

The City School

Unified Mid-Year Examinations
2018 - 2019
Class 11



SCHOOL NAME

INDEX NUMBER

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DATE

COMPUTER SCIENCE

Paper 1 Theory

2210/12

1 hour 45 minutes

Candidates answer on the Question Paper.
No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your School name, Index number and Date in the spaces provided.

Write in dark blue or black pen.

You may use a pencil for any diagrams, graphs or rough working.

Do not use paper clips, glue or correction fluid.

Calculators must not be used in this paper.

Answer **all** questions.

No marks will be awarded for using brand names of software packages or hardware.

At the end of examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The maximum number of marks is 75.

Invigilated By: _____

Checked By: _____

Marks Talled By: _____

This document consists of 11 printed pages and 1 blank page.

1 A computer uses binary codes for letters of the alphabet as follow:

A=100, B=101, C=103.....,X=124, Y=125, Z=126

(a) Write the denary value of 'Z' in binary using an 8-bit register:

--	--	--	--	--	--	--	--

[1]

(b) To convert the binary code for 'Z' to the binary code for 'z', all the bits in the 8-bit register in part (a) are moved (shifted) one place to the right.

(i) Write down the content of the 8-bit register after the bits have been moved to the right.

--	--	--	--	--	--	--	--

[1]

(ii) Convert the binary value in part (b) (i) into denary:

.....
.....
..... [1]

(iii) Convert the binary value in part (b) i into hexadecimal:

.....
.....
..... [1]

(c) Convert the following hexadecimal number into denary

(i) ADF

.....
.....
..... [1]

(ii) Convert the denary number 2240 into hexadecimal

.....
.....
..... [1]

(iii) Convert the hexadecimal 2FA into 16-bit binary number.

.....
.....
..... [1]

(d) Define what is memory dump?

.....
.....
..... [2]

2 Mustafa is using internet service at the following transfer rates

- Downloading Speed: 160 megabits per second data transfer rate
- Uploading 32 megabits per second data transfer rate

(a) He is planning to download a video file which is 960 megabytes (960MB), how long it will take to download the complete video file (in seconds).

.....
.....
..... [1]

(b) He is planning to share 30 photographs of his birthday party on social media; each photo is of 10 megabytes in size; how long it will take to upload all 30 photographs(in seconds).

.....
.....
..... [1]

3 (a) Name the type and method of data transmission being described below

(i) Data is transmitted in both directions but not at the same time, along a single channel or wire.

..... [1]

(ii) Several bits of data transmitted in both directions at the same time over several channels or wires

..... [1]

(b) Give the meaning of the term USB

..... [1]

(c) Give one example of the devices which can be connected using USB Connection

.....
..... [1]

(d) Give one drawback of the USB

.....
..... [1]

(e) Nine bytes were transmitted from one computer to another computer, Even parity was used by both systems, an additional byte called parity byte was also sent at the end of the transmission.

The following table shows the nine bytes and parity byte following transmission:

	Parity Bit	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
Byte 1	1	1	1	0	1	1	1	0
Byte 2	1	0	0	0	0	1	0	0
Byte 3	0	1	1	1	0	0	1	0
Byte 4	0	1	1	1	1	0	1	1
Byte 5	1	1	0	0	0	1	1	0
Byte 6	0	1	1	0	1	1	0	1
Byte 7	1	0	0	1	0	0	0	0
Byte 8	0	1	1	1	1	1	0	1
Byte 9	0	0	0	0	1	0	0	1
Parity Byte	0	0	1	1	1	1	0	0

(i) one of the bit has been transmitted incorrectly, indicate which bit is incorrect by giving its bit number and byte number:

Bit number:

Byte number: [2]

(ii) Explain how you arrived at your answer in part (e) i

.....
.....
..... [2]

(iii) Write down the corrected byte.

..... [1]

- 4 HTML is made up of structure and presentation; explain the difference between these two terms

Structure

.....

.....

.....

Presentation

.....

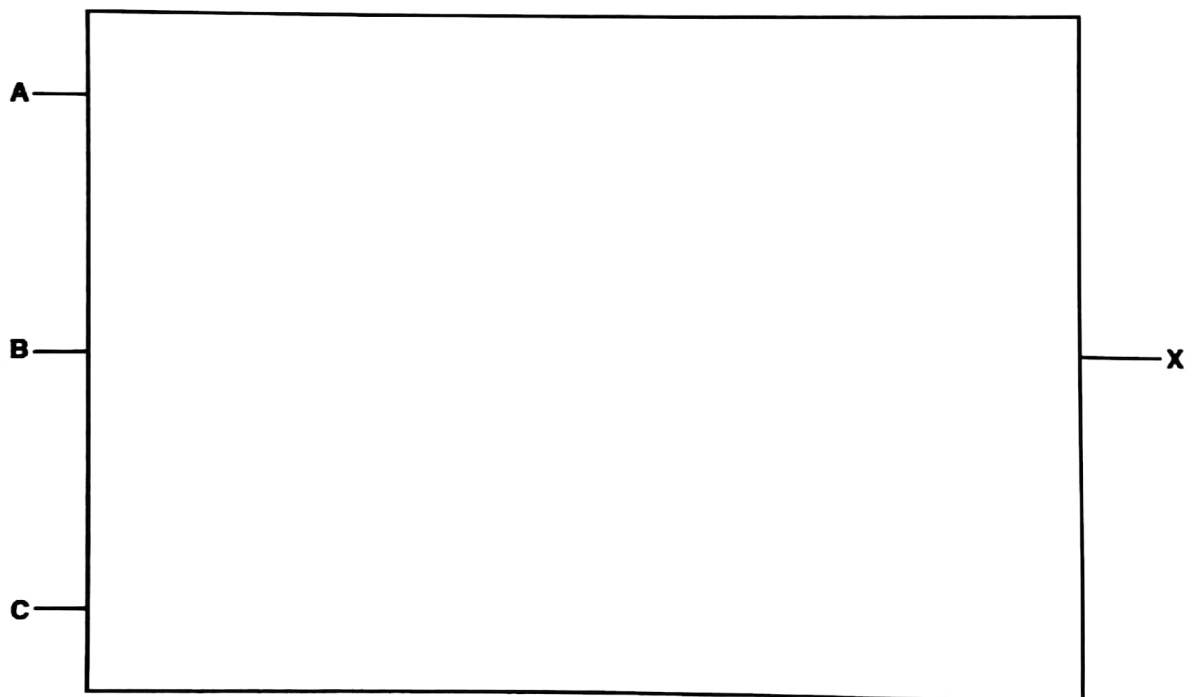
.....

