



eduresourceza.com

ST BENEDICT'S COLLEGE



SUBJECT GRADE EXAMINER NAME CLASS	Information Technology Theory	DATE	July 2013
	12	MARKS	180
	Mrs Kruger	MODERATOR	Mrs Kench
		DURATION	3 Hours

COGNITIVE LEVELS			
LOW ORDER	61 %	MIDDLE ORDER	%
		HIGH ORDER	39 %

INSTRUCTIONS	
TEACHER'S SIGNATURE	
PARENT'S SIGNATURE	

QUESTION 1**TERMINOLOGY****20 MARKS**

Choose the most appropriate term/concept from COLUMN B that matches a description in COLUMN A. Write only the letter (A – R) next to the question number (1.1 – 1.10) in the ANSWER BOOK, for example 1.11 S.

COLUMN A		COLUMN B	
1.1	A bus design for communication between CPU, memory and peripherals, using serial connections and dedicated point-to-point links between these components.	A	Disk clean-up
		B	PCI-x
		C	Cap
1.2	A way of notifying people that the contents of a website or blog have been updated.	D	Peer-to-peer
		E	e-mail
1.3	A utility that re-organises the files on a computer's hard drive, thus speeding up access and performance of the computer.	F	Bandwidth
		G	URL Spoofing
1.4	Type of network suitable requiring user authentication and a file server.	H	Object
		I	Biometrics
1.5	Software that can be downloaded and used for a short time before paying for it.	J	Client/server
1.6	Maximum amount of data that a user can transfer on a monthly basis over his/her Internet connection.	K	Carpal Tunnel Syndrome
		L	RSS Feed
1.7	Replication of a legitimate site to appear similar on a different server under the control of an attacker.	M	Freeware
		N	Field
1.8	An instantiation of a class in object oriented programming	O	Disk defragmenter
		P	track changes
1.9	A freely-distributable open-source operating system that runs on various hardware platforms.	Q	Shareware + beta
		R	Linux
1.10	Using human characteristics for authentication	S	PCI-e
		T	Android

QUESTION 2**20 MARKS**

Define the following terms:

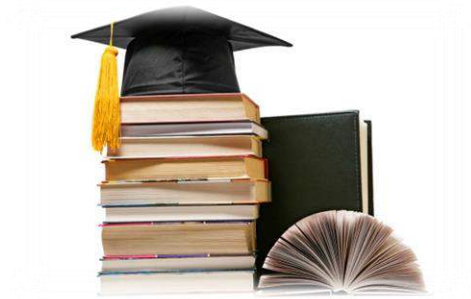
- 2.1 Bluetooth
- 2.2 Spooling
- 2.3 Firmware
- 2.4 RAID
- 2.5 Buffer
- 2.6 Centralised processing
- 2.7 Data Structure
- 2.8 Gateway
- 2.9 Polymorphism
- 2.10 Interpreter

QUESTION 3**45 MARKS****SCENARIO**

Your school needs a well-organised and functioning media centre/library. The school library should focus on digital, as well as printed media.

A team, of which you are a member, of Information Technology (IT) learners has been appointed to assist with computerising the media centre/library. The team is required to set up a management system in such a way that:

- books will be catalogued on computer;
- books will be issued via the computer system;
- records are kept of electronic and print media received or found; and
- learners in the school will receive information on library skills.



Your school management team has agreed to purchase another twenty laptops that can be used in a networked environment. After doing research, you suggest that the library consider the specifications of the two following laptops:

Laptop 1

HP Probook 8470w Notebook - specifications and warranty

System features

Processor type Intel Quad Core i7-3610QM Ivy Bridge with HT (2.30 GHz, 6MB L3 Cache)

Operating system installed Windows 7 Professional 64

Memory

Standard memory 4 GB 1600 MHz DDR3 SDRAM

Storage

Internal drives 256 GB SSD

Optical drives DVD+/-RW SuperMulti DL LightScribe

Graphics

Display 14" diagonal LED-backlit HD+ Anti-Glare (1600 x 900)

Graphics AMD FirePro M2000 (1GB dedicated GDDR5)

Expansion features

Ports 2 USB 3.0, 1 USB 2.0 charging, 1 eSATA/USB 2.0 combp, 1 stereo microphone in, 1 stereo headphone/line-out, 1 AC power, 1 RJ-45, 1 RJ-11, 1 docking connector, 1 secondary battery connector, 1 VGA

