**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**SECOND TRIMESTER (Batch 2021-23)**

**END TERM EXAMINATION, JAN-2022**

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| Course Name | **Operations Management** | Course Code | **40502** |
| Max. Time | **2 hours** | Max. Marks | **40** |

 **INSTRUCTIONS:**

Students can use MS Excel Solver to answer question No. 5. However following instructions MUST be followed for Q. 5

* Mathematical model of LPP must be written in the answer sheet in physical form.
* Solution generated on Excel Must be stored in MS Excel file with student’s name as file name and file must be submitted to exam invigilator before leaving examination hall.
* Analysis of Solver output solution Must be done in physical (pen & Paper form) in the answer sheet.
* Students are allowed to open MS Excel only, If a students is found opening any other tab in examination hall, He/she will be awarded “F” grade.

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**Q1**. Tata-Hitachi, a major Indo-Japanese automobile manufacturer was immensely benefitted by application of Five “S” concepts in the production of its construction machinery company which manufactures Hydraulic excavators. An operations management expert felt that these concepts can also be used to improve daily life. Consider yourself in the shoe of that Operations Manager and explain how these concepts can improve your own working / living space at home . **(7 Marks)**

**Q2**. Explain factors which affect location decision :

1. Petroleum refining plant,
2. Ammunition manufacturing plant,
3. Ketchup manufacturing plant
4. Multispecialty hospital.

**(2 x 4=8 Marks)**

**Q3**. Sunshine Paints is a manufacturer of Industrial and decorative paints. The company operates 365 days a year and uses a common base chemical (mineral Turpentine) for making different type of paints. The quarterly demand of this base chemical is 12,000 Liters. The standard deviation of daily demand is 35 liters and lead time is five days. The company wish to ensures 95 % availability of this raw material (Z = 1.645). The ordering cost is Rs 90/- per order and carrying cost is 10 % of the unit cost per year. Each liter of base chemical costs Rs. 60/-. Apply inventory management concept and find out Economical Order Quantity, Total Cost of this inventory policy and Reorder Point. (**2 + 3 + 3 Marks)**

**Q4**. “Super-Way” is a chain which offers custom made sandwiches to its customers. The process steps for making a sandwich are as under :-

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Process Step** | **Precedence** | **Time (Minutes)** |
| A | Take customer order, receive payment and issue token to the kitchen for the start of burger assembly process  | -- | 2 |
| B | Take out 6 or 12 inch bread and cut it from center | A | 1 |
| C | Apply butter and cheese spread on bread | B | 1.5 |
| D | Take out Pattie (Chickpeas, Potato, Chicken, Fish etc.) from the fridge and preheat in microwave oven | A | 3 |
| E | Assemble the burger by putting Pattie and salad | C,D | 1 |
| F | Carry out burger dressing with Mayonnaise, Garlic Sauce, Chili Sauce, Mustard Sauce etc. | E | 2 |
| G | Wrap burger in Paper roll and offer it to customer | F | 0.5 |

 “Super-Way” only operates for Four hours every day in the evening from 18:00 – 22:00 hrs. without any break and has a customer demand of 80 Burgers every evening. Apply Operations Management concepts and plan a burger production process with minimum number of employees. Also calculate performance parameters.

**(7 Marks)**

**Q5**. The global furniture maker company IKEA has newly introduced three different styles of cabinets: an Italian model, a French Country model, and a Caribbean model. However, their production process involves certain sets of activities. Each cabinet which is under production must go through three departments: carpentry, painting, and finishing. The maximum available hours for painting are 700. The table (given below) contains all relevant information regarding their production times (hours per cabinet). When IKEA sells these cabinets, it assumes a profit of $78 from the sales of Caribbean cabinet. The Italian and French cabinets each generate the profits of $72 and $65 respectively. The company cannot allow the carpentry hours for more than 1360 hours. The total available time for finishing the cabinets is 430 hours. IKEA also has an obligation to deliver a minimum of 60 cabinets in each style to a furniture distributor. It would like to determine the product mix that maximizes the daily profit. Formulate the problem as an LP model. Solve the problem using MS Excel Solver. Discuss the output and sensitivity analysis result generated from the excel solution in detail.

|  |  |  |  |
| --- | --- | --- | --- |
| Cabinet Style | Carpentry | Painting | Finishing |
| Italian | 3 | 1.5 | .75 |
| French | 2.25 | 1 | .75 |
| Caribbean | 2.5 | 1.25 | .85 |

**(3 + 4 + 3 = 10 Marks)**