 5*
C	42 + 37 + *85* +
D	42 + 37 + 85** +

Correct Ans: **A**

Itemcode : **PG1065**

Q65: A basic block can be analyzed by

A	Flow graph
B	A graph with cycles
C	DAG
D	None of above

Correct Ans: **C**

Itemcode : **PG1066**

Q66: In which phase 'type checking' is done ?.

A	Lexical analysis
B	Code optimization
C	Syntax analysis
D	Semantic analysis

Correct Ans: **D**

Itemcode : **PG1067**

Q67: To eliminate backtracking which one is used?

A	Left Recursion
B	Left Factoring
C	Right Recursion
D	Right Factoring

Correct Ans: **B**

Itemcode : **PG1068**

Q68: Consider the grammar shown below:

S -> CC

C -> cC/a

The grammer is

A	LL(1)
B	SLR(1) But not LL(1)
C	LALR (1) but not SLR(1)
D	LR(1) but not LALR

Correct Ans: **A**

Itemcode : **PG1069**

Q69: Consider the following grammar:

S -> AB

B -> ab

A -> aa

A -> a

B -> b

The grammar is

A	Ambiguous
B	Unambiguous
C	Can't predictable
D	None of these

Correct Ans: **A**

Itemcode : **PG1070**

Q70: The parse tree is constructed and then it is traversed and the semantic rules are evaluated in a particular order by a

A	Recursive evaluator
B	Bottom up translation
C	Top down translation
D	Phase tree method

Correct Ans: **A**

Itemcode : **PG1071**

Q71: A process executes the following segment of code

For (i = 1; i < 10; i++) fork();

The number of new processes created is

A	1024
B	1023
C	1025
D	1028

Correct Ans: **B**

Itemcode : **PG1072**

Q72: What is a kernel-level thread?

i) Threads that are spawned by OS Kernel

ii) Threads that are launched by user directly accessing the kernel

A	(i) only
B	(ii) only
C	Both (i) and (ii)
D	Neither (i) nor (ii)

Correct Ans: **A**

Itemcode : **PG1073**

Q73: Which of the following does not interrupt a running process?

A	Device
B	Timer
C	Scheduler
D	Power failure

Correct Ans: **C**

Itemcode : **PG1074**

Q74: Which of the following is the property of time sharing system?

(i) Multiple user access

	(ii) Multiprogramming
A	(i) only
B	(ii) only
C	Both (i) and (ii)
D	Neither (i) nor (ii)

Correct Ans: **C**

Itemcode : **PG1075**

Q75: Which of the following is used to call an OS function?

A	Interrupt
B	Trap
C	Supervisor call
D	All of these

Correct Ans: **C**

Itemcode : **PG1076**

Q76: Consider the given IP address, 156.216.24.65 with a subnet mask of 7 bits, what are the number of hosts and Subnets?

A	512,128
B	510,126
C	511,127
D	509,125

Correct Ans: **B**

Itemcode : **PG1077**

Q77: The mechanism of leaky bucket algorithm

A	Reduces congestion
B	Turns uneven flow of packet into even flow
C	Smoothens out bursts
D	All the above

Correct Ans: **D**

Itemcode : **PG1078**

Q78: The highest IP address in digital notation is

A	255.0.0.0

B	255.255.0.0
C	255.255.255.0
D	255.255.255.255

Correct Ans: **D**

Itemcode : **PG1079**

Q79: Which of the following is not an active attack?

A	Denial of Service
B	Traffic Analysis
C	Replay
D	Masquerade

Correct Ans: **B**

Itemcode : **PG1080**

Q80: Verifying the true identity of the sender of a message recipient is known as –

A	Authentication
B	Fabrication
C	Cryptography
D	Availability

Correct Ans: **A**

Itemcode : **PG1081**

Q81: What was the share of industries sector during the financial year 2016-17 (in percentage terms) in the economy of H.P.?

A	5.6
B	9.4
C	25.2
D	30.5

Correct Ans: **C**

Itemcode : **PG1082**

Q82: Approximately how much electricity will be generated in the proposed Renukaji Dam?

A	30 MW
B	40 MW

C	50 MW
D	60 MW

Correct Ans: **B**

Itemcode : **PG1083**

Q83: Among the following peaks in H.P., which one is the highest?

