**BBDNITM**

**MECHANICAL DEPARTMENT**

**SESSION(2018-19)**

**OPERATIONS RESEARCH (NME 051)**

**Assignment no. 3**

**Question 01.** Explain the following:

* 1. Pure strategy, mixed strategy and saddle point in a two person zero-sum game.
  2. The important characteristic of queuing system.

**Question 02.** Explain the principle of dominance in game theory and solve the following game:

Player B

Player A B1 B2 B3

A1 1 7 2

A2 6 2 7

A3 5 2 6

**Question 03.** Use the graphical method for solving the following game and find the value of the game:

Player B

Player A B1 B2 B3

A1 3 5 3

A2 4 3 2

**Question 04.** What is saddle point? How a game problem can be solved with and without using saddle point?

**Question 05.** There are five jobs, each of which must go through the two machine A and B in the order AB. Processing times are given in Table. Determine a sequence for the five jobs that will minimize the total elapsed time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Job** | **1** | **2** | **3** | **4** | **5** |
| **Machine A** | 5 | 1 | 9 | 3 | 10 |
| **Machine B** | 2 | 6 | 7 | 8 | 4 |

**Question 06.** There are none jobs, each of which must go through the two machine I and II in the order I-II. Processing times are given in Table. Determine a sequence for the five jobs that will minimize the total elapsed time.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Job** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |
| **Machine I** | 2 | 5 | 4 | 9 | 6 | 8 | 7 | 5 | 4 |
| **Machine II** | 6 | 8 | 7 | 4 | 3 | 9 | 3 | 8 | 11 |

**Question 07.** Four jobs 1, 2, 3 and 4 are to be processed on each of the five machine A, B, C, D and E in order ABCDE. Find the total minimum elapsed time and idle time.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Machine/Job*** | ***1*** | ***2*** | ***3*** | ***4*** |
| ***A*** | *7* | *6* | *5* | *8* |
| ***B*** | *5* | *6* | *4* | *3* |
| ***C*** | *2* | *4* | *5* | *3* |
| ***D*** | *3* | *5* | *6* | *2* |
| ***E*** | *9* | *10* | *8* | *6* |