Slots 1 Express Card/54, 1 SD/MMC, 1 Smart Card Reader
1 secure digital/MultiMedia card

Communications

Network interface Integrated Intel 82579LM gigabit Network Connection (10/100/1000)

Wireless technologies Intel Centrino 802.11a/b/g/n; Bluetooth 4.0+EDR

<http://www.comx-computers.co.za/Buy-Notebooks-Laptops-NB-HLY540EA-HP-Probook-8470w-lp-74994.php>

Laptop 2

HP ProBook 4330s Notebook PC - specifications and warranty

System features

Processor type Intel Duo Core i5-2520M Sandy Bridge Processor (2.50 GHz, 3 MB L3 cache)

Operating system installed Genuine Windows 7 Professional 64

Memory

Standard memory 3 GB 1333 MHz DDR3 SDRAM

Storage

Internal drives 320 GB 7200 rpm SATA II

Optical drives DVD+/-RW SuperMulti DL LightScribe

Graphics

Display 17.3" diagonal LED-backlit HD+ Anti-Glare 1600 x 900

Graphics ATI Mobility Radeon HD 6370 with 1 GB dedicated video memory

Expansion features

Ports 3 USB 2.0, 1 eSATA/USB 2.0 Combo, 1 external VGA monitor, 1 HDMI, 1, stereo microphone in, 1 stereo headphone/line-out, 1 AC power, 1 RJ-45, 1 RJ-11 (select models)

Slots 1 Express Card/34, 1 Media Card Reader

Communications

Network interface Realtek Ethernet (10/100/1000 NIC)

Wireless technologies Broadcom 802.11b/g/n; 1x1 Wi-Fi and 2070 Bluetooth 2.1+EDR Combo

<http://www.comx.co.za/Buy-Notebooks-Laptops-XX837EA-HP-Probook-4720s-lp-41524.php>

3.1 CPU

- 3.1.1 Explain how cache improves the efficiency of the CPU. (2)
- 3.1.2 Which processor would be the fastest? Give two reasons for your answer. (2)
- 3.1.3 Explain how pipelining will improve the speed of the processor. (4)
- 3.1.4 Both processors are advertised with “64” in the CPU specification. What does this indicate and what part of the CPU is affected by this. (2)
- 3.1.5 Laptop 1 has a quad core processor. Do you think all the cores will be used all the time? Give two reasons to justify your answer. (2)
- 3.1.6 What is the term for having more than one core on a CPU? (1)
- 3.1.7 Newer CPUs can be overclocked. How does this differ from how overclocking was originally achieved? (4)
- 3.1.8 Why would a CPU need to be overclocked? Give two reasons for your answer. (2)
- 3.1.9 Can you use any chipset with laptops 1’s CPU? (1)
- 3.1.10 Newer chipset design moves the Northbridge into the CPU. How will this improve the speed of a computer? (2)
- 3.1.11 Which two components will still need to be connected to the Northbridge if it was combined with the CPU? (2)

3.2 RAM

- 3.2.1 Explain what DDR3 SDRAM means. (3)
- 3.2.2 Laptop 2 has 3Gb of RAM. Do you think this is enough RAM for a student doing IT in matric? Justify your answer. (2)
- 3.2.3 A friend says that to get more RAM you just need more virtual memory. Is this a viable solution? Explain your answer. (2)
- 3.2.4 Caching is a common concept used to improve the access speed of slower devices/components. Which device uses RAM to increase its access speed? (1)

3.3 Secondary Storage

- 3.3.1 Laptop 1 has a SSD. Define “Solid State Drive” and explain the difference in performance when compared to mechanical HDDs? (3)
- 3.3.2 Latency is the delay waiting for a component or device to respond. Describe latency in terms of mechanical hard drives. (2)

3.4 Cooling

- 3.4.1 Describe two possible cooling methods that will be used by the laptops. (4)

3.5 Printing

The school management team has agreed to purchase five printers for the library. Consider the three following advertisements.

