UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2021 – 1st Year Examination – Semester 1

IT1206 – Computer Systems
Multiple Choice Question Paper

(TWO HOURS)

<u>Important Instructions :</u>

- The duration of the paper is **2 (two) hours**.
- The medium of instruction and questions is English.
- The paper has **40 questions** and **11 pages**.
- All questions are of the **MCQ** (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) choices with <u>**one or more**</u> correct answers.
- All questions will carry **equal** marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
- Calculators are **not** allowed.
- *All Rights Reserved.*

1) Who amongst the following is regarded as the creator of the **first** digital electronic computer?

(a) George Boole

(b) Alan Turing

(c) John V Atanasoff

(d) Frederic Calland Williams

(e) John von Neumann

2) Which of the following is/are used to represent a function of a combinational logic circuit?

(a) ER Diagram	(b) Linear Algebra	(c) Truth Table
(d) Boolean Algebra	(e) Logic Bombs	

3) Which of the following can be considered as common input devices?

(a) Microphone, Mouse

(b) Scanner, Monitor

(c) Digital camera, Speaker

(d) Keyboard, Joystick

(e) Headphone, Speaker

4) Which of the following is/are the component(s) of a standard motherboard of a common computer?

(a) BIOS chip	(c) Microprocessor slot	(e) Platters
(b) Hard Drive	(d) Battery socket	

5) Which of the following is/are the types of RAM used in computer systems?

(a) Synchronous SRAM

(b) Extended Data Out RAM

(c) Double Data Rate SDRAM

(d) Fast Page Mode DRAM

(e) Rambus SRAM

6) What is/are the **binary representation(s)** of the decimal number **113**?

(a) 1110011	(b) 1011001	(c) 1110000
(d) 1110001	(e) 0110001	

7) What is/are the **decimal representation(s)** of the binary number **1001001.011**?

(a) 72.75	(b) 72.325	(c) 145.325
(d) 145.375	(e) 73.375	

8) Which of the following is/are logical component(s) of a CPU?

(a) Control Unit	(b) Power Unit
(c) Arithmetic and Logic Unit	(d) Main Memory
(e) BIOS	

9) Which of the following is/are regarded as *Network Operating Systems*?

(a) MS DOS 1.x
(b) Windows 9x
(c) Novell Netware
(d) Symbian OS
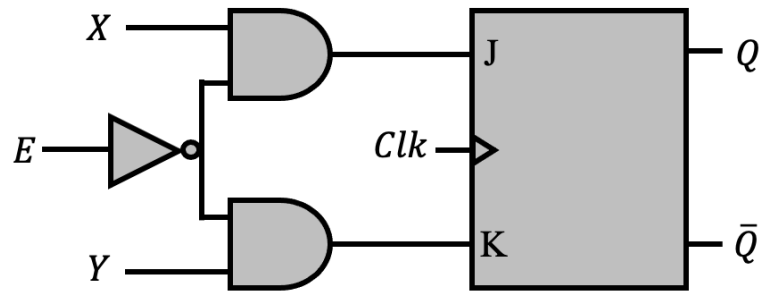(e) Windows 2000 Server

10) Which of the following is/are **wired media** type(s) for data communication?

(a) Coaxial	(b) Twisted-pair	(c) Infrared
(d) Bluetooth	(e) Fiber-optic	

11) Which of the following is/are **TRUE** about the Combinational Logic Circuit?

(a) It is considered as a memoryless digital logic circuit.
(b) CPU registers are example for Combinational Logic Circuits.
(c) At any given time, its output depends only on the combination of its inputs.
(d) It is only made up from NAND and NOR gates.
(e) Combinational Logic Circuit is a device which converts many signals into one.

12) Which of the following is/are considered as the toggle condition(s) for a logic circuit arrangement with a **J-K Flip-Flop** as shown in the figure?

(a) E=1, X=1 and Y=1   (b) E=0, X=0 and Y=0   (c) E=0, X=0 and Y=1

(d) E=0, X=1 and Y=1   (e) E=1, X=0 and Y=0

13) Which of the following is/are **TRUE** about the *Graphic Tablet*?

(a) It is an Input device that converts information through a hand-held stylus.

(b) It can be used to capture users' signatures.

(c) It is also called a video display terminal.

(d) It can also be used to replace a computer mouse.

(e) It is a device that can be used for video recording and rendering.

14) Which key(s) of a standard keyboard is/are used to make characters either **upper** or **lower** case?

