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GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2012

MEMORANDUM

MARKS: 180

This memorandum consists of 19 pages.

SECTION A: MULTIPLE-CHOICE QUESTIONS**QUESTION 1**

- | | | |
|------|-----|-----|
| 1.1 | C ✓ | (1) |
| 1.2 | B ✓ | (1) |
| 1.3 | B ✓ | (1) |
| 1.4 | B ✓ | (1) |
| 1.5 | C ✓ | (1) |
| 1.6 | C ✓ | (1) |
| 1.7 | A ✓ | (1) |
| 1.8 | D ✓ | (1) |
| 1.9 | B ✓ | (1) |
| 1.10 | D ✓ | (1) |

TOTAL SECTION A: 10

SECTION B: HARDWARE AND SOFTWARE**QUESTION 2**

- 2.1 2.1.1 (a) *Refresh rate* is the number of times/speed of how often✓ the screen must be refreshed or redrawn✓ per second

NOTE: Do not accept the word rate/rating (2)

- (b) *Any THREE valid reasons* ✓✓✓
- Uses less electricity/ LCD more environmentally friendly
 - Doesn't flicker/Less eye strain/Lower refresh rate
 - Uses less space on desktop
 - Lightweight screen
 - LCD has better screen resolution/better image quality
 - LCD is newer technology than CRT

NOTE:
Do not accept cheaper/faster (3)

- 2.1.2 (a) (i) Metadata is data✓ about data✓

Also accept:

Metadata is additional/detailed attributes/properties about data/file

NOTE: Do not accept any example (2)

- (ii) *Any ONE correct example of metadata* ✓

- Model of camera
- Author (photographers name)
- Title/key words/comments/subject/category
- Last saved by/Date last saved/Last printed
- Revision number/Application name/Company
- Date created

Accept any alternative correct example

NOTE: Do not accept basic file properties e.g. size, filename, etc. (1)

- (b) *Any ONE method* ✓

- Reducing the size of the read/write heads/density of tracks
- Change the process of storing data e.g. using vertical/perpendicular recording
- Using file compression (1)

- 2.1.3 (a) *Any ONE fact* ✓
- It must be of the same size (number of pins)/Must fit into the slots on the motherboard
 - The speed of the RAM must be compatible with the motherboard/FSB/System bus
- NOTE:**
Also accept any mention of motherboard compatibility/checking/comparing the specifications of the RAM (1)
- (b) (i) *Any ONE of the following descriptions about virtual memory*
The operating system use secondary storage ✓ (hard drive) space as memory ✓ (temporary or simulated or additional RAM).
- OR**
- Space on the hard disk that can be used to act as memory. (2)
- (ii) *Any ONE fact why virtual memory isn't the solution* ✓
- Virtual memory is slow/using hard disk space as memory slows down the performance
 - Thrashing may occur
 - To be effective the need for a large amount of secondary storage (hard disk space) arises (1)
- (c) • RAM and cache are different ✓ types of memory (DRAM and SRAM).
• Cache memory is found in the CPU, RAM on the motherboard. ✓
• Upgrading RAM means replacing DIMMs while upgrading cache means replacing the CPU ✓ (3)
- 2.1.4 (a) Universal Serial Bus ✓ (1)
- (b) *Accept any ONE of the following:* ✓
- Firewire (Windows)
 - Thunderbolt (Mac)
 - HDMI (1)
- (c) *Any ONE of the following driver descriptions*
Program ✓ that tells an operating system how to communicate with a specific device. ✓
- OR**
- Software designed to control a piece of hardware. (2)

- (d) *Standard driver. Any ONE correct fact ✓*
- is already part of the operating system
 - no need to load extra drivers
- (1)

- (e) *Any ONE device that connects to USB port that can make use of standard/generic driver ✓*
- Examples of devices:
- Mouse.
 - Keyboard.
 - External storage device (e.g. hard drive/flashdisk).
 - Printer/scanner/camera
- (1)

2.2 2.2.1 A *computer virus* is a software program ✓ that is intended to damage ✓ files on a computer system without the user's knowledge or permission.

