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| KZN **DEPARTMENT OF EDUCATION**  **JUNE EXAMINATIONS – 2013**  **INFORMATION TECHNOLOGY**  **GRADE 12**  **PAPER 2**  **DURATION**: 2 HOURS **MARKS**: 150  **DATE: 10 JUNE 2013**  **INSTRUCTIONS TO CANDIDATES**:   1. Read all questions carefully before attempting any answers. 2. Answer all questions. 3. Use the mark scheme as a guide to the length of your answers. 4. Write neatly and legibly. 5. All final answers must be inked. 6. Number answers exactly as the questions. 7. Write down clear and concise answers. 8. Ensure that this paper contains 5 questions and 14 pages. |

**QUESTION ONE [**Multiple choice**]**

***For each of the questions below(1.1. to 1.10.), write down the question number and next***

***to it write down only the letter of your choice that best matches the question.***

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| 1.1.  1.2.  1.3.  1.4.  1.5.  1.6.  1.7.  1.8.  1.9.  1.10. | A technique of using the superscalar design of the CPU to appear to the operating system as two CPUs when in fact only one is present.   1. Hyperthreading 2. Pipeline 3. Dual core 4. Multiprocessing   \_\_\_\_\_\_\_\_\_is an audio or video newsletter that can be played or viewed on a portable media player.   1. Wikis 2. Podcasts 3. Blogs 4. RSS   Software that is distributed freely, but either it can only be used for a limited time, or limited capabilities are available.   1. Shareware 2. Open Source Software 3. Freeware 4. Proprietary software   A GUI component that allows the user to choose one from a given (small) set of options.   1. Check box 2. Dialogue box 3. Combo box 4. Radio button   The storage of files that are static (not going to change), usually onto a secondary system or onto a DVD for example, so that space may be freed up.   1. RAID 2. Archiving 3. Backup 4. Duplicating   Users connect to the internet via this server so security control for viruses etc. can be implemented at one central point. Access to the internet can also be speeded up by storing(caching) recently accessed pages on disk.   1. e-Mail servers 2. Network servers 3. Proxy servers 4. File servers   A network where access is provided to the organizations’ private network to users from outside the organization.   1. Extranet 2. Intranet 3. Firewall 4. WLAN   \_\_\_\_\_\_\_\_ is also known as links pages, offer a selection of internet services from one convenient location.   1. Informational website 2. Social networking site 3. Weblog 4. Portal website   Is an identity theft scam where the user does not receive an e-mail. The user’s computer is infiltrated and automatically redirected to a fake site where the infiltrator has full control over all the data that the user enters.   1. Spamming 2. Pharming 3. Phishing 4. E-mail spoofing   A law which allows people to use and distribute work whilst still allowing the creator some control over where and how it can be used.   1. Copyleft 2. Copyright 3. Piracy 4. Plagiarism   **TOTAL QUESTION ONE = [10]** |

**QUESTION TWO**

In 2012, the Government of South Africa carried out a national survey to gain insight into the effects of ICT on society as a whole. This survey proved to the investigating team in charge that, too many people lacked basic skills when it came to using a computer. The interest is great, but there was a lack of funds for those who could not afford to advance themselves.

In the light of this information, the government embarked on an empowerment crusade, which is being funded by the “National Lottery” and a few other benefactors (big business concerns). The aim is to set up centres in towns across the country, targeting the vast majority of computer illiterate people in South Africa.

You have been selected to form part of a team to manage the centre in your area. Your knowledge and experience is required to help make decisions on hardware and software related issues. Your area is one out of nine centres that has been selected in your town.

Each centre has been provided with similar funding to assist in setting up. They are required to have at least fifteen computers at each centre. After looking at several quotations of computers, your team has reduced the choices to the last two listed below. Examine these quotes and answer the questions posed by the team members.