(a) ESC   (b) Return   (c) Shift

(d) Caps Lock   (e) Ctrl + Shift

15) Which of the following statements is/are **TRUE** regarding *Static Random Access Memory* (SRAM)?

(a) SRAM is also referred to as non-volatile memory

(b) SRAM is used for cache memory.

(c) SRAM do not lose its data once the power is turned off.

(d) The information stored in SRAM can be checked with the help of the BIOS.

(e) SRAM uses capacitors to store and hold information.

16) Which of the following statements is/are **TRUE** about *PCI Slots* in a computer motherboard?

> (a) PCI stands for Peripheral Component Interconnect.
>
> (b) It can be used to plug DRAM modules.
>
> (c) PCI slot is not a built-in slot on a device.
>
> (d) Mouse/Keyboard can be connected via PCI Slots.
>
> (e) It is a hybrid standard of ISA and VL-Bus (earlier buses).

17) Which of the following statements is/are **TRUE** about the IDE in computer interfaces?

> (a) IDE stands for Integrated Data Electronics.
>
> (b) Formally called the AT Attachment interface.
>
> (c) IDE is used to connect projectors to the Laptop/Computer.
>
> (d) The main components of IDE are interface, Connector and Socket.
>
> (e) IDE is used to connect Hard disks to the motherboard.

18) Which of the following is/are **incorrectly** matching description for the corresponding PC maintenance tool?

> (a) Electrostatic discharge – For discharging any static electricity on hands, cloths, tools or components.
>
> (b) Flat blade – Important to use the matching screwdriver in particular screw.
>
> (c) Bootable CD or Floppy – To boot the system without an operating system.
>
> (d) Multimeter – For testing and evaluating the operation of SIMMs, DIMMs, and RIMMs
>
> (e) Needle nosed pliers – For grabbing parts.

19) Which of the following is/are regarded as factors to be considered in *Passive Preventive Maintenance*?

> (a) Dust and pollutants.
>
> (b) Temperature variations.
>
> (c) Fragmented files in hard disk.
>
> (d) Thermal stress.
>
> (e) Malware detection.

20) Which of the following is/are a **TRUE** statement about backup?

> (a) A backup is defined as a duplicate copy of data that is stored on separate storage device.
>
> (b) A backup can be helpful to recover accidentally deleted files.
>
> (c) Data backup is not helpful in a physical damage to the original data source.
>
> (d) A backup can be used when the original data is corrupted or deleted due to malware.
>
> (e) Cloud is not a data backup storage method.

21) Which of the following is/are **TRUE** about *CPU Interrupts*?

(a) An interrupt is triggered within the CPU.

(b) An interrupt alters the normal execution of a program.

(c) An interrupt is triggered outside the CPU.

(d) Interrupt is a sub-type of Exceptions.

(e) Interrupt is a sub-routine in the operating system's kernel.

22) What are the **smallest and largest** decimal values of signed binary numbers (Two's Complement) that can be represented by 16 bits?

(a) 0 and 65536

(b) -131072 and+ 131071

(c) -65536 and +65535

(d) -32768 and +32767

(e) -8192 and +8191

23) Which of the following Boolean expression(s) that can be derived from the Boolean expression $\overline{(A + \bar{B}).(\bar{D} + F)}$ **only using** *De Morgen's Theorem*?

(a) $A.\bar{B} + \bar{D}.F$ (b) $(\bar{A} + B).(D + \bar{F})$ (c) $\overline{(A + \bar{B})} + \overline{(\bar{D} + F)}$

(d) $(A + \bar{B}).(\bar{D} + F)$ (e) $(\bar{A}.B) + (D.\bar{F})$

24) Which of the following Boolean expression(s) are equivalent to the Boolean expression $x.(x + \bar{y})$?

(a) x (b) $\bar{y}$ (c) $x.\bar{x} + y.\bar{y}$

(d) $x.\bar{y}$ (e) $x + \bar{y}$

25) Which of the following is/are **TRUE** about the *Fetch-Decode-Execute cycle* of a CPU?

(a) The CPU performs the *fetch-decode-execute cycle* for each instruction in a running program.

(b) The CPU sends the contents of the Program Counter (PC) to the Memory Address Register (MAR) and sends a read command on the control bus during the Fetch phase.

(c) Decoding in the *fetch-decode-execute cycle* is assisted by the Control Unit (CU).

(d) Execution in the *fetch-decode-execute cycle* performs the expected operation and produce the outcome of the instruction which is being manipulated.

