

### Answer key (CSE)

1. C	2. D	3. A	4. B	5. B
6. A	7. C	8. A	9. A	10. A
11. B	12. D	13. D	14. C	15. B
16. B	17. A	18. C	19. C	20. D
21. D	22. B	23. A	24. A	25. C
26. A	27. D	28. C	29. B	30. B
31. C	32. A	33. D	34. D	35. B
36. A	37. C	38. D	39. B	40. A

*Basant*  
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Ph.D. Entrance Examination of COMPUTER SCIENCE & ENGINEERING

1. Let P: If Sameer bowls, Rajat hits a century.; Q: If Rajat bowls, Sameer gets out on first ball. Now if P is true and Q is false then which of the following can be true?
  - a. Rajat bowled and Sameer got out on first ball
  - b. Rajat did not bowled
  - c. Sameer bowled and Rajat hits a century
  - d. Sameer bowled and Rajat got out
2. Let P: We should be happy., Q: We should be motivated., R: We should be overconfident. Then 'We should be happy or motivated but not overconfident.' is best represented by?
  - a.  $\sim P \vee \sim Q \vee R$
  - b.  $P \wedge \sim Q \wedge R$
  - c.  $P \vee Q \wedge R$
  - d.  $P \vee Q \wedge \sim R$
3. Translate the following statement into FOL.  
"For every "a", if "a" is a Ph.D. student, then "a" is a scholar"
  - a.  $\forall a$  Ph.D. student (a) scholar(a)
  - b.  $\exists a$  PhD student (a) scholar(a)
  - c. All of the mentioned
  - d. None of the mentioned
4. Given numbers 9, 10, 12, 13, 13, 13, 15, 15, 16, 16, 18, 22, 23, 24, 24, 25, calculate Mean, Median and Mode
  - a. 15.5, 16.75, 16
  - b. 16.75, 15.5, 16
  - c. 16, 16.75, 15.5
  - d. 16, 15.5, 16.75
5. Calculate the standard deviation of 10, 12, 23, 23, 16, 23, 21, 16 for population
  - a. 2.8989794855664
  - b. 4.8989794855664
  - c. 1.8989794855664
  - d. 4.5989794855664
6. In Boolean Algebra absorption Law for  $AB+AC+B$  gives answer
  - a.  $AC+B$
  - b.  $AB$
  - c.  $AC$
  - d. None of these
7. Bubble sort complexity is \_\_\_\_\_
  - a.  $O(n)$
  - b.  $O(\log n)$
  - c.  $O(n^2)$
  - d.  $O(n \log n)$
8. Empty graph is known as
  - a. Trivial graph
  - b. Regular graph
  - c. Bipartite graph
  - d. None of these

9. In a simple graph the maximum degree of any vertex with  $n$  vertices is
- $n-1$
  - $n+1$
  - $2n-1$
  - $n$
10. Number of edges in a complete graph is calculated by formula
- $(N*(N-1))/2$
  - $(N-1)/2$
  - $N*(N-1)$
  - $(N*(N-1))/5$
11. A 3-input AND gate Boolean expression is \_\_\_\_\_.
- $X = AB$
  - $X = ABC$
  - $X = A + B + C$
  - $X = AB + C$
12. A four-input OR gate when  $A = 1, B = 1, C = 0,$  and  $D = 0$  would be accurately described when
- $1 + 1 + 0 + 0 = 01$
  - $1 + 1 + 0 + 0 = 00$
  - $1 + 1 + 0 + 0 = 0$
  - $1 + 1 + 0 + 0 = 1$
13. ADD X Y corresponds to which addressing?
- Indirect
  - Index
  - Immediate
  - Absolute
14. Devices that deliver or receive huge volumes of data over a short distance should connect using \_\_\_\_\_
- BUS
  - Serial port
  - Parallel port
  - Isochronous port
15. Which bitwise operator will be used to invert all the bits in a bit array
- OR
  - NOT
  - XOR
  - NAND
16. What is output of
- ```
#include <stdio.h>
#if X == 4
    #define Y 4
#else
    #define Y 6
#endif
int main()
{ printf("%d", Y);
  return 0; }
```
- 4
  - 6
  - 4 or 6 depending on value of X
  - Compile time error

