



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2005/2006 – 1st Year Examination – Semester 2

IT2102: Computer Systems

Multiple Choice Question Paper

**12th August, 2006
(TWO HOURS)**

Important Instructions :

- The duration of the paper is 2 (two) hours.
- The medium of instruction and questions is English.
- The paper has **50 questions** and **12 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 -1 (*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) Consider the following k-map.

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

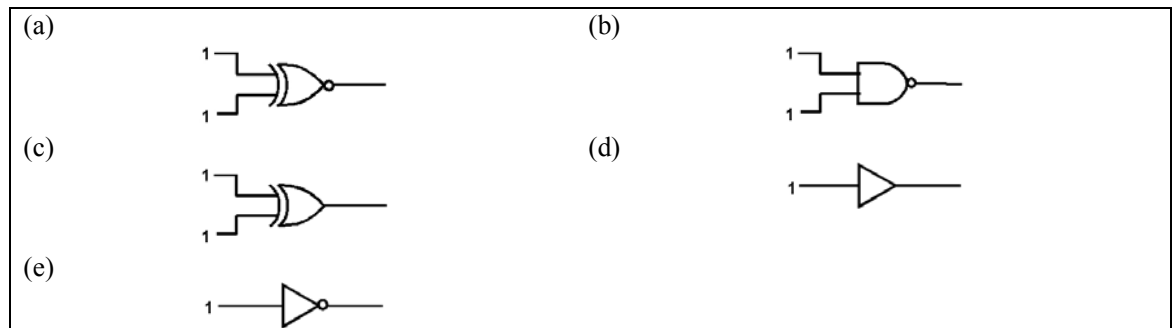
Which of the following Boolean logic formule can be deduced from the k-map given above?

- | | |
|--|--|
| (a) $(\overline{B}.D) + (\overline{A}.B.\overline{C}) + (\overline{A}.\overline{C}.D) + (B.C.D)$ | (b) $(\overline{B}.D) + (\overline{A}.B.\overline{C}) + (\overline{A}.\overline{C}.D) + (B.C.D)$ |
| (c) $(\overline{B}.D) + (\overline{A}.B.\overline{C}) + (\overline{A}.\overline{C}.D) + (B.C.D)$ | (d) $(\overline{B}.D) + (\overline{A}.B.\overline{C}) + (\overline{A}.\overline{C}.D) + (B.C.D)$ |
| (e) $(\overline{B}.D) + (\overline{A}.B.\overline{C}) + (\overline{A}.\overline{C}.D) + (B.C.D)$ | |

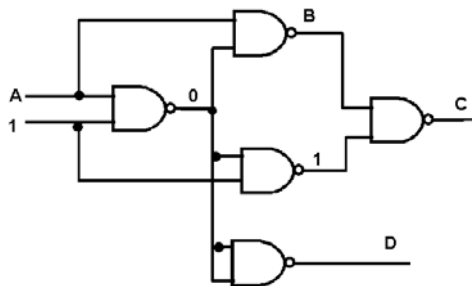
- 2) Consider the following logic function $f(AB)$.

$$f(AB) = (A \oplus B) + \overline{(A \oplus B)}$$

Which of the following logic circuits would represent the output of the above logic function $f(AB)$?



- 3) The following is a Half-adder logic circuit.



What are the respective values at A, B, C and D?

- | | | | | |
|-----|-------|-------|-------|-------|
| (a) | A - 0 | B - 0 | C - 0 | D - 1 |
| (b) | A - 0 | B - 1 | C - 1 | D - 0 |
| (c) | A - 1 | B - 0 | C - 0 | D - 1 |
| (d) | A - 1 | B - 1 | C - 0 | D - 1 |
| (e) | A - 1 | B - 1 | C - 1 | D - 1 |

- 4) Figure 1 and (i), (ii) and (iii) represent logic circuits.

