



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2020 – 1st Year Examination – Semester 1

IT1206 – Computer Systems
Multiple Choice Question Paper

(TWO HOURS)

Important Instructions :

- The duration of the paper is **2 (two) hours**.
- The medium of instruction and questions is English.
- The paper has **40 questions** and **09 pages**.
- All questions are of the **MCQ** (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 4 (four) choices with **one or more** 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 thoroughly 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) Which of the following is/are a first generation of computer?

- (a) ICL-2900
- (b) IBM-1401
- (c) IBM-1620
- (d) EDVAC
- (e) CDC-1604

2) Which of the following is/are **TRUE** regarding the Von Neumann architecture?

- (a) Single Instruction, Multiple Data (SIMD)
- (b) Single Program, Multiple Data (SPMD)
- (c) Single Instruction Stream, Single Data Stream (SISD)
- (d) Multiple Instruction, Multiple Data (MIMD)
- (e) Multiple Instruction, Single Data (MISD)

3) Registers are high-speed storage areas in the CPU. Which of the following registers is/are contained in the CPU?

- | | | |
|---------------------|----------------------|----------------------------------|
| (a) Accumulator | (b) Input Register | (c) Current Instruction Register |
| (d) Program Counter | (e) Address Register | |

4) If you want maximum performance and future compatibility, what kind of system board(s) is/are the most suitable for processor upgrades?

- | | | |
|----------|---------|---------|
| (a) AGA | (b) PCI | (c) ISA |
| (d) EISA | (e) ML | |

5) Which of the following technology/technologies can be used for Processor Cache Memory?

- | | | |
|----------|----------------|------------|
| (a) DRAM | (b) DDR2 SDRAM | (c) EEPROM |
| (d) SRAM | (e) DDR SDRAM | |

6) Which of the following statement(s) appropriately describe(s) the Windows NT operating system?

- (a) Windows NT is a single-user – single-tasking operating system.
- (b) Windows NT is a multi-user – single-tasking operating system.
- (c) Windows NT is a single-user – multi-tasking operating system.
- (d) Windows NT is a multi-user – multi-tasking operating system.
- (e) Windows NT is a Network Operating System.

7) Which of the following is/are **NOT** a networking hardware device/devices?

- | | |
|--------------------|--------------------|
| (a) Network Switch | (b) Network Socket |
| (c) Network Bridge | (d) Network Router |
| (e) Network Hub | |

8) Which of the following is/are **TRUE** regarding the *System Calls* of an Operating System?

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|--|
| (a) System calls are not exposed to the other programs running on the computer. |
| (b) The operating system provides information and services to the other programs via system calls. |
| (c) System calls are the functions that are part of utility programs. |
| (d) System calls are designed only to be used by system software. |
| (e) System calls are also known as utility programs. |

9) Which of the following is/are **NOT** a Local Area Network (LAN) topology?

- | | | |
|----------|-------------|-------------|
| (a) Star | (b) Bus | (c) Lattice |
| (d) Ring | (e) Octopus | |

10) Which of the following is/are wireless data communication standard(s)?

- | | | |
|---------------|--------------|----------|
| (a) ADSL | (b) Ethernet | (c) WiFi |
| (d) Bluetooth | (e) Firewall | |

11) What is the correct translation of the decimal number 23 into **binary** and **hexadecimal** representations respectively?

- | | | |
|------------------------|------------------------|------------------------|
| (a) 10111_2 and 0x18 | (b) 11101_2 and 0x17 | (c) 10111_2 and 0x17 |
| (d) 10101_2 and 0x18 | (e) 11101_2 and 0x18 | |

12) What is the decimal representation of the 8 bit two's complement binary value 11000100?

