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ST BENEDICT'S COLLEGE**Grade 11
INFORMATION TECHNOLOGY
PAPER I – THEORY
November 2010**

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Moderator : D Kench

Time: 2½ hours
Marks: 150

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 12 pages. Please check that your paper is complete.
2. Read the questions carefully.
3. You must answer all the questions.
4. Please number your answers clearly. You may answer the questions in any order.
5. All questions must be answered in your examination book

SECTION A			
Q1	Terminology	10	
Q2	HW/SW	46	
Q3	Networks	30	
Q4	e-Communication	28	
SECTION B			
Q5	Software Development	36	
TOTAL		150	

SECTION A**QUESTION 1: Multiple Choice Questions****[10]**

1.1 Which components on the motherboard does the Northbridge connect?

- a) CPU, Memory, Video
- b) CPU, Hard Drive, DVD
- c) CPU, Memory, USB
- d) CPU, Hard Drive, USB

(1)

1.2 The following address was noted in a technical manual for a school website.
<ftp://www.northpeakhs.edu.za>. What is the main purpose of this address?

- a) To locate the school's website
- b) To locate the school's email server
- c) To locate files to be uploaded and downloaded
- d) To locate the school's database for the admin staff

(1)

1.3 Which of the following interfaces is used to power a peripheral device?

- a) SCSI
- b) USB
- c) Parallel
- d) Infra-red

(1)

1.4 Consider the following list of hardware items :

- i) UPS
- ii) AGP
- iii) 250 W power supply
- iv) Heat sinks

(1)

Which items may be essential to provide continuous operation of a computer system?

- a) All 4 items
- b) Items (i) , (iii) and (iv)
- c) Item (i)
- d) Items (ii) and (iii)

1.5 The fetch/execute cycle ..

- a) Is used in database management systems to process queries
- b) Is used to show how instructions are processed at a low level in the computer
- c) Enhances the performance of RAM by fetching the next memory location before the current one is processed.
- d) Describe how a program translator deals with lines of codes

(1)

1.6 A file with an extension of .dll is

- a) A dynamic-link library file
- b) Used to implement direct links to LAN servers
- c) The source code for a database management system
- d) Used to provide communication to peripheral devices

(1)

- 1.7** Which one of the following represents a list of operating systems for smart phones?
a) Symbian, Windows Mobile, Unix
b) Symbian, Windows Mobile, Android
c) Palm OS, Unix, OS X Cloud Leopard
d) Palm OS, Windows XP Lite, OS X Leopard
(1)
- 1.8** Activities meant to cause people to give out confidential information are known as
a) Spyware
b) Data Mining
c) Social engineering
d) Identity theft
(1)
- 1.9** The part of the processor that performs all computations and logic operations is the:
a) Register
b) Cache
c) Control unit
d) ALU
(1)
- 1.10** Virtual memory uses
a) hard disk as RAM
b) RAM as hard disk memory
c) Volatile memory as non-volatile memory
d) None of the above
(1)

SCENARIO

You have managed to get a student job, during the holidays with an IT company, that will be providing services to FIFA for the 2010 Soccer world cup. Each of the Stadia will require an IT infrastructure for the administrative office. Your company has been awarded the contract to set up the offices at each stadium. *(Yawn, yet another boring soccer themed question!!)*

QUESTION 2: Hardware and Software**[46]**

You have been asked to get quotes for basic workstations that will be used by the admin staff, for general office functions.

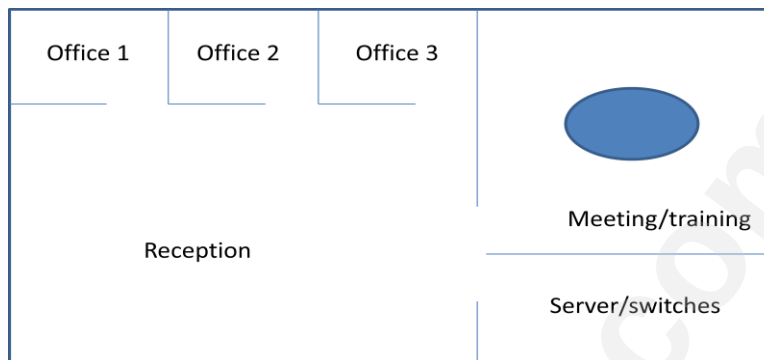
You have received a quote for a **Mecer Premium Combo**. The specs are listed below.

