Answer Keys for Ph.D Entrance Exam (CSE)

Q. No.	Answer	Q. No.	Answer
1	D	21	C
2	C	22	D
3	D	23	C
4	C	24	D
5	D	25	D
6	C	26	B
7	C	27	C
8	A	28	A
9	B	29	B
10	B	30	A
11	B	31	B
12	C	32	A
13	B	33	A
14	D	34	C
15	B	35	A
16	A	36	D
17	D	37	C
18	C	38	C
19	A	39	B
20	A	40	A

As received from examiner

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MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA

Ph.D. Entrance Examination of COMPUTER SCIENCE ENGINEERING

1. The first type declarative sentences in object language, which are considered to be primitive, are denoted by _____ .
   (a) small letters
   (b) digits
   (c) any letters
   (d) capital letters

2. The declarative sentences to which it is possible to assign one and only one of the two possible truth values are called _____ .
   (a) conjuctions
   (b) disjunctions
   (c) statements
   (d) connectives

3. Which of the following devices forwards packets between networks by processing the routing information included in the packet?
   (a) firewall
   (b) bridge
   (c) hub
   (d) router

4. There are 3 blue socks, 5 brown socks, and 4 white socks in a drawer. If two socks are picked up randomly, what is the probability that the selected socks are of the same color?
   (a) 1
   (b) 0
   (c) 19/66
   (d) 4/11

5. Which of the following allows you to connect and login to a remote computer?
   (a) SMTP
   (b) HTTP
   (c) FTP
   (d) Telnet

6. The curve y=f(x) is called the distribution curve of the corresponding random variable x. It is evident that the distribution curve lies between _____
   (a) Y=0, X=0
   (b) Y=0, X=1
   (c) Y=0, Y=1
   (d) X=0, X=1

7. If X and Y are two sets, then X ∩ (Y ∪ X) C equals
   (a) X
   (b) Y
   (c) Ø
   (d) None of these

8. If $A = \{x \mid -1 < x < 1\} = B$, then function $f(x) = x/2$ from A to B is:
   (a) injective
   (b) surjective
   (c) both injective and surjective
   (d) neither injective nor surjective

9. There are _____ minterms for 3 variables (a, b, c)
   (a) 0
   (b) 8
   (c) 2
   (d) 1

10. What does a foreign key combined with a primary key create?
    (a) Network model between the tables that connect them
    (b) Parent-Child relationship between the tables that connects them
    (c) One to many relationship between the tables that connects them
    (d) All of the mentioned

11. The value of P(n, n-1) is
(a) n
(b) n!
(c) 2n
(d) 2n!

12. The number of squares that can be formed on a chessboard is
(a) 64
(b) 160
(c) 204
(d) 224

13. What is the number of edges present in a complete graph having n vertices?
(a) (n*(n+1))/2
(b) (n*(n-1))/2
(c) n
(d) n-1

14. A major goal of the db system is to minimize the number of block transfers between the disk and memory. Which of the following helps in achieving this goal?
(a) Secondary storage
(b) Storage
(c) Catalog
(d) Buffer

15. A graph is called a if it is a connected acyclic graph:
(a) Cyclic graph
(b) Regular graph
(c) Tree
(d) Trivial graph

16. How many bits are needed to store one BCD digit?
(a) 4 bits
(b) 2 bits
(b) 3 bits
(d) 1 bit

17. Which of these sets of logic gates are known as universal gates?
(a) XOR, NAND, OR
(b) OR, NOT, XOR
(c) NOR, NAND, XNOR
(d) NOR, NAND

18. _____ command is used in SQL to issue multiple CREATE TABLE, CREATE VIEW and GRANT statements in a single transaction.
(a) CREATE CLUSTER
(b) CREATE PACKAGE
(c) CREATE SCHEMA
(d) All of the mentioned

19. Which of the following CPU register holds data or information before going to the decoder?
(a) Memory data register
(b) Control register
(c) Accumulator
(d) Stack