- | | | |
|---------|--------|---------|
| (a) -64 | (b) 64 | (c) -60 |
| (d) 60 | (e) 62 | |

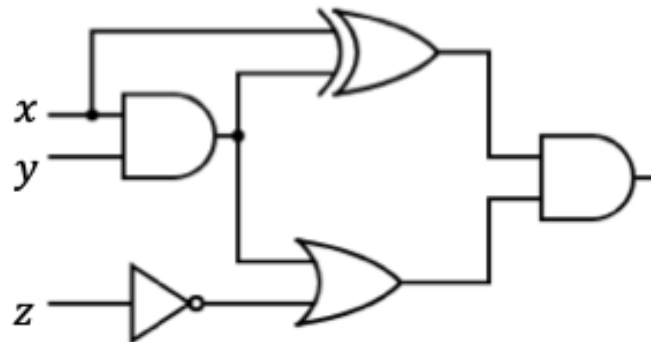
13) What is the corresponding bit pattern for the decimal number 4 in four-bit excess-k representation where $K=8$?

- | | | |
|----------|----------|----------|
| (a) 0000 | (b) 0010 | (c) 0100 |
| (d) 1100 | (e) 1010 | |

14) Which of the following statements is/are **TRUE** regarding the *Preventive Maintenance* in computer maintenance?

- (a) Preventive maintenance implies fixing a fault as soon as possible.
- (b) Preventive maintenance implies reducing the frequency of occurrence of a fault.
- (c) Preventive maintenance attempts to minimize software faults.
- (d) Use of an Uninterruptible Power Supply (UPS) is a passive preventive maintenance method.
- (e) Installation of a virus guard and updating its virus signatures is a passive preventive maintenance method.

15) What is the Boolean algebraic expression that accurately represents the output of the following circuit diagram?



- (a) $(x + (x.y)).(x.y + z')$
- (b) $(x \oplus (x + y)).((x + y).z')$
- (c) $(x \oplus (x.y)).(x.y + z')$
- (d) $(x \oplus (x.y))'.(x.y + z')$
- (e) $(x + (x.y)) + (x.y + z')$

16) What is the equivalent Boolean algebraic term that would result after applying *De Morgan's theorem* to $(x + y' + z)'$?

- | | | |
|-----------------|---------------------|------------------|
| (a) $(x'.y.z')$ | (b) $(x' + y + z')$ | (c) $(x'.y.z')'$ |
| (d) $(x.y'.z)$ | (e) $(x + y' + z)$ | |

17) Which of the following statements is/are **TRUE** regarding *Interrupts* and *Exception* in the context of CPU?

- (a) An interrupt may alter the normal sequence of instructions that are being executed.
- (b) An exception does not alter the normal sequence of instructions that are being executed.
- (c) An interrupt is triggered by the CPU internal event.
- (d) An exception is triggered within the CPU.
- (e) After handling an interrupt or exception that occurred during the execution of a program, the CPU starts the execution of the program from its beginning.

- 18) What is/are the **TRUE** statement(s) within the context of the *Fetch-Decode-Execute Instruction Cycle* of the CPU?
- | |
|---|
| (a) During the fetch stage, the Program Counter value is copied to the Memory Data Register.
(b) During the fetch stage, the Program Counter value is copied to Memory Address Register.
(c) During the decode stage, the Arithmetic and Logic Unit of the CPU determines what instruction to be performed.
(d) During the decode stage, the Control Unit of the CPU determines what instruction to be performed.
(e) During the execution stage, relevant instruction is performed, and the result is stored back in the Memory Data Register. |
|---|
- 19) What is/are the **TRUE** statements regarding the classes of Instruction Set Architecture (ISA)?
- | |
|--|
| (a) Accumulator based architecture reduces memory traffic.
(b) Shorter instructions are possible with Accumulator based architecture.
(c) Stack-based architecture leads to an execution bottleneck.
(d) General-purpose register-based architecture increases memory traffic.
(e) General-purpose register-based architecture results in longer instructions. |
|--|
- 20) Assume that the machine executes the instruction **LOAD \$R1, 800**. The base register contains the value 100. The memory addresses 600, 800 and 900 contain values 700, 500 and 600 respectively. Which of the following values will be loaded to the register **\$R1** when it employs *Immediate Addressing* mode?
- | | | |
|---------|------------------------|---------|
| (a) 800 | (b) 600 | (c) 500 |
| (d) 700 | (e) None of the above. | |
- 21) Which of the following contain(s) a Three-axis Controller?
- | | | |
|-----------------|-----------------------------------|------------------------|
| (a) Thumb-stick | (b) Accelerator Peddle | (c) Accelerator Peddle |
| (d) Gyro-meters | (e) Accelerometer in a Wii-Remote | |
- 22) Which of the following is/are a **FALSE** statement about input devices?
- | |
|---|
| (a) Each device maintains a state.
(b) User interaction causes state changes in the device.
(c) Each device may have one or many types of analogue/digital controller components on it.
(d) Signal strength can be used to determine the position on the data tablet.
(e) Input devices refer to any device that can provide an input of information, data, or commands into the computer system. |
|---|
- 23) Which of the following is/are (a) biometric device(s)?
- | | | |
|--------------------|--------------------|-------------------------|
| (a) Barcode Reader | (b) IRIS Scanners | (c) Fingerprint Readers |
| (d) DVD Camcorder | (e) Kinect Devices | |