(e) The Memory Data register which is also known as Memory Buffer register holds the result of the performed instruction.

26) Which of the following layout(s) are appropriate for a Karnaugh Map with three Boolean variables A, B and C?

(a).

	$\bar{A}.\bar{B}$	$\bar{A}.B$	$A.\bar{B}$	$A.B$
$\bar{C}$				
C				

(b).

	$\bar{A}.\bar{B}$	$\bar{A}.B$	$A.B$	$A.\bar{B}$
$\bar{C}$				
C				

(c).

	$\bar{A}.B$	$A.B$	$A.\bar{B}$	$\bar{A}.\bar{B}$
$\bar{C}$				
C				

(d).

	$A.B$	$A.\bar{B}$	$\bar{A}.\bar{B}$	$\bar{A}.B$
C				
$\bar{C}$				

(e)

	$A.B$	$A.\bar{B}$	$\bar{A}.B$	$\bar{A}.\bar{B}$
C				
$\bar{C}$				

27) What is/are **TRUE** about *Instruction Level Pipelining*?

(a) It increases CPU's instruction throughput.

(b) It overlaps smaller steps in the fetch-decode-execute cycle for consecutive instructions.

(c) It helps to achieve Instruction level parallelism.

(d) Pipeline conflicts affects the instruction throughput.

(e) Theoretically, a fetch-decode-execute cycle with lesser steps have better throughput compared to a fetch-decode-execute cycle with more steps.

28) What is/are **TRUE** about *Operating Systems*?

(a) System software is a sub-type of Operating Systems.

(b) Operating System provides common services for its programs.

(c) Operating System manages hardware and software resources in a computer.

(d) Command line interface of an Operating system limits user interactions to text-based command execution and textual response viewing.

(e) Graphical user interface of an Operating system limits user interaction to menus and icons.

29) Which of the following is/are **TRUE** about *device drivers* in a computer?

(a) Device driver provides a software interface to hardware devices.

(b) Device driver acts as a translator between a hardware device and the applications or operating systems that use it.

(c) Device drivers are hardware dependent and operating-system-specific.

(d) Device drivers are hardware independent and operating-system-specific.

(e) The kernel of an operating system is the main device driver in a computer.

30) Which of the following is/are **TRUE** statement(s)?

> (a) The IP address for a Network Interface Card is defined by the hardware manufacturer.
>
> (b) A modem can transform a computer's digital signal to analog.
>
> (c) Network switch is a type of router which enables packet switching.
>
> (d) Network router is a device used to connect segments of a network which has the same IP address range.
>
> (e) A signal introduced at the input port of a hub appears at every output port except the original incoming port.

31) Which of the following statements is/are **TRUE** with respect to the technology of *Gesture Recognition*?

> (a) Gesture recognition platform allows people to communicate fully with computers through speech and gestures.
>
> (b) Computer can understand human gestures but no ability to execute commands from it.
>
> (c) The Kinect device and the Leap Sensor are examples of gesture recognition devices.
>
> (d) Gesture recognition device is designed to convert the scanned images of handwritten, typed or printed text into digital text.
>
> (e) Gesture recognition technology can be used to scan flat images.

32) Which of the following statements is/are **TRUE** with respect to *DRAM*?

> (a) DRAM uses flip-flops.
>
> (b) DRAM utilizes low power than SRAM.
>
> (c) DRAM needs to be refreshed periodically.
>
> (d) DRAM is much cheaper than SRAM.
>
> (e) Cache memory uses DRAM to store data.

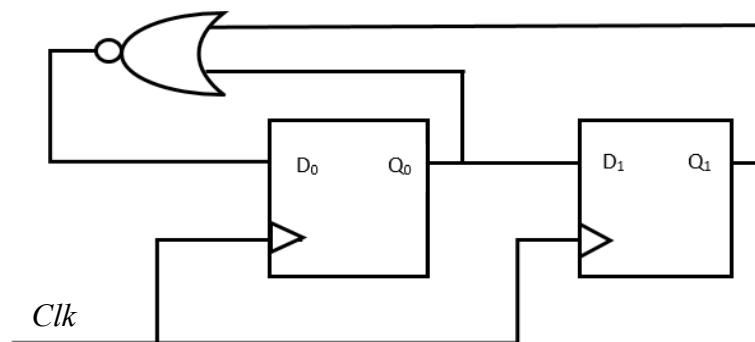33) Which of the following statements is/are **TRUE** regarding the *Network Interface Controller* (NIC)?