PRINTER 1 MULTIFUNCTION INKJET PRINTER	PRINTER 2 PHOTOSMART PRINTER	PRINTER 3 LASER PRINTER
- Prints up to 22 ppm black and 16 ppm colour - Create brilliant photos with optional 5-colour print 36-bit colour scanner depth; 12-bit grey-scale 4 800 dpi	- Print, copy, scan (flatbed) - USB 3.8 colour graphic display unit - Card slots, 10 x 15 cm snapshots and 12 x 18 cm photos	- Prints up to 50 ppm 150 sheet paper tray capacity - Smallest laser-printing system - New chemically prepared toner - Hi-speed USB 2.0 connectivity 266 MHz processor

- 3.5.1 Determine which specification indicates that you can easily print photos from a cell phone or digital camera *if you have no cable*. (1)
- 3.5.2 The librarian needs some advice on whether she/he should use refilled printer cartridges and toner cartridges. List TWO benefits of using refilled cartridges. (2)
- 3.5.3 List ONE potential disadvantage of using refilled cartridges. (1)

QUESTION 4**17 MARKS**

- 4.1 List the three functions of an operating system. (3)
- 4.2 Many students confuse multi-tasking with multi-threading. Explain both terms and decide which will be complex to program. Justify your answer. (6)
- 4.3 What is a software interrupt? (2)
- 4.4 Explain how interrupts are related to IRQ lines. (3)
- 4.5 Your friend says that there is no difference between a printer driver and printer controller. Either agree or disagree with this statement and justify your answer. (3)

QUESTION 5**24 MARKS**

- 5.1 The computers used for the media centre/library will be linked in a school network. Identify THREE advantages of using a **network** that relate *specifically to this library scenario*. (3)
- 5.2 What type of cables would you suggest for the media centre to connect all the computers together in a LAN. (1)
- 5.3 You discover that a bridge has been bought to link all the computers via cables in the media centre. Explain why this will not work, and name the device that is needed. (2)
- 5.4 What topology would you recommend for a cabled solution? (1)
- 5.5 Explain the difference between a MAC address and an IP address. (2)
- 5.6 The media centre needs to be connected to the Internet. Would you need a gateway or a router to connect the media centre LAN to the Internet? Justify your answer. (3)
- 5.7 There are two media access methods namely, Token Passing and CSMA/CD. Which method do you think is the most effective for a busy network? Justify your answer. (3)
- 5.8 Do you think it would be better to create a wireless LAN for the media centre to connect all the computers as opposed to the cabled solution? Give two reasons for your answer by referring to the scenario. (2)

- 5.9 Would you need a wireless bridge inside the media centre if you were going to implement a wireless LAN? Justify your answer. (2)
- 5.10 A student downloads a file from a web site. List three protocols that will be used for the download to be achieved. (3)
- 5.11 Cell phone companies are beginning to offer LTE for Internet connectivity. Name two technologies that could be replaced by LTE. (2)

QUESTION 6

27 MARKS

- 6.1 Explain why a firewall would be needed to this scenario by defining a firewall and listing two possible threats to the network. (3)
- 6.2 The library already has a usage policy document in place concerning the use of the computer centre. The librarian now wishes to compile suitable guidelines for the learners using the network. Identify THREE guidelines to be included in the **network user policy**. (3)
- 6.3 To make the library an interactive place of learning, improving communication is important to enable library staff to be kept up to date regarding current topics and trends. Forums, mailing lists and RSS helps with this.
- 6.3.1 What is a Forum? (1)
- 6.3.2 Explain how RSS helps by describing how it works? (2)
- 6.4 With so much information and internet exposure, security of students and information is vital to any organisation.
- 6.4.1 Phishing attacks are always a risk. Explain the term “Phishing” (2)
- 6.4.2 What TWO software services can assist in keeping phishing attacks at bay? (2)
- 6.4.3 What is the difference between a **Hacker** and a **Cracker**? (2)
- 6.5 SSL makes use of Public Key Encryption with a Digital Certificate. Explain fully how the library can use a credit card to safely purchase books online by referring to this type of encryption. (6)
- 6.6 With the recent number of “false” FaceBook and Twitter accounts being created to impersonate/incriminate people, especially celebrities or politicians, e-crime is once again highlighted.
- 6.6.1 Discuss the phenomenon of Cyber-bullying and suggest a method of reducing the ability of social networking users to do this. (3)
- 6.6.2 Would the abovementioned user abilities to create pseudo users on social networking sites increase identity fraud? Motivate your answer. (3)

