**Suryadatta Education Foundation’s**

**Suryadatta Institutes of Management and Mass Communication, Pune**

**MCA Department**

**MCA-I SEM-II**

**Subject: Optimization Techniques Chapter No:3**

**Chapter Name:** **Sequential model and related Problems**

**Assignment No:1**

1. A book binder has one printing press, one binding machine and manuscripts of 7 different books. The times required for performing printing and binding operations for different books are shown below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Book | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Printing time (hours) | 20 | 90 | 80 | 20 | 120 | 15 | 65 |
| Binding time (hours) | 25 | 60 | 75 | 30 | 90 | 35 | 50 |

Decide the optimum sequence of processing of books in order to minimize the total time required to bring out all the books.

2. Find solution of Processing 7 Jobs Through 2 Machines Problem

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Job | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Machine-1 | 3 | 12 | 15 | 6 | 10 | 11 | 9 |
| Machine-2 | 8 | 10 | 10 | 6 | 12 | 1 | 3 |

3 Find solution of Processing 5 Jobs Through 3 Machines Problem

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Job | 1 | 2 | 3 | 4 | 5 |
| Machine-1 | 8 | 10 | 6 | 7 | 11 |
| Machine-2 | 5 | 6 | 2 | 3 | 4 |
| Machine-3 | 4 | 9 | 8 | 6 | 5 |

**Find the total Idle time on a machine & Total elapsed time.**

**4.**Find solution of Processing 5 Jobs Through 4 Machines Problem

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Job | 1 | 2 | 3 | 4 | 5 |
| Machine-1 | 11 | 13 | 9 | 16 | 17 |
| Machine-2 | 4 | 3 | 5 | 2 | 6 |
| Machine-3 | 6 | 7 | 5 | 8 | 4 |
| Machine-4 | 15 | 8 | 13 | 9 | 11 |

**Find the total Idle time on a machine & Total elapsed time.**

5. Determine the optimal sequence of performing 5 jobs on 4 machines that minimizes total elapsed time. The machining of each job is required in the order ABCD and the process timings (in hrs.) are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Job | M1 | M2 | M3 | M4 |
| J1 | 24 | 9 | 12 | 21 |
| J2 | 27 | 6 | 15 | 15 |
| J3 | 18 | 12 | 15 | 24 |
| J4 | 36 | 15 | 3 | 27 |
| J5 | 21 | 3 | 6 | 9 |

Find:1) Total elapsed time 2) Idle time