	Motherboard : Mecer Intel Core 2 Supports: • Dual DDR2 800 1333MHz FSB 1 • PCI, 2 • PCIe x 1, • 4 DIMM (8 GB) • PCI Express x 16 Slot Includes: • Intel High Definition Audio (5.1 Channel) • Intel GMA 3100 Integrated Graphics 1 EIDE, • 6 Serial ATA II, • 1 E-SATA • Front Audio Firewire
ADDITIONAL ITEMS REQUIRED	
Processor	
Intel Tray Core 2TMDuo E4700 Processor , 2.60 GHz Dual Core, 2MB L2 Cache, 800MHz FSB Includes heatsink and fan	
Hard Drive	
Seagate BarracudaTM 7200.10 Series – 80GB (SATA2) RAID	
Memory	
DDR2-8-512 512MB DDR2 – 800 DIMM (PC800)	
Wireless	
Internal Wireless PCI Card *IEEE 802.11b/g/Turbo g Standard for 2.4GHz Wireless Lan *Wireless connection up to 125Mbps *(WEP) data encryption	
Miscellaneous items	
Power Supply Case Mouse Keyboard Monitor 1 GB USB2.0 Flash Memory Storage 56K Internal Fax / Modem Cables, cable ties	

- 2.1** RAM is the primary memory on the motherboard.
- 2.1.1** What is the maximum amount of RAM that can be installed on the PC's motherboard. Justify your answer. (2)
- 2.1.2** The quote specifies 2MB L2 cache. Where is L2 Cache memory located? (1)
- 2.1.3** State 3 differences between RAM and Cache. (3)
- 2.2** The CPU performs a critical function in a computer.
- 2.2.1** Specify the speed of the CPU (1)
- 2.2.2** "Heatsink and fan" affects the running of the computer. What is the function of the heatsink and fan? (2)
- 2.2.3** Which would you suggest would be a faster CPU. A hyperthreaded CPU or a dual core CPU? Explain your answer. (2)
- 2.3** You may choose to have the disk drive partitioned. What does this mean and what would be the advantage of choosing this option? (2)
- 2.4** The PC does not come with an Operating System. The suppliers suggest the following :
Microsoft Vista Business
- 2.4.1** List the three main functions of an operating system (3)
- 2.4.2** Would you recommend the use of an open-source operating system? Justify your answer using the scenario? (3)
- 2.5** The motherboard supports the chipset, which comprises of the Northbridge and the Southbridge :
- 2.5.1** Indicate whether the following components would be connected to the Northbridge or the South Bridge (3)
- AGP
 - SATA
 - PCI
 - PCIx
 - RAM
 - CPU
- 2.6** All PCs will be connected to a central server. The data on the server must be protected from loss or damage.
- 2.6.1** Describe three well contrasted, major **physical** (not software) threats to such a system. (6)
- 2.6.2** You have been asked to investigate RAID solutions
- (a) Explain the concept of RAID. (2)
 - (b) Would you recommend RAID 1 or RAID 5. Justify your answer (2)
- 2.7** PC Interfaces
- 2.7.1** What are the differences between SCSI and IDE interfaces? (2)
- 2.7.2** Explain the term Universal Serial Bus (USB) and its advantages. (2)
- 2.7.3** What are the two options to connect graphics cards available to you? (2)
- 2.8** What is an interrupt? Give an example of a hardware and software interrupt. (4)
- 2.9** Explain the difference between a printer driver and a printer controller. (4)

QUESTION 3 : Networks**[30]**

The basic layout of the admin offices at each of the stadia is shown below. You have been asked to design the LAN.