QUESTION 7

15 MARKS

- 7.1 Learners downloaded information for their school projects. Some lazy learners copied chunks of information from the websites they accessed and did not acknowledge their sources.
- 7.1.1 Name the term to describe what these learners are guilty of. (1)
- 7.1.2 Suggest ONE way in which teachers can check if the work was **copied** from a website. (1)

- 7.2 One of the learners brought in a licensed graphics program that was bought for home use and asked the librarian to load it on the library computers.
- 7.2.1 Explain why this action is **not legal**. (2)
- 7.3 The school management team has agreed to purchase books over the Internet.
- 7.3.1 Name TWO **commonly** accessed websites from which books can be purchased. (2)
- 7.3.2 The school wants to provide each student with an iPad tablet, with all the books in eBook form, thus reducing paper and enabling students to work digitally. In your opinion, will iPads be a viable solution at your school? Justify your answer. (3)
- 7.3.3 The school realises that it will be very difficult for the entire school to change to iPads overnight. Suggest to management a plan where iPads can be phased in over a period of time. Mention the how long it will take, and what changes will need to occur in each phase to make the adoption of iPads successful. (3)
- 7.4 Learners have been asked to create a pod-cast about global warming. Define a *pod-cast*? (1)
- 7.5 The library staff will make their payments on-line.
- 7.5.1 Name TWO security features that have been built into Internet banking *besides* passwords and the use of PIN codes. (2)

QUESTION 8

22 MARKS

- 8.1 Normalise the table to third normal form. Note that each book can be taken out many times and each lender may take out many books. Also note that a lender could take out the same book on different dates but it is not possible for a book to be taken out by the same person on the same date.

Write your answer as a set of relations where each table is followed by a list of fields in brackets and the primary key is underlined.

tblBooks

Author	ISBN	Category	LenderID	LenderName	DateLent
Aaron Mcgruder	491-6-16-369459-6	Autobiography	12345	Mr N Mzobe	23rd May
Andy Riley	648-2-05-990141-3	Action Thriller	12345	Mr N Mzobe	6th June
Bill Amend	105-1-22-359432-5	Action Thriller	12785	Mrs T Nagel	21st May
Bill Watterson	223-9-88-554911-1	Politics	12785	Mrs T Nagel	22nd May
Bill Watterson	924-7-79-654407-6	Instructional	12785	Mrs T Nagel	19th May
Bill Watterson	335-0-41-919130-8	Science	12785	Mrs T Nagel	1st June
Bill Watterson	091-6-88-769790-7	Science	13429	Mrs C Naidoo	15th May
Bill Watterson	770-2-06-866905-2	Action Thriller	13429	Mrs C Naidoo	24th May
Bill Watterson	199-8-52-149358-0	Instructional	13429	Mrs C Naidoo	16th May
Bill Watterson	056-1-12-145323-1	Politics	13429	Mrs C Naidoo	8th May
Bill Watterson	056-1-72-491005-2	Autobiography	13429	Mrs C Naidoo	29th May
Charles Burns	117-8-69-888287-3	History	13429	Mrs C Naidoo	9th June
Charles M. Schulz, et al	170-6-68-929836-3	Action Thriller	13429	Mrs C Naidoo	30th June
Charles M. Schulz, et al	402-5-75-241985-0	Adventure	22076	Mr E Nel	9th May
Charles M. Schulz, et al	363-5-59-258183-7	Science	22076	Mr E Nel	27th June

(10)

- 8.2 Write a method that will return a Boolean value to check the validity of an ISBN number. The ISBN number will be sent a String parameter. An ISBN number consists of 12 digits and a check digit. Each of the 12 digits, starting from the left to right, is multiplied by 1 or 3 alternatively. The sum of these 12 products mod 10 gives us either zero or a number between 1 to 9. Subtract the number from 10 and it gives us the checksum. The number will only have one dash at the second last position to separate the check digit.

Example: 978007063546-3

$$\begin{aligned} &1 \times 9 + 3 \times 7 + 1 \times 8 + 3 \times 0 + 1 \times 0 + 3 \times 7 + 1 \times 0 + 3 \times 6 + 1 \times 3 + 3 \times 5 + 1 \times 4 + 3 \times 6 \\ \Rightarrow &9 + 21 + 8 + 21 + 18 + 3 + 15 + 4 + 18 \\ \Rightarrow &117 \Rightarrow 117 \bmod 10 \Rightarrow 7 \Rightarrow 10 - 7 \Rightarrow 3. \end{aligned}$$

(12)