**Section: A**

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| **Q1:** | Pizza House is a well-known pizza brand in Singapore. They currently serve 6 types of pizza flavours at their outlets across various towns in Singapore.  The pivot table representation below (Figure 1.1) shows the value using index to demonstrate the importance of type of pizza. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-1282749288_-188499238.jpeg **Figure 1.1**  i) Identify the type of pizza and town for Pizza House to increase the efforts and spending on marketing and promotions for improving the sales. Fill in the blanks below.   |  |  | | --- | --- | | Type of pizza | () | | Town | () |   ii) Identify the type of pizza for Pizza House to stay focussed and maintain the sales in Punggol East town. Fill in the blank below.   |  |  | | --- | --- | | Type of pizza | () | | **Mark (3)** |

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| **Q2:** | The snapshot of pivot table below (Figure 1.2) shows the ‘running totals in months’ for ‘Veggie & Fruity’ pizza. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1160977786_401045249.jpeg **Figure 1.2**  How much quantity of pizza sold in December at Simei? Show all workings. | **Mark (2)** |
|  |  | |
|  | Word Count: 19 | Max Words: 1000 |

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| **Q3:** | The pivot table below (Figure 1.3) shows values as ‘difference from next month’. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-829566286_1502541471.jpeg **Figure 1.3**  Given that the sales volume in October for Seafood is 449. Calculate the sales volume for Seafood pizzas for December. Show the workings. | **Mark (3)** |
|  |  | |
|  | Word Count: 36 | Max Words: 1000 |

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| **Q4:** | A typical business data for a day is shown below in Figure 1.4. Which approach (Relational Database or Data Warehouse) is preferred, if the objective is to ensure that the updates of the shipment information captured instantaneously and triggers the next step in business process? C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1715408552_991939440.jpeg **Figure 1.4**  Fill in the blank:  () | **Mark (2)** |

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| **Q5:** | The following extract was obtained from a Market Basket Analysis of customer purchase transactions in Pizza House. How do you interpret this information? Explain.   |  |  | | --- | --- | | **Rule 1** | **BBQ Special & Seafood -> Garden Salad has a confidence of 0.625** | | **Mark (2)** |
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|  | Word Count: 19 | Max Words: 1000 |

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| **Q6:** | Figure 1.5 below shows the co-occurrence table of products P1 to P49? C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-702582066_1451966297.jpeg **Figure 1.5**  How many ways can we choose two items from the products in the co-occurrence table for analysis? Fill in the blank below.  () | **Mark (1)** |

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| **Q7:** | Figure 1.6 below shows the co-occurrence table of six types of pizzas sold in Pizza House in December. The Supply Chain Analyst makes use of Market Basket Analysis to decide which product they should bundle with Garden Salad to improve on the sales process based on 16 transactions obtained. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-192881888_-339663869.jpeg **Figure 1.6**  Fill in the blanks below A1 to A5.  .C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-192881888_117335945.jpeg   |  |  | | --- | --- | | **A1** | () | | **A2** | () | | **A3** | () | | **A4** | () | | **A5** | () | | **Mark (5)** |

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**Section: B**

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| **Q8:** | Changi Express Logistics located in Changi North, owns a fleet of specialized trucks to deliver frozen and chilled products from its warehouse to customers all over the Singapore. As the business is growing continuously, the management is considering to setup another warehouse in Joo Koon.  Suggest suitable GIS analytical tool that can be used to find out the demography of customers living within 0.8km of a location to setup a new warehouse. Fill in the blank below.  () | **Mark (2)** |

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| **Q9:** | The following screen capture was obtained from a smart phone application which provide the required location. The location (shown as an oval shape in Figure 2.1) was obtained indoor in a building. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_838683469_614729480.jpeg **Figure 2.1**  Suggest the type of positioning system the smart phone application is using. Fill in the blank. () | **Mark (1)** |

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| **Q10:** | Referring to Figure 2.1, explain on how was it possible to get the information indoor. | **Mark (3)** |
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|  | Word Count: 64 | Max Words: 1000 |

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| **Q11:** | In an early trial for a new Electronic Road Pricing (ERP) system for the vehicles using GPS, it was discovered that the accuracy of satellite tracking in open areas such as highways to be above 95%, whereas for city centre, it has dipped to about 30%. Identify this phenomenon and give your explanation. | **Mark (3)** |
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|  | Word Count: 45 | Max Words: 1000 |

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| **Q12:** | Census data, Satellite images and Aerial photographs are 3 sources of spatial data. For each source, describe how the data is collected. Give an example for each type to describe the application associated with the type of spatial data. | **Mark (6)** |
|  |  | |
|  | Word Count: 90 | Max Words: 2000 |

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**Section: C**

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| **Q13:** | The following excerpts was extracted from the newspaper. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-1072878148_179927173.jpeg **Figure 3.1**  Based on Singapore Standard SS564, give any **TWO (2)** ways on how does the Green Data Centre Standard help data centres to go “green”? | **Mark (2)** |
|  |  | |
|  | Word Count: 23 | Max Words: 1000 |