- 3.1** In planning the LAN there are a number of choices that need to be made regarding the layout and medium to be used.
- 3.1.1** The topology describes the physical layout of a network. You have been asked to implement a star topology.
- Describe a star topology.
 - List two important characteristics of a star topology. **(3)**
- 3.1.2** LANS may include a hybrid of mediums. Which of the following would you make use of when setting up the LAN.
- Fibre optic
 - Wireless
 - UTP
- Explain the characteristics and application of two types of medium. **(6)**
- 3.2** You would like to set up a wireless printer in the foyer. You have the choice of buying a printer that uses Bluetooth or a printer that has an irDA connection. Which would you select? Give 2 reasons for your choice. **(2)**
- 3.3** Which of the following networking items would you require? Describe the functionality of the items you select
- Modem
 - Switch
 - Router
 - Hub
 - firewall
- (4)**

3.4

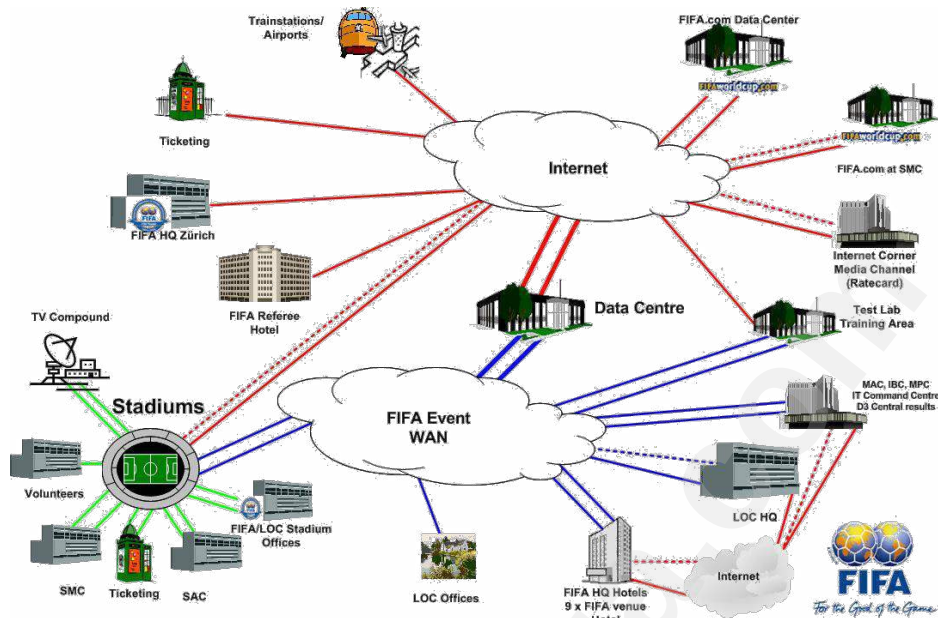


Figure 1: (see enlarged image on page 11)

3.4.1 Figure 1 is a diagram of the FIFA network requirements. Networks can be described by the geographic areas they span. Identify where 3 of the following network features can be applied in the FIFA NW :

- LAN
- WAN
- VPN
- Satellite
- Microwave

(6)

3.5 It is compulsory for each stadium to have internet connectivity. A local land-line telephone operator, who is one of the sponsors of the Soccer 2010 World Cup, offered the Soccer 2010 World Cup Committee an ADSL internet connection with an uncapped bandwidth, while another sponsor, a cellular telephone company has offered 3G internet connectivity.

3.5.1 What does 3G stand for? (1)

3.5.2 Which option would you recommend for the Soccer 2010 World Cup Committee, ADSL or 3G? Give a reason for your answer. (2)

3.5.3 Explain the phrase “uncapped bandwidth”. (2)

3.6 A question was raised with regard to desks, chairs and lighting in the centres. Name TWO health issues that will have to be considered when designing the computer centres and explain measures you could take to minimize the effects of these issues. (4)

QUESTION 4

[28]



Project 2010 is involved with the monitoring of ICT systems ahead of the 2010 World Cup. The following 2 articles have been taken from the Project 2010 website.

4.1 Cyber attacks expected to increase ahead of 2010 - 29/06/2009

The dedicated Symantec division at Workgroup has announced that South Africans should protect themselves against the plethora of Internet attacks likely to hit around the 2010 World Cup, notes a CRN report. Mainly focussed on monetary gain, FIFA-related spam is set to grow in the run-up to the event, says Justice Mcebi, product manager for Symantec at Workgroup who adds that, according to Symantec's monthly spam reports, around 10% of all spam in 2008 was fraud-related, such as those advertising fake tickets. 'During the previous FIFA World Cup, related phishing attacks jumped by 40%,' he says. 'As many as 4 615 phishing hosts per month were discovered in 2008, which was a rise of 66 percent over the previous year.'

