CS & IT ENGINEERING

Operating System

Process Synchronization / Coordination

DPP 08 Discussion Notes

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TOPICS TO BE COVERED
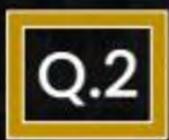
01 Question

02 Discussion

Q.1 In dining philosopher's problem, deadlock can occur when ___   [MCQ]

A. Two philosopher's pick there left fork and get preempted before picking right fork.

B. Two philosopher's sitting in front of each other pick there left fork and then right fork.

C. Four philosophers are sitting and doing nothing. ✗

D. All philosopher's pick there left fork and preempted before picking right fork.

Q.2

Consider the following code:

[MCQ]

```
# define N 6
void p (int i)
{
    while (1)
    {
        T(i);           Think (i)
        T_f(i);         Take fork (i)
        T_f((i + 1)%N);
        x(i)  eat()
        p_f(i);  put fork().
        p_f((i+1)%N);
    }
}
```

1, 2, 3, 4, 5, 6

1. i = 1

i = 2

A. Prevents Deadlock but has starvation.

B. Has deadlock but do not have starvation.

C. Has deadlock and starvation both.

D. Do not have deadlock and starvation.

T is a think function, T_f is a take fork function, x is a eat function, p_f is a put fork function, and i represents the philosopher. Which of the following is true about above code?

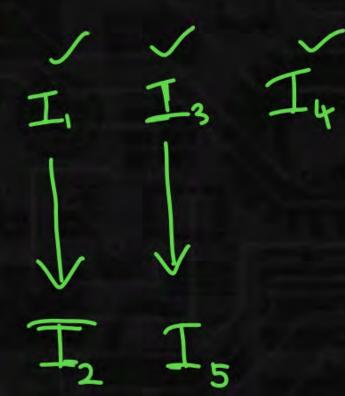**Q.3** How many of the following instructions can run independently?

[NAT]

$I_1: p = q * r;$ → Run Ind.

$I_2: q = p + z;$

$I_3: l = m + k;$

$I_4: n = a + b;$

$I_5: m = z + s;$

$I_1 \quad I_3 \quad I_4$ ✓ ✓ ✓

$I_1 \to I_2$
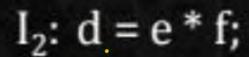
$I_3 \to I_5$

③

Q.4

Consider the following instructions:

I_1: $a = b + c$;

I_2: $d = e * f$;

I_3: $k = a + d$;

I_4: $l = k + m$;

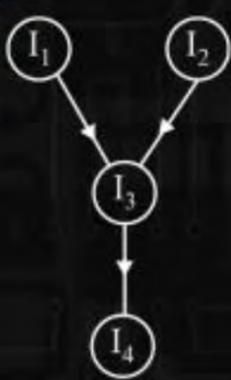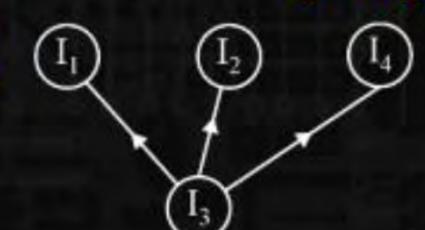Which of the following is correct precedence graph for the above instructions?

A.

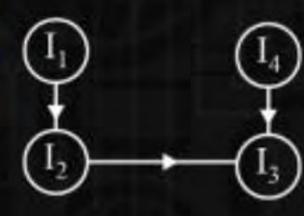B.

C.

D.

Q.5 Solve the following code by co-begin and co-end [MSQ] (PW)

$x = 4;$

co-begin

1. $x = x + 5;$ $x = 9$
2. $x = x + 6;$ $x = 15$

co-end;

$x = 9$

2
1. Read
2. Update

3. $x = 10$

Read
Update
write

What could be the possible final value of x?
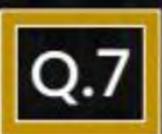
A. 5

B. 9

C. 10

D. 15

Q.6 Busy waiting is _____.

A. When a process polling on a variable. ✗

B. When a process periodically checks a variable. ✗

C. When a process issues an interrupt. ✗

D. When a process continuously checks a variable. ✓

Q.7

Consider the following concurrent program, how many levels are there in it's precedence graph?

S_1:
Parbegin
  begin;
    S_2; S_3;
  end;
  begin
    S_4;
    begin
      S_5; S_6;
    end;
    Parbegin
      S_7
      begin
        S_8; S_9
      end;
    Parend;
  end;
Parend;
S_{10}

level 1 — S_1

level 2 — S_2 S_4

level 3 — S_3 S_5 S_7

level 4 — S_6 S_8

level 5 — S_9

level 6 — S_{10}

6