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| WONDER COMPUTERS (R4399)  C:\Program Files\Microsoft Office\MEDIA\CAGCAT10\j0285750.wmf  Intel Pentium Dual-Core 2.2 GHz  2 Gig DDR2 Memory  300 Gig hard drive  DVD writer  USB optical mouse and keyboard  On-board network card  AGP 16xBus   * Windows XP * MS Office 2007 * Free Educational Software | **X-MACHINES (R5299)**    Intel Pentium Quad Core 2.4 GHz (MMX)  4 Gig DDR2 Memory  320 Gigabyte HDD  DVD RW Dual layer drive  USB optical mouse and keyboard  On-board network card  PCI-Express Bus  MMX instruction set  Additional Graphics card   * Windows Vista * MS Office 2007 * Free Educational Software * Free Gaming Software |

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| 2.1.  2.2.  2.3.  2.3.1.  2.3.2.  2.3.3.  2.3.4.  2.4.  2.4.1.  2.4.2.  2.4.3.  2.4.4.  2.5.  2.5.1. | What is the difference between the two processors?  Explain to your team:   1. What is an instruction set? 2. The two main types of instruction sets is called RISC and CISC. Differentiate between these two types. 3. The computer by X-Machines has MMX instruction set. What distinguishes this instruction set from the standard instruction set? 4. Both quotations contain modern motherboards whose chipset contains two ports (Northbridge and Southbridge). Differentiate between the Northbridge and Southbridge.   DDR is an improved version of DRAM and MRAM is a new type of RAM.  State why you think the RAM of X-Machines is preferred to that of Wonder Computers. Give two reasons.  Differentiate between MRAM and DRAM based on the method used to store data.  The team has heard about “Virtual Memory”, but they don’t have a clue as to what it is. Briefly explain what virtual memory is.  Explain the terms in relation to virtual memory listed below:   1. Paging 2. Thrashing   Somebody picked up that the quotes did not mention ports e.g. USB or FireWire.  What is a FireWire port?  What does USB stand for?  What is the function of the PCI bus?  Explain what advantage does the AGP Bus have over the PCI Bus.  At each centre, people will be taught basic skills like typing a letter, creating a CV, using the internet, e-mail, drawing up budgets, income and expenses etc.  List two applications software, found in the packages offered, that will assist in training students in the abovementioned skills. | (2)  (2)  (2)  (2)  (2)  (2)  (2)  (2)  (2)  (2)  (2)  (1)  (1)  (2)  (2) |

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| 2.5.2.  2.5.3.  2.6.  2.6.1.  2.6.2.  2.6.3.  2.6.4.  2.6.5.  2.6.6.  2.7.  2.7.1.  2.7.2.  2.8.  2.9. | List two common functions of Windows Vista and Windows XP.  You have been asked about Open Source Software instead of XP and Vista.  Give one advantage and one disadvantage of O.S.S.  All centres will receive funding for a LAN setup, provided they submit an acceptable plan for the LAN. The intention is to later connect all centres to each other on a WAN.  State 2 advantages of having a network.  The team is considering a Client-Server network. Provide two reasons to the team why you think that this is not such a good idea for your centre.  A team member suggested a Star topology, while others suggested a ring, for the centre. Draw a diagram to illustrate these topologies, showing the basic layout and the direction of data transmission (You may use arrows to show data flow).  Due to the size of the LAN, the team wanted to know what cabling would best suit the LAN. State two 2 advantages of UTP cables and two disadvantages of fibre optic cables.  State two reasons why you think the network needs a switch.  Since the funding is more than adequate, the team decides to go wireless instead of cables. They make a recommendation to install Wifi.   1. What does Wifi stand for? 2. Explain to the team exactly what Wifi means. 3. You still do not agree with going Wifi even though the team feels strongly. Motivate why you think going Wifi in this centre is not feasible.   All centres involved in this community upliftment project have agreed to connect their LAN onto a WAN, throughout the country, at some stage.    State two advantages of using wireless mediafor this WAN.  You also stated that they should consider the use of a **router** to connect to the WAN.  List two advantages having of a router.  While setting up the network, the team realized that the task was not as simple as it was made to sound. There was a serious need for skilled personnel to install and maintain the network. Explain the purpose of having the following personnel:   1. Network technician 2. Network administrator   P.t.o. 2.9. The team decided…  The team decided to go for one printer. You tried to explain to them that the congestion of jobs sent to one printer may cause loss of these jobs. Explain how this problem of slow printers and volumes of jobs may be solved by explaining the meaning of the terms below:   1. Buffer 2. Spooler   **TOTAL QUESTION TWO = [64]** | (2)  (2)  (2)  (2)  (4)  (4)  (2)  (1)  (2)  (2)  (3)  (2)  (2)  (2)  (2)  (2) |

