**School of Isolated and Distance Education**

**SEMESTER ONE EXAMINATION 2020**

**YEAR 11 COMPUTER SCIENCE AECSC**

**Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**SIDE Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**SIDE Student Coordinator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Base School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**SUPERVISOR’S DECLARATION**

I declare that this examination paper has been completed by the student named above. The time and resource restrictions have been observed and the student has NOT accessed notes, texts, reference books, the internet, a computer, a calculator or a mobile phone unless otherwise specified. I understand that breaches of the examination rules could lead to an examination paper being cancelled or having an examination mark significantly lowered.

**Supervisor’s Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_**

**TIME ALLOWED FOR THIS <<PAPER/SECTION>>**

Reading Time ten minutes

Working Time two and a half hours

**MATERIALS REQUIRED/RECOMMENDED FOR THIS PAPER**

**To be provided by the supervisor**

This Question/Answer Booklet

**To be provided by the candidate**

Standard items: pens, pencils, eraser, correction fluid/tape, ruler, highlighters

Special items: non-programmable calculators, MATHOMAT and/or Mathaid and/or any system flowchart template

**NO OTHER ITEMS MAY BE TAKEN INTO THE EXAMINATION ROOM**

**IMPORTANT INFORMATION FOR CANDIDATES**

No other items may be taken into the examination room. It is your responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor before reading any further.

**Structure of this paper**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Number of questions available | Number of questions to be answered | Suggested working time (minutes) | Marks available | Percentage of examination |
| Section One:  Short answer | 20 | 20 | 70 | 100 | 40 |
| Section Two:  Extended answer | 5 | 5 | 110 | 86 | 60 |
|  |  |  |  | **Total** | 100 |

**Instructions to candidates**

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2020*. Sitting this examination implies that you agree to abide by these rules.

2. Write your answers in the spaces provided in this Question/Answer Booklet. A blue or black ballpoint or ink pen should be used. Wherever appropriate, fully labelled diagrams, tables and examples should be used to illustrate and support your answers.

3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question. Where no specific instructions are given, you should feel free to use a range of formats to express your knowledge and understandings.

4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
  + Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question(s) that you are continuing to answer at the top of the page.

**Section 1: Short Answer 40%(100 Marks)**

This section contains **20** questions. You must answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue to answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
* Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

**Question 1 (3 marks)**

Discuss the differences between a solid-state drive (SSD) and a magnetic disk storage device.

**Question 2 (6 marks)**

1. Explain what is mean by the term ‘Standard Operating Environment’ (SOE). (2 marks)

1. Outline briefly two advantages and two disadvantages of implementing an SOE. (4 marks)

Advantage 1:

Advantage 2:

Disadvantage 1:

Disadvantage 2:

**Question 3 (5 marks)**

Jasmine’s project has a very tight budget and the system must be in place by August 2, 2020.

1. Which type of system development methodology should Jasmine use and why? (3 marks)

1. Which project management tools could she use to ensure the costs are contained with budget and the deadline is met? (2 marks)

**Question 4 (1 mark)**

What is the role of the program counter within a system unit.

**Question 5 (3 marks)**

The number of surveys being undertaken on a mobile phone is increasing. Identify and briefly discuss three strategies that would help a user input data into the survey forms using a mobile device.

**Question 6 (3 marks)**

Explain the benefits of using a relational database to store and access data.

**Question 7 (2 marks)**

Identify two (2) preventative maintenance techniques that should be carried out on a system unit and its peripherals.

**Question 8 (4 marks)**

Data is transferred around the Computer System using the following buses: - Data, Address and Control. Discuss two of these and discuss what their purpose within the system unit is.

**Question 9 (6 marks)**

Discuss the legal and ethical issues associated with the following scenarios.

1. A teacher uses the schools database to determine the gender distribution across subjects within the school.

1. The teacher uses the internet history of the computers in a classroom to audit the websites students are visiting.

1. Using students’ personal data to create a mailing list for a local charity.

**Question 10 (8 marks)**

Explain how the fetch-execute cycle interacts with a system’s RAM, system clock, control unit and registers.

**Question 11 (12 marks)**

Describe four data gathering techniques that can be used within the SDLC and at which stage they are likely to be used and why.

