

- ✓ State the formal definition of CRT. (3)
- ✓ Prove the existence of Modular Inverse of a number A with respect to M. (5)
- ✓ What do you understand by 'Path Relaxation'? (2)
- ✓ Can you improve the following code to run faster? Explain your answer with complexity analysis. (5)

```

void SieveOfEratosthenes(int n)
{
    bool prime[n + 1];
    memset(prime, true, sizeof(prime));

    for (int p = 2; p * p <= n; p++) {
        if (prime[p] == true) {
            for (int i = p * p; i <= n; i += p)
                prime[i] = false;
        }
    }
    for (int p = 2; p <= n; p++)
        if (prime[p])
            cout << p << " ";
}

```

- ✓ Write down each step for the 'Floyd-Warshall Algorithm' on the following graph. Start from node a. (5)

