1. The following processes are being scheduled using a preemptive, roundrobin scheduling algorithm.

Process	Priority	Burst	Arrival
P_1	40	20	0
P_2	30	25	25
P_3	30	25	30
P_4	35	15	60
P_5	5	10	100
P_6	10	10	105

Each process is assigned a numerical priority,with ahigher number indicating a higher relative priority. In addition to the processes listed below, the system also has an **idle task** (which consumes no CPU resources and is identified as P_{idle}). This task has priority 0 and is scheduled whenever the system has no other available processes to run. The length of a time quantum is 10 units. If a process ispreempted by a higher-priority process, the preempted process is placed at theend of the queue.

a. Show the scheduling order of the processes using a Gantt chart.

b. What is the turnaround time for each process?

c. What is the waiting time for each process?

d. What is the CPU utilization rate?

简答题 (15 分)   3分
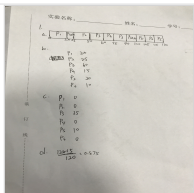
图像.jpeg

答案解释:

a.

P_1	P_1	P_{idle}	P_2	P_3	P_2	P_3	P_4	P_4	P_2	P_3	P_{idle}	P_5	P_6	P_5
10	20	25	35	45	55	60	70	75	80	90	100	105	115	120

b.

P_1	P_2	P_3	P_4	P_5	P_6	
20	55	60	15	20	10	

c.

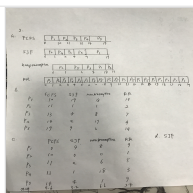| P_1	P_2	P_3	P_4	P_5	P_6	
0	30	35	0	10	0	

d.

105/120=87.5%

2. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority), and RR (quantum= 1) scheduling.

b. What is the turnaround time of each process for each of the scheduling algorithms in part a?

c. What is the waiting time of each process for each of the scheduling algorithms in part a?

d. Which of the schedules in part a results in the minimal average waiting time (over all processes)?

简答题 (15 分)　　12分

图像 2.jpeg

答案解释:

a. Gantt Charts

FCFS

P1										P2	P3		P4	P5				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

SJF

P2	P4	P3		P5					P1									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Non-preemptive Priority

P2	P5					P1										P3		P4
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

RR(quantum=1)

P1	P2	P3	P4	P5	P1	P3	P5	P1	P5	P1	P5	P1	P5	P1	P1	P1	P1	P1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

b. Turnaround Time

Process	FCFS	SJF	NPP	RR(quantum=1)
P1	10	19	16	19
P2	11	1	1	2
P3	13	4	18	7
P4	14	2	19	4
P5	19	9	6	14
Average	13.4	7.2	12	9.2

c. Waiting Time

Process	FCFS	SJF	NPP	RR(quantum=1)
P1	0	9	6	9
P2	10	0	0	1
P3	11	2	16	5
P4	13	1	18	3
P5	14	4	1	9
Average	9.6	3.2	8.2	5.4

d. According to the average waiting time shown in the table above, Shortest Job First has the minimal average waiting time over all processes.

3. Which of the following scheduling algorithms could result in starvation?

多选题 (8 分)　　8分

A. First-come, first-served

B. Shortest job first

C. Round robin

D. Priority

正确答案: B D

4. Usingt he Windows xp scheduling algorithm, what is the numeric priority of a thread for the following scenarios?
　　a. A thread in the REALTIME PRIORITYCLASSwith a relative priority of HIGHEST.＿＿＿＿
　　b. A thread in the NORMAL PRIORITY CLASSwith a relative priority of NORMAL.＿＿＿＿
　　c.A thread in the HIGH PRIORITY CLASS with a relative priority of ABOVE NORMAL.＿＿＿＿

填空题 (12 分)　　12 分　　(请按题目中的空缺顺序依次填写答案)

(1)　26

(2)　8

(3)　14

正确答案:

(1) 26

(2) 8

(3) 14

5. whenround-robin(RR) scheduling algorithm is used to allocate the CPU to eachprocess and a running state process uses up a time
　　quantum, the state of thatrunning process will become ＿＿＿.

单选题 (5 分)　　5分

A. Waiting

B. Running

C. Ready

D. Terminated

正确答案: C

6. A measure of the number ofprocesses completed per time unit is called?

单选题 (5 分)　　5分

A. Throughput

B. Waiting time

C. Response time

D. CPU utilization

正确答案: A

7.　One of the problems with priority scheduling is _____ .

单选题 (5 分)　　5分

A. aging

B. starvation

C. process death

D. average waiting time

正确答案: B

8.　Suppose 4 processes arrive atthe same time and the average execution time of every process is 2 hours. Ifthey run on a CPU one by one, then the average turnaround time is _____.

单选题 (5 分)　　5分

A. 1 hour

B. 2.5 hours

C. 5 hours

D. 8 hours

正确答案: C

9.　Why the Shortest-Job-Firstprocess scheduling cannot be implemented?

单选题 (5 分)　　5分

A. It is too complex

B. It requires special hardware

C. The length of the next CPU burst is not known

D. The length of the next I/O burst is notknown

正确答案: C

10.　The best process schedulingalgorithm in terms of average waiting time is _____ ?

单选题 (5 分)　　5分

A. FCFS

B. Priority

C. Round-Robin

D. SJF/SPF

11. Among CPU scheduling policies,First Come First Serve (FCFS) is attractive because ____.

单选题 (5 分)　　5分

A. it is simple to implement

B. it minimizes the total waiting time in the system

C. it minimizes the average waiting time inthe system

D. it minimizes the average response time in the system

正确答案: A

12. 下列进程调度算法中，综合考虑进程等待时间和执行时间的是？

单选题 (5 分)　　5分

A. 时间片轮转调度算法

B. 短进程优先调度算法

C. 先来先服务调度算法

D. 高响应比优先调度算法

正确答案: D

13. 下列选项中，降低进程优先级的合理时机是？

单选题 (5 分)　　5分

A. 进程的时间片用完

B. 进程刚完成I/O，进入就绪队列

C. 进程长期处于就绪队列中

D. 进程从就绪态转为运行态

正确答案: A

14. 下列选项中，满足短任务优先且不会发生饥饿现象的调度算法是？

单选题 (5 分)　　5分

A. 先来先服务

B. 高响应比优先

C. 时间片轮转

D. 非抢占式短任务优先

正确答案: B

正确答案: B