OR

Potentially damaging software that affects a computer negatively. (2)

- 2.2.2 *Any TWO of ✓✓*
- Always scan a memory stick (or any other device) for viruses before it is used.
 - Install a firewall/antivirus.
 - Do not boot your computer from a device such as a memory stick or external hard drive of unknown origin.
 - Have an up-to-date antivirus program/software installed on your computer/Update your antivirus program regularly
 - Disable the "autorun" function.
 - Opening any unknown/suspicious e-mail attachments
- Or any other correct answer.* (2)

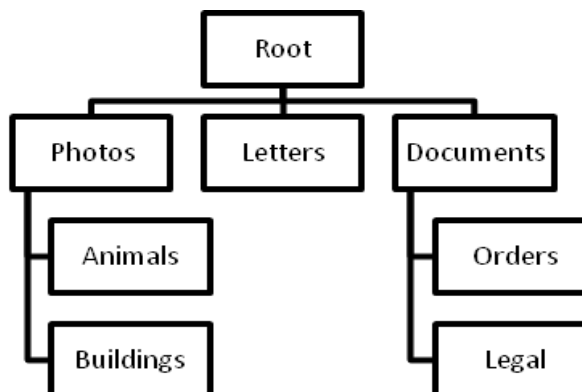
- 2.2.3 *Any TWO of the following in any order: ✓✓*
- tracks (2)
 - sectors
 - clusters

- 2.2.4 *Accept any correct labelled visual diagram of a file structure showing three levels of file management. ✓✓*

NOTE:

Any structure without labels – ONE mark

EXAMPLE:



(2)

- 2.3 2.3.1 *RFID: Radio Frequency Identification ✓* (1)

- 2.3.2 Each lion can have a tag (transponder) ✓ and a receiver can be on each of the feeding stations that need to be monitored ✓. (2)
Also accept any correct alternative explanation

- 2.4 *Accept any TWO ways a server is better suited to ensure higher performance than a PC ✓✓*

Examples:

- A higher performance CPU.
- More RAM.
- Higher performance hard drives/SCSI/higher RPM drives.
- Server software/more robust operating systems

NOTE:

A larger hard drive/more storage space not acceptable.

Giving an example is acceptable for one mark.

(2)

- 2.5 2.5.1 *Accept any ONE correct function of the chipset ✓*
 • Control data transfer/data flow between components on the motherboard.
 • Determine the maximum capability of the motherboard. (1)

- 2.5.2 (a) South Bridge ✓ (1)

- (b) North Bridge ✓ (1)

- (c) South Bridge ✓ (1)

- 2.6 2.6.1 *Pipelining is a method of processing where the processor is able to read new instructions ✓ from memory before the instruction that is busy being processed is completed. ✓* (2)

- 2.6.2 *Any TWO correct facts about cache ✓✓*
TWO MARKS FOR:
- Instructions/data probably needed next by the CPU are placed in cache memory which reduced time lost while waiting for instructions/data from RAM as a result it improves the performance of the CPU.
- ONE MARK EACH FOR:*
- Cache memory is situated inside the CPU or close by.
 - Cache faster type of memory – can feed the CPU with instructions at a faster rate.
 - Instructions/data probably needed next by the CPU are placed in cache memory. (2)
- 2.6.3 (a) *Over-clocking* is when the settings of the CPU are changed in order for it to run at higher rates than it was designed for. ✓
Accept any similar explanation
- NOTE:** *Also accept the following (due to translation error)*
Clock multiplication:
- is the increasing of the CPU's speed in relation to the motherboards speed
 - allows the running of the CPU at a faster rate than the motherboard (1)
- (b) *Any TWO correct facts about preventing overheating ✓✓*
- Large heat sink on CPU/North Bridge chipset.
 - Using thermal paste
 - Heat conductive plate over system bus.
 - Additional cooling fans in case.
 - Alternative cooling systems – any sensible example. (2)
- 2.7 2.7.1 Satellite/Microwaves✓ communication (1)
- 2.7.2 *Any TWO valid examples from scenario (zoo/reptile park/aquarium) ✓✓*
- Guiding someone to a specific animal enclosure.
 - Give you information about the layout of the park.
 - Together with audio feed it can give you information about animals at a specific location.
 - Using satellite technology (GPS), audio and/or multimedia content is triggered based on a user's location in the park. (2)
- 2.7.3 MP3/wav ✓
NOTE: Do not accept avi/MP4 or any other video format (1)