17. Output of

```
include <stdio.h>
int main()
{
    int x = 5;
    int const * ptr = &x;
    ++(*ptr);
    printf("%d", x);
    return 0;
}
```

- a. Compiler Error
  - b. Runtime Error
  - c. 6
  - d. 5
18. Consider a four-vertex complete graph G. There are \_\_\_ spanning trees in the graph G.
- a. 15
  - b. 8
  - c. 16
  - d. 13
19. How long does it take for an insertion sort algorithm to complete if the input is already sorted?
- a.  $O(N^2)$
  - b.  $O(N \log N)$
  - c.  $O(N)$
  - d.  $O(M \log N)$
20. How long does it take for Dijkstra's algorithm to execute using the Binary min-heap method?
- a.  $O(V)$
  - b.  $O(V \log V)$
  - c.  $O(E)$
  - d.  $O(E \log V)$
21. Which of the following statements regarding the 0/1 knapsack problem and the fractional knapsack problem is true?
- a. In 0/1 knapsack problem items are divisible and in fractional knapsack items are indivisible
  - b. Both are the same
  - c. 0/1 knapsack is solved using a greedy algorithm and fractional knapsack is solved using dynamic programming
  - d. In 0/1 knapsack problem items are indivisible and in fractional knapsack items are divisible
22. How many times is the for loop executed in the Bellman Ford Algorithm?
- a. V times
  - b. V-1
  - c. E
  - d. E-1
23. The postfix of  $(A + B) * (C * D - E) * F / G$  is?
- a.  $AB + CD * E - FG / **$
  - b.  $AB + CD * E - F ** G /$
  - c.  $AB + CD * E - * F * G /$
  - d.  $AB + CDE * - * F * G /$
24. The Data structure used in standard implementation of Breadth First Search is?
- a. Stack
  - b. Queue
  - c. Linked List
  - d. array

25. How much auxiliary memory do pushdown automata have to behave like a Turing machine?
- 0
  - Exactly 2
  - 2 or more
  - Both B and C are correct
26. If Turing machine accepts all the words of the languages  $L$  and rejects or loops for other words, which are not in  $L$ , then  $L$  is said to be
- Recursive enumerable
  - Context free language
  - Recursive
  - None of above
27. Which of the following symbol table implementation has the minimum access time?
- Self-organizing list
  - Linear
  - Search tree
  - Hash table
28. A bottom-up parser generates
- Left-most derivation in reverse
  - Left-most derivation
  - Right-most derivation in reverse
  - Right-most derivation
29. Which of the following class of statement usually produces no executable code when compiled?
- Assignment Statement
  - Structural Statement
  - Declaration Statement
  - Input/Output Statement
30. Operating system is
- Application Software
  - System Software
  - None of above
  - Both A and B
31. Page replacement algorithms are part of
- Scheduling process
  - File management
  - Virtual memory
  - Protection & Security
32. Running multiple programs at the same time is called
- Multitasking
  - Foreground Tasking
  - Single Tasking
  - Symmetric Tasking
33. A table can have only one
- Secondary Key
  - Alternate Key
  - Unique Key
  - Primary Key
34. In the architecture of a database system external level is the
- Physical Level
  - Logical level
  - Conceptual level
  - View Level



35. .... is a condition specified on a database schema and restricts the data that can be stored in an instance of the database.
- Key Constraint
  - Check Constraint
  - Foreign Key Constraint
  - Integrity Constraint
36. Class A, B, and C are together referred to as
- Classful addressing
  - Classless addressing
  - Eventful addressing
  - Graded addressing
37. The concept of connecting the computers for sharing resources is called \_\_\_\_.
- Internetworking
  - Intranetworking
  - Networking
  - None of above
38. Which layer is used to for making end to end connectivity?
- Session Layer
  - Application Layer
  - Logical layer
  - Transport Layer
39. How many total versions of IP addresses are there
- 1
  - 2
  - 3
  - 4
40. If  $6P(A) = 8P(B) = 14P(A \cap B) = 1$ , then  $P(A' / B) = ?$
- $3/7$
  - $4/7$
  - $3/5$
  - $2/5$