ZOHO CORPORATION

Placement Test Paper 2024

Software Developer - Campus Recruitment

ROUND 1: APTITUDE & C PROGRAMMING
- Total Questions: 20 (10 Aptitude + 10 C Programming)
- Time Duration: 60 minutes
- No negative marking
- This is a pen-paper based test
- Fill in the blanks - no multiple choice options

SECTION A: QUANTITATIVE APTITUDE (10 Questions)

1. A motorist travels to a place 150 km away at an average speed of 50 km/hr and returns at 30 km/hr. Find his average speed for the whole journey.

2. Two pipes can fill a tank in 20 and 24 minutes respectively and a waste pipe can empty 3 gallons per minute. If all pipes work together, the tank fills in 15 minutes. Find the capacity of the tank.

3. The HCF and LCM of two numbers are 12 and 180 respectively. If one number is 36, find the other number.

4. A sum of money doubles itself in 8 years at simple interest. In how many years will it become triple?

5. In how many ways can 6 people be arranged in a row such that 2 particular people are always together?

6. A bag contains 4 red balls, 5 blue balls and 3 green balls. What is the probability of drawing 2 balls of different colors?

7. The area of a triangle with vertices at (0,0), (4,0) and (0,6) is how many square units?

8. If $\log_2(x) + \log_2(x+3) = 2$, find the value of x.

9. A clock shows 3:00. What is the angle between the hour and minute hands?

10. If the 7th term of an arithmetic progression is 20 and the 12th term is 35, find the 20th term.

SECTION B: C PROGRAMMING OUTPUT QUESTIONS (10 Questions)

Find the output of the following C code snippets:

11. What will be the output?

```
#include
int main() {
    int a = 10, b = 20, c = 30;
    printf("%d", (a > b) ? (a > c ? a : c) : (b > c ? b :
c));
    return 0;
}
```

12. What will be the output?

```
#include
int main() {
    int x = 5;
    printf("%d %d %d", x, ++x, x++);
    return 0;
}
```

13. What will be the output?

```
#include
int main() {
    char *str = "Hello";
    printf("%c %c %c", *str, *(str+2), str[4]);
    return 0;
}
```

14. What will be the output?

```
#include
int main() {
    int arr[] = {10, 20, 30, 40, 50};
    int *p = arr + 2;
    printf("%d %d", *p, *(p-1));
    return 0;
}
```

15. What will be the output?

```
#include
int main() {
    int a = 0;
    for(; a < 3; a++) {
        if(a == 1) continue;
        printf("%d ", a);
    }
    return 0;
}
```

16. What will be the output?

```
#include
int main() {
    int x = 8;
    printf("%d %d", x & 5, x | 3);
    return 0;
}
```

17. What will be the output?

```
#include
int fun(int n) {
    return (n > 1) ? n * fun(n-1) : 1;
}
int main() {
    printf("%d", fun(5));
    return 0;
}
```

18. What will be the output?

```
#include
int main() {
    int i = 1;
    switch(i) {
        case 1: printf("One ");
        case 2: printf("Two ");
        default: printf("Default");
    }
    return 0;
}
```

19. What will be the output?

```
#include
int main() {
    float f = 3.14;
    int *p = (int*)&f;
    printf("%d", *p);
    return 0;
}
```

20. What will be the output?

```
#include
int main() {
    char str[] = "ABC";
    printf("%d", sizeof(str));
    return 0;
}
```

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ROUNDS 2 & 3: Programming Challenges

ROUND 2: BASIC PROGRAMMING
- 5 coding problems • Time: 90 minutes • Code on laptop/system
- Minimum 3 problems must be solved to qualify

ROUND 2: CODING PROBLEMS

1. Sum of Diagonal Elements EASY

Write a program to find the sum of diagonal elements in a 3x3 matrix.

Input: 3x3 matrix
Output: Sum of primary diagonal elements

Example:
Input: [[1,2,3],[4,5,6],[7,8,9]]
Output: 15 (1+5+9)

2. Prime Numbers in Range EASY

Given a list of integers, find and display all prime numbers from the list.

Example:
Input: 5 numbers: 2 4 7 8 11
Output: 2 7 11

3. Parentheses Validation MEDIUM

Check if parentheses '(' and ')' are balanced in a given string.

Example:
Input: "((()))"
Output: 0 (balanced)
Input: "(()"
Output: 1 (not balanced)

4. Remove Consecutive Vowels MEDIUM

Remove vowels from a string, but if two or more vowels occur together, ignore all of them.

Example:
Input: "beautiful"
Output: "btfl" (ignore 'eau' as consecutive vowels)

5. Social Network Friends HARD

Find friends who are not mutual between two people in a social network.

Input Format:
3
Mani 3 ram raj guna
Ram 2 kumar kishore
Mughil 3 praveen naveen ramesh

Output: Friends of Mani who are not friends of Ram: raj guna

ROUND 3: ADVANCED PROGRAMMING
• 1 complex system design • Time: 3-6 hours • OOP concepts essential
• Focus on modularity, database design, and real-world functionality

ROUND 3: SYSTEM DESIGN CHALLENGE

1. Railway Reservation System HARD

Problem: Design a complete railway reservation system with the following modules:

Core Modules:

1. **Booking Module:** Reserve tickets for passengers
2. **Availability Checking:** Check seat availability for routes
3. **Cancellation Module:** Cancel existing reservations
4. **Chart Preparation:** Generate passenger lists for trains

System Requirements:

- Multiple trains with different routes and schedules
- Different ticket classes (AC, Sleeper, General)
- Waiting list management
- Passenger information storage
- Date-wise booking management

Expected Implementation:

- Use proper OOP design with classes for Train, Passenger, Ticket, etc.
- Implement data structures for efficient seat management
- Handle edge cases (fully booked trains, invalid dates)
- Provide clean console-based interface for testing
- Code should be modular and well-documented

Sample Operations:

```
1. Book Ticket:
   Input: Train No, Date, From, To, Passenger Details
   Output: Ticket confirmation or waiting list number

2. Check Availability:
   Input: Train No, Date, From, To
   Output: Available seats by class

3. Cancel Ticket:
   Input: Ticket ID
   Output: Cancellation confirmation
```