TOTAL SECTION B: 50

SECTION C: APPLICATIONS AND IMPLICATIONS**QUESTION 3: e-COMMUNICATION**

- 3.1 3.1.1 *Accept any TWO advantages from the parks perspective ✓✓*
- The park can use e-communication to promote their services and products.
 - The park's services get promoted world wide/potential visitors to the park may view the parks' services on the Internet before visiting the park.
 - Visitors may be informed of disruptions in services using an e-mail/sms
 - Cost effectiveness with explanation/example (2)
- 3.1.2 *Accept any ONE disadvantage from a visitors viewpoint ✓*
- People get distracted by phone calls/sms.
 - Do not get away from work related issues.
 - Chatting online can disrupt the outing.
 - Public places have insecure Internet connections (1)
- 3.2 3.2.1 The http changes to **https**✓://www.redpark.co.za (1)
- 3.2.2 *Encryption* is a method for changing data✓ into an unreadable format✓
- ONE MARK FOR :*
A correct example explaining encryption
- TWO MARKS FOR:*
Scrambling data (2)
- 3.2.3 The message must be decrypted using the private✓ key✓. (2)
- 3.2.4 A ✓ (1)
- 3.3 *Accept any TWO sensible practical examples of using podcasting. ✓✓*
- Daily commentary about the health of an endangered animal can be recorded.
 - Keep the visitors updated on activities taking place at the park.
 - Recordings of the actual birth process can be made and released via podcasting.
 - Press releases regarding the arrival of new animals/babies can be released via podcasting. (2)
- 3.4 Trojan is a program with malicious intent✓, presenting itself as some useful/harmless program✓. (2)

[13]

QUESTION 4: SOCIAL AND ETHICAL ISSUES

- 4.1 *Any TWO correct ways to reduce electricity consumption – have to be IT related ✓✓*
- Use "greener" hardware which uses less power.
 - Make use of laptops instead of desktop computers.
 - Turn off computers when not used.
 - Share resources such as printer, scanners and other peripherals.
 - Computer hardware may make use of sleep mode. (2)
- 4.2 4.2.1 *Accept any TWO valid responsible recommendations to dispose of old computers ✓✓*
- Request special e-waste centres to collect the old computers/Separate the metal and plastic parts and send to appropriate recycle centres.
 - Donate the computers to a school or charity.
 - Make old machines available to a second hand dealership. (2)
- 4.2.2 YES or NO
NOTE: Must be supported by a valid reason to get the marks
Accept any valid reason for replacing old computers ✓✓
If answered YES:
- This is a cost effective approach.
 - Computers should last five years but will then be old enough to warrant an upgrade.
 - New technology advances in computing make it ideal to upgrade every five years.
- If answered NO:**
- Too expensive
 - The period of 5 years may be viewed as too long and a shorter term of 3 years may be advocated. (2)
- 4.3 *Any TWO viable recommendations ✓✓*
- Software is available that will perform a low level format on the hard drives to ensure that data cannot be retrieved.
 - If the hard drive is no longer required it can also be destroyed.
 - Lock the old hard drives in the vault of the nature park for archiving purposes.
 - Make use of file encryption software to encrypt the data and files.
- NOTE:**
Do not accept format/quick format of hard drive.
Do not accept making backups (2)

4.4 YES or NO

NOTE: Must be supported by a valid reason to get the marks

Accept ONE correct explanation ✓✓

If answered YES:

- The company has the right to know what type of person they are employing.
- The employee may be a potential embarrassment to the company due to his statements on Facebook.
- By viewing the profile the company may prevent victimization of other employees.

If answered NO:

- It is intrusive on a person's private life.
- An employee has the right to confidentiality provided they do not do anything that jeopardizes the organization they work for.
- The constitution protects freedom of speech and association. (2)

4.5 Computer crimes are illegal activities✓ performed using a computer✓. (2)

NOTE:

Also accept an example.