24) Which of the following can be used to insert an internal card to a computer?

- | | | |
|--------------------|--------------|---------|
| (a) Bus | (b) USB Port | (c) Bay |
| (d) Expansion Slot | (e) Cells | |

25) Which of the following statement(s) is/are **TRUE** about Multiplexers?

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|--|
| (a) It is a kind of decoder that decodes several inputs and gives one output. |
| (b) Multiplexers work only with Analog signal. |
| (c) It takes one input and returns results in many outputs. |
| (d) A multiplexer is a device that converts many signals into one. |
| (e) It is a type of encoder which decodes several inputs and gives one output. |

26) Which is/are the part(s) of a processor that contains the hardware necessary to perform all the operations required by a computer?

- | | | |
|----------------------|---------------|----------------|
| (a) Program Counters | (b) Data path | (c) Controller |
| (d) Registers | (e) Cache | |

27) Which of the following statement(s) is/are **FALSE** with respect to Memory?

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|--|
| (a) SRAM is very expensive compared to DRAM. |
| (b) SRAM is used as a cache memory. |
| (c) Flash memory is a volatile type of memory. |
| (d) Double Data Rate SDRAM is a type of RAMs used in computer systems. |
| (e) Cache memory is manufactured using high-speed SDRAM |

28) An active HIGH input S-R latch is formed by the cross-coupling of two gates. What of the following logic gate(s) is/are used to implement an S-R latch?

- | | |
|------------------------------------|--------------------|
| (a) One NOR gate and One OR gate | (b) Two NAND gates |
| (c) Two OR gates | (d) Two NOR gates |
| (e) One NOR gate and One NAND gate | |

29) Which of the following reason(s) is/are **TRUE** with respect to backups?

- | |
|--|
| (a) Hard drives do crash. |
| (b) Overwriting a file can never happen. |
| (c) Physical computer damage can lost the date |
| (d) Viruses can corrupt or delete files. |
| (e) Power fluctuation cannot destroy the data. |

30) What is/are the purpose(s) of the **accumulator**?

- (a) To perform arithmetic operations
- (b) To hold the accumulation of instructions that have happened
- (c) To remember the previous instruction being worked on
- (d) To hold the results of a calculation
- (e) To carry data between a CPU and the system memory via the motherboard

31) What is/are the simplified Boolean algebraic expression(s) that you can derive from the following Karnaugh Map?

