



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)
Academic Year 2012/2013 – 1st Year Examination – Semester 1

IT1204 – Computer Systems I
Multiple Choice Question Paper

23rd March, 2013
(TWO HOUR)

Important Instructions :

- The duration of the paper is **2 (two) hour**.
- The medium of instruction and questions is English.
- The paper has **50 questions** and **13 pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) 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 completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

1) Which of the following statement(s) is/are true ?

- | |
|---|
| (a) Herman Hollerith designed the Analytical Engine. |
| (b) The Pascaline developed by Blaise Pascal could perform addition with carry and subtraction. |
| (c) The Pascaline developed by Blaise Pascal read data from punch cards. |
| (d) The Differential Engine was developed by Blaise Pascal. |
| (e) Ada Lovelace is considered to be the first computer programmer. |

2) invented the Analytical Engine.

How should the blank space be filled?

- | | | |
|-----------------------|-------------------------|----------------------|
| (a) Blaise Pascal | (b) Charles Babbage | (c) John Von Neumann |
| (d) John V. Atanasoff | (e) John Presper Eckert | |

3) What is/are the specific computing technology/ies still in Research and Development in Fifth Generation of Computer evolutions?

- | | | |
|-----------------------------|--------------------------|--------------------|
| (a) Artificial Intelligence | (b) Quantum Computing | (c) Nanotechnology |
| (d) Natural Language | (e) High Level Languages | |

4) Which of the following is the range of integers that can be represented using two's complement notation on a 16-bit register?

- | | | |
|----------------------|----------------------|----------------------|
| (a) -32768 to +32768 | (b) -65536 to +65535 | (c) -65536 to +65536 |
| (d) -32767 to +32767 | (e) -32768 to +32767 | |

5) What is the binary number equivalent of the hexadecimal number CDAB?

- | | | |
|-------------------------|-------------------------|-------------------------|
| (a) 1010 1011 1100 1101 | (b) 1100 1101 1010 1011 | (c) 1100 1011 1100 1110 |
| (d) 1011 1110 0101 1101 | (e) 1100 1100 1010 1011 | |

6) The 16-bit number 1000000000000000 in the form of Two's Compliment is equivalent to the decimal number

- | | | |
|------------|------------|-------|
| (a) -65535 | (b) -32768 | (c) 0 |
| (d) -32767 | (e) -1 | |

7) The IEEE standard 32-bit floating point representation of the binary number 27.5 is

- | | |
|---|--|
| (a) 0 01111111110000000000000000000000 | (b) 1 10000011100111000000000000000000 |
| (c) 0 10000011 101110000000000000000000 | (d) 0 10000011111000000000000000000000 |
| (e) 0 11000001 111000000000000000000000 | |

8) Which of the following statement(s) about floating point representation is/are true?

- (a) Floating-point representation is an approximate representation of real numbers.
- (b) Using a greater number of bits in the representation can reduce errors but can never eliminate them.
- (c) Floating point errors (Overflow/Underflow) can cause programs to crash.
- (d) Floating point errors can lead to erroneous results which are hard to detect.
- (e) To add two floating-point numbers it is not necessary to express the numbers with the same exponent.

9) Which of the following is the correct 16-bit floating point representation of the decimal number +47.625? Assume 8 bits for the mantissa and 7 bits for the exponent.

- (a) 1 1000100 01111101
- (b) 0 0111111 10111101
- (c) 0 0111011 01111101
- (d) 0 1000100 01111101
- (e) 0 0111111 10000010

10) The equivalent in decimal number to the IEEE standard 32-bit floating point representation of 1 10000011 111111000000000000000000 is

- (a) -16.875
- (b) -63.5
- (c) -127
- (d) -31.5
- (e) -31.75

11) Consider the following three statements about S-R Flipflops and J-K Flipflops.

- (i) J-K Flipflops do not output the unstable states (uncertainty) associated with R-S Flipflops.
- (ii) If $J \neq K$, the next output state of the J-K Flipflop will be the same as the current state.
- (iii) When $R = 1$ and $S = 0$, the next output state of the R-S Flipflop will be 0 irrespective of the current output state.