- 4.1.1** Identify and explain the significance of 2 threats that are being discussed in the above article. (4)
- 4.1.2** Create a user guide that can be distributed to give 5 tips to "the man in the street" on how to protect themselves against these threats. (5)

4.2 Read the article below titled *2010 WC volunteer programme opens*, and then study the web page in Figure 2. (there is an enlarged image of the web page on page 12)

2010 WC volunteer programme opens

The application process for the World Cup volunteer programme opened on Monday with Organising Committee CEO Danny Jordaan calling on members of the public to support this initiative. 15 000 volunteers are required in 16 functional areas, including accreditation, marketing, media, protocol services, transportation, administration, environmental services, IT and telecommunication and language support. 'From ushering people to their seats, to assisting the media and foreign language speakers, welcoming people at the airport and driving guests around, it is the volunteers that actually make the tournament happen,' Jordaan said. The application form is available on FIFA.com. There will also be a number of application venues in every host city

The screenshot shows a web browser window titled "2010 FIFA World Cup South Africa™ - Windows Internet Explorer". The address bar shows the URL "https://ems-sa.fifa.com/VSMRegistration/LoginDetails.aspx". The page displays the "Volunteer Application Form" with a "Login Details" section. The form includes fields for Username, Password, Retype Password, Security Question, and Security Answer. A note states: "Your Username should contain at least 6 characters. Your password should be a minimum of 8 characters (case-sensitive), be different than your Username contain at least one number or special character and contain no spaces." There are "Continue" and "Return to Login" buttons at the bottom of the form. The footer of the page reads "Copyright © FIFA 2007-2009. All rights reserved."

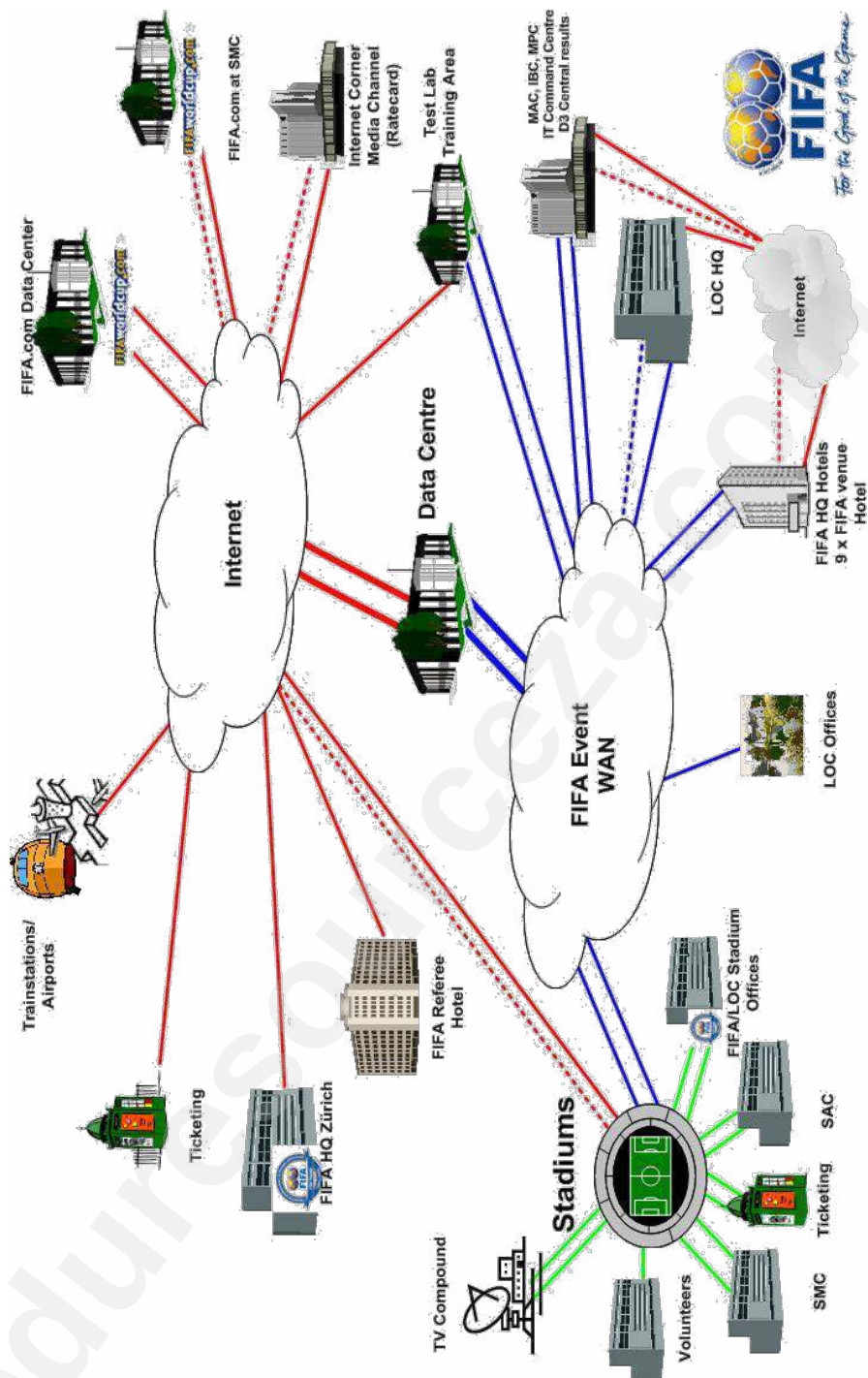
Figure 2: (see enlarged image on page 12)

