**Section: Question 1**

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| **Q1:** | 1a) In Singapore, which of the following is a dependent demand item at a drink stall of a coffee shop typically? | **Mark (1)** |
|  | Ice Lemon Tea | |
|  | Orange Juice | |
|  | Cut Fruits | |
|  | Coffee Powder | |

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| **Q2:** | 1b) The bamboo fibre made from a bamboo plant will be used to make baby diapers. Thus for diaper manufacturer, the bamboo fibre is considered as\_\_\_\_\_\_\_\_. | **Mark (1)** |
|  | Raw Materials | |
|  | Work-in-Process (WIP) | |
|  | Pipeline Inventory | |
|  | Finished Goods | |

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| **Q3:** | 1c) Which of the following statement is CORRECT for (s, S) inventory review system? | **Mark (1)** |
|  | It has a fixed order quantity | |
|  | It has a maximum inventory level | |
|  | It is always required to place an order at the time of review | |
|  | It is a periodic review system | |

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| **Q4:** | 1d) Regarding Reorder Point, Safety Stock, Optimal Order Quantity and Order-up-to Level, which of the following statement is not TRUE? | **Mark (1)** |
|  | Order-up-to Level will be reached when a new order is received at the warehouse physically | |
|  | Safety Stock is the buffer stock that is maintained to avoid stock out due to longer replenishment lead time or unusual high demand | |
|  | Optimal Order Quantity is the order quantity that minimizes the total holding cost and ordering cost | |
|  | Reorder Point reduces the probability of a stock-out during the replenishment lead time | |

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| **Q5:** | 1e) The diagrams in Figure 1a are the demand patterns for the 4 parties: Factory, Distributor, Wholesaler and Retailer in a typical supply chain. Which diagram should be demand pattern of the Distributor in this supply chain?                           Figure 1a Demand Patterns for 4 Supply Chain Parties  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-352622554_-1786493840.png | **Mark (1)** |
|  | Diagram  C | |
|  | Diagram  B | |
|  | Diagram  D | |
|  | Diagram  A | |

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**Section: Question 2**

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| **Q6:** | A-Steel Pte Ltd is a steel distributor. The annual demand for one popular product SKU-X001 was 120,000 kg  in 2017. Figure 2a is the inventory level for SKU-X001 throughout the year of 2017.                   Figure 2a Inventory Level for SKU - X001 in 2017  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_831437861_-1858040123.png  2a) Refer to Figure 2a, how many orders were placed in the whole year?(). | **Mark (1)** |

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| **Q7:** | 2b) Refer to Figure 2a, i) What is the average inventory level of SKU-X001 in 2017? ii) What is the inventory turnover for SKU-X001 in 2017? Show your workings clearly. | **Mark (4)** |
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|  | Word Count: 8 | Max Words: 1000 |

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| **Q8:** | 2c) If ordering cost is $6,000 per order and holding cost is $0.5 per kg, what is the Economic Order Quantity (EOQ) for this product, assuming demand is constant from year to year? Show your workings clearly. | **Mark (3)** |
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| **Q9:** | 2d) Assuming demand is constant and one year has 50 weeks, the replenishment lead time is 4 weeks, calculate the Reorder Point (ROP) for SKU-X001. Show your workings clearly. | **Mark (2)** |
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|  | Word Count: 7 | Max Words: 1000 |

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| **Q10:** | 2e) A-steel Pte Ltd receives a new quotation for SKU – X001 from their supplier, the information is as follows  • Forecasted annual demand increases to 125,000kg • Unit price = $2 per kg • Minimum Order Quantity (MOQ) = 20,000kg • Ordering Cost: $6,000 per order • Price discount of 10% when order is equal or above 50,000kg, ordering cost is reduced to $4,000 • Price discount of 12% when order is equal or above 80,000kg, ordering cost is reduced to $2,000 • Holding cost = 20% of the unit price  Based on the information, fill in the blanks  in Table 2a. Round up your answer to the nearest integer. Based on the Table 2a, the final optimal order quantity should be . Working is not required.                           Table 2a EOQ Model for a Scenario with Quantity Discount   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Quantity | MOQ (price breaks) | Unit Purchase Price | Optimal Order Qty | Adjusted order quantity | Ordering Costs | Material Costs | Holding Costs | **Total Costs** | | 20000~50000 | 20,000 | 2 | 61,238 | 61,238 | 12,247 | 250,000 |  | 274,495 | | 50000~80000 |  |  |  | 52,705 |  |  | 9,487 | 243,974 | | ≥80000 | 80,000 | 1.76 | 37,689 |  | 3,125 | 220,000 | 14,080 | 237,205 | | **Mark (8)** |