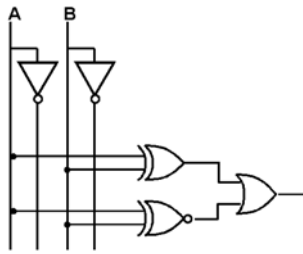
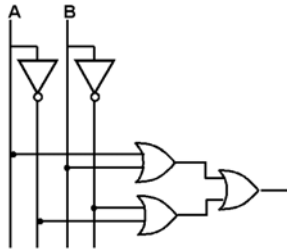
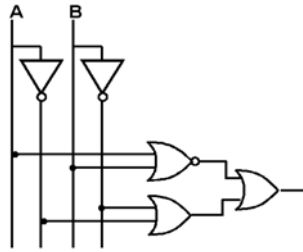


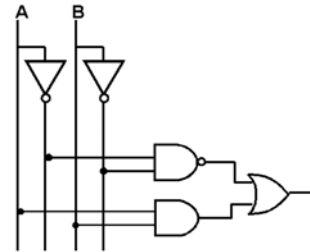
Figure 1



(i)



(ii)



(iii)

Which of the above logic circuits (i), (ii) and (iii) provide a similar output to the logic circuit Figure 1?

- | | | |
|----------------|------------------|-----------|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (i) & (ii) | (e) (ii) & (iii) | |

- 5) Consider the following logic function $f(ABC)$.

$$f(ABC) = (A + B + \overline{C}).(A + \overline{B} + \overline{C})$$

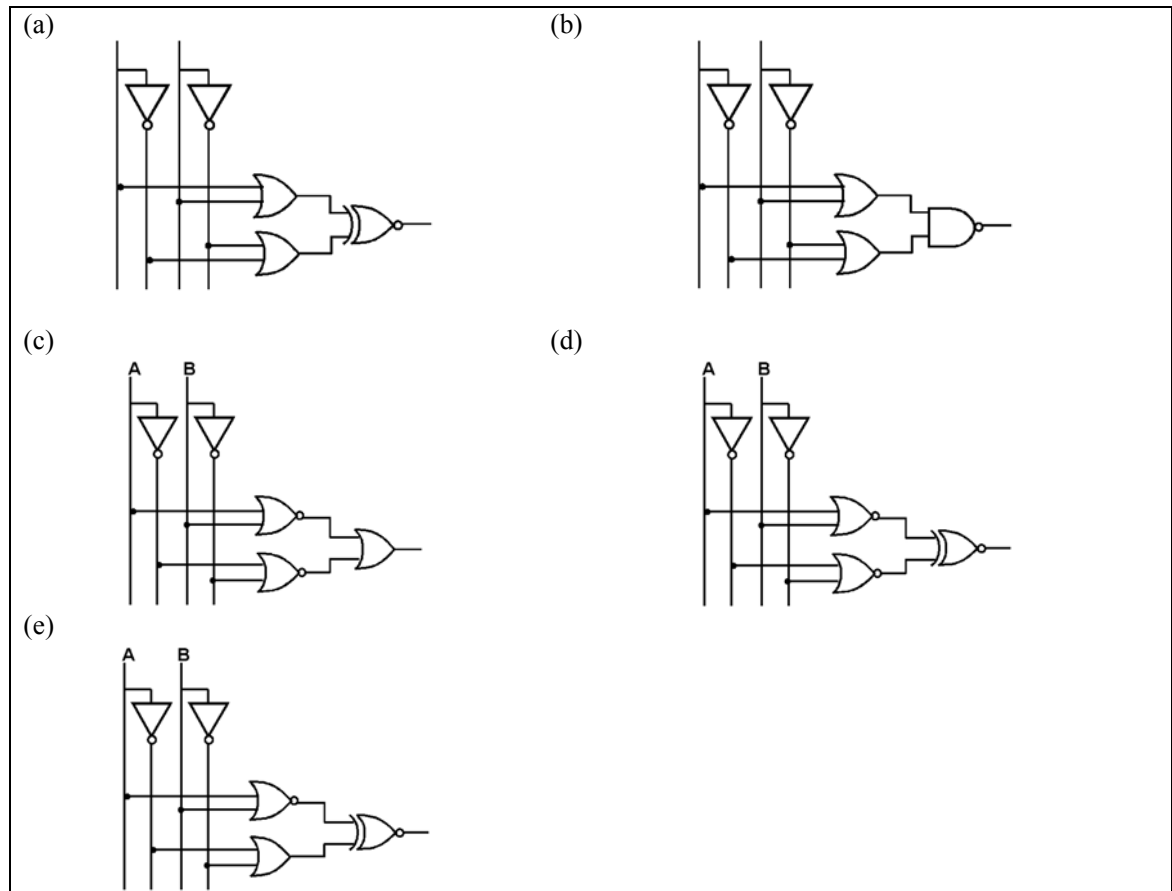
Which of the following would be results if the above logic function were to be simplified using k-maps?

