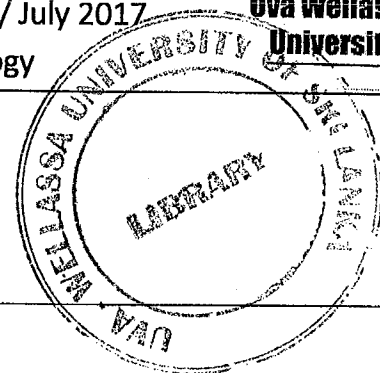


Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
400 Level 1st Semester Examination – June / July 2017
SCT 465-3 Manufacturing Technology



Instructions to candidates

Duration: Three (03) hours

Number of questions: Six (06) Essay Questions

Mark allocation: 600 marks

Answer all questions

1.

- a. Name three performance measures you can use to compare two manufacturing schedules and explain them in detail.

(30 marks)

- b. A scheduling problem is named as 8/1//nT. Explain this problem term by term.

(20 marks)

- c. Solve the following scheduling problem for a single machine to minimize the number of tardy jobs.

Job	1	2	3	4	5	6
Due Date	11	15	21	24	28	5
Processing Time	5	2	7	10	4	8

(20 marks)

- d. Schedule the following 8/2/F/F_{max} problem using the Johnson's Algorithm.

Job	1	2	3	4	5	6	7	8
Processing Time on M1	5	2	1	3	5	8	7	4
Processing Time on M2	8	4	6	2	9	7	1	8

(30 marks)

2.

- a. How do you prepare a schedule for a glass factory? Discuss the algorithms that are applicable, performance need to be measured and data required to prepare the schedule.

(30 marks)

- b. What is meant by the following terms with reference to scheduling

- Idle times
- Optimum schedule
- Tardy jobs
- Process sequence of a job

(20 marks)

- c. Solve the following 8/2/G/F_{max} problem using Johnson's Algorithm

Job	Processing Time on Machine			
	First Machine		Second Machine	
1	M1	3	M2	1
2	M1	2	M2	4
3	M1	8	M2	6
4	M1	5	M2	7
5	M2	6	M1	5
6	M2	7	M1	2
7	M1	9	—	—
8	M2	5	—	—

(50 marks)

3.

a. Briefly explain the objectives of scheduling.

(10 marks)

b. Mention possible actions you can take to develop a good schedule

(10 marks)

c. What are the possible problems/faults of a schedule?

(10 marks)

d. Solve the following $8/1//n_T$ problem using the Moore's Algorithm.

Job	1	2	3	4	5	6	7	8
Due Date	12	25	11	20	30	15	7	10
Processing Time	6	7	4	3	4	8	5	2

(30 marks)

e. Schedule the following $10/2/F/F_{\max}$ problem using the Johnson's Algorithm.

(40 marks)

Job	1	2	3	4	5	6	7	8	9	10
Processing Time on M1	5	3	1	2	6	7	9	4	8	10
Processing Time on M2	10	4	6	2	9	7	1	8	5	3

4.

a. What is Kanban? Write down the steps in implementing a Kanban system for your production facility.

(30 marks)

b. Draw a model of a single-stage single-product Kanban system without backorders.

(20 marks)

c. What are the basic components of a Flexible Manufacturing System (FMS)?

(20 marks)

d. What are the different types of layouts possible in FMS? Explain the factors affecting the layout of the FMS.

(30 marks)

5.

- a. What are the applications of sand casting process.
(15 marks)
- b. What are the metals that can be used for sand casting?
(10 marks)
- c. "Sand casting is the most popular type of casting process." Is this statement true? Justify.
(25 marks)
- d. Name four manufacturing processes that can be used for plastics. Describe two of them giving details of the process, applications and materials that are possible to use.
(50 marks)

6.

- a. What are the difference between forming and forging operations? What are the examples of products made using these processes?
(25 marks)
- b. Name five machine processes and explain the shapes that you can obtain from each process.
(25 marks)
- c. What is wire drawing? What are the applications of wire drawing? Explain why the drawing speed is important.
(25 marks)
- d. What are the advantages of having non traditional methods of manufacturing? Give three examples of non traditional manufacturing methods.
(25 marks)

