**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

PGDM THIRD TRIMESTER (Batch 2020 - 2022)

END-TERM EXAMINATION, May - 2021

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| Course Name | **Operations Research** | Course Code | **OM 302** |
| Max. Time | **2 hours** | Max. Marks | **40** |

**INSTRUCTIONS:** *All questions are compulsory. Students can use MS Excel Solver. Please save MS Excel sheets as “Your Name” for submission & evaluation.* Any pictures and hand written solutions may be sent as photos along with answer sheet

**Q.1** “Tasty Bites Bakery” produces three types of biscuits, Butter, Chocolate and Almond. All these biscuits pass through three production departments molding, baking and packaging. Each unit (Carton of 100 small packets) of Butter biscuits requires 3.5, 4.5 and 1.0 hours of molding, baking and packaging respectively. Each unit of Chocolate biscuit requires 2.0, 4.0 and 1.5 hours of molding, baking and packaging respectively. Each unit of Almond biscuits requires 3.5, 4.5, 2.0 hours of molding, baking and packaging respectively. Every day, 150 hours are available in molding department, 100 hours in baking department and 80 hours in packaging department. Each Butter biscuit carton contributes Rs 600 profit, each Chocolate biscuit carton contributes Rs 950 profit and each carton of Almonds biscuits contributes Rs. 1200 profit.

Analyze the business situation and provide management recommendations for business improvement to Tasty Bites Bakery. **(09 Marks)**

**Q.2** Taka Sky Entertainment Pvt. Ltd. (TSEPL) and Ariel Entertainment Limited (AEL) are the only two arch rivals in DTH TV channel market in the eastern territory state. The marketing director of TSEPL was worried about the market share and wanted to formulate his firm’s strategy in this competitive environment. He asked his MIS team to gather data for projecting next year market share. Accordingly, the MIS team gathered the following information and presented it to the marketing director of TSEPL: -

* No advertising, medium advertising and heavy advertising by both the firms will result in equal market share.
* TSEPL with no advertising and AEL with medium advertising will result in 44 % market share for TSEPL. TSEPL with no advertising AEL with heavy advertising will result in 26 % market share for TSEPL.
* TSEPL with Medium advertising and AEL with no advertising will result in 67 % market share for TSEPL. TSEPL with medium advertising and AEL with heavy advertising will result in 40 % market share for TSEPL.
* TSEPL with Heavy advertising and AEL with no advertising will result in 81 % market share for TSEPL. TSEPL with heavy advertising and AEL with medium advertising will result in 55 % market share for TSEPL.

Analyze the situation and suggest best course of action for TSEPL. **(09 Marks)**

**Q.3** Agrawal Packers & Logistics is a big logistic company which is engaged in logistic and freight movements. The company has its head quarter at Bhopal (MP). The present CEO Mr. Ajay Pandit is really concerned about the cash flow in the company, as many accounts are not received in time. He therefore called for Mr. Pradeep Sharma, the finance manager, and asked him to present the details of accounts receivable within a week. Mr. Pradeep Sharma worked out the details and came up with the following information.

The company has 1000 accounts receivable in this month out of which, 230 are already paid i.e. the entire amount overdue has been received. Mr. Pradeep Sharma further informed that 70 accounts are overdue for more than three months and so these accounts can be considered as “Bad Debt”. Out of the remaining 700 accounts, 550 accounts are overdue for less than one month. Mr. Pradeep carried out a deeper analysis of these 550 accounts, and based on past experience, he concluded that 350 accounts will surely be received immediately, 150 accounts will be received within 1 month, 50 accounts will be received between 1-3 months and No account will be a bad debt. The CEO and Finance manager further carried out a deeper analysis of remaining 150 accounts which are overdue between 1-3 months. They predicted that out of these 150 accounts, 70 will definitely be realized immediately, 30 will end up as bad debt, 35 accounts can be received within next one month and remaining 15 account can be realized within 1-3 months. The CEO Mr. Ajay Pandit and Finance Manager Mr. Pradeep Sharma were really worried about the situation and wanted to predict the situation after one month.

* Analyze the situation as a management expert and predict the percentage of all four type of accounts after one month.
* If the same trend continues, what shall be the account status after two months, and in the long run? Draw meaningful management conclusions.

**(09 Marks)**

**Q4.** “Karataka Gold Company” was a government owned Minerals Company which had gold mines at Kaveri village in the state. These mines became uneconomical for gold extraction four decades ago and so they were sold to the local residents of the area. Mr. Swami Gowdda’s father purchased a big piece of land four decades ago in Kaveri village and was operating a brick kiln for last four decades. However, with change in technology in last four decades, the quality of seismic survey output improved. So a better land analysis survey can now be done. The recent technological changes brought new perspective Mr. Swami Gowdda’s land. He was in need of money and so decided to explore possibilities for realization of his land.

It is estimated that the land owned by Mr. Swami Gowdda can yield gold worth of Rs. 150 Million but it would cost Rs 7.5 Million in exploration. Alternatively, He can sell the land in Rs. 70 Million. The probability of finding gold is 0.25.

Mr. Swami Gowdda can carry out a seismic survey of his land before exploration which will cost him Rs. 3.5 Million. Based on past experience, if there is gold in the land then the probability of unfavorable seismic result (no gold result in survey report) is 0.15. At the same time, if there is no gold then the possibility of unfavorable seismic result (no gold result in survey report) is 0.85.

Analyze the situation and suggest best course of action for Mr. Swami Gowdda.

 **(13 Marks)**