

CS & IT ENGINEERING

Operating System

Memory Management

DPP 03 (Discussion Notes)



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TOPICS TO BE
COVERED

01 Question

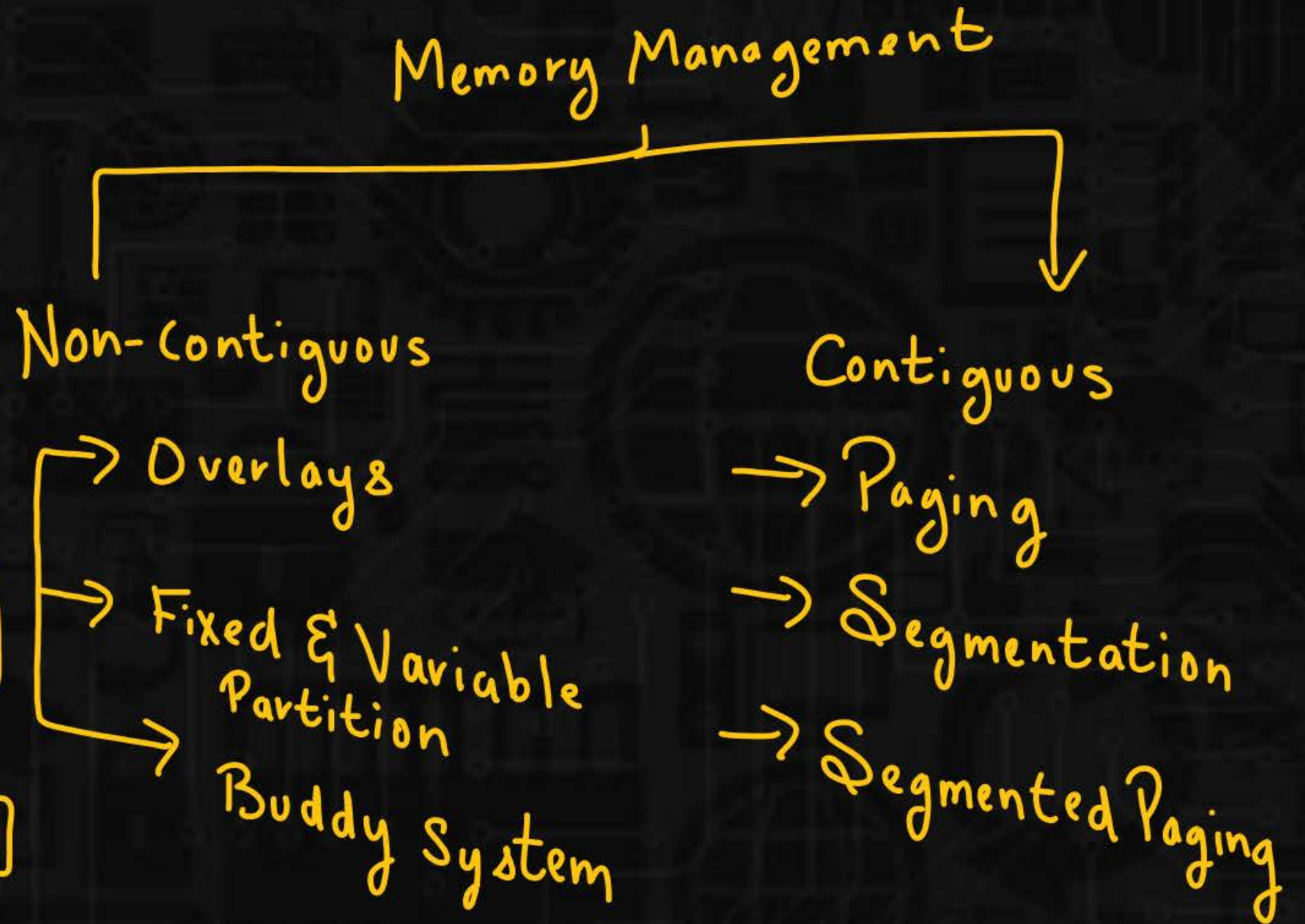
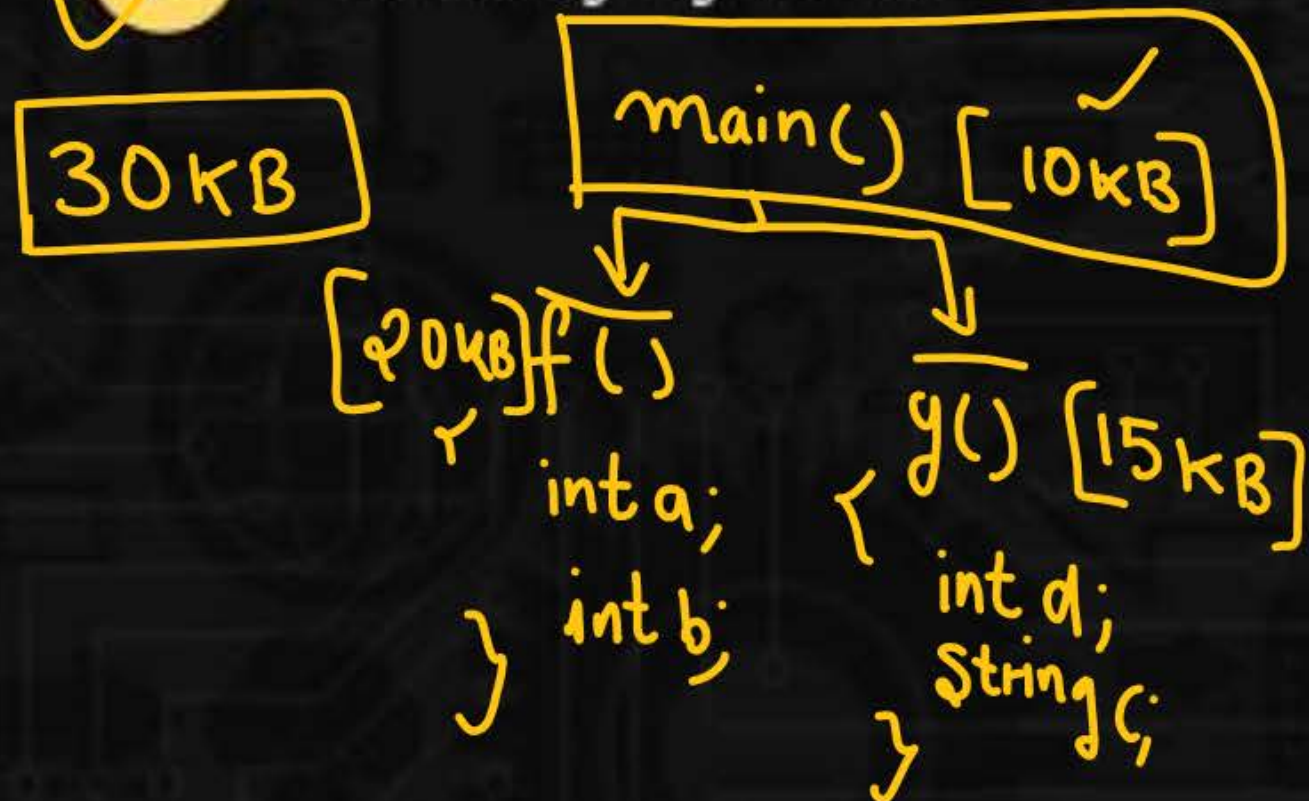
02 Discussion