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| **Q14:** | The data centre at PK Logistics experienced 16 hours of outage during May 2018. The outage was due to a hardware failure of two servers (10 hours) and a network device (6 hours) which occurred on different days of the month. Given that the desired service level is 98.0%, does this data centre meets the desired service level? Show the workings. | **Mark (3)** |
|  |  | |
|  | Word Count: 29 | Max Words: 1000 |

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| **Q15:** | The following extract from a magazine describes an implementation of Clould Computing Strategy at a company called Byte-Com.   |  | | --- | | *Byte-Com offers electronic services that improve supply chain efficiency. It wanted to develop an application for the aerospace MRO, which relies on special-order drop shipment for most transactions. They are placed randomly by phone, by fax, or through websites.*  *Byte-Com considered building an on-premises server farm to house the project, but it decided that would be too costly as it requires millions of dollars to set up a data centre. By taking advantage of the Virtual Inventory solution using Microsoft Windows Azure, distributors will have immediate, online access to a global parts supply 24x7 using their web browser.*  *The virtual data storage is expected to increase sales and drive down costs. The servers (Virtual) are rented on an as-needed basis, and the IT professionals who manage them have full control of the software configuration. Hence, there was no need for the purchase of a physical server.*  *Besides that, the company is also able to build and run custom applications as services. Hosted application servers that have near-infinite scalability resulting from the large resource pools they rely on are available.*  *In May 2018, Byte-Com released a pilot version of the application to 10 enterprise wholesalers and suppliers, and demand is rapidly increasing. The solution is able to grow to more than 0.5 trillion rows of data and more than 1 terabytes. Byte-Com reports that it was able to launch the new service in just 75 days and able to bring innovation to the marketplace fast.* |   Identify **ONE (1)** example for each Cloud Computing service model (SaaS, PaaS and IaaS), that was mentioned above. | **Mark (3)** |
|  |  | |
|  | Word Count: 18 | Max Words: 1000 |

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| **Q16:** | Figure 3.2 below provides the specifications for two RFID readers. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_1869532827_-509163360.jpeg **Figure 3.2**  Fill in the type of frequency and type of tag that is suitable for the readers (Figure 3.2).   |  |  | | --- | --- | | **Specifications 1** | | | Type of Frequency | () | | Type of Tag | () |  |  |  | | --- | --- | | **Specifications 2** | | | Type of Frequency | () | | Type of Tag | () | | **Mark (4)** |

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| **Q17:** | How is Biometric system is different from RFID system in auotmated identification of truck drivers for a logistics company? | **Mark (2)** |
|  |  | |
|  | Word Count: 59 | Max Words: 1000 |

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| **Q18:** | List any **TWO (2)** advantages of automated identification technology deployment using bar code as compared to Electronic Product Code (EPC) standards. | **Mark (2)** |
|  |  | |
|  | Word Count: 42 | Max Words: 1000 |

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| **Q19:** | Give any **TWO (2)** applications of using EPC standards in logistics applications. | **Mark (2)** |
|  |  | |
|  | Word Count: 15 | Max Words: 1000 |

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**Section: D**

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| **Q20:** | Changi Express Logistics owns a fleet of specialized trucks to deliver frozen and chilled products from its warehouse to customers in Singapore. Each truck makes at least 1 trip per day from different pick and drop locations. The Planning Department has decided to design a database for maintain the data and do planning of the trips that each vehicle made so as to optimize the route planning. Figure 4.1 below shows the ER Diagram for design of database.  C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-1825542545_-810317583.jpeg **Figure 4.1**  Suggest suitable data types and length (if any) for each of the fields mentioned below and fill in the blanks.   |  |  |  |  | | --- | --- | --- | --- | | **S.No.** | **Field Name** | **Description** | **Datatype** | | 1. | ShipmentId | It contains between 5 and 7 characters (e.g. SH016 or IN06437). | () | | 2. | OrderId | OrderId must be alphanumeric and the length is fixed (e.g. OR345) | () | | 3. | EndTime | EndTime for the trip contains the date and time information | () | | 4. | UoM | UoM contains either PC or Carton. | () | | **Mark (4)** |

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| **Q21:** | Referring to ERD in Figure 4.1, identify a table which has intersection data. List at least **TWO (2)** fields of intersection data. | **Mark (3)** |
|  |  | |
|  | Word Count: 15 | Max Words: 1000 |

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| **Q22:** | The Warehouse Manager would like to know the total fleet size owned by the company. Write an SQL statement to the requirement. | **Mark (2)** |
|  |  | |
|  | Word Count: 4 | Max Words: 1000 |

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| **Q23:** | The manager of Distribution Services needs to generate a report on the vehicles’ schedule. Write an SQL statement to generate a report that lists the Vehicle no, CustomerDONo, PickLoc, EndTime. | **Mark (5)** |
|  |  | |
|  | Word Count: 19 | Max Words: 1000 |