A	Deo Tibba
B	Shipki
C	Leo Pargial
D	Manerang

Correct Ans: **C**

Itemcode : **PG1084**

Q84: How many fair price shops are being run by the Civil Supplies Corporation in H.P.?

A	51
B	71
C	81
D	91

Correct Ans: **B**

Itemcode : **PG1085**

Q85: According to 2010-11 agicultural census what is the percentage of Semi-medium holdings in H.P.?

A	2.87
B	8.84
C	18.17
D	20.15

Correct Ans: **B**

Itemcode : **PG1086**

Q86: What is the Share of H.P. Government in funding the H.P. Forest Eco-Systems Climate proofing project?

A	10.50 percent
B	12.60 percent
C	14.90 percent

D	15.70 percent

Correct Ans: **C**

Itemcode : **PG1087**

Q87: Out of 14 silk yarn reeling units which have been set up in H.P. in the private sector, how many are in Sirmour Distict?

A	Nil
B	One
C	Two
D	Three

Correct Ans: **B**

Itemcode : **PG1088**

Q88: What is the generation capacity of Sai Kothi-I hydro power project?

A	5 MW
B	10 MW
C	15 MW
D	20 MW

Correct Ans: **C**

Itemcode : **PG1089**

Q89: Which classes are covered in H.P. under PRAYAS scheme?

A	Ist to V
B	VI to VIII
C	IX to X
D	+1 and +2

Correct Ans: **B**

Itemcode : **PG1090**

Q90: At which place in Kinnaur District of H.P. has Milkfed installed a milk processing plant?

A	Reckong Peo
B	Sangla
C	Morang
D	Pooh

Correct Ans: **A**

Itemcode : **PG1091**

Q91: How many seats did the Mizo National Front win during the 2018 Assembly elections in Mizoram?

A	22
B	24
C	26
D	28

Correct Ans: **C**

Itemcode : **PG1092**

Q92: Which Indian Wicket-Keeper holds the record of most catches in a Cricket Test match?

A	M.S. Dhoni
B	Dinesh Kartik
C	Farooq Engineer
D	Rishabh Pant

Correct Ans: **D**

Itemcode : **PG1093**

Q93: What is the proposed venue of 107th Indian Science Congress to be held in 2020?

A	Kharagpur
B	Bengaluru
C	Hyderabad
D	Pune

Correct Ans: **B**

Itemcode : **PG1094**

Q94: What would be the total length of the proposed highway corridor between Dera Baba Nanak (India) and Gurdwara Kartarpur Sahib (Pakistan)?

A	3.7 Kms.
B	4.6 Kms.
C	5.3 Kms.
D	6.2 Kms.

Correct Ans: **D**

Itemcode : **PG1095**	
Q95: Kumbh is held in India at four places. Three of them are: Haridwar, Ujjain and Prayag. Which is the fourth?	
A	Nashik
B	Puri
C	Gaya
D	Tirupati
Correct Ans: **A**	

Itemcode : **PG1096**	
Q96: Who is called Father Teresa?	
A	Ehrlich Paul
B	Abdul Sattar Edhi
C	Bob Dylan
D	Otto Dix
Correct Ans: **B**	

Itemcode : **PG1097**	
Q97: With whom did Tasuku of Japan share the 2018 Nobel prize for Medicine?	
A	Arthur Ashkin
B	Gregory Winter
C	Denis Mukwego
D	James Allison
Correct Ans: **D**	

Itemcode : **PG1098**	
Q98: To which country does Vanessa Ponce de Leon, who won the 2018 Miss World Crown at a pageant held in Sanya (China) in December, 2018, belong?	
A	Panama
B	Brazil
C	Argentina
D	Mexico
Correct Ans: **D**	

Itemcode : **PG1099**

Q99: Which day is observed as Mother'Day?	
A	2nd Sunday of March
B	Second Sunday of May
C	Second Sunday of June
D	Second Sunday of July
Correct Ans: **B**	

Itemcode : **PG1100** **Q100:** Which city is called the Forbidden city?	
A	Kathmandu
B	Thimphu
C	Lhasa
D	Mosul
Correct Ans: **C**	