20. When using Branching, the usual sequencing of the PC is altered. A new instruction is loaded which is called as _____
(a) Branch target
(b) Loop target
(c) Forward target
(d) Jump instruction

21. The effective address of the following instruction is MUL 5(R1,R2).
(a) 5+R1+R2
(b) 5+(R1*R2)
(c) 5+[R1]+[R2]
(d) 5*([R1]+[R2])

22. Which data structure do we use for testing a palindrome?
(a) Heap
(b) Tree
(c) Priority queue
(d) Stack

23. A splay operation refers to:
(a) the removal of leaf node
(b) the movement of root to leaf
(c) the movement of a node to root
(d) the movement of parent node to a child node's down

24. What is the time complexity for checking if an undirected graph with E edges and V vertices is Bipartite, given its adjacency matrix?
(a) O(E)
(b) O(V)
(c) O(E*E)
(d) O(V*V)

25. What is the best and worst case time complexity for a quick sort algorithm?
(a) Best case: O(1), Worst case: O(n*log(n))
(b) Best case: O(n), Worst case: O(n*log(n))
(c) Best case: O(n*log(n)), Worst case: O(n*log(n))
(d) Best case: O(n*log(n)), Worst case: O(n*n)

26. What is the advantage of external hashing over open addressing?
(a) Less space is used
(b) Deletion operation is easier.
(c) The time complexity is lesser
(d) All of the above

27. What is the time and space complexity to delete a node from the singly linked list?
(a) Time complexity: O(1), Space complexity: O(1)
(b) Time complexity: O(1), Space complexity: O(n)
(c) Time complexity: O(n), Space complexity: O(1)
(d) Time complexity: O(n), Space complexity: O(n)

28. Which among the following sorting algorithm is the most optimal one to sort a random linked list?
(a) Merge sort
(b) Insertion sort
(c) Quick sort
(d) Heap sort

29. How will you increment the rear end in a circular queue?
(a) rear =rear+1
(b) (rear+1) % max
(c) (rear % max) + 1
(d) rear+1

30. What can be the relation between sparsity and density in a matrix?
(a) Sparsity = 1- Density
(b) Sparsity = Density + 1
(c) Sparsity = Total number of elements * density
(d) Sparsity = Density divided by total number of elements

31. What is "trial division" as a technique in number theory and prime factorization?
(a) A method to find the smallest prime number
(b) A method to verify if a number is prime by dividing it by smaller primes
(c) A method to find the largest prime number
(d) A method to add prime numbers

32. What is the "overlap" property in dynamic programming?
(a) The property that two subproblems share a common solution
(b) The property that subproblems cannot be solved independently
(c) The property that subproblems do not share any common elements
(d) The property that all subproblems have identical solutions

33. There are _____ tuples in finite state machine.
(a) 4   (b) 5
(c) 6   (d) 2

34. The minimum number of productions required to produce a language consisting of palindrome strings over $\Sigma=\{a,b\}$ is:
(a) 3   (b) 7
(c) 5   (d) 6

35. What is bootstrapping called?
(a) Cold boot   (b) Cold hot boot
(c) Cold hot strap   (d) Hot boot

36. Which of the following does not interrupt the running process?
(a) Timer interrupt   (b) Device
(c) Power failure   (d) Scheduler process

37. Select the correct command to find the number of values in a column.
(a) ADD   (b) SUM
(c) COUNT   (d) TOTAL

38. In the context of databases, what is denormalization?
(a) The process of organizing data to minimize redundancy
(b) The process of converting complex data types into simpler ones
(c) The process of introducing redundancy to improve query performance
(d) The process of encrypting sensitive data

39. What is the purpose of the SQL keyword "CHECK" when defining a table constraint?
(a) It ensures that a column cannot have NULL values
(b) It enforces a condition to limit the values that can be inserted into a column
(c) It creates an index on the specified column
(d) It establishes a link between two tables

40. Which of the following address belongs class A?
(a) 121.12.12.248
(b) 130.12.12.248
(c) 128.12.12.248
(d) 129.12.12.248