Do not accept rephrasing of the question e.g. "crime using a computer"

[12]

TOTAL SECTION C: 25

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT**QUESTION 5: ALGORITHMS AND PLANNING**

- 5.1 5.1.1 (a) Currency ✓
Also accept: Number (1)
- (b) Text ✓
Also accept: Text with maximum 10 characters (1)
- 5.1.2 *Number is suitable* because you can use any combination of two numbers e.g. 0 and 1 or 0 and -1 to indicate true/yes or false/no ✓ (1)
- 5.1.3 (a) Accept any correct explanation of the condition for validation in pseudo or programming code. ✓✓✓

Examples:
 - "K" OR "U" OR "M"
 - IN("K","U","M")**NOTE:**
Accept double/single/no quotes
Do not accept rephrasing of the given question (3)
- (b) *Accept any appropriate error message* ✓
Examples:
 - Make only use of the letters K/M/U.
 - Only the letters K, M or U are allowed (1)
- 5.2 5.2.1 (a) The table doesn't provide for more than two different types of trees✓✓ to be bought per order.
Accept any similar explanation (2)
- (b) With the field OrderDate as primary key, only one record with a certain date is allowed in the table. It means you are only allowed one order for a certain date ✓✓
Accept any similar explanation (2)
- 5.2.2 (a) *Combined primary key* consists of two or more fields✓ combined together as primary key✓, in order to uniquely identify each record
NOTE:
Do not accept two primary keys per table (2)

- (b) *Accept any TWO valid reasons ✓✓*
- To uniquely identify each record
 - So that one order may have more than two types of trees.
- **If TreeID is not part of primary key (KEY = OrderNo):**
 - You can only buy one tree per order.
 - A new order has to be placed every time you buy more than one type of tree
 - **If OrderNo is not part of primary key (KEY = TreeID):**
 - You can order a certain type of tree only once
 - If you want to buy the same type of tree you have to assign a new TreeID for that tree. (2)
- (c) *Partial dependency – each field in the table must be fully dependant on the whole single primary key/part of the combined primary key ✓ (1)*
- 5.2.3 (a) One-to-Many ✓
(note the order of the 1 and many)
Also accept:
- 1 to ∞ / 1 \rightarrow ∞
 - 1 to M / 1 \rightarrow M (1)
- (b) Any ONE of ✓
- OrderNo
 - TreeID (1)
- (c) YES ✓
Accept ONE correct explanation/reason ✓
- The field TotalAmount can be a calculated field
 - The total for the order can be calculated using a function/formula in a query.
 - The field can be calculated using an aggregate function such as SUM
- NOTE:**
- If only answered YES – no mark allocated (2)
- 5.3 5.3.1 Algorithm is a set of steps✓ to solve a problem. ✓
Also accept any other valid/similar explanation (2)

- 5.3.2 (a) (i) **Impact:** ✓ (*accept ONE correct impact*)
- Nothing/The execution of the program won't be affected/The program will produce negative output.
 - No run-time error will occur.
 - The flow of the program will continue and the user will be asked to enter the next day's number of enclosures cleaned. (1)
- (ii) **Explanation:** ✓ (*accept a valid explanation for the impact mentioned*)
- No data validation is done on the input value and therefore the program will accept the value typed in.
 - The input data (-3) is an acceptable integer number but not valid/correct given the scenario. Being negative number it will be deducted from the total number of enclosures cleaned.
 - A logical error will occur with the displayed value being incorrect - the total number of enclosures cleaned will be less than the actual number – the cleaning staff will be paid less than required (1)
- (b) Runtime ✓ (1)
- 5.3.3 (a) Logical error is when the output received/displayed ✓ is incorrect or not as expected ✓ because of an error based on logic. (2)
Also accept any other valid/acceptable explanation
- (b) *Accept ONE correction for each logical error*
Correction for error Line 4: ✓
Move line 4 to any position above the starting point of the loop ✓.
- OR**
- Move line 4 between lines 1/2 or 2/3.
- Correction for error Line 7:** ✓
Change line 7 to: $\text{Pay} \leftarrow \text{Pay} + (\text{Number} * 100)$ ✓
- OR**
- Change line 7 to: $\text{Pay} \leftarrow \text{Total} * 100$
Move line 7 to outside the loop, between lines 8 and 9. (2 x 2) (4)
- 5.4 5.4.1 *Accept any ONE correct reason for using a WHILE in stead of FOR-loop* ✓
- The size of the text file is unknown
 - For-loops are used when the number of repetitions is known (1)
- 5.4.2 (a) AND ✓ (1)
- (b) OR ✓ (1)

