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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2023/2024**

- COURSE NAME : SYSTEM OPERATION FUNDAMENTAL
- COURSE CODE : DAT 10303
- PROGRAMME CODE : DAT
- EXAMINATION DATE : JANUARY / FEBRUARY 2024
- DURATION : 2 HOURS 30 MINUTES
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.
 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA **CLOSED BOOK**

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

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Q1 (a) Explain the action that will be performed by these Linux commands.

- (i) `ln -s my_file.txt my_link.txt` (2 marks)
- (ii) `cp filename /temp` (2 marks)
- (iii) `sudo apt install mlocate` (2 marks)
- (iv) `sort seksyen1 seksyen2 > dat10303` (3 marks)
- (v) `cat hello.txt | grep "dog" | grep -v "cat"` (3 marks)
- (vi) `echo Johor, Malaysia >> address` (3 marks)
- (vii) `cat hello.txt | sort | uniq > data.txt` (3 marks)
- (viii) `chmod 600 private.txt` (2 marks)
- (ix) `cat final_exam.txt | grep "lulus" | grep -v "meniru"` (3 marks)
- (x) `tail -20 messages.txt` (2 marks)

Q2 (a) Write the answer for this First Come First Serve scheduling algorithm scenario.

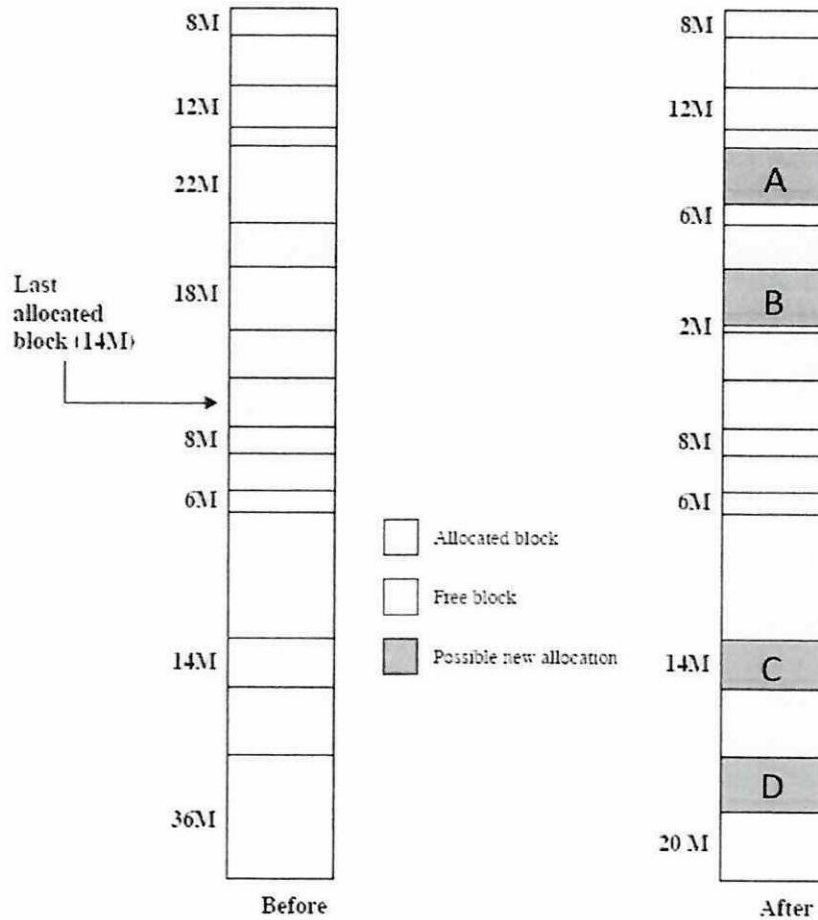
PROCESS	BURST TIME
P_1	24
P_2	3
P_3	3

Notes : Suppose that the processes arrive in the order: P_1 , P_2 , P_3

- (i) Illustrate the Gantt Chart for First Come First Serve Scheduling algorithm based on the above scenario. (6 marks)
- (ii) State the waiting time for P_1 based on the schedule in **Q2(a)(i)**. (1 mark)
- (iii) State the waiting time for P_2 based on the schedule in **Q2(a)(i)**. (1 mark)
- (iv) State the waiting time for P_3 based on the schedule in **Q2(a)(i)**. (1 mark)
- (v) Calculate the average waiting time and show your calculations. (3 marks)
- (b) State **TWO (2)** advantages and **TWO (2)** disadvantages of Shortest Job First Scheduling Algorithm. (4 marks)
- (c) Differentiate these three types of Memory Allocation Algorithms.
 - (i) Best Fit Algorithm. (2 marks)
 - (ii) First Fit Algorithm. (2 marks)
 - (iii) Next Fit Algorithm. (2 marks)

- (d) Write the answer for this memory configuration scenario after several placement and swapping-out operations.

If a 16-Mbyte allocation request comes in, where would the process be allocated among the possible new location of **A**, **B**, **C** and **D** in the memory, by using the below figure as guidelines for these algorithms.



Notes :

The last allocated block shown was 14M.

- (i) First Fit Algorithm (1 mark)
- (ii) Best Fit Algorithm (1 mark)
- (iii) Next Fit Algorithm (1 mark)

- Q3**
- (a) Illustrate the Five State Process Model. (5 marks)
 - (b) Give definitions of operating systems. (2 marks)
 - (c) Provide **TWO (2)** examples of real-time embedded systems. (2 marks)
 - (d) State the functions of virtual machines. (2 marks)
 - (e) Provide **TWO (2)** examples of Linux Distro operating systems that can be installed in virtual machines. (2 marks)
 - (f) Differentiate between BIOS and UEFI. (6 marks)
 - (g) Explain the **TWO (2)** steps of basic instruction cycle of Fetch Cycle and Execute Cycle. (4 marks)
 - (h) State **FOUR (4)** components of operating systems. (2 marks)
- Q4**
- (a) Explain the **THREE (3)** main types of file access methods. (6 marks)
 - (b)
 - (i) Explain a situation when thrashing will occur. (3 marks)
 - (ii) How will thrashing affect CPU Utilization and System performance. (2 marks)
 - (iii) When will page fault and swapping occur in thrashing. (6 marks)
 - (c)
 - (i) What are the supports needed for virtual memory. (2 marks)
 - (ii) Explain the **TWO (2)** important jobs of virtual memory in Operating Systems. (6 marks)

-END OF QUESTIONS –