**QUESTION THREE**

*Your centre finally has the fifteen computers in an appropriate LAN environment and you now belong to a WAN of all centres in your city through wireless media. All computers are linked to a Client-Server network. The team however is still uncertain about internet connectivity. They require clarity on certain issues.*

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| 3.1.  3.2.  3.2.1.  3.2.2.  3.3.  3.4.  3.5.  3.5.1.  3.5.2.  3.6.  3.7.  3.7.1.  3.7.2.  3.7.3.  3.7.4. | Your ISP is offering you **ADSL connection** with a **100Gb capped** per month. Explain to the team what the underlined words mean.  Another popular way of connecting to the internet is 3G connection. Answer the questions posed by the team regarding this type of connection.  Does one need a modem for a 3G connection? Explain you answer.  List two types of technology that may be used with 3G.  People who come to your centre will need to learn how to work with e-mail, since all your correspondence is done via e-mail. Some of the important features of e-mail need to be explained.   1. Explain what is netiquette by using one example. 2. The word SPAM is commonly associated with e-mails. What is the meaning of SPAM?   Apart from e-mails, list two other ways that people may communicate over the internet.  People need to be informed about social networking websites on the net. They need to have some idea of the dangers and advantages of these sites.  State two disadvantages of social networking sites.  State one advantage of participating in activities on social networking sites.  The one skill that has been identified by your team as a “**must learn**” is the ability to verify the information on the internet is reliable. Name two ways of checking this.  This brings us to the question on security of data on the internet. Your network technician suggested two ways of securing your data. He recommended RAID and SSL.  Briefly explain how SSL (Secure Sockets Layer) can ensure that private electronic communication takes place.  All web pages do not use SSL. Why not?  Explain what is RAID.  The team has recommended RAID level 1. Does RAID level 1 protect against data loss.  **TOTAL QUEST THREE = [26]** | (4)  (3)  (2)  (2)  (1)  (2)  (2)  (1)  (2)  (2)  (1)  (2)  (2) |

**QUESTION FOUR**

The department of Social Development has decided to exercise some control over the entire project of funding each centre. They are afraid that some centres may misuse the funds, hence they will be sending monitors to check records of each centre to verify that community training and upliftment is taking place.

***You have been asked to examine the database tables developed by your team and give your experienced input.***

**Database Tables:**

| **tblStudents** | | | |
| --- | --- | --- | --- |
| **StudentID** | **FirstName** | **Surname** | **ContactNo** |
| 101 | Kelly | Peters | 0716721341 |
| 102 | Polly | Saunders | 0735621342 |
| 103 | Sally | Nolan | 0841212315 |
| 104 | Harry | Phelps | 0838654321 |
| 105 | Marlon | Barends | 0819979892 |
| 106 | Nathan | Chetty | 0716654420 |