What statement(s) is/are correct about R-S Flipflops and J-K Flipflops?

- (a) Only (i)
- (b) Only (ii)
- (c) Only (iii)
- (d) Only (i) and (iii)
- (e) All

12) Consider the following Boolean expressions.

(i) $A\bar{B} + \bar{A}B$

(ii) $\bar{A}\bar{B} + AB$

(iii) $(A+B).AB$

(iv) $\overline{(A+B)} + AB$

(v) $\bar{A}\bar{B}.A.B$

Which of the above Boolean expression(s) is/are equivalent to $\overline{A \oplus B}$,

- | | | |
|------------------------|------------------------------|-----------------------|
| (a) Only (i) | (b) Only (ii) | (c) Only (i) and (iv) |
| (d) Only (ii) and (iv) | (e) Only (i), (ii) and (iii) | |

13) Consider the following Karnaugh map.

CD \	00	01	11	10
00	1	0	0	0
01	0	1	1	0
11	0	1	1	0
10	1	0	0	1

Which of the following Boolean logic formulae can be deduced from the k-map given above?

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

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

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

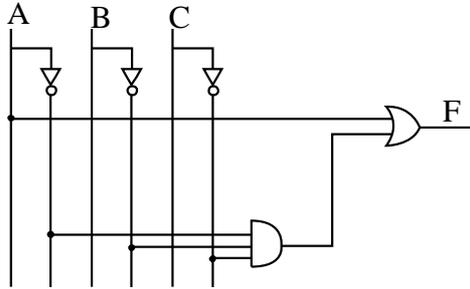
(iv) $B.D + \bar{B}.C.D + \bar{A}\bar{B}.C.\bar{D}$

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

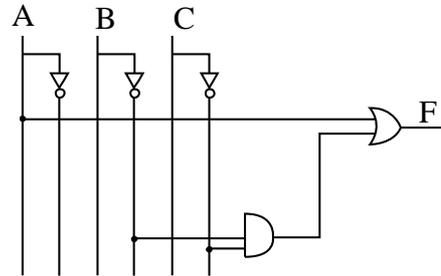
- | | | |
|---------------|-----------------------|----------------|
| (a) Only (i) | (b) Only (i) and (ii) | (c) Only (iii) |
| (d) Only (iv) | (e) Only (iv) and (v) | |

14) Consider the following logic function

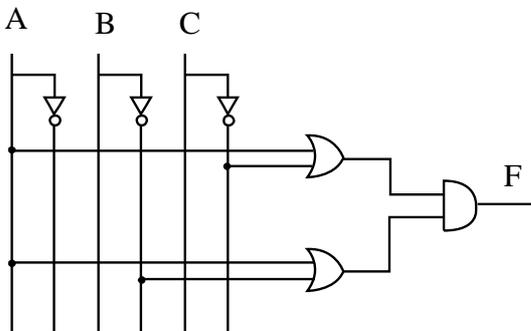
$$F = A.B.C + \overline{A}\overline{B}\overline{C} + A.\overline{B}.\overline{C} + A.B.\overline{C} + \overline{A}.\overline{B}.C$$



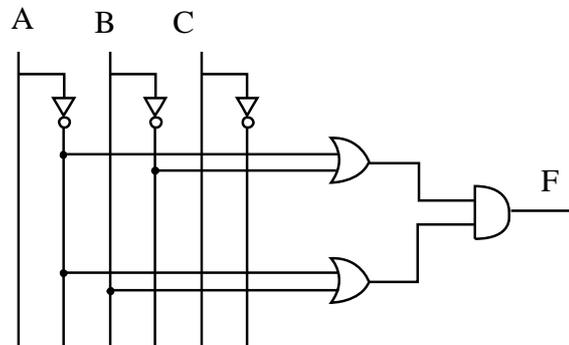
(i)



