

CS & IT ENGINEERING

Operating System

Process Synchronization /
Coordination

DPP 09 (Discussion Notes)



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TOPICS TO BE COVERED

01 Question

02 Discussion

Q.1

Which of the following can prevent deadlock in dining philosopher's problem?

[MCQ]



A.

Allow at most four philosophers' to be sitting simultaneously at the table. ✓

B.

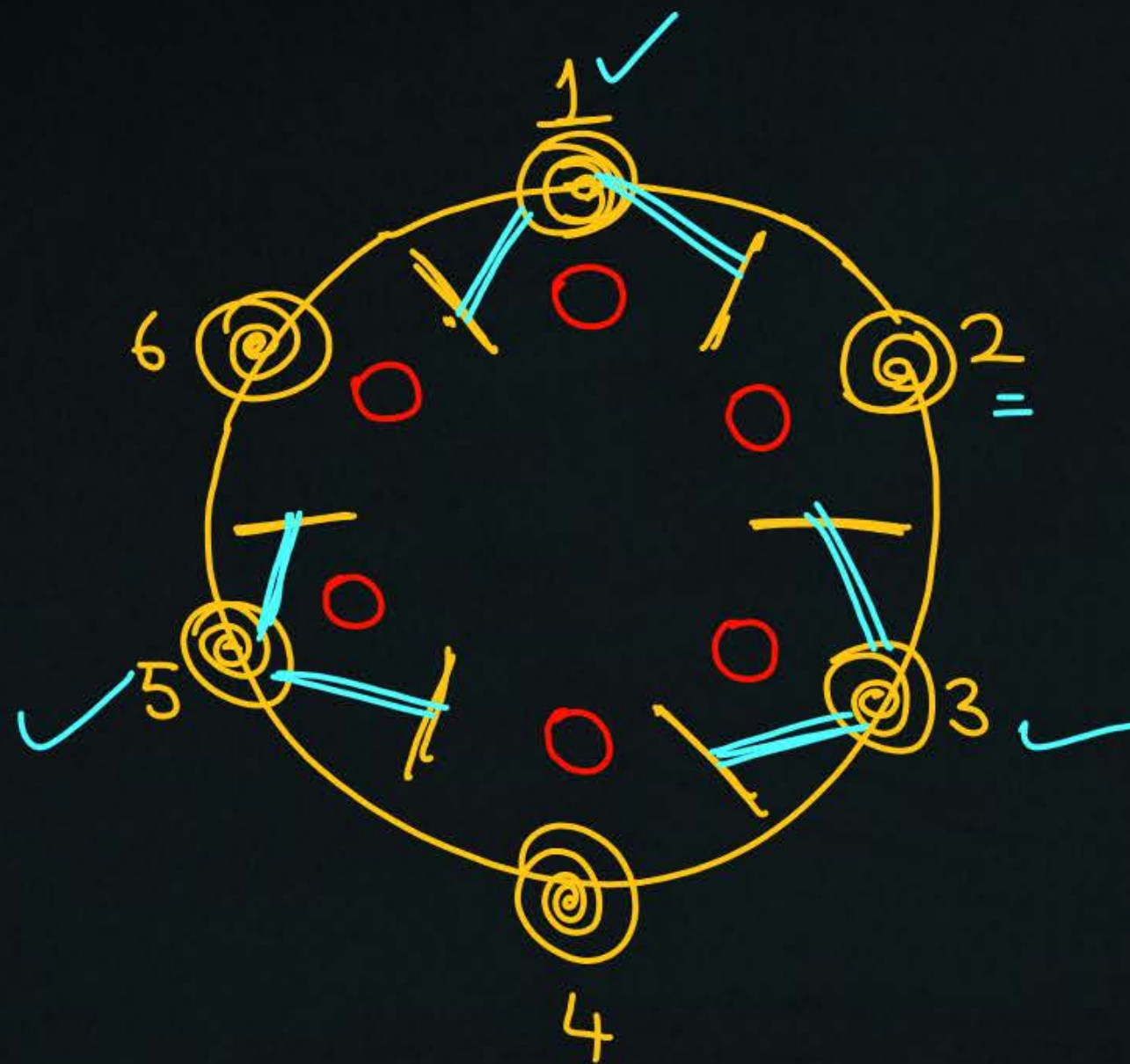
Allow a philosopher to pick up chopsticks only if both chopsticks are available (to do this, they must pick them up in a critical section). ✓

C.