5.4.3 *All names ✓✓✓*

Rose
Nugget
Peach
Suzi

NOTE: *Subtract one mark for each error. (maximum three errors)* (3)

- 5.5 5.5.1 (a) *Accept ONE correct purpose of the constructor method ✓*
- It creates an instance of/initialises the object
 - It reserves/creates memory space for the object in RAM (1)
- (b) The compiler will look at the arguments (parameters) and find the constructor with matching number/type of parameter(s). ✓ (1)
- (c) Overloading ✓ (1)
- 5.5.2 (a) Accessor ✓ (get) (1)
- (b) + `getHospitalisation()` ✓ : boolean ✓
Accept any alternative name for the method
Accept any appropriate return data type e.g. string/integer (2)
- 5.5.3 (a) *Accept ONE aim of toString() method ✓*
- Give a standard output/description of the attributes of an object
 - Allows the output of the values of the attributes of an object
 - To combine all attributes of the class in a single string (1)
- (b) *Accept ONE correct reason ✓✓*
- The use of the class name as a reference to an object in the program is not allowed
 - The use of private attributes is not possible in another unit/class
- NOTE:**
Do not accept any programming syntax (2)
- (c) *Accept ONE correct reason ✓✓*
- The toString method's return type is string; whereas the parameter's data type is integer
 - The method NeedTrees is a mutator method (setting a value) – cannot be part of another statement
 - The IF statement requires a logical expression to evaluate. (2)

TOTAL SECTION D: 48

SECTION E**QUESTION 6: INTEGRATED SCENARIO**

- 6.1 6.1.1 *Accept any TWO correct reasons for having a website ✓✓*
- Many people use the Internet to search for tourist destinations or nature parks specifically.
 - The website may be used in the marketing the park.
 - The website can be an education tool in the parks social responsibility to the community.
 - The website allows international contact.
 - Online bookings
- (2)
- 6.1.2 *Accept any THREE recommendations/aspects of a well designed website ✓✓✓*
- The website should have an attractive design with enough space between elements to make it easy to read.
 - There should be appropriate use of graphics and colours.
 - A standard template should be used across all the pages so that the user can easily understand the website.
 - Content should be well written and up to date.
 - The website should be easy to navigate.
 - User friendly
- (3)
- 6.1.3 (a) *Accept any ONE of the following: ✓*
- The website will not load.
 - A webpage has been defaced such as an image changed.
 - The site has been deleted or replaced by a different web page.
 - Antivirus software detects a virus on the website when it is browsed.
- Accept any correct alternative answer*
- (1)
- (b) *Accept any TWO ways of preventing hacking ✓✓*
- The server should have all software updates installed.
 - The website should be well programmed so that there is not a way that a hacker can gain entry through a particular webpage.
 - A firewall should be used to protect the website.
 - An administrator should monitor traffic to the website to catch any suspicious activity.
 - Do not use the default password for the underlying database.
- (2)

- (c) *Accept any TWO reasons why hackers need access* ✓✓
- For financial gain.
 - To prove that they can to gain status amongst their peers.
 - To point out security flaws in the website to the administrator.
 - A political issue that the hacker has with the organisation behind the website.
 - For entertainment
- Accept any correct alternative answer* (2)
- 6.1.4 (a) *Accept any ONE reason for having search engine friendly website* ✓
- So that it receives the most visits possible to the website.
 - People will most likely open the websites listed at the top of the result set.
 - The name of the park gets promoted and more people are aware of the park.
- Accept any correct alternative explanation/reason* (1)
- (b) *Accept any ONE explanation* ✓ (indexing) ✓ (database)
TWO MARKS FOR:
- Spiders are programs that index websites in a local database.
 - Spiders are programs that traverse all linked pages where possible on the internet and store the content in a database. When a user searches, the search engine searches its own database which is fast.
- ONE MARK FOR:
- A program that makes a lot of information accessible by linking it to the search engine/site.
 - Spiders are programs that index websites
- (2)
- 6.1.5 *Accept any TWO aspects about good navigation* ✓✓
- It should be clearly visible on every page.
 - It should perform in a consistent and uniform manner.
 - It should function on any browser.
 - It should show the layout of the website.
 - It should have a Home page link.
 - Displays different categories on different pages
- (2)
- 6.1.6 (a) *FTP: A standard* ✓ *that permits file uploading and downloading* ✓ *between different computers.*
- ONE MARK FOR:
File Transfer Protocol. (2)

