A1.3

Operating systems and control systems

CHAPTER ASSIGNMENT · 24 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Show your working. You may use the chapter page to help you.

Questions from the Guru Jazzy chapter page, for classroom use.

Exam-style questions

1 Describe how an operating system organizes files. [2]

2 Outline how an operating system loads an application. [3]

3 Describe memory management in an operating system. [3]

4 Outline why an operating system keeps audit logs. [2]

5 Three processes arrive at time 0 in the order A (6 units), B (2), C (1). Calculate the average waiting time under FCFS. [3]

6 Compare first come first served and round robin scheduling. [4]

7 Explain how priority scheduling can leave a process waiting indefinitely, and one solution. [3]

8 Discuss whether a hospital heart monitor should use interrupts or polling for a critical alarm sensor. [4]

Chapter quiz

Q1 What does abstraction mean for an operating system?

A	B	C	D
Compressing files	Hiding hardware details behind simple services	Running in the cloud	Deleting unused data

Q2 Why is virtual memory slower than RAM?

A	B	C	D
It is encrypted	It uses secondary storage	It runs on the GPU	It needs the internet

Q3 Which technique lets several print jobs wait in a queue?

A	B	C	D
Spooling	Caching	Defragmentation	Polling

Q4 What must be installed for an OS to use a new graphics card?

A	B	C	D
A hypervisor	A device driver	A firewall	A compiler

Q5 Which scheduler is non-pre-emptive?

A	B	C	D
Round robin	First come first served	Multilevel queue	None of them

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Q6 What fixes starvation in priority scheduling?

A	B	C	D
Ageing	Spooling	Polling	Shorter names

Q7 What happens if the round robin quantum is very long?

A	B	C	D
It behaves like FCFS	It stops working	Starvation always occurs	Memory runs out

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Q8 A smartphone needs to save battery while waiting for a touch. Which is better?

A	B	C	D
Polling	Interrupts	Both are equal	Spooling

Q9 When can polling beat interrupts?

A	B	C	D
Rare, random events	Regular, predictable events	Airbag systems	Never

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Q10 A binary semaphore is 0 and Process B needs the resource. What happens?

A	B	C	D
B overwrites it	B is blocked until it is released	B crashes	The semaphore becomes 2

Q11 P1 holds file X and wants Y, while P2 holds Y and wants X. What is this?

A	B	C	D
Starvation	Deadlock	Spooling	Thrashing

Q12 A low-priority process holds a lock that a high-priority process needs. What is this?

A	B	C	D
Priority inversion	Ageing	Overflow	Round robin

Q13 What does the Banker's algorithm do?

A	B	C	D
Prevents overflow	Avoids deadlock by granting only safe allocations	Encrypts data	Bills users

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Q14 Which system is open loop?

A	B	C	D
A toaster on a fixed timer	A thermostat	Cruise control	A self-driving car

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Q15 Which part turns an electrical signal into movement?

A	B	C	D
Sensor	Controller	Actuator	Set point

End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/ib-computer-science/a1-3-operating-systems/