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Section : 03

Faculty : NTR

Ans to the ques no:- 1

Q

```

(P1)
int main() {
    int a = 9;
    int b = 3;
    i = fork(); ————— (P2)
    if (i < 0) {
        printf("fork failed\n");
    }
    else if (i == 0) { ————— (P3)
        j = fork();
        if (j < 0) {
            printf("fork failed\n");
        }
        else if (j == 0) {
            a = a * b;
            b = a a / b;
        }
        else {
            wait();
            a = a + b;
            b = b - a;
        }
    }
    else {
        wait();
        a = a - b;
        b = b + a;
    }
    printf("Value of a: %d\n", a);
    printf("Value of b: %d\n", b);
    return 0;
}
    
```

P1
~~a = 9~~
~~b = 3~~
~~i > 0~~
 wait()
 a = 9 - 3
 = 6
 b = 3 + 6
 = 9

P2
~~a = 9~~
~~b = 3~~
 i = 0
 j > 0
 wait()
 a = 9 + 3 = 12
 b = b - a
 = 3 - 12
 = -9
 X

P3
~~a = 9~~
~~b = 3~~
 i = 0
 j = 0
 a = 9 * 3 = 27
 b = 27 / 3 = 9
 X

Output:-

Value of a: 27

Value of b: 9

Value of a: 12

Value of b: -9

Value of a: 6

Value of b: 9

Ans to the ques no:- 2

(a)

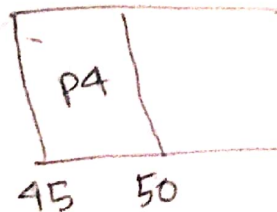
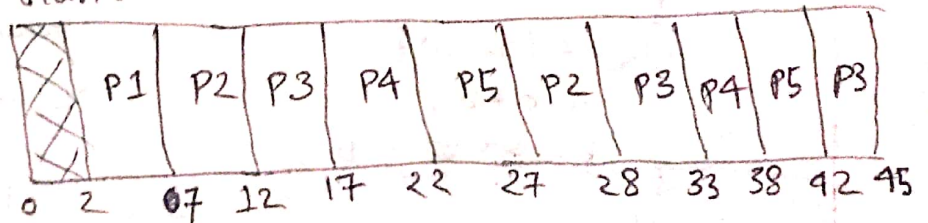
Considering lowest number as the highest priority.
Given, time quantum = 5 units.

Process	AT	BT	Priority
X P1	2	5	1
- P2	6	6	5
- P3	6	13	4
- P4	10	15	222222
- P5	12	9	3

~~Queue~~ Stack

P1	5
P2	6
P3	13
P4	15
P4	15
P5	9
P2	1
P3	8
P4	10
P5	4
P3	3
P4	5

Gantt Chart



For, Waiting time :-

$$P_1 = (2-2) = 0$$

$$P_2 = (7-6) + (27-12) = 16$$

$$P_3 = (12-6) + (28-17) + (42-33) = 26$$

$$P_4 = (17-10) + (33-22) + (45-38) = 25$$

$$P_5 = (22-12) + (38-27) = 21$$

$$\therefore \text{Average waiting time} = \frac{0 + 16 + 26 + 25 + 21}{5}$$
$$= 17.6 \text{ units}$$

For turnaround time :-

$$P_1 = (7-2) = 5$$

$$P_2 = (28-6) = 22$$

$$P_3 = (45-6) = ~~40~~ 39$$

$$P_4 = (50-10) = 40$$

$$P_5 = (42-12) = 30$$

$$\therefore \text{Average Turnaround time} = \frac{5 + 22 + 39 + 40 + 30}{5}$$
$$= 27.2 \text{ units}$$

Ans to the ques no:- 3

(a)

$$P = 86\% = 0.86$$

$$n = 2$$

$$\therefore S = 1 - 86\% = 0.14$$

$$\begin{aligned}\therefore \text{Speed up} &= \frac{1}{S + \frac{P}{n}} \\ &= \frac{1}{0.14 + \frac{0.86}{2}} \\ &= \frac{100}{57}\end{aligned}$$

For 2 times speedup,

$$2 \times \frac{100}{57} = \frac{1}{0.14 + \frac{0.86}{n}}$$

$$\Rightarrow 0.14 + \frac{0.86}{n} = \frac{1}{2 \times \frac{100}{57}}$$

$$\Rightarrow \frac{0.86}{n} = \frac{1}{2 \times \frac{100}{57}} - 0.14$$

$$\Rightarrow \frac{0.86}{n} = \frac{29}{200}$$

$$\Rightarrow \frac{n}{0.86} = \frac{200}{29}$$

$$\therefore n = \frac{200}{29} \times 0.86$$

$$= 5.93$$

$$\approx 6$$

So, approximately 6 cones will be needed.