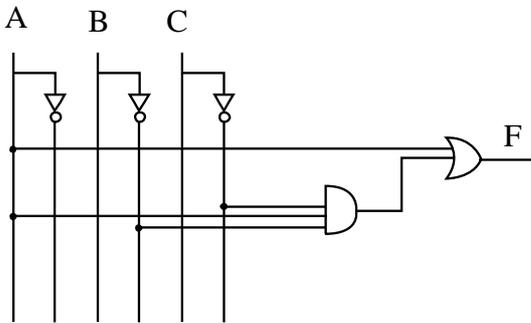
(ii)



(iii)



(iv)

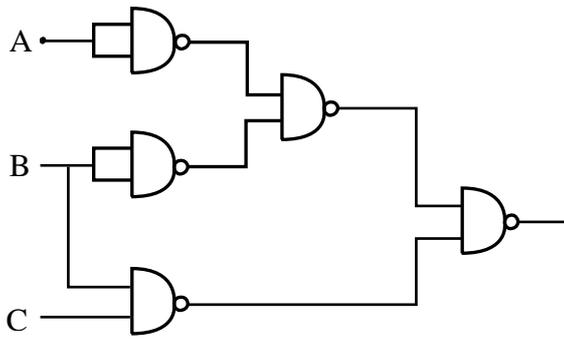
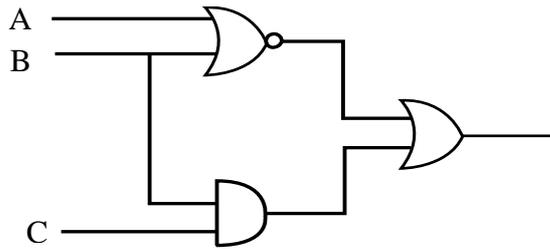


(v)

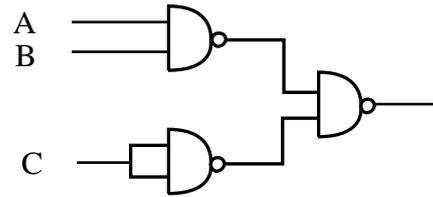
Which of the above logic circuit diagrams provide a similar output to the above logic function F?

- | | | |
|-----------------------|------------------------------|----------------|
| (a) Only (i) and (ii) | (b) Only (i), (ii) and (iii) | (c) Only (iii) |
| (d) Only (iv) and (v) | (e) All | |

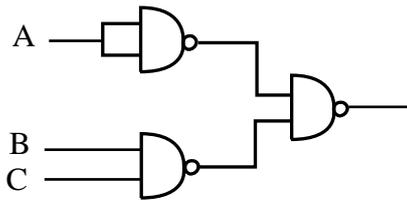
15) Following figure represent a logic circuit



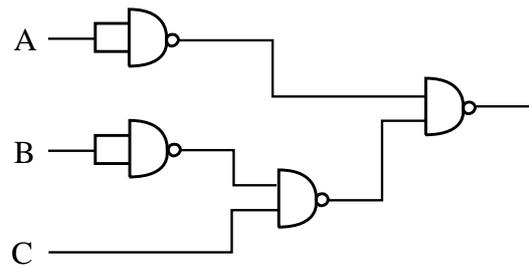
(i)



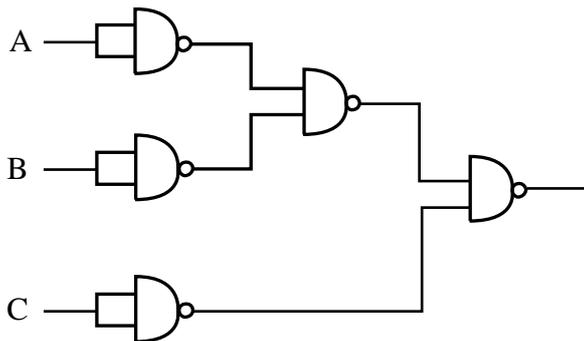
(ii)



(iii)



(iv)



(v)

Which of the above logic circuit(s) constructed by using only NAND gates provide(s) a similar output to the given logic circuit?