Q.1

Which of the following are contiguous allocation technique [MSQ] in memory management?



- A. Paging (NC)
- B. Overlays
- C. Segmentation (NC)
- D. Buddy system



Q.2

[MCQ]



Consider the following statements:

- (i) Overlaying is only possible when program can be divided into independent modules. ✓
- (ii) Overlaying is needed when process is larger than amount of memory allocated to it. ✓
- (iii) Overlaying requires special support from operating system and performed in kernel mode. ✗

Which of the following is correct?

- A. All (i), (ii) and (iii) are correct.
- B. (ii) and (iii) are correct.
- C. (i) and (iii) are correct.
- ✓ D. (i) and (ii) are correct.

Q.3

Which of the following statements is/are TRUE?

[MSQ]



A.

☐ In fixed length partition, each memory partition should be of same size.

B.

☒ Memory address protection is done with the help of registers. ✓

C.

☒ Free-space management is done using binary bits. ✓

D.

☐ In fixed-length partition, two program can reside in one partitions.



Q.4

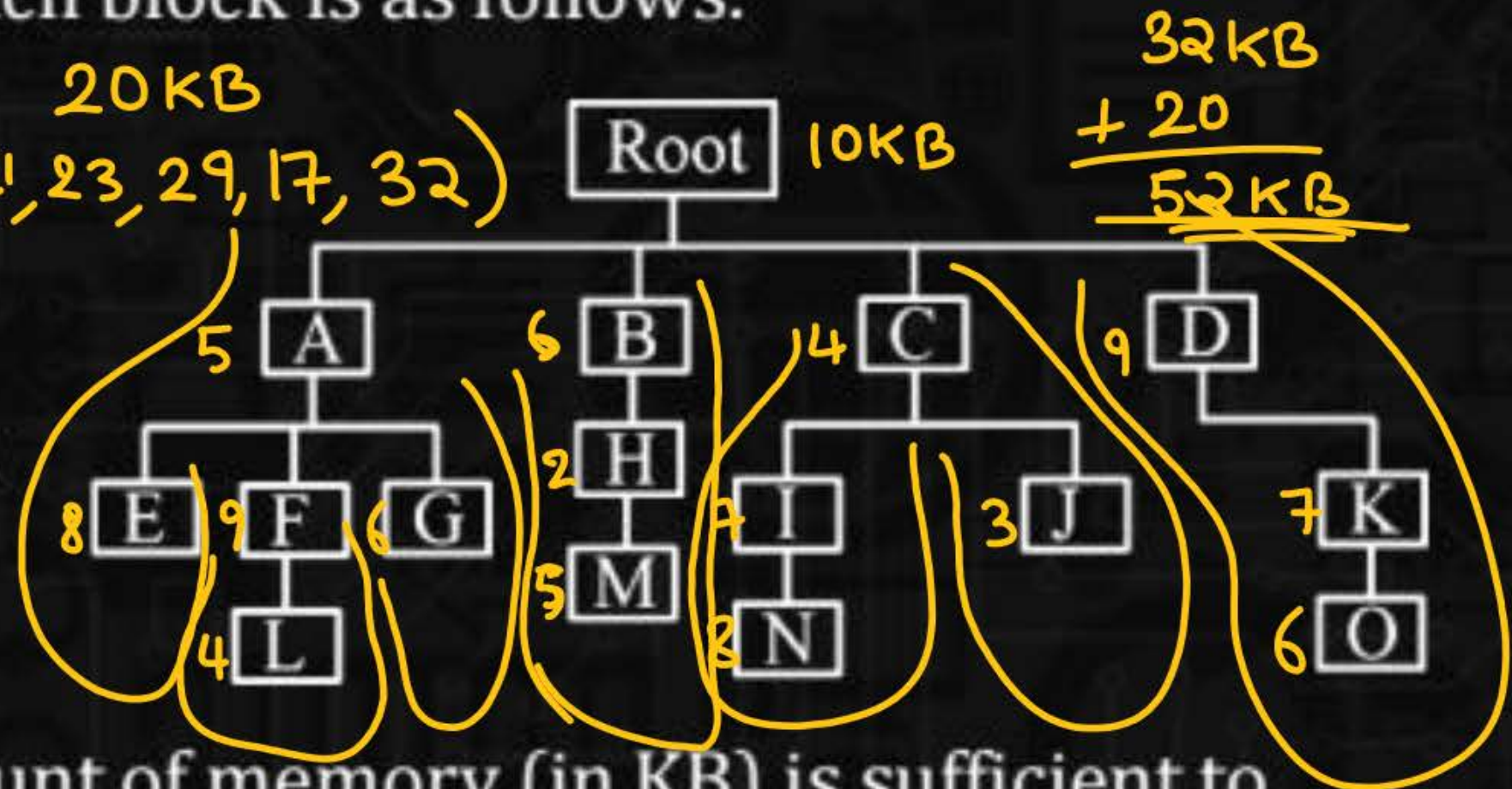


Consider the following diagram representing a program, blocks connected horizontally are independent modules and blocks connected vertically are dependent modules. [NAT]

Memory requirement of each block is as follows:

Root: 10 KB

A: 5 KB F: 9 KB K: 7 KB
B: 6 KB G: 6 KB L: 4 KB
C: 4 KB H: 2 KB M: 5 KB
D: 9 KB I: 7 KB N: 8 KB
E: 8 KB J: 3 KB O: 6 KB



What is the minimum amount of memory (in KB) is sufficient to execute this program using overlay's when routine loading also needs 20 KB of space?

Q.5

[MCQ]



Consider the following statements:

- (i) Next fit may execute faster than first fit. ✓
