



Model Ans

MID-TERM. Exam(1)
Academic Year 1448 Hijri.- FIRST. Semester

Exam Information معلومات الامتحان		
Course name	Operating Systems	اسم المقرر
Course Code	CYB215 / CYB345	رمز المقرر
Exam Date	26/10/05	تاريخ الامتحان
Exam Time	12:00 – 13:00	وقت الامتحان
Exam Duration	1 Hour	مدة الامتحان
Classroom No.		رقم قاعة الاختبار
Instructor Name	Dr. Parveen Begam Abdul Kareem	اسم استاذ المقرر
Student Information معلومات الطالب		
Student's Name		اسم الطالب
ID number	ANSWER KEY	الرقم الجامعي
Section No.		رقم الشعبة
Serial Number		الرقم التسلسلي

General Instructions:

- Your Exam consists of 3 PAGES (except this paper)
 - Phones and smart devices are forbidden inside the hall.
- عدد صفحات الامتحان 3 صفحة. (باستثناء هذه الورقة)
 - يمنع استخدام الهواتف والأجهزة الذكية داخل القاعة.

هذا الجزء خاص بأستاذ المادة

This section is ONLY for instructor

#	Course Learning Outcomes (CLOs)	Related Question (s)	Points	Final Score
1	State the main objectives, the structure, and the role or function of an operating system.	Part 1	5	----- 15
2	Describe the fundamental concepts in operating system.	Part 2	10	
3	Explain the main cybersecurity issues related to operating systems.			

Part 1 – (5 points: MCQ - 3 points & Essay - 2 points)

[CLO 1]

Q1: Which of the following is TRUE with respect to the main memory?

w.r.t
HDD

- a) Volatile; Faster; Larger
- b) Non-volatile; Faster; Larger
- ☒ c) Volatile; Faster; Smaller
- d) Volatile; Slower; Larger

Q2: Loosely coupled systems are also called as

- a) Multi-programmed systems
- b) Parallel systems
- ☒ c) Distributed systems
- d) Real-time systems

Q3: Disk scheduling is the responsibility of

- a) File management
- b) Process management
- ☒ c) Secondary storage management
- d) Memory management

Q4: List out the FIVE important differences between Interrupt routines and Trap instructions.

INTERRUPTS	TRAPS
Hardware/device generated	Software/program generated
Associated with an interrupt vector and interrupt routine	Associated with an trap vector and trap routine
Not Severe (may just be a notification)	May be Severe (e.g. division by zero)
May be recoverable	May not be recoverable
Asynchronous to process (same process when repeated may not issue the same interrupt at the same exact time)	Synchronous to process (same process when repeated will cause the same trap at the same exact time)

Part 2 – (10 points: Complete 4 ; MCQ – 3 & Essay - 3 points)

[CLO 2 & 3]

Q1: OS keeps all the vital information about a process in (Process Control Block).

Q2: is a sequential execution of a function in a program. (Thread)

Q3: scheduler selects which processes should be brought into the ready queue. (Job scheduler)

Q4: When CPU switches to another process, system must save the state of the old process and load the saved state for new process is called as (Context Switch)

Q5: Which of the following algorithms suffer from the problem of starvation?

- a) FCFS and SJF
- b) SJF and Priority
- c) Priority and RR
- d) FCFS and RR

Q6: In CPU scheduling, what does “preemptive scheduling” mean?

- a) The OS cannot interrupt a running process
- b) The OS can interrupt and remove a running process from the CPU
- c) Processes schedule themselves
- d) Only system processes can be scheduled

Q7: In CPU scheduling, [time terminated – time submitted] is called as?

- a) CPU Utilization
- b) Response time
- c) Waiting time
- d) Turnaround time

Q8: CPU Scheduling Problem: Consider the following processes with their arrival times and burst times. Using **Non-preemptive SJF** scheduling algorithm: Draw a Gantt chart showing the execution order and timing; Calculate the average waiting time and average turn-around time

PROCESS	BURST TIME	ARRIVAL TIME
P1	6	2

P2	2	5
P3	8	1
P4	3	0
P5	4	4

P4	P1	P2	P5	P3	
0	3	9	11	15	23

Process	AT	BT	WT	TAT
P ₁	2	6	1	9 - 2 = 7
P ₂	5	2	4	6
P ₃	1	8	14	22
P ₄	0	3	0	3
P ₅	4	4	7	11

AVERAGE WAITING TIME - 5.2 ms

AVERAGE TURN-AROUND TIME - 9.4 ms

$$AWT = \frac{26}{5} = 5.2$$

$$ATAT = \frac{49}{5} = 9.8$$