Technique 1:

Stage:

Why:

Technique 2:

Stage:

Why:

Technique 3:

Stage:

Why:

Technique 4:

Stage:

Why:

**Question 12 (2 marks)**

What is the purpose of a feasibility study within the System Development Life Cycle?

**Question 13 (10 marks)**

Lionel is delivering a course where students have several different assessments over the year.

* All the tests count for 20% of the marks (Test 1- Test 4).
* The Projects are weighted as follows: Project 1: 10%, Project 2: 5%, Project 3: 10% and Project 4: 15%.
* The two semester exams are weighted at 20% each.

He has recorded the results in a spreadsheet below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E | F | G | H | I | J | K | M | N |
| 1 | **Name** | **Test**  **1** | **Test 2** | **Test 3** | **Test 4** | **Proj 1** | **Proj 2** | **Proj 3** | **Proj**  **4** | **Exam**  **1** | **Exam 2** |  |  |
| 2 | **Tom** | 86 | 91 | 78 | 78 | 75 | 74 | 51 | 79 | 81 | 80 |  |  |
| 3 | **Bill** | 58 | 65 | 45 | 75 | 72 | 78 | 57 | 89 | 68 | 69 |  |  |
| 4 | **Jane** | 89 | 88 | 79 | 75 | 78 | 82 | 100 | 88 | 87 | 86 |  |  |
| 5 | **Sara** | 65 | 72 | 73 | 68 | 58 | 44 | 65 | 64 | 69 | 71 |  |  |
| 6 | **Dave** | 52 | 56 | 58 | 68 | 69 | 67 | 66 | 72 | 68 | 67 |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  | 65 | C |  |  |  |  |
| 10 |  |  |  |  |  |  |  | 75 | B |  |  |  |  |
| 11 |  |  |  |  |  |  |  | 85 | A |  |  |  |  |

1. Write a formula that will output the average for each assessment in Row 7. (2 marks)

1. Write the formula that will calculate the weighted average for each student (column M).

(4 marks)

1. Write the formula that will allocate a grade based on the students weighted average in Column N. (4 marks)

**Question 14 (6 marks)**

Using examples, explain the following software types

1. Utility software

1. Application software

1. Operating System software

**Question 15 (8 marks)**

For a system with the following specifications:

* Processor Intel(R) Core(TM) i3-7100 CPU @ 3.90GHz, 3912 Mhz, 2 Core(s), 4 Logical Processor(s),
* L3, Cache
* 256Mb SSD,
* 1Tb SATA Hard disc drive
* 23” touch display,
* wireless keyboard and mouse
* Integrated 2MP webcam and microphone.

Identify all components listed above as one of the following:

.

|  |  |
| --- | --- |
| Input |  |
| Process |  |
| Output |  |
| Store |  |

**Question 16 (4 marks)**

Harriet has been advised that she will need to protect her new system from malware. Identify two malware types and two different protective measures she should incorporate into this system to protect it.

**Question 17 (10 marks)**

1. Identify the errors in this Entity Relationship Diagram and discuss their impact on data integrity. (4 marks)

A screenshot of a cell phone

Description generated with high confidence

1. Correct the Entity Relationship Diagram by redrawing it below. You only need to show primary and foreign key attributes. (6 marks)

**Question 18 (2 marks)**

Explain the function of a context diagram

**Question 19 (2 marks)**

Explain the function of a data flow diagram.

**Question 20 (3 marks)**

Identify the errors in the Data Flow Diagram that follows.

A screenshot of a cell phone

Description generated with very high confidence

**End of Section 1**

**Section Two: Extended answer 60% (86 Marks)**

This section has **five (5)** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue to answer.

* Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
* Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 110 minutes.

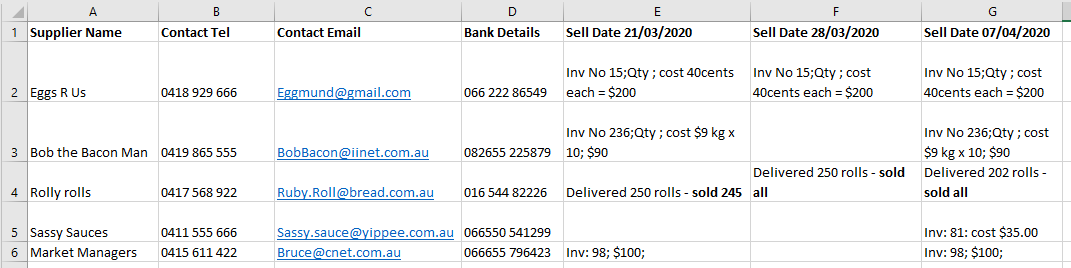
Riko owns a small microbusiness that sells egg and bacon rolls at a local freshfood market. Business has been steadily grown and he now has an opportunity to expand the business to run at other local fresh food markets and he realizes that he now needs a better system of managing the data generated in his business.