| **TblCourses** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **CourseID** | **StudentID** | **CourseDescription** | **DateEnrolled** | **TrainerName** | **TrainerRating** | **PartTime** |
| 1 | 101 | Hardware | 2/6/2013 | Denis Lawton | 8 | False |
| 2 | 101 | Networks | 2/6/2013 | OswaldoArdiles | 6 | True |
| 3 | 102 | Internet | 2/4/2013 | Cameron Wright | 9 | True |
| 4 | 106 | MS Office | 3/1/2013 | Phill Williams | 6 | False |
| 5 | 104 | MS Office | 3/5/2013 | Patrick Portland | 8 | True |
| 6 | 105 | Software Development | 1/31/2013 | Denis Lawton | 8 | False |
| 7 | 105 | Windows | 2/7/2013 | Chris Waddle | 9 | True |
| 8 | 103 | Networks | 2/20/2013 | Phill Williams | 7 | False |
| 9 | 102 | Internet | 2/19/2013 | Chris Waddle | 9 | False |

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| 4.1.  4.2. | The ContactNumber field in **tblStudents** has been created as a text field. Explain why this field may cause a problem if it was set as a number field.  Explain why it is necessary to repeat the StudentID field in **tblCourses**. | (2)  (2) |

4.3.**After having a close look at the tables, you recommend that tblCourses be normalized to**

**form the following tables:**

| **tblTrainers** | | | |
| --- | --- | --- | --- |
| **TrainerID** | **TrainerName** | **TrainerRating** | **PartTime** |
| 1 | Denis Lawton | 8 | False |
| 2 | OswaldoArdiles | 6 | True |
| 3 | Cameron Wright | 9 | True |
| 4 | Phill Williams | 6 | False |
| 5 | Patrick Portland | 8 | True |
| 6 | Chris Waddle | 9 | False |

| **TblCourse** | | | | |
| --- | --- | --- | --- | --- |
| **CourseID** | **StudentNO** | **DateEnrolled** | **CourseDescription** | **TrainerID** |
| 1 | 101 | 2/6/2013 | Hardware |  |
| 2 | 101 | 2/6/2013 | Networks |  |
| 3 | 102 | 2/4/2013 | Internet | A |
| 4 | 106 | 3/1/2013 | MS Office |  |
| 5 | 104 | 3/5/2013 | MS Office | B |
| 6 | 105 | 1/31/2013 | Software Development |  |
| 7 | 105 | 2/7/2013 | Windows | C |
| 8 | 103 | 2/20/2013 | Networks |  |
| 9 | 102 | 2/19/2013 | Internet |  |