- (ii) Worst fit suffers from internal fragmentation ✓

Which of the following statements is CORRECT?

A.

Only (i) is correct.

B.

Only (ii) is correct.

C. ✓

Both (i) and (ii) are correct.

D.

None of these



Q.6

Match the following:

[MCQ]



- (i) Fixed partition ^{2,5} (1) Suffers from external fragmentation.
(2) suffers from internal fragmentation.
- (ii) Variable partition ^{1,3,4,} (3) Flexible degree of multiprogramming.
(4) Preferred allocation policy is worst fit.
(5) Preferred allocation policy is best fit.

A.

1-(i), 2-(ii), 3-(i), 4-(ii), 5-(i)

B.

1-(ii), 2-(i), 3-(ii), 4-(ii), 5-(i)

C.

1-(i), 2-(i), 3-(ii), 4-(i), 5-(ii)

D.

1-(ii), 2-(ii), 3-(i), 4-(i), 5-(ii)

Q.7

[MCQ]



Given memory partitions in order as:

P_1 : 200 KB; P_2 : 400 KB; P_3 : 150 KB; P_4 : 500 KB. How would worst fit algorithm place processes (in order) requiring size 215 KB, 300 KB, 25 KB, 400 KB.

Note: The space left after filling a partition is not used by any process.

- A. ☒ P_4, P_1, P_3 , 400 KB wait.
- B. ☒ P_1, P_2, P_3 , 25 KB wait.
- C. ☒ P_4, P_2, P_3 , 400 KB wait.
- D. ☒ P_3, P_2, P_4 , 300 KB wait.



Q.8



Consider a five memory partitions of size 100 KB, 200 KB, 300 KB, 450 KB, and 600 KB. The partitions are required to be allotted to ~~six~~ ^{five} processes of size 180 KB, 50 KB, 210 KB, 30 KB, and 80 KB. Calculate the memory wastage using best-fit [NAT] algorithm?

1100 KB

| | | |
|-----|----------------|-----|
| 100 | P ₁ | 50 |
| 200 | P ₂ | 20 |
| 300 | P ₃ | 90 |
| 450 | P ₄ | 420 |
| 600 | P ₅ | 520 |

180 KB, 50, 210, 30, 80
P₂

$$50 + 20 + 90 + 420 + 520$$

$$\Rightarrow 160 + 420 + 520$$

$$\Rightarrow 160 + 940$$

$$\Rightarrow \underline{\underline{1100 \text{ KB}}}$$

