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| **C:\Users\ADMIN\Desktop\j.png** | **JAIPURIA INSTITUE OF MANAGEMENT, INDORE**  Post Graduate Diploma in Management |
| **Course Title: Operations Management (Course Code: 40502)**  **End-Term Examination, Term – II (January 2025)** | |
| **Time Duration: 2 Hours Total Marks: 40** | |

***General Instructions*:** *Students are allowed one or two textbooks of choice and her/his class work copy in the examination hall. Students can make necessary assumptions if required.*

**Golden Furniture House**

Golden Furniture House (GFH) is a home decor furniture house in Indore. The store was established in year 1953 and is currently being operated by third generation entrepreneur Mr. Rajesh Jain. Mr. Jain graduated in management from a top business school of India and joined this family business in the year 2010. GFH has an excellent reputation in the market and so there is no scarcity of orders.

Golden Furniture makes a range of furniture like sofas, dining tables, chairs, study tables etc. The salary cost for the fashion house for their employees and artisans is @ Rs. 200/- per hour. Their main sofa set with 3 + 1 + 1 variant is the most popular item. Each three-seater sofa has four round legs, one base frame with two long and two short rectangular sections, one back rest with two long and two short rectangular sections, two side rests and two plywood sheets, one each for base and back rest. Each one-seater sofa has four round legs, one base frame with two long and two short rectangular sections, one back rest with two long and two short rectangular sections, two side rests and two plywood sheets one each for base and back rest. The processing steps for this “main sofa set” (i.e. one piece three seat sofa and two pieces of single seat sofa) are given below. This item has a very high demand, and Golden Furniture is currently not able to meet all the demand for this “main sofa set”.

The production process for making “main sofa set” is: - prepare round legs, prepare rectangular frames for sofa seat, prepare rectangular frames for back rest and prepare hand rests. The seat for sofa is assembled using rectangular seat frame, plywood sheet and foam. The back rest for sofa is also assembled using rectangular back frame, plywood sheet and foam. The final assembly of the sofa is done using all previous components (round legs, assembled base seat, assembled back rest and handles). Thus, one unit of the “main sofa set” (the combined set of 3 + 1 + 1 sofa set is called one main sofa set unit) requires 3 x 4 = 12 round legs, three base frames, three back rest, three seats and 3 x 2 = 6 side hand rests. Preparation of round legs is done on wood lathe machine, shaping of rectangular wood sections for frame is done on shaper machines and shaping of hand rests is also done on shaping machines.

The operational facilities for Sofa making are as under: -

* Wood lathe section where rectangular pieces of wood are carved in round shape legs
* Shaping section where wood planks are cut and shaped in rectangular frames for seat and back rest
* Side hand rest shaping section where side rest of sofa are shaped
* Sofa frame is made by assembling main frame, legs and hand rest
* Plywood cutting section where plywood sheets are cut in desired sizes
* Back and seat assembly section where rectangular frames and plywood sheets are assembled
* Cushing section where cushions are tailor made for back and seat of the sofa using cloth and sponge sheets.
* Finishing section where all components of sofa are brought (sofa Frame, back and seat assembly, cushions for back and seat etc.) and final sofa is assembled.

Mr. Rajesh Jain has ambitious plans to expand his business for “main sofa set” and has shortlisted three locations near his existing factory, Dewas, Pithampur and Mandideep. However, all the locations have a combination of fixed and variable costs. The fixed costs for these three locations, Dewas, Pithampur and Mandideep are 50 million, 30 million and 40 million respectively. The variable cost per unit of the “main sofa item” for these three locations are Rs. 40,000/-, Rs, 60,000/- and 50,000/- respectively.

GFH recently received some special orders for designer sofa sets. Mr. Rajesh Jain wanted to predict the time required to complete these special orders. The production process for these sofa sets is - Woodwork, Cushioning and Finishing. The time (in hours) to manufacture these special sofa sets in the three sections i.e. Woodwork, Cushioning and Finishing are: - *Marriage Garden Sofa* --- 135, 120, 35; *Corporate Sofa* --- 139, 108, 40; *Luxury Hotel Sofa* -- 148, 125, 50; *Airport Lounge sofa* – 140, 110, 25; *Academic Institution lounge sofa* – 135, 125, 38 hours respectively.

The sofa making requires Sagwan wood, which GFH purchases from reputed suppliers. This item is a crucial item for making sofas as a shortage shall stop entire production. Last month’s consumption was 6000 cubic feet of wood. The cost of Sagwan wood is Rs. 1000/- per cubic foot. The cost of placing an order and inventory carrying costs in the last five years are given below.

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| Year | **2020** | **2021** | **2022** | **2023** | **2024** |
| Ordering Cost per order (Rs.) | 5000.0 | 5600.0 | 6272.0 | 7024.6 | 7867.6 |
| Carrying cost per unit per month (Rs.) | 50.0 | 51.5 | 58.2 | 65.8 | 74.3 |

Mr. Jain is in a dilemma and wishes to optimize the operations management practices in the year 2025. Apply operations management concepts and generate meaningful management insights.