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| 4.3.1.  4.3.2.  4.3.3.  4.4.  4.4.1.  4.4.2.  4.4.3.  4.5. | Identify the primary key in tblStudents. What is the purpose of the primary key in a table?  The TrainerID field in **tblCourse** is a foreign key. There are three field values in TrainerID column that are labeled A, B, C. Write down **only** what these **three field** **values** will be in the table in question. Use **tblTrainers** and the original **tblCourses** to help you fill these values.  List two advantages of normalizing a database.  The part time trainers at your centre have been doing really well. As an incentive to get them to come back and do better, your team has decided to give them extra remuneration using the following criteria:   * **An amount of R200 is given to all part time trainers who have a rating of 7 and over.**   Study the portion of the algorithm code given below. This code is used to determine the trainer who qualifies for the extra remuneration.  **…. Line 8 If RATING >= 7 OR PART\_TIME = YES THEN**  **Line 9 INCENTIVE = R200**  Complete the trace table shown below by filling in the missing values for letters (a) to (e) **only**.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **VALUE OF RATING** | **VALUE OF PART TIME** | **RESULT OF**  **RATING >=7** | **RESULT OF**  **PART TIME = YES** | **RESULT OF**  **RATING >= 7 OR**  **PART TIME = YES** | | **3** | **YES** | **FALSE** | **TRUE** | **(a)** | | **6** | **NO** | **(b)** | **(c)** | **(d)** | | **9** | **YES** | **TRUE** | **TRUE** | **(e)** |   Does your result on the trace table satisfy the criteria stated above? State which answers on the trace table areincorrect.  Rectify the algorithm above so that the correct results are generated on the trace table.  It has been a year since your team has been training and equipping people to survive in the world of Information Technology. You have managed to compile an array of the number of people trained for the last 10 months of the year. The department only requires the average number of people trained over the last 8 months.  **TrainedArray**:   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Array Index | [0] | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | | No. Trained | 18 | 20 | 22 | 27 | 24 | 17 | 15 | 22 | 23 | 10 |   ***Study the algorithm provided below which helps find the average of the values in the array.***  **Line**   1. **START** 2. **TotalTrained🡨0** 3. **AverageTrained🡨 0** 4. **Startpos = 2** 5. **Loop until StartPos> 10** 6. **TotalTrained = TotalTrained + TrainedArray[StartPos]** 7. **StartPos = StartPos + 1** 8. **End {Loop}** 9. **AverageTrained = TotalTrained / StartPos** 10. **Display AverageTrained** 11. **END.** | | (2)  (3)  (2)  (5)  (2)  (2) |
| 4.5.1.  4.5.2.  4.6.  4.6.1.  4.6.2.  4.6.3.  4.6.4. | | Suggest suitable data types for the variables:   1. StartPos 2. AverageTrained   When this code is executed, a run-time error message is displayed. According to the compiler, the error is found in line 6 of the algorithm.   1. Identify the actual error message that is displayed when the code is terminated. 2. What do you understand by a “run-time” error? 3. Change line 5 of the algorithm such that the code will execute and give an output. 4. After rectifying the error in line 5, the program still gives the incorrect output.   What type of error, is this incorrect output associated with?   1. Correct the error by writing down the line number and the correct statement that will produce the output you are looking for.   You are required to design an OOP to keep records of students that train at the centre. The previous software consultant had already started a design. The team wants you to make sense of the design and take off from where the consultant had stopped.  Study the breakdown below and answer the questions:  The consultant named the Program: (**StudentRec**)   |  | | --- | | Fields used in the Code(All private declarations) | | StudentID: Integer  NameInFull : String  DateEnrolled: String;  FeesOwing:double; |  |  | | --- | | Methods (All declared as public) | | constructor()  constructor(stID , name)  getIdNo() : String  getFees(): double  setDate(date) |   What is the name given to the two types of constructors listed in the method definitions?  Give one example each of the following from the descriptions given in the tables:   1. Accessor method 2. Mutator method 3. Void method 4. Typed method   What did the consultant mean by stating “declared as public” and “declared as private”?  What is the purpose of defining:   1. Accessor methods 2. Mutator methods   **TOTAL QUESTION FOUR = 40** | (1)  (1)  (2)  (2)  (1)  (1)  (2)  (2)  (4)  (2)  (1)  (1) |

**QUESTION FIVE – INTEGRATED SCENARIO**

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| 5.1.  5.1.1.  5.1.2.  5.1.3.  5.2.  5.2.1.  5.2.2.  5.3. | A local businessman in your community heard about the project the centre is running and has decided to sponsor your team members with a smartphone (iPhone) each. He also informed the team, that he is willing to assist the team in setting up the centre for e-commerce so that the team may financially sustain the centre by saving on costs of running and generating its own income.  List two characteristics of a smartphone.  What is the meaning of e-commerce?  List two advantages of e-commerce to the centre.  Security threats are fast becoming a problem at the centre. The team has given you the description of two security threats. They require you to **identify** the threat and **give a solution**.  Software that can take on any form e.g. worm, virus, Trojan, website etc. It records things ranging from computer specifications to recording of websites that you have visited and sends it back to the creator.  A fake e-mail used to try and get you to click onto a link (that looks official) enticing you to update details such as account numbers or pins.  What is a DoS(denial of service) attack?  **TOTAL QUESTION FIVE = [10]** | (2)  (1)  (2)  (2)  (2)  (1) |