- (b) **HTTP** is used to serve up web pages that can be interpreted by a browser and displayed in a graphical way✓

FTP can only transfer complete files✓

NOTE:

If FTP is explained in Question 6.1.6 (a) and only HTTP answered in (b) two marks. (2)

- (c) *Accept any ONE other way of updating website ✓*
- He could make use of a content management system
 - He could have a web-based file management system to update files
 - He could update files directly on the server (1)

- 6.1.7 (a) RAID 0 creates one logical drive and does not duplicate✓, mirror or backup data in any way✓.
Accept any correct alternative explanation. (2)

- (b) RAID 1 operates by duplicating/mirroring✓ the data✓ across two hard disks ✓ having high fault tolerance. (3)

- (c) *Any TWO server operating systems ✓✓*
- Ubuntu Server
 - Windows Server
 - FreeBSD
 - Novell
 - Unix
 - Linux (2)

- (d) Web caching saves files of recently accessed websites on the hard disk✓. When the visited site is revisited the web browser does not have to re-download the website from the Internet again.✓ (2)

- 6.2 6.2.1 *Communication protocol* is a set of rules/procedures✓ that is used to determine how data is sent between two devices✓ in a network. (2)

Also accept any TWO of the following facts about protocol:

The protocol determines:

- if compression of data is required
- the fault tolerance/control to determine if the data sent was received correctly
- the method that the sending device determines when transmission is terminated
- the method that the receiving device indicates that the complete message was received

- 6.2.2 *Network topology* is the possible layout or physical connection of the devices in a network. ✓ (1)
- 6.2.3 Star/Bus ✓ (1)
- 6.2.4 *Accept any TWO correct reasons for not using UTP* ✓✓ (2)
- UTP is highly susceptible to signal loss/attenuation/cable length is limited to ± 100m
 - Using UTP cable for 5 km would require signal boosters every 100m – extra cost implication
 - UTP is susceptible to EMI
 - UTP is susceptible to eavesdropping
- 6.2.5 (a) VPN is a private network ✓ which uses the Internet to connect computers as if they are connected via a LAN ✓. (2)
- Also accept any ONE of the following explanations:*
- This allows a client to join a private or secure network using a non-secure connection.
 - VPN uses encryption to protect access to the network or the data on the network.
- Also accept Virtual Private Network for one mark.
- (b) *Accept ONE disadvantage of using a VPN* ✓ (1)
- Can be slow.
 - Not available for all clients if internet connection not available/can be "off line" due to cable theft of Telkom lines.
 - If user forget password – cannot connect to VPN
 - Specialised security measures needed/security can be easily compromised
- 6.3 6.3.1 *Accept any TWO correct reasons for preferring RSS* ✓✓ (2)
- An RSS feed reader updates itself automatically/only supply the content that changed.
 - User receives instant updates.
 - Safer than browsing the website directly.
- 6.3.2 *Accept any TWO correct online alternatives* ✓✓ (2)
- Facebook
 - Twitter
 - An e-mail newsletter/ mailing lists.
 - Podcasting
 - Forums
 - Blog
 - UTube
- NOTE: Do not accept Wiki, IM, IRC, RSS Feed**

- 6.4 6.4.1 *Accept any TWO correct ways for e-mails not to be flagged as spam ✓✓*
- The e-mail should not contain too many hyperlinks
 - The e-mail should be sent from an appropriate address
 - There should not be full word capital letters in the subject or body
 - The e-mail may not contain suspect words/phrases/attachments
 - The e-mail needs an appropriate subject line
 - Too many recipients (2)
- 6.4.2 *Accept any ONE correct fact for having a unsubscribe option✓*
- A user should always have the option to unsubscribe
 - If no unsubscribe option, the email is classed as spam and can be reported. (1)
- 6.4.3 (a) PDF document ✓ (1)
- (b) *Accept any ONE correct reason ✓*
- PDF is a compressed universal format that can contain text and images.
 - PDF documents can be password protected to prevent editing of file
 - TIFF is uncompressed and is not as widely supported. (1)
- TOTAL SECTION E: 47**
GRAND TOTAL: 180