**Section: Question 1**

Recall the Beer Game you played in class. There were two game scenarios, “Classic” and “Transparent” modes. The “Classic” mode simulated the “Bullwhip Effect”; while the “Transparent” mode reduced the effect.

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| **Q1:** | From the following list, select **THREE (3)** main causes of “Bullwhip Effect” in the “Classic” mode of the Beer Game. | **Mark (3)** |
|  | | |
|  |  |  |
|  | High inventory level | |
|  | Forecasting based purely on orders received | |
|  | Timely information | |
|  | Safety Stock | |
|  | Fluctuating order demand | |
|  | Over reacting to order backlog | |

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| **Q2:** | In the “Transparent” mode of the game, the “Bullwhip Effect” can be minimised by ensuring order data and of information among the supply chain partners to improve order processing and lead times.  (You may use the following key words: analysis / automation / delivery / elimination / fulfilment / maintaining / maintenance / normal / normalisation / sharing / transforming / transformation / transparency / transportation / variation / visibility) | **Mark (3)** |

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| **Q3:** | Supply chain control tower is one of the many tools that can be used to minimise the “Bullwhip Effect”.  Explain why it is so challenging to access the supply chain partner’s operation data for the implementation. | **Mark (1)** |
|  |  | |
|  | Word Count: 35 | Max Words: 1000 |

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**Section: Question 2**

AB Aerospace Ltd is a private jet manufacturer for their clients worldwide. Their clients can order an airplane model from their catalogue or based on the model displayed in the hanger showroom in the US. The company also offers their clients the options for customisation in the airplane, e.g. cabin materials, seating arrangement, on-board gadgets etc.

In response to their client’s feedback, AB Aerospace has decided to launch a new airplane model. This new model allows more demanding client to specify the technical aspects of the airplane, e.g. maximum passenger on board, engine capacity, flight range, fuel consumption etc. The company’s engineers will design and build the airplane from conceptual design, construction drawings and modelling to the final product in accordance to client’s specification.

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| **Q4:** | What is the distinct difference between a Build to Stock (BTS) and Configure to Order (CTO) product? | **Mark (1)** |
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|  | Word Count: 32 | Max Words: 1000 |

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| **Q5:** | What do you think is the company’s current production strategy?  Explain your answer. | **Mark (2)** |
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|  | Word Count: 42 | Max Words: 1000 |

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| **Q6:** | What manufacturing material flow system do you think the company uses for the current production strategy?  Answer: | **Mark (1)** |

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| **Q7:** | Name and explain the new production strategy that the company will adopt for the new airplane model. | **Mark (2)** |
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|  | Word Count: 14 | Max Words: 1000 |

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| **Q8:** | What will be the manufacturing material flow system of the new production strategy for the new airplane model?  Answer: | **Mark (1)** |

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**Section: Question 3**

Gary owns 20 outlets selling fashion accessories in various malls in Singapore. All the outlets hold and replenish their stock independently. Gary recently learned the concept of centralisation and decided to try the concept out by combining 4 outlets (A, B, C and D) into a single outlet E. The historical data analysis on one of the popular accessories (the product) is shown in Table 3.1. The following are two known facts about the product:

•       The replenishment lead time from the supplier is 1 week.

•       The desired customer service level is 98% (safety factor of 2.06).

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| **Q9:** | In Table 3.1, fill in the blanks with the correct values.  **Table 3.1. Historical Data Analysis**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **System** | **Outlet** | **Average Weekly Demand** | **Weekly Standard Deviation** | **Coefficient of Variance (COV)** | **Safety Stock (SS)** | | Decentralized | A | 80 | 20 | 0.25 | 42 | | B | 105 | 20 | 0.19 | 42 | | C | 75 | 15 | 0.20 |  | | D | 60 | 10 |  | 21 | | Centralized | E |  | 32 |  |  | | **Mark (4)** |