He has made a note of all the business processes and noted the following:

1. His egg supplier also runs a business at the market so Rico simply grabs the eggs that he needs for the day and pays the egg supplier in cash, the following week.
2. He uses fresh bread rolls from his supplier and he picks those up on his way to the market in the mornings. He pays for them at pick up via his business credit card and keeps the receipt that detail the number of bread rolls brought on his bread receipt spike.The bacon supplier provides frozen bacon once a fortnight. Rico keeps the picking slip on a spike in his home/office and pays the bacon supplier when they send an invoice to him at the end of each month. He checks off the delivery slips to the invoice carefully as this supplier often makes a mistake. When Rico finds an error, it is always this supplier accidentally overcharging, he sends an email requesting a credit. He keeps a copy of this email on the spike as the bacon supplier will supply a credit on the following months statement.
3. Rico sells the bacon rolls for $7.00 each and works out how many he sells each market day by recording how many he has left over or if he sold out. He jots this down on the back of the bread receipt.
4. Each fortnight, Rico needs to pay for the rent of his stall to the market organisers.

During the week, Rico will enter all his outgoings and turnover for the business into a spreadsheet as follows.

**Figure 1**



**Question 21 (10 marks)**

Referring to information given on page 13 and 14, create a context diagram to represent the data Rico uses within his business below.

**Question 22 (20 marks)**

Create a data flow diagram below for Rico’s business.

**Question 23 (24 marks)**

1. Refer to Figure 1, page 14. Explain to Rico why moving to a Relational Database would help him manage the business data. (4 marks)

1. Explain which project management methodology you would recommend for Rico as he transitions all his data from a paper-based file into a relational database. (3 marks)

1. Create an Entity Relationship Diagram that to help design the database based on the information contained in Figure 1 and the scenario.

The Analyst has advised you that there are **six**(6) Entities and they are Suppliers; Invoice; Item/Invoice; Items; Items/Sold; and Sold.

You need only include the Primary Key and Foreign Key attributes.

(17 marks)

**Question 24 (13 Marks)**

Rico is keen to move ahead and has been provided with a GANTT chart that documents the timeline of key tasks.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Job No | Job | Time  Days | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | Prelim Analysis | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Analysis | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Design | 5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | Development | 7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | Implementation | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | Evaluation. | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | Maintenance | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Refer to the Gantt chart and explain when the following occurs to ensure a smooth transition and that cash flow is available at critical stages.

1. When does Rico need to purchase the hardware to run the new system? (1 mark)

1. Rico will use the computer only for email, word and his database application. Discuss the specifications that would be most suited to Rico in terms of RAM, CPU and Hard Drive storage. (6 marks)

1. Identify during which task(s) the context, data flow diagrams and the ERD’s are created? Justify your choice. (6 marks)

Context:

Data Flow Diagram:

ERD:

**Question 25 (19 marks)**

Rico has been advised he needs to purchase the latest model computer to store and edit his database. This computer will be positioned in his home/office He will also need to be connected to the internet so that he can update this database

1. Discuss the security measures should deploy to protect the computer and its data physically from threats such as theft. (3 marks)

1. Discuss the measures Rico should take to protect the important business data stored on his computer. (3 marks)

The Market Managers have advised of a change in the way they charge their stall owners. They are now applying a small charge according to the business turnover and have requested that Rico email his bank account and turnover figures, so they can set up a direct debit to pay for these additional charges.

1. Discuss measures Rico should consider when sending this data to the Market Managers

(3 marks)

1. To run the second market stall, Rico is employing someone and has concerns about the security and integrity of the data that this person will be required to enter directly into the database using the internet.

Rico has decided to develop a Code of Conduct.

1. What is a Code of Conduct? (2 marks)

1. Identify and justify four items that should be included in this Code of Conduct to protect the business data. (8 marks)

**End of Questions**