**DSECLZG416 - MFDS Assignment**

Each question carries 2.5 Marks( 2.5 x 4 = 10 Marks)

Start date: 12th March 2021

End Date: 5th April 2021

1. Submissions are individual
2. Solve these on paper, scan, and upload
3. Plagiarism results in zero
4. Write your name,BITS ID and Section on each page

Q1.A clothing company manufactures blankets, bedspread, pillows and pillow covers. All these productions are done in 4 different departments – cutting, cushioning, fastening and packaging. The company has received order for the products from a famous hospital during a time period. The following table gives data of production in terms of a day and profit in terms of Rupees(1000).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Department | Blankets | Bedspread | Pillow | Pillowcovers | Capacity(day) |
| Cutting | 10 | 10 | 8 | 5 | 1500 |
| Cushioning | 8 | 12 | 10 | 4 | 1500 |
| Fastening | 15 | 20 | 15 | 8 | 1500 |
| Packaging | 5 | 5 | 2 | 1 | 1500 |
| Demand | 1200 | 1000 | 800 | 750 |  |
| Unit Profit | 40 | 50 | 20 | 10 |  |

Formulate an optimal production plan for the company.

Q2. Can we conclude that the function function f(x,y,z)=3 subject to +=16 is always convex.Justify your answer.

Q3. Find the singular value decomposition of A= and the unit vector x at which the length is maximum and compute the maximum length.

Q4. Give examples for the following and also write its matrix and Graphical representations

1. A relation which reflexive, symmetric but not transitive
2. A relation which not reflexive, symmetric but transitive
3. A relation which reflexive, not symmetric but transitive
4. A relation which not reflexive, symmetric but not transitive
5. An equivalence relation.

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**In case of any concern related to assignment mail to TAs of your section ccing me**