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| **Q10:** | Shows **ALL** the calculations for the values you provided. | **Mark (4)** |
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|  | Word Count: 59 | Max Words: 1000 |

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| **Q11:** | Which system, decentralized or centralized, holds more safety stock?  Justify your answer based on your calculation from the information provided. | **Mark (2)** |
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|  | Word Count: 27 | Max Words: 1000 |

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| **Q12:** | Based on the historical sales data, Gary is also considering to merge 2 other outlet F & G (not in Table 3.1) which are negatively correlated.  Will Gary benefit from doing so? Explain your answer. | **Mark (2)** |
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|  | Word Count: 39 | Max Words: 1000 |

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**Section: Question 4**

F&B Co. Ltd. is an established consumer food and beverage company for Asian markets. The company adopts SCOR model for their supply chain and has one of the best practices on applying the model in the industry.

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| **Q13:** | The following diagram shows a Level-2 SCOR model of the company’s end-to-end supply chain from their suppliers to stores.    Identify the process category “A”, “B”, “C”, “D” & “E” in circle respectively.  A =  B =  C =  D =  E = | **Mark (5)** |

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| **Q14:** | The company has to constantly prioritize and align the supply chain’s performance of the internal processes with the business strategy.  Name **ONE (1)** performance attribute and explain how the company applies it. | **Mark (2)** |
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|  | Word Count: 24 | Max Words: 1000 |

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**Section: Question 5**

Turku Light (TL), a manufacturer of LED Lights in Europe, recently expanded into Asian markets including Singapore, Japan and China. The company intends to select a few appropriate sites for the new manufacturing plants to serve these markets.

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| **Q15:** | When TL considers the strategic factors for its new plants, out of the 6 types of facility, which **TWO (2)** types are intended for regional or local customers?  Answers:   and  facilities | **Mark (2)** |

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| **Q16:** | TL collected the relevant data and engaged a consultant to use “The Capacitated Plant Location Model” for decision making. The model is set up as shown in Table 5.1 and the result is shown in Table 5.2.    Based on above results, answer the following questions:  (i) How many factories should TL open in total?  (ii) Which factory still have excess capacity? What’s the amount of the excess capacity? | **Mark (3)** |
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|  | Word Count: 52 | Max Words: 1000 |

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| **Q17:** | As TL only wants to open high capacity factory, the consultant set an additional constraint and re-ran the model. The result is shown in Table 5.3.    Compared to the total cost incurred in the solution of b), how much additional cost will be incurred? | **Mark (3)** |
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|  | Word Count: 53 | Max Words: 1000 |

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**Section: Question 6**

ARMS Corp. is a manufacturer of branded computers sold worldwide. Their primary sales channels are the local retail shops in countries across the world. They have a distribution centre in each country to store the related parts and accessories for the computer products. To fulfil a product order, the parts and accessories are picked, combined and packed together according to the orders received through the retail shops and shipped to the customers.

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| **Q18:** | Based on the description, identify the supply chain distribution network that the company has put in place. | **Mark (1)** |
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|  | Word Count: 5 | Max Words: 1000 |

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| **Q19:** | The “Drop Ship” distribution network is best suited for the following characteristics. (Select the answers that apply) | **Mark (3)** |
|  | | |
|  |  |  |
|  | High value product | |
|  | High demand product | |
|  | Low value product | |
|  | Low demand uncertainty | |
|  | Low demand product | |
|  | High demand uncertainty | |

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| **Q20:** | With computer prices dropping and the rising operation costs, especially in developed countries, the company’s supply chain management team is considering changing the distribution network design to “Drop Ship” model.  Explain **TWO (2)** criteria the team needs to consider when making changes to a network design. | **Mark (2)** |
|  |  | |
|  | Word Count: 15 | Max Words: 1000 |

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| **Q21:** | What **THREE (3)** changes would you recommend the team to make to implement the “Drop Ship” model? | **Mark (3)** |
|  |  | |
|  | Word Count: 33 | Max Words: 1000 |

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