- | | |
|--------------------------|--------------------------|
| (a) $\overline{C} + A$ | (b) $C + \overline{C}.A$ |
| (c) $C.\overline{A}$ | (d) $\overline{C}.A$ |
| (e) $\overline{C}.A + B$ | |

- 6) Consider the following logic function.

$$f(AB) = \overline{A}.\overline{B} + A.B$$

Which of the logic circuit diagrams provide a similar output to the above logic function $f(AB)$?



- 7) The equivalent in hexadecimal to the decimal number 973 is

(a) 4BC	(b) CB4	(c) 6D
(d) 6CD	(e) 4CD	

- 8) The equivalent in binary to the hexadecimal number A7FE is

(a) 101101111111110	(b) 1010011111111110
(c) 1010100101111110	(d) 101101111111111
(e) 1011011111101110	

- 9) The equivalent in binary to the decimal number 4.625 is

(a) 100.001	(b) 100.110
(c) 100.111	(d) 100.101
(e) 100.1001	

- 10) Which unsigned binary number in the result of the subtraction of unsigned binary number 10111001 from the unsigned binary number 00101101?

(a) 01110011	(b) 10001100	(c) 00001100
(d) 01110100	(e) 10001101	

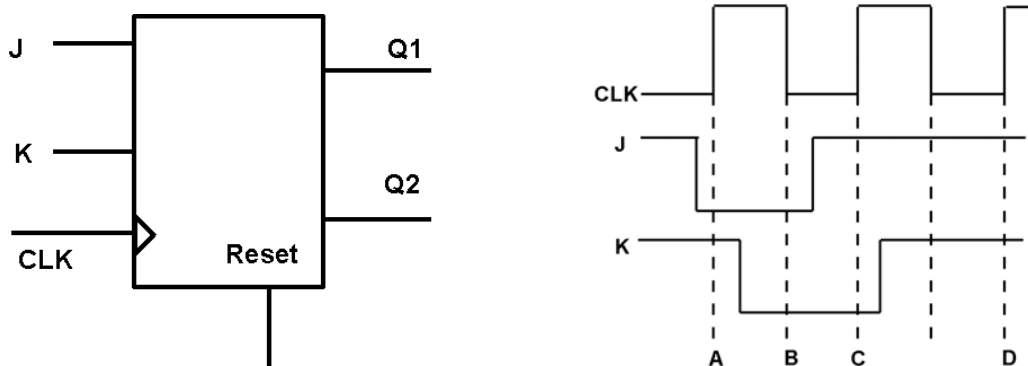
- 11) The result of the addition of the unsigned binary number 101.101 by the unsigned binary number 1011.110 is;

(a) 11110.111	(b) 10001.011	(c) 10000.111
(d) 10001.111	(e) 10000.011	

- 12) The result of the subtraction of binary number 11101.110 from the binary number 101101.101 is;

(a) 111.001	(b) 1111.001	(c) 1111.111
(d) 111.111	(e) 111.101	

- 13) Consider the circuit diagram showing the connection of a JK-flip-flop and the timing diagram given below.



What are the respective values of Q1 at A, B, C and D?

(a) A - 0	B - 0	C - 0	D - 0
(b) A - 0	B - 0	C - 1	D - 0
(c) A - 1	B - 1	C - 0	D - 1
(d) A - 0	B - 1	C - 1	D - 1
(e) A - 1	B - 0	C - 1	D - 0

- 14) A 2:4 decoder has 2 inputs A and B, where B is the least significant bit and 4 outputs F0, F1, F2 and F3 where F0 is the least significant bit. What are the valid set Boolean logic expressions that could implement the decoder's functionality?