- | | | |
|---------------|---------------|----------------|
| (a) Only (i) | (b) Only (ii) | (c) Only (iii) |
| (d) Only (iv) | (e) Only (v) | |

16) What is the most compact form of the following Boolean expression?

$$F = \bar{x}y + xy\bar{z} + xyz$$

- (i) $\bar{x}y + y$
- (ii) y
- (iii) x
- (iv) $\bar{x}y + x$
- (v) $\bar{x}y + xy$

- | | | |
|---------------|---------------|----------------|
| (a) Only (i) | (b) Only (ii) | (c) Only (iii) |
| (d) Only (iv) | (e) Only (v) | |

17) Output of the Boolean function $F(x, y, z) = \bar{x}\bar{y} + z\bar{x} + \bar{y}z$ is 1 when

- | | | |
|---------------------|---------------------|---------------------|
| (a) $x=1, y=1, z=0$ | (b) $x=1, y=0, z=1$ | (c) $x=0, y=0, z=1$ |
| (d) $x=0, y=1, z=1$ | (e) $x=0, y=1, z=0$ | |

18) Consider the following logic function

$$F = A.B.C + A.B.\bar{C} + A.\bar{B}.C + \bar{A}.\bar{B}.\bar{C} + \bar{A}.B.\bar{C}$$

Which of the following would be results if the above logic function were to be simplified using Karnaugh map?

- (i) $A.B + A.C + \bar{A}.B$
- (ii) $A.B + A.\bar{C} + \bar{A}.\bar{C}$
- (iii) $A.B + A.C + \bar{A}.\bar{C}$
- (iv) $A.C + \bar{B}.\bar{C} + \bar{A}.\bar{C}$
- (v) $A.C + B.\bar{C} + \bar{A}.\bar{C}$

- | | | |
|------------------------|------------------------|------------------------|
| (a) Only (i) and (ii) | (b) Only (i) and (iii) | (c) Only (ii) and (iv) |
| (d) Only (iii) and (v) | (e) Only (iv) and (v) | |

Questions 19, 20 and 21 based on the following:

A two- word instruction is stored in memory at addresses 300 and 301 respectively. The instruction is “load to AC (Accumulator)“. The first word of the instruction specifies the operation code and address mode, and the second word specifies the operand part. The operand has the value 400. The content of memory addresses 400 and 500 are 500 and 200 respectively. The content of index register R is 100

- 19) What is the value loaded to the AC after the execution of the instruction, if the addressing mode is Immediate?

(a) 300	(b) 500	(c) 200
(d) 100	(e) 400	

- 20) What is the value loaded to the AC after the execution of the instruction, if the addressing mode is Direct?

(a) 300	(b) 500	(c) 200
(d) 100	(e) 400	

- 21) What is the value loaded to the AC after the execution of the instruction, if the addressing mode is Indexed?

(a) 300	(b) 500	(c) 200
(d) 100	(e) 400	

- 22) Which of the following statements is/are true with respect to the Central Processing Unit (CPU)?

(a) Registers hold only data that can be readily accessed by the CPU.
(b) Arithmetic-Logic-Unit (ALU) and Control Unit (CU) are two principal parts of the CPU.
(c) ALU determines which actions are to be carried out according to the values in a Program Counter (PC) register and a status register.
(d) Control Unit sends signals to CPU components to perform sequenced operations.
(e) ALU operations are controlled by the Control Unit.

- 23) Which of the following reason(s) will not trigger interrupts?

(a) Arithmetic underflow or overflow
(b) User-defined break points (when debugging a program)
(c) Arithmetic errors (division by zero)
(d) Complex Logic Operations
(e) Hardware malfunction

24) Which of the following memory type(s) is/are having a direct data path to the processor?

- | | | |
|----------------|------------|-----------|
| (a) SRAM | (b) EDORAM | (c) RDRAM |
| (d) DDR2 SDRAM | (e) MPDRAM | |

25) Which of the following memory is referred to as the “Hyper Page Mode” RAM?

- | | | |
|------------|------------|-----------|
| (a) SRAM | (b) RDRAM | (c) FPRAM |
| (d) EDORAM | (e) MPDRAM | |

26) Which of the following memory is referred to as “Multiport Dynamic” RAM?