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| **Q24:** | Rewrite the query below using the **IN** keyword to give the same output.  select shipmentId, UOM, HAWB from shipment where category = ‘IMP’ or Category = ‘EXP’ | **Mark (3)** |
|  |  | |
|  | Word Count: 11 | Max Words: 1000 |

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**Section: E**

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| **Q25:** | ProKonstruct is a Project Management Consulting company which provides services in heavy construction sector. One of the projects that ProKonstruct is currently working is Thomson-East Coast Line (TEL). TEL will be the sixth line to be introduced into the MRT system of Singapore. On 21-July-2016, the LTA marked the start of construction of Thomson-East Coast Line. The 43km stretch from Woodlands North to Gardens by the Bay costs S$18 billion approx. It will add 31 new stations to the existing rail network, with 7 interchange stations, which will link to the East-West Line, North-South Line, Circle Line and the Downtown Line. The line will be opening in several stages – 2019, 2020, 2021, 2023 and 2024.  Give any **THREE (3)** reasons why you would consider TEL to be a project. | **Mark (3)** |
|  |  | |
|  | Word Count: 39 | Max Words: 1000 |

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| **Q26:** | Based on your Project Management knowledge, describe and identify the relationship / dependency for the two scenarios given below.   |  |  | | --- | --- | | **Scenario-1** | **Scenario-2** | | C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-2133803924_2110536748.jpeg | C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-2133803924_197362595.jpeg | | **Mark (4)** |
|  |  | |
|  | Word Count: 14 | Max Words: 1000 |

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| **Q27:** | Based on your knowledge on Gantt charts, map the symbols and their representation.   |  |  |  | | --- | --- | --- | | **a**. Critical Path | **c**. Summary of Tasks | **e**. Non-critical activity | | **b**. Milestones | **d**. Dependency between tasks | **f**. Duration of tasks |   Indicate your mapping for 1,2,3,4 with **a** *or* **b** *or* **c** *or* **d** *or* **e** *or* **f**, below in the blanks.   |  |  | | --- | --- | | 1. Thick black bars | () | | 2. Arrows | () | | 3. Black Diamonds | () | | 4. Lighter Horizontal Bars | () | | **Mark (4)** |

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| **Q28:** | The figure below details the activities, their relationship and durations for completion of a project. C:\Users\17046589\AppData\Roaming\Republic Poly\eQuest\_assessmentimages\_assessmentimg_-556589687_1886656199.jpeg **Figure 5.1**  How many paths in total are there? | **Mark (2)** |
|  |  | |
|  | Word Count: 29 | Max Words: 100 |

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| **Q29:** | Referring to Figure 5.1, find the critical path and calculate its duration. Show the working clearly. | **Mark (3)** |
|  |  | |
|  | Word Count: 73 | Max Words: 100 |

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| **Q30:** | What is work breakdown structure? How is it created? | **Mark (3)** |
|  |  | |
|  | Word Count: 57 | Max Words: 1000 |

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| **Q31:** | Changi Express Logistics considering to make use of data interchange using XML with their business partners. Explain how this act is going to help Changi Express Logistics in improving the supply chain sustainability and reduce the carbon foot print. Give your reasoning. | **Mark (2)** |
|  |  | |
|  | Word Count: 36 | Max Words: 1000 |

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| **Q32:** | The following shipment notice Shipment10143-03-19 was generated to enable B2B transactions between overseas freight forwarder and Changi Express Logistics.   |  | | --- | | **Shipment10143-03-19** | | <?xml version=”1.0”?>  <SHIP\_NOTE>  <Shipment> SHP6789  <Port> Hyesan  <Carriername> KIJ672  <Pallet> 50  <Part No> KOP93  <EstArrival> 09-Jan-2019  </EstArrival>  </PartNo>  </CarrierName>  <VesselName/>  </Shipment>  <SHIP\_NOTE> |   Is the above code well formed? Support your answer with **TWO (2)** reasons. | **Mark (3)** |
|  |  | |
|  | Word Count: 26 | Max Words: 1000 |

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| **Q33:** | To improve the internal processes, Changi Express Logistics has implemented robotic process automation for document processing in two departments Finance and Warehouse. Finance department’s process includes the downloading of invoice from myBiz website for the goods received. The script will check the information from local excel document, and input the information into myBiz website for submission, and supplier’s invoice will be downloaded from myBiz website into a local computer. The process is repeated for about 20~25times a day. While running, you realized that the script encountered some error after successfully running 9 times, after the information submission into website and just before the downloading of invoice from myBiz website. What could be the cause of error? Propose and explain your corrective action. | **Mark (3)** |
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|  | Word Count: 86 | Max Words: 1000 |

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| **Q34:** | Along with robotic process automation, Changi Express Logistics is also considering to use Artificial Intelligence to improve the productivity. What is the difference between Robotic Process Automation and Artificial Intelligence? Propose any **TWO (2)** areas for the use of AI in Changi Express Logistics. Give an example for each area proposed. | **Mark (5)** |
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|  | Word Count: 62 | Max Words: 1000 |

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