[Pages: 4]

Reg. No. : …….

Name: ….…….

EIGHT SEMESTER B.TECH. DEGREE EXAMINATION

(2013 SCHEME)

MODEL QUESTION PAPER

13.801 INDUSTRIAL SCHEDULING (N)

TIME: 3 HOURS MAXIMUM MARKS: 100

PART A

(Answer all the questions, each question carries 2 marks each)

1. What is the difference between scheduling and sequencing?
2. Explain the term L_{max}?
3. Explain the term SPT?
4. Brief the algorithm in neighbourhood search technique?
5. What is LNS and CP rule?
6. What are the assumptions in Johnson's rule?
7. What is a CDS approach in flow shop scheduling?
8. What are the types of schedules in a job shop scheduling?
9. Expand and explain MOPNR?
10. Tell any four assumptions of dynamic job shop model.

(10x2=20)

PART B

(Answer any one question from each module. Each question carry 20 marks)

Module-I

11. Consider the following single machine scheduling problem with the processing time (P_j) and the weights (w_j) for each job.

Job j	1	2	3	4	5	6
P_j	8	12	7	16	9	4
w_j	4	10	4	3	8	10

a) Generate a sequence to minimize weighted completion time. What is the flow time of each job in the shop?

b) Compare the minimum weighted completion time with the minimum completion time without weights.

OR

12. The following table shows the processing time (P_j) and due dates (d_j) for a single machine.

Job j	1	2	3	4	5	6
P_j	12	2	6	14	8	13
d_j	41	4	44	16	35	30

The manager mainly wants to minimize the maximum lateness but also wants to reduce the number of late operations.

a) What sequence do you suggest? Justify your choice.
b) Calculate L_{max} and U for the solution.

Module-II

13. Solve the following single machine problem using branch and bound technique.

Job j	1	2	3	4
Processing time P_j	5	6	9	8
Due date d_j	9	7	11	13

OR

14. The following 11 operations are to be scheduled on four parallel machines

Job j	1	2	3	4	5	6	7	8	9	10	11
Processing time P_j	12	6	7	8	2	3	15	17	20	14	19

The goals are to minimize the overall time in the shop and to reduce the maximum time in the shop

a) What sequence is more optimal? Justify the answer.
b) Calculate the overall time and maximum time in the shop.

Module-III

15. Consider the following data pertaining to 3 machine and 4 jobs.

Job j	1	2	3	4
M1	6	8	3	4
M2	4	1	2	3
M3	5	6	4	7

Apply Johnsons rule and find the optimal solution.

OR

16. Find the optimal makespan for the following flow shop problem. If there is an additional constraint of no wait in process, does the optimal makespan change? Does the optimal sequence change? (P_{ij}-denotes processing time for the ith machine jth job)

Job j	1	2	3	4
P_{1j}	9	13	15	20
P_{2j}	11	17	18	24
P_{3j}	8	12	14	18
P_{4j}	6	10	12	15

Module-IV

17. Explain the branch and bound algorithm to find the solution to a job shop problem with the help of a application.

OR

18. Consider the following problem with 4 machines and 3 jobs.

Jobs	Machine sequence	Processing times		
1	1,2,3	$P_{11}=9$	$P_{21}=8$	$P_{31}=4$
2	1,2,4	$P_{12}=5$	$P_{22}=6$	$P_{42}=3$
3	3,1,2	$P_{33}=10$	$P_{13}=4$	$P_{23}=9$

Find the optimal sequence for the job shop instance