- | | | |
|-----------|------------|----------------|
| (a) FPRAM | (b) EDORAM | (c) DDR2 SDRAM |
| (d) RDRAM | (e) VRAM | |

27) Which of the following is/are Optical Storage Device(s)?

- | | | |
|--------------|-------------------|------------------|
| (a) Zip Disk | (b) Super Disk | (c) Memory Stick |
| (d) CD-ROM | (e) Magnetic Tape | |

28) Which of the following is an/are impact printer(s)?

- | | | |
|--------------------|--------------------------|-------------------------|
| (a) Plotter | (b) Ink Jet printers | (c) Dot matrix printers |
| (d) Laser printers | (e) Thermal Wax printers | |

29) Which of the following is/are true with respect to Hybrid Hard Drive (HDD)?

- | |
|---|
| (a) A type of large-buffer computer hard disk drive. |
| (b) It is different from standard hard drives in that it employs a large buffer of non-volatile flash memory to cache data during normal use. |
| (c) Some of the benefits are speed, decreased power consumption, improved reliability, and a faster boot process. |
| (d) First released primarily for notebook computers in early 2007. |
| (e) Available in the memory sizes starting from 10 GB to 120 GB. |

30) Which of the following statement(s) is/are incorrect with Wi-Fi?

- (a) The speed of an IEEE 802.11b network is much higher than that of an IEEE 802.11g network.
- (b) Wi-Fi refers to the IEEE 802.11b wireless Ethernet standard.
- (c) The maximum speed of a Wi-Fi network is 11MBps.
- (d) Access points are a must in-order to communicate via Wi-Fi.
- (e) Establishing a Wi-Fi network is less expensive compared with establishing a 10/100 Ethernet (wired) network.

31) Which of the following is/are essential component(s) of a typical motherboard?

- (a) Microprocessor slot
- (b) RAM memory sockets
- (c) Sound Card
- (d) Chip Set
- (e) BIOS

32) Which of the following statement(s) is/are true when replacing a motherboard of an existing computer?

- (a) The motherboard has to be compatible with the existing speakers connected to the sound card.
- (b) The existing processor has to be compatible with the motherboard.
- (c) The power supply has to be of the same form factor as the motherboard.
- (d) The motherboard has to be compatible with the existing hard disk.
- (e) The motherboard has to be compatible with the existing keyboard.

33) Which of the following expansion cards support the connection of up to 63 peripherals in a *tree chain topology*?

- (a) Sound card
- (b) Fire-wire card
- (c) Network card
- (d) Graphics card
- (e) TV and video capture card

34) Which of the following statements is/are true with Fire-Wire?

- (a) FireWire is a connector on your computer, which allows you to transfer information from one FireWire device to another very quickly.
- (b) Fire Wire contains its own processor and a memory to improve performance level.
- (c) FireWire was created by a joint effort from Apple, Sony and Panasonic that was standardized in 1995 as IEEE1394.
- (d) Fire-wire interface is extremely fast and hence popular in connecting audio and video multimedia devices to the PC.
- (e) Fire Wire is also commonly known as iLink on Sony devices and accordingly with IEEE1394 standard.

35) Which of the following statement(s) is/are true with respect to the technology of PLASMA monitors?

- (a) A Plasma display uses a special gas sandwiched between two glass plates.
- (b) A Plasma display uses a flash light like the LCD display.
- (c) Plasma technologies mainly used for PCs, Mobile Phones, Laptops and PDAs.
- (d) Plasmas high operating temperature can be painful to touch.
- (e) Plasma technology is used for large screen and some laptops.

36) Which of the following function(s) can be done easily by using the wheel on a mouse?

- (a) Scroll through documents
- (b) Select objects
- (c) Draggin
- (d) Change size
- (e) Zooming a picture

37) Which of the following statements is/are true with respect to BIOS?

- (a) In modern systems, BIOS chips are also available on interface and adapter cards like the VGA card, SCSI adapter and Network interface card.
- (b) Most modern day motherboard BIOS chips are EEPROMs, hence we could easily do a BIOS upgrade (Burn a newer version of the BIOS software).
- (c) BIOS are the most prominent CMOS type chip in the computer system.
- (d) BIOS settings configuration cannot be written into the BIOS chip since it is a ROM.
- (e) The BIOS mainly consists of standard drivers for the primary input and output devices and other components like motherboard, memory and on-board interfaces.