An odd-numbered philosopher picks up first left chopstick and then right chopstick, whereas an even-numbered philosopher picks up right chopstick and then left chopstick. ✓

D.

All of the above



Q.2

Dining philosopher problem is ____.

A.

Solution to producer-consumer problem. ✗

B.

Example of concurrency-control problem.

C.

Application of semaphore.

D.

Classical IPC problem.

Q.3

Which of the following statements is/are correct?

A.

Concurrency is about doing multiple things at once.

B.

Concurrency is about dealing with multiple things at once.

C.

Parallelism is about doing multiple things at once.

D.

Parallelism is about dealing with multiple things at once.

Q.4

Which of the following condition must be satisfy if two statements are concurrent/independent?

A.

Atleast one shared variable should be present. ✗

B.

No shared variable should present. ✓

C.

Output of one statement should serve as input to other statement. ✗

D.

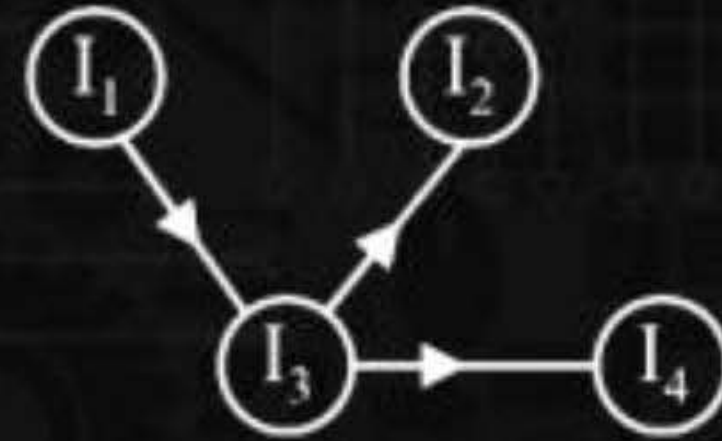
Output of one statement should not serve as input to other statement. ✓

Q.5

Consider the following precedence graph:

[NAT] PW

How many nodes are dependent?



I_3



I_2

I_3



I_4

I_1



I_3

3

Q.6

[MCQ]



Consider the following code by begin and end

a = 3

b = 4

begin:

b = a * b ✓

a = a * b ✓

$$\Rightarrow b = 3 * 4 \Rightarrow 12$$

$$\Rightarrow a = 3 * 12 \Rightarrow 36$$

end;

What could be the possible final values of a, b?

A.

a:{12}; b:{12}

B.

a:{12}; b:{12, 24}

C.

a:{12, 24}; b:{12}

☒ D.

a:{36}; b:{12}

Q.7

How many of the following statements is/are not independent?



[NAT]

$$I_1: a = b + c$$

$$I_2: c = d * e$$

$$I_3: e = a * g$$

$$I_4: g = e + m$$

$$I_5: m = m + f$$



5

Q.8



Consider a counting semaphore variable 'X', following are the semaphore operations performed 20P, 6V, 8V, 7P, 12P, 16V.

What will be the largest initial value of 'X' to keep 2 processes in suspended list? **[NAT]**

$$X - 20 + 6 + 8 - 7 - 12 + 16 = -2$$

$$X - 6 - 19 + 16 = -2$$

$$X - 25 + 16 = -2$$

$$X - 9 = -2$$

$$X = 9 - 2 \Rightarrow \underline{7}$$

7

