# IIITH PGEE - 2021

## Paper 1: Aptitude

1. 1st January 2029 is Monday, which month will have the same calendar as of January from the same year.
   OPTIONS: a. July, b. August, c. November, d. October
2. 2, 2, 3, 6, X ,45, 157.5. what is the value in place of 'X'?
3. 3,6=45 2,4=20 1,7=?
4. It is estimated that 50% of emails are spam emails. Some software that has been applied to filter can detect 99% of spam emails, and the probability for a false positive (a non-spam email detected as spam) is 5%. Now if an email is detected as spam, then what is the probability that it is in fact these spam emails before they reach your inbox. A certain brand of software claims that it is a non-spam email?
5. X% error in measuring side of a cube. What would be the % error in measuring surface area of cube.
6. Initial value of bacteria density, decaying rate, time was given. Find density after 5 years?
7. 40ft tall tower. If a monkey climbs 5ft and slides 3ft. How much steps to reach at top of building.
8. A container contains 40 liters of milk. From this container, 4 liters of milk were taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container?
9. Solve the inequality: |x-7| <= 1 find range of X.
10. Cloth: Fabric :: sound then (a)music (b)pitch (c)decibel (d)vibrations
11. Two guys (let's say X and Y) are standing and facing each other in the evening time. if X's shadow is on his/her right side then in which direction Y is facing. OPTIONS: North, East, South and can't say
12. The Perimeter of shape is P. Which has the lowest area?
    OPTIONS: A. Equilateral Triangle, B. Right angle Isosceles Triangle, C. Square, D. Other
13. Which of the following cannot be the sum of two or more consecutive positive integers? ANSWER: Powers of 2 can't be
14. Find unfolding of a given 3D shape? (Prism was given with square base)
15. $30x^2 + 11x + 1 = 0$ and $42y^2 + 13y + 1 = 0$, then which option is correct? OPTIONS: A. x>y B. x<=y C. x=y
16. A said to B that the girl is the daughter of the brother-in-law and mother of my friend. Relation between A's friend and that girl?
17. A has invested Rs. x, B invested Rs Y then after 4 months A removed 4000 and B added 4000. Then after 2-month C invested 25000. Who get max share?
18. 2 Pattern Completion
19. Puzzle Based Question
20. 2 Questions of Spatial Aptitude
21. 2 Questions of Syllogism
22. 2 basic comprehensions were given. Each Comprehensions consists of 3-5 questions.

## Paper 2: Technical

1. No of ones in binary representation of (3*2048 + 15*512 + 5*16 + 3).
2. The characteristic equation of NOR S-R latch is
   OPTIONS: A. Q(t+1) = S + Q(t)R' B. Q(t+1) = SR + Q(t)R'
   C. Q(t+1) = SR' + Q(t)R D. Q(t+1) = S'R' + Q(t)R
3. There is a multiplexer with 2 input X and Y and one control line Z. X is selected when Z=0 and Y is selected when Z=1. What value will you assign to X, Y, Z if you want f = T + R as output.
4. In a number system, the product of 44 and 11 is 1034 in some number system. The number 111 in that number system when converted to decimal number system?
5. One Question from MUX (2 x 1), asked to Implement A+B.

6. POS equation was given and SOP was asked.
7. What is the minimum number of gates required to implement the Boolean function (AB+C) if we have to use only 2-input NOR gates? Options: 3, 4, 5, 6
8. Definition of How Optimal Page Replacement Algorithm works?
9. Number of Page fault of the memory reference given using XYZ algorithm?
10. Pipeline improves: OPTIONS: (a). throughput (b). latency (c). both (d). None
11. A 32-bit physical address having direct mapped cache with block size 16 B, cache size 4KB and main memory size 4GB. Find tag bits
12. A 4-way set associative cache with 64 KB size and size of each block 32B. Find the total no. of sets present?
13. Implementation of queue using linked list and array. OPTIONS: (a) O (1) to dequeue or enqueue using LL. (b) O (1) to dequeue or enqueue using Array. (c). Both a and b (d) None.
14. Insertion of elements in Empty AVL tree.
15. Find the max element in the min. heap?
16. One question on h(k) = kmod7 (using Quadratic Probing) with values given. Guess the array after element insertion.
17. MSQ: BST deletion of node with two children but distinct elements in BST?
    OPTIONS: (a). replace deleted node with min. element of left subtree. (b) replace deleted node with min. element of right subtree. (c) replace deleted node with max elem. of left subtree. (d) replace deleted node with max elem. of right subtree.
18. MSQ: What does the function return?

```
static int function (int x) {
  if (x==1) return x;
  return 2*f(x/2);}
```

    OPTIONS: a) largest power of 2 less than or equal to x.
    b) For x <0 it goes into infinite loop.
19. Element 363 is to be searched in binary search tree, what is the incorrect sequence in which elements are visited during searching for 363?
20. MSQ: Given input sequence a, b, c, d, e. Which of the following permutations can be obtained in the output using stack?
21. Identify the sorting algorithm from the number series of array.
22. Dynamic Programming: Matrix Multiplication
23. Finding Shortest Path Using Dijkstra graph was given.
24. You have a BST with all unique values. Which traversal will give you a sorted list?
    OPTIONS: A. Preorder, B. In order, C. Post order, D. None
25. Coding questions (only C language): Print absolute mod of number.
26. Coding questions (only C language): Count total number of prime numbers between 1 to <n.
27. LIKE operator in SQL, Fetch the details of those whose city is Telangana
28. Definition of Logical data Independence.
29. Two phase locking has growing and shrinking phase. In growing phase locks are acquired and in shrinking phase locks are released. What would happen if single phase locking is used i.e., locks are acquired right before read/write and released right after read/write?
30. MSQ: Possible subnet mask of class A IPV4. OPTIONS: (a) 255.0.0.0 (b) 255.255.0.0 (c) 255.255.255.0 (d) 255.255.255.255
31. WAN use which Routing Protocol- OPTIONS: 1) CSMA/CD 2) TCP 3) OSPF
32. A line segment AB is given of length 2a and point is marked on this line say “P”. Find the probability such that the area of rectangle formed from AP and PB exceeds $(a^2)/2$.
33. There are 2 sets, then calculate How many one-one functions are formed?
34. “COMPUTER” total arrangements possible with first and last character consonants only.

*In Total: 50 questions in Aptitude section, 40 questions in Technical Section + 2 Coding Question*

*Gate Overflow Tag: [https://gateoverflow.in/tag/iiith-pgee?start=0](https://gateoverflow.in/tag/iiith-pgee?start=0)*