38) Which of the following statement(s) is/are always true about a bus system available in a computer?

- (a) The fastest bus in a computer is the processor bus which is used to transfer data between the processor and cache or main memory.
- (b) PCI card is in the form of 16-bit slots mounted on the mother board and is in white colour.
- (c) ISA bus could handle maximum of only 16-bits, and ISA cards cannot be plugged-in to the EISA slots.
- (d) SCSI adapters cannot be plugged-in to the PCI-X slots.
- (e) AGP slots are designed particularly to be used with video cards.

39) Which of the following organizations established the Small Computer System Interface (SCSI) standard?

- (a) Microsoft
- (b) IBM
- (c) ISO
- (d) IEEE
- (e) ANSI

40) Which of the following interfaces could be used to connect a VGA card?

- | | | |
|-------------|--------------|-----------------|
| (a) AGP | (b) PCI | (c) PCI-Express |
| (d) USB 2.0 | (e) Firewire | |

41) What does RADSLS stand for with respect to Networking?

- | |
|---|
| (a) Rate-Adaptive Digital Subscriber Line |
| (b) Rate-Adaptive Dial-up Subscriber Line |
| (c) Rate-Adaptive Dial-up Server Line |
| (d) Rate-Asynchronous Digital Subscriber Line |
| (e) Rate-Asynchronous Dial-up Subscriber Line |

42) Which of the following is/are true about Optical Fiber Cables?

- | |
|--|
| (a) Used to transmit data over long distances at a high data range like 40GB/s |
| (b) Save space in cabling specially in LAN environment |
| (c) Immune to electrical interface preventing cross talks |
| (d) Glass or plastic fiber designed to guide light over its length |
| (e) Electro-magnetic signals in the space between inner and outer conductors |

43) Which of the following factors is an/are advantage(s) in a network computer system?

- | | | |
|-----------------------|--------------------------|------------------------|
| (a) Enforce standards | (b) High reliability | (c) Data fragmentation |
| (d) Resource sharing | (e) Remote Computability | |

44) Which of the following options in a software installation process allows users to select the components they wish to install?

- | | | |
|------------|--------------|-------------|
| (a) Full | (b) Typical | (c) Network |
| (d) Custom | (e) Standard | |

45) Which of the following statements is/are true with operating systems?

- | |
|---|
| (a) Single User/Single Tasking operating systems take up a very large space in the memory when they are running programs. |
| (b) Multi-User/Multitasking operating systems allow changes to be made from the terminal server. |
| (c) Multi User/Multitasking operating systems support more than one user at a time, performing more than one task at a time. |
| (d) Single User/Multitasking operating systems allow to perform two or more functions at any given time. |
| (e) Real-Time operating systems accept inputs, processes the inputs and gives the appropriate response in milliseconds or microseconds. |

46) What is the most practical method to remove a software application from a PC?

- (a) Delete all files of the software application
- (b) Remove the icon for the application and delete the executable file of the software application
- (c) Uninstall the software application
- (d) Delete the Folder of the software application
- (e) Back-up the software application

47) Which of the following software is/are focused on supporting communication, collaboration and coordination?

- (a) E-business software
- (b) Groupware
- (c) Lotus Notes
- (d) Project Management Software
- (e) Enterprise Application Software

48) Which of the following software is/are designed to be able to modify the source code of the programs?

- (a) Compilers
- (b) Open Source
- (c) Freeware
- (d) Proprietary
- (e) Shareware

49) Which of the following component(s) might require upgrading, for the computer to support a high-end realistic 3D game?

- (a) Keyboard
- (b) Operating System
- (c) Main Memory
- (d) DVD-ROM
- (e) VGA Card

50) Which of the following can cause damage to the computer electrically?

- (a) Power-line noise
- (b) Continuous power supply
- (c) Lightning
- (d) Static Electricity
- (e) Uninterrupted Power Supply (UPS)