..... [2]

- 5 Consider the logic statement:

$X = 1$ if $((A \text{ is NOT } 1 \text{ OR } B \text{ is } 1) \text{ NOR } C \text{ is } 1) \text{ NAND } ((A \text{ is } 1 \text{ AND } C \text{ is } 1) \text{ NOR } B \text{ is } 1)$

- (a) Draw a logic circuit to represent the given logic statement.



[6]

(b) Complete the truth table for the given logic statement.

A	B	C	Working Space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

6 (a) Give **two** functions of typical operating system (OS).

.....
.....
..... [2]

(b) Describe **two** different types of interrupt.

.....
.....
..... [2]

(c) What is meant by the term buffer?

.....
.....
..... [2]

(d) Six stages in a von Neumann fetch –execute cycle are shown in the table below.

Put each stage in the correct sequence by writing the numbers 1 to 6 in the right hand column. The first one has been done for you.

The contents (instructions) of the MDR are then copied and placed into the current instruction register(CIR)	
The instruction is finally decoded and then executed by sending out signals (via the control bus) to the various components of the computer system	
The value in the PC is then incremented by 1 so that it now points to the next instruction which has to be fetched	
The contents (instruction) at the memory location(address) contained in MAR are then copied temporarily into the memory data register(MDR)	
The program counter (PC) contains the address of the memory location of the next instruction which has to be fetched	1
This address is then copied from the PC to the memory address register (MAR); this is done using the address bus	

[5]

(e) Translators, such as a compiler and an interpreter, are used when writing and running computer programs.

Describe how a compiler and an interpreter translate a computer program.

Compiler

.....

 [1]

Interpreter

.....

 [1]

7 Rehan purchased a cinema ticket which displays this barcode.



(a) Identify this type of barcode.

..... [1]

(b) Explain how the data stored in this barcode is read.

.....
.....
..... [2]

8 Ali purchased a new tablet computer that has a touch screen which uses capacitive technology

(a) Describe how a capacitive touch screen registers Ali's touch.

.....
..... [1]

(b) Ali is wearing gloves because it is cold.

He presses an icon on touch screen but his action is not registered, explain why the touch screen will not register his touch

.....
..... [1]

9 (a) Give one advantage of using SSD rather than HDD in a computer system.

.....
 [1]

(b) The following table shows six features of optical media, by placing tick(✓) in the correct boxes, indicate which features refer to which optical media

Optical media	Use red laser to read/write	Use blue laser to read/write	Use two polycarbonate layers	Use one polycarbonate layer	Track pitch < 1 μm	Track pitch > 1 μm
CD						
DVD						
Blu-ray						

[3]

(c) Cross match the following computer terms to its correct description.

Secondary Storage	Data is stored on internet, hosted network or any cloud network. Google drive and OneDrive are the examples of online storage
Offline Storage	It is non-volatile storage and is removable from a computer/ device and is not internal. An example would be CD/DVD/USB stick/SD card/magnetic tape/ external HDD/SSD
Online Storage	It is not directly accessed by the CPU and is Non-volatile storage, it is internal to the computer/device, and an example would be HDD/SSD

[3]

10 Describe a suitable different application that uses each of the following sensors.

Sensor	Application
Pressure	
Moisture/Humidity	
Infra-Red/Motion	

[3]

11 Mubashir wants to email a file to his teacher. The file is too large so it must be compressed.

(a) Name two types of compression that Mubashir could use.

Compression type 1

.....

Compression type 2

..... [2]

(b) The file Mubashir is sending contains the source code for a large computer program.

Identify which type of compression would be most suitable for Mubashir to use.

Explain your choice.

Compression type

..... [1]

Explanation

.....

.....

..... [2]

12 (a) Explain two functions of Proxy server.

.....

.....

.....

..... [2]

(b) Describe how TLS (Transport Layer security) differs from SSL (Secure Socket layer)

.....

.....

.....

..... [2]

(c) Which five terms are being described below?

Set of principles set out to regulate the use of computers and computer systems	
The taking of another person's idea or work and claiming it as their own work without any acknowledgement to the originator	
Software a user can download from the internet free of charge; once downloaded, there are no fees when using it; however, it is subject to copyright laws	
Software that users are allowed to try out free of charge for a trial period; at the end of the trial period, user will be requested to pay a fee if they want to continue using it	
Users have freedom to run, copy, change or adapt this software without the need to seek permission; the software is not protected by copyright but there are still some restrictions	

[5]