	$A'.B'$	$A'.B$	$A.B$	$A.B'$
$C'.D'$	1	1	0	1
$C'.D$	0	0	0	0
$C.D$	0	0	0	0
$C.D'$	1	1	0	1

- (a) $A'.D' + B'.D'$
- (b) $A'.D' + A.B'.D$
- (c) $D'.(A' + B')$
- (d) $A.D + B.D$
- (e) $D.(A + B)$

32) What is the **most simplified** Boolean algebraic expression that can be derived from the following Boolean algebraic expression?

$$F(x, y, z) = x.y' + x.z' + y.z' + x.y.z + y.z$$

- (a) $x.y' + x.z' + y$
- (b) $x + x.z' + y$
- (c) $x.y' + x.z' + x.y.z + y$
- (d) $x + y$
- (e) x

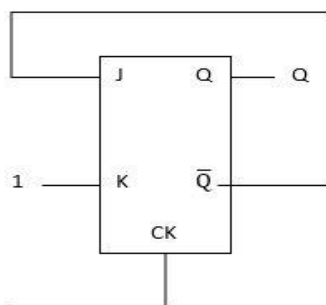
33) What is the corresponding decimal number for the following binary number given in the IEEE-754 standard (1 bit for sign, 8 bits for the exponent, 23 bits for the mantissa)?

0 10000000 110 0000 0000 0000 0000 0000

- (a) 1.75
- (b) 3.5
- (c) 2.25
- (d) 0.375
- (e) 0.7

- 34) Which of the following is/are **TRUE** regarding the CPU internal registers?
- (a) Accumulator holds frequently accessed data by the CPU.
 - (b) Memory Address Register holds the memory address of data that needs to be accessed.
 - (c) Memory Data Register holds the data that is being transferred to or from memory.
 - (d) Program Counter holds the address of the next instruction to be executed.
 - (e) Previous Instruction Register holds the instruction that was executed before the current instruction.
- 35) Which of the following is/are **NOT** regarded as a duty/duties of the *Power on Self-Test* (POST) of a computer?
- (a) Update BIOS when it is necessary.
 - (b) Identify available devices for booting.
 - (c) Verify the system main memory.
 - (d) Indicate booting up errors, if available.
 - (e) Virus and Malware check.
- 36) Which of the following is/are **TRUE** about read-only memory (ROM)?
- (a) To reduce the memory access time, we generally make use of ROM.
 - (b) ROM data can be easily modernized.
 - (c) Data in ROM remains there even without electrical power. Simply it says non-volatile.
 - (d) A ROM stores vast amounts of inexpensive data storage.
 - (e) ROM chips are easily interchanged between different kinds of computers.
- 37) Which of the following statements is/are **TRUE** with respect to the technology of Kinect Devices?
- (a) The Kinect sensor is very sensitive to the orientation of the user with respect to the sensor and is susceptible to occlusions.
 - (b) Kinect device has a limited range and field of view. Hence it can only detect fingers or small tools.
 - (c) Kinect device works with a limited range; therefore, the user can notice a significant delay between his action and the expected feedback.
 - (d) It allows the user to wirelessly interact with a computer by moving their body in 3D space.
 - (e) In the Kinect device, some analogue buttons allow measuring Button Pressure at Downstate using a range of scalar values.
- 38) Which of the following statements is/are **TRUE** about the SCSI?
- (a) SCSI stands for Small Computer System Interface.
 - (b) SCSI is mainly used to connect low-speed disk drives to high-end PCs.
 - (c) SCSI is a hardware bus similar in the function of the IDE controller supporting hard disk drives, CD-ROM drives, and other peripherals.
 - (d) SCSI is a low-cost solution when compared to IDE.
 - (e) Most servers use SCSI than ATA (IDE), because of its support for higher performance.

- 39) A JK flip flop, has $J = \bar{Q}$ and $K=1$. Assume the flip flop was initially cleared and is clocked for six (6) pulses, the sequence at the Q output(s) from the following will be,



- | | | |
|------------|------------|------------|
| (a) 010000 | (b) 011001 | (c) 010101 |
| (d) 010100 | (e) 010010 | |

- 40) Consider the following modified SR flip-flop Block diagrams. Which of the block diagram provide an output equivalent to the JK Flip-Flop in question (39)?