> A. Connects the computer to a computer network for communication with other devices.
>
> B. May enable a wired or a wireless connection to a local area network.
>
> C. Manages the software, the hardware, the files and communication in the network.
>
> D. NIC comes as a physical card that can be connected to an expansion slot in a computer.

> (a) A and B Only
>
> (b) A and C Only
>
> (c) C and D Only
>
> (d) A, B and D Only
>
> (e) B, C and D Only

34) Which of the following statements is/are **TRUE** with respect to *active prevention maintenance*?

(a) Active prevention maintenance program does not depend on the quality of the components of the system.

(b) Active prevention maintenance involves periodic cleaning of the system and its components.

(c) Defragmenting the hard disk is an active prevention maintenance procedure.

(d) It implies the provision of physically and an electrically best suited environment for the system.

(e) Active preventive maintenance procedures ensure longer and trouble-free life for a PC.

35) Which of the following is/are the sequence(s) of the output states of Q_0 **and** Q_1 for the circuit shown below? Assume the starting state at the first clock pulse is 00 where $Q_0=0$ and $Q_1=0$.

D_0 Q_0 D_1 Q_1

Clk

(a) 00, 01, 10, 11, 00, …

(b) 00, 10,10, 01, 10, …

(c) 00, 10, 01, 00, 10, …

(d) 00, 10, 10, 00, 10, ...

(e) 00, 01, 10, 00, 01, ...

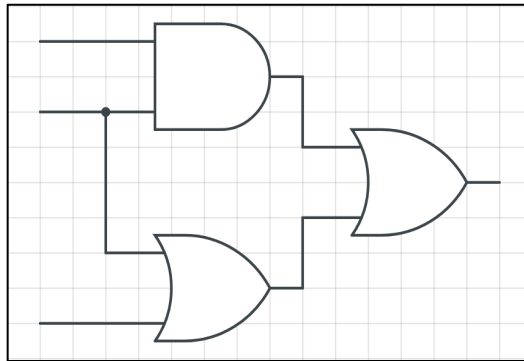36) What is/are the decimal value(s) of the following **IEEE-754 single precision** floating point representation?

1 01111100 11000000000000000000000

(a) -0.4375　　　　　　　　　　(b) -0.21875

(c) -0.109375　　　　　　　　　(d) -0.09375

(e) -0.31725

37) What is/are the **round off error(s)** if you store the decimal number 2.3125 in an **8-bit** floating point representation where *mantissa*, *exponent* and *sign* are given in 4, 3 and 1 bits respectively? Also note that exponent is given in *excess-3* representation.

(a) 0.0625　　　　　　(b) 0.2500　　　　　　(c) 0.0250

(d) 0.6250　　　　　　(e) 0.6525

38) What is/are the logically equivalent circuit(s) that can be built **only using NAND gates** for the circuit given below?

(a)

(b)

(c)

(d)

(e)

39) What is/are the most simplified **Product of Sum** representation for the following Karnaugh Map?

		AB			
		00	01	11	10
CD	00	0	0	1	1
	01	1	1	0	1
	11	1	0	0	1
	10	0	0	1	1

(a) $A\bar{B} + A\bar{D} + \bar{B}D + \bar{A}\bar{C}D$

(b) $(A + D).(\bar{A} + \bar{B} + \bar{D}).(\bar{B} + \bar{C} + \bar{D})$

(c) $(A + D).(\bar{A} + \bar{B} + \bar{D}).(A + \bar{B} + \bar{C})$

(d) $(A.D) + (\bar{A}.\bar{B}.\bar{D}) + (\bar{B}.\bar{C}.\bar{D})$

(e) None of the above.

40) A computer memory holds numeric values 10, 20 in its memory addresses 0xA0 and 0xB0 respectively. If the following machine instruction code is executed in the computer, what are the corresponding values for memory addresses 0xA0 and 0xB0 in a sequence?

Note: Interpretations of the machine instructions are as given here.

- **LOAD R, A**   Load the register R with the content of the address A.

- **ADD R1, R2, R3** Add the numeric values in R2 and R3 and place the results in R1.

- **STORE R, A**   Store the content of the register R to the memory location whose address is A.

```
LOAD    1,    0xA0
LOAD    2,    0xB0
ADD     0,    1,    2
STORE   0,    0xB0
LOAD    2,    0xB0
ADD     0,    1,    2
STORE   0,    0xA0
```

(a) 10, 20

(b) 10, 30

(c) 40, 30

(d) 30, 40

(e) 10, 40

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