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**Section: Question 3**

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| **Q11:** | Amazing Toys Co. Ltd. distributes MCU’s toys to ASEAN countries and has a large Regional Distribution Centre (RDC) in Singapore. The company has been achieving 92% customer service level for all products distributed from this RDC. The RDC adopts weekly periodic review (R, S) system to manage the inventory. The weekly average demand of a popular toy model with product number SKU-THOR was 1000 units. The replenishment lead time for SKU-THOR was 4 weeks. (Note: There are 52 weeks and 12 months in a year)  3a)  Assuming a monthly demand standard deviation of 500,   i) Calculate the Safety Stock (SS) for SKU-THOR. Show your workings clearly.  ii) If safety stock is taken into consideration, calculate the Target Inventory Level (S). Show your workings clearly. | **Mark (6)** |
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|  | Word Count: 49 | Max Words: 1000 |

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| **Q12:** | 3b) The company still encounters stock-out for the fast-moving item SKU-THOR. Some staff question the (R, S) review system is not very appropriate to prevent stock-out,  i) Do you agree? Why?    ii) Recommend TWO (2) possible changes to reduce the chance of stock-out.  iii) If its customers are willing to wait when stock-out and the company still uses (R, S) review system, will the order-up-to level (S) increase or decrease? Justify your answer. | **Mark (6)** |
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| **Q13:** | 3c) As a distributor, Amazing Toys wants to collaborate with its downstream and upstream players to reduce the bullwhip effect occurred along the supply chain.  i) Name ONE (1) party which could be Amazing Toys’ downstream player.   ii) List TWO (2) challenges to implement this collaboration strategy. | **Mark (3)** |
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**Section: Question 4**

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| **Q14:** | Lucy runs a chain of household convenient stores at various shopping malls. She is trying different ways to ensure her inventory accuracy.  4a) Lucy decided to use GTIN-13 barcoding system on all her products   i) Explain the purpose of the check digit in the GTIN-13 numbering structure.  ii) Except the check digit, what are the other parts in a GTIN-13 numbering structure? | **Mark (3)** |
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|  | Word Count: 40 | Max Words: 1000 |

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| **Q15:** | 4b) To improve information visibility, there was a suggestion to change the current barcoding system to 2D coding system. Give **TWO (2)** advantages of using 2D barcoding system over the 1D barcode system. | **Mark (2)** |
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| **Q16:** | 4c) Lucy has planned her physical inventory counting for all her shops. Fill in the blank of A and B to complete the process flow for this counting exercise.  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1401463920_749887066.png   A step is to ;  B step is to | **Mark (2)** |

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| **Q17:** | 4d) Lucy plans to do cycle counting at all her stores. It counts the inventory 12 times per year for Class ‘A’ items, 6 times per year for Class ‘B’ items and 2 times per year for Class ‘C’ items.        Table 4a Number of Counts for ABC Items   |  |  |  |  | | --- | --- | --- | --- | | Class | A | B | C | | Number of items | 50 | 100 | 300 |         Refer to Table 4a, what is the total number of counts that the company needs to perform for Class ‘A’ and Class ‘B’ items in a month? Show your workings clearly. | **Mark (2)** |
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|  | Word Count: 31 | Max Words: 1000 |

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| **Q18:** | 4e) After cycle counting for one of the A items, the actual quantity for this A item is 543 while the system records show 522, but the maximum allowed quantity is 527, further investigation must be carried out to find out the causes. What is the possible tolerance level for Class A item?  Show your workings clearly. | **Mark (3)** |
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|  | Word Count: 36 | Max Words: 1000 |

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