- 4.2.1** The Volunteer program is available to all South Africans. Some potential volunteers may not have access to the Internet in their homes. Provide three ways that this problem can be overcome? Comment on this taking into consideration the digital divide. (6)
- 4.2.2** IT is listed as one of the functional areas requiring volunteers. Name one IT related job, give a brief job description and list two skills required, that you feel would be relevant for a volunteer. (4)
- 4.3** Your boss feels that the world cup will present a number of *e-Commerce* opportunities. Explain the term *e-Commerce* and list three opportunities you feel would be relevant. (5)
- 4.4** How could the following *e-Communication* tools be used effectively by the World Cup Committee? Choose two to discuss. (4)
- RSS Feeds
 - Blogs
 - Podcasts
 - Social networking sites (give an example)

SECTION B**Question 5****[36]**

You have been asked to develop a booking application for the volunteers who will be attending training courses before the world cup. There are a number of different courses, venues and dates. You will need to keep information about the courses, the attendees and the actual bookings.

- 5.1** The process followed for developing an application is known as the System Development Life Cycle which you used in developing your PAT project. Outline the phases of the SDLC stressing what you feel are the most important benefits of each stage. **(8)**
- 5.2** Identify one class that you would need to create for such an application. Create a class definition table for that class. You must include at least four fields and four different methods in your table. **(8)**
- 5.3** How would you apply the following Object Oriented Programming features to your class :
- a)** Encapsulation
 - b)** Information hiding. **(4)**
- 5.4** The delegates will need to supply their ID numbers and Date of Birth. Write a Java method to validate an ID number. An ID number has 13 digits. The first 6 digits are made up of the Date of Birth in the form YYMMDD. A year is considered valid if it is after 1920 (20) or before 2010 (10) inclusive. You may assume a leap year is divisible by 4. The method will be called:
`boolean valid = validateDate(String IDnum);` **(16)**



The screenshot shows a web browser window titled "2010 FIFA World Cup South Africa™ - Windows Internet Explorer". The address bar shows the URL "https://emis-sa.fifa.com/NSMRegistration/LoginDetails.aspx". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The status bar at the bottom indicates "Internet Explorer is currently running with add-ons disabled".

The main content area displays the "Volunteer Application Form" for the "2010 FIFA World Cup South Africa™". It features the FIFA logo and a "Login Details" section with the following fields, each marked with a red asterisk to indicate it is mandatory:

- Username *
- Password *
- Retype Password *
- Security Question *
- Security Answer *

Below the fields, there is a dropdown menu labeled "<Select>". To the right of the fields, a note states: "Fields marked as * are mandatory. Your Username should contain at least 6 characters. Your password should be a minimum of 8 characters (case-sensitive), be different than your Username contain at least one number or special character and contain no spaces." At the bottom of the form are two buttons: "Continue" and "Return to Login".

At the bottom of the page, a copyright notice reads: "Copyright © FIFA 2007-2009. All rights reserved."