(a) $F0 = \overline{A}\overline{B}; F1 = \overline{A}B; F2 = A\overline{B}; F3 = AB$
(b) $F0 = \overline{A}\overline{B}; F1 = A\overline{B}; F2 = \overline{A}B; F3 = AB$
(c) $F0 = A\overline{B}; F1 = \overline{A}\overline{B}; F2 = A\overline{B}; F3 = \overline{A}\overline{B}$
(d) $F0 = A\overline{B}; F1 = A\overline{B}; F2 = \overline{A}B; F3 = \overline{A}\overline{B}$
(e) $F0 = \overline{A}\overline{B}; F1 = A\overline{B}; F2 = \overline{A}B; F3 = A\overline{B}$

15) The IEEE short floating point representation of the binary number -1001.1011 is

- | | | | |
|-----|---|----------|---------------------------|
| (a) | 0 | 00000011 | 001101100000000000000000 |
| (b) | 1 | 00000011 | 0000000000000000000011011 |
| (c) | 1 | 00000011 | 001101100000000000000000 |
| (d) | 1 | 00011011 | 000000000000000000000011 |
| (e) | 1 | 00011011 | 110000000000000000000000 |

16) Which of the following are microprocessors?

- | | |
|-----|-------------|
| (a) | Xenon |
| (b) | Thunderbird |
| (c) | Intel 4004 |
| (d) | Duron |
| (e) | Intel 5005 |

17) Each of the blanks labelled A – E of the paragraph given below has to be filled with the most appropriate word selected from the phrases labelled (i) – (v). Note that one word or phrase might be used more than once.

- (i) Difference Engine
- (ii) Analytical Engine
- (iii) Charles Babbage
- (iv) John V Atanasoff
- (v) Herman Hollerith

The first mechanical computer wasA.....'sB..... Ten years later he developed theC..... which is regarded as the first real predecessor to the modern computer because it had all the elements of what is considered a computer today.D..... an employee of the US census department came up with the idea of Punch cards. He went on to found a company, which was later known as IBM.E..... developed the first ABC, the first to use modern digital switching.

- | | | | | | |
|-----|------------|----------|-----------|-----------|-----------|
| (a) | A – (iii) | B – (ii) | C – (i) | D – (v) | E – (iv) |
| (b) | A – (iv) | B – (ii) | C – (i) | D – (iii) | E – (v) |
| (c) | A – (iii) | B – (i) | C – (ii) | D – (iv) | E – (v) |
| (d) | A – (iii), | B – (i), | C – (ii), | D – (v), | E – (iv) |
| (e) | A – (iv) | B – (ii) | C – (i) | D – (v) | E – (iii) |

18) Given below are some statements associated with the development of the computer. Identify the correct statement(s) from among them.

- | | |
|-----|--|
| (a) | The difference between the 80386SX processor and the 80386DX processor was the width of the data bus. |
| (b) | The maximum Main memory addressed by a 32-bit processor is 2GB. |
| (c) | The 8086 processor has a data bus width of 8-bits. |
| (d) | The difference between the 80486SX processor and the 80486DX processor was the speed of the processor. |
| (e) | The 8088 processor has a data bus width of 16-bits. |

19) Which of the following are parts of the computer chassis?

- | | | |
|-------------------------------|-------------------------------|------------------------------|
| (a) Power supply | (b) Drive bays | (c) Power and Reset switches |
| (d) Intruder detection switch | (e) Front panel USB connector | |

- 20) Following are some statements associated with microprocessors. Identify the correct statement(s) from among them.
- (a) The Control Unit is the component of the CPU that implements the microprocessors instruction set.
 - (b) The instruction received by the CPU is decoded by the Arithmetic Logic Unit.
 - (c) A CPU Register is used to hold a binary value temporarily for storage, for manipulation, and/or for simple calculations.
 - (d) The CPU Registers have special addresses such as AX, BX.
 - (e) The Control Units are programmed and not hardwired.
- 21) Given below are some statements associated with computer memory. Identify the correct statement(s) from among them.
- (a) SRAM is more dense than DRAM.
 - (b) DRAM is used as cache memory.
 - (c) SRAM is slower than DRAM.
 - (d) SRAM has a lower cost than DRAM.
 - (e) SRAM does not require refreshing like DRAM.
- 22) Given below are some statements associated with the Width parameter of processors. Identify the correct statement(s) from among them.
- (a) The width parameters of a processor refers to the data bus, internal registers and the address bus.
 - (b) The Pentium 4 processor has a data bus that is twice the width of the internal registers.
 - (c) The width of the address bus does not have an implication on the maximum addressable main memory of a computer.
 - (d) The width of the internal registers has no implication on the size of the data chunk processed by the processor.
 - (e) The length of an instruction in a processor with a 64-bit internal register has to always be 32-bits.
- 23) Which of the following are processor modes of microprocessors developed after the Intel 80386?
- (a) Virtual-real
 - (b) Real-protected
 - (c) Real
 - (d) Protected
 - (e) Virtual-protected
- 24) Given below are some statements associated with Cache memory. Identify the correct statement(s) from among them.
- (a) When a “cache miss” occurs in the level 1 cache, it searches for the data/instruction in the level 2 cache, if a level 2 cache is available.
 - (b) When a “cache miss” occurs in the level 1 cache, it searches for the data/instruction in the main memory, even if a level 2 cache is available.
 - (c) When a “cache miss” occurs in the level 1 cache, it searches for the data/instruction in the main memory, if a level 2 cache is not available.
 - (d) When a “cache miss” occurs in the level 2 cache, it searches for the data/instruction in the level 1 cache.
 - (e) When a “cache miss” occurs in the level 2 cache, it searches for the data/instruction in the main memory.

- 25) Following are some statements associated with the Speed parameter of processors. Identify the correct statement(s) from among them.

- | |
|--|
| (a) Pentium 4 processors can execute as many as three or more instructions per cycle.
(b) The processors speed is equivalent to some multiple of the motherboard speed.
(c) The 8086 processors take one cycle to execute one instruction.
(d) The processor does not do any task during a wait state.
(e) One half of a single clock cycle is the smallest element of time for the processor. |
|--|

- 26) Following are some statements associated with motherboard form factors. Identify the correct statement(s) from among them.

- | |
|---|
| (a) The ATX has a double main key power supply connector.
(b) The ATX has not relocated the CPU from the original location of the Baby-AT form factor.
(c) The motherboard form factor refers to the physical dimensions of the motherboard.
(d) The ATX form factor is a combination of the best features of the Baby-AT and the LPX form factors.
(e) The ATX has a built in single high external Input/Output connector panel. |
|---|

- 27) Following are some statements associated with cache memory. Identify the correct statement(s) from among them.

- | |
|---|
| (a) The level 2 cache has a higher capacity than the level 1 cache.
(b) The level 2 cache is used to reduce the dramatic slowdown when the data/information is not available in the level 1 cache.
(c) Processors beyond the Pentium III have the level 2 cache on-chip.
(d) Newer processors have integrated level 2 cache that runs at the same speed as the processor core.
(e) The level 1 cache is of DRAM type and the level 2 cache is of SRAM type. |
|---|

The blanks in the Questions 28 – 32 have to be filled by selecting the most appropriate words/phrases from the list labelled (i) – (v). Note that one word/phrase may be used in more than one instance.

- (i) Socket A
- (ii) Slot 1
- (iii) Socket 478
- (iv) Socket 603
- (v) Slot 2

- 28) The AMD Duron processors are supported by

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

- 29) The second generation of the Intel Pentium IV processors supported by

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

- 30) The Intel Xeon (based on the Pentium IV) processors are supported by

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

- 31) The Slot versions of the Intel Pentium II and Pentium III processors are supported by

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

- 32) The slot versions of the Intel Celeron processors are supported by
- | | | |
|----------|----------|-----------|
| (a) (i) | (b) (ii) | (c) (iii) |
| (d) (iv) | (e) (v) | |
- 33) Following are some statements associated with system buses. Identify the correct statement(s) from among them.
- | |
|---|
| (a) The processor bus is also called the front-side bus.
(b) The AGP bus is a high-speed 64-bit bus.
(c) The processor bus is primary used by the processor to pass information to the main memory or cache.
(d) The PCI bus is available in modern computers as a 33MHz, 64-bit.
(e) The ISA bus is a 33MHz, 16-bit bus. |
|---|
- 34) Following are some statements associated with the motherboard chipset. Identify the correct statement(s) from among them.
- | |
|---|
| (a) The chipset constitutes of the east bridge and the west bridge.
(b) The memory controllers are located within the chipset.
(c) A single chipset may supports different generations of processors.
(d) The processor cannot communicate with the main memory without going through the chipset.
(e) The chipset how fast the buses will run. |
|---|
- 35) Following are some statements associated with Plug and Play. Identify the correct statement(s) from among them.
- | |
|---|
| (a) If your system is fully PnP-compatible, potential conflicts are always resolved automatically.
(b) Identification of any PnP PCI or ISA devices is primarily done by the operating system.
(c) A special BIOS that supports PnP is required for a PnP system.
(d) An operating system that supports PnP is required for a PnP system.
(e) The allocation of resources for a PnP device is primarily done by the operating system. |
|---|
- 36) Given below are some statements associated with the BIOS and the CMOS. Identify the correct statement(s) from among them.
- | |
|---|
| (a) The possible BIOS source is an adapter card ROM.
(b) BIOS stands for the Basic Input Output System.
(c) The BIOS loads the POST program stored in the CMOS.
(d) The Bootstrap loader is run from the CMOS.
(e) The BIOS forms a layer that enable a given operating system and applications to run on different hardware. |
|---|
- 37) Given below are some statements associated with computer memory. Identify the correct statement(s) from among them.
- | |
|---|
| (a) Dynamic random access memory is faster than Static random access memory.
(b) Main memory is used by the processor to store primary active programs and data.
(c) Logical mapping refer to how the memory addresses are mapped to actual chips.
(d) The cache memory is of Dynamic random access memory.
(e) The production cost of Dynamic random access memory is higher than that of Static random access memory. |
|---|

- 38) Following are some statements associated with the computer memory. Identify the correct statement(s) from among them.
- (a) Single channel RDRAM transfer 16-bits at a time.
 - (b) DDR SDRAM memory transfer 32-bits at a time.
 - (c) SDRAM are capable of supporting up to 166MHz system bus cycling.
 - (d) DDR SDRAM memory transfers data on the rising edge and the falling edge of the clock cycle.
 - (e) RDRAMs consumes more power than SDRAMs.
- 39) Given below are some statements associated with IDE interface. Identify the correct statement(s) from among them.
- (a) ATA is a 16-bit parallel interface.
 - (b) The 40-conductor cable is supported by ATA-7.
 - (c) ATA-6 has a maximum speed of 66 Mbps.
 - (d) ATA-7 has a maximum speed of 133 MBps.
 - (e) ATA-7 has only 4 Ultra DMA modes.
- 40) Given below are some statements associated with IDE interface. Identify the correct statement(s) from among them.
- (a) Pin-40 carries the Drive Active/Slave Present (DASP) signal.
 - (b) The stripe on the interface cable denotes pin-1.
 - (c) The IDE interface has 8 Data-Bit pins.
 - (d) Pin-20 is the missing/blocked pin in the IDE interface.
 - (e) Pin-28 is the cable select pin of the IDE interface.
- 41) Following are some statements associated with a Small Computer System Interface (SCSI). Identify the correct statement(s) from among them.
- (a) In addition to SCSI devices, the SCSI adapter is also allocated a SCSI ID.
 - (b) A single SCSI bus can support up to 8 or 16 SCSI IDs.
 - (c) The SCSI Ultra4 is the latest SCSI versions.
 - (d) SCSI Ultra2 uses the serial bus.
 - (e) SCSI Ultra4 has a slower transmission rate than serial ATA.
- 42) Following are some statements associated with USB interfaces. Identify the correct statement(s) from among them.
- (a) USB 1.1 functions at 12 MBps.
 - (b) USB 2.0 functions at 480 MBps.
 - (c) USB 2.0 is fully backward compatible with USB 1.1.
 - (d) A single USB root hub supports up to 127 devices.
 - (e) USB requires a new IRQ for each device that is connected to the USB root hub.
- 43) Following are some statements associated with the Parallel port. Identify the correct statement(s) from among them.
- (a) IEEE 1394 is a parallel port standard.
 - (b) The standard parallel port has 4 input and 8 output connections.
 - (c) All parallel ports function in one mode.
 - (d) The enhanced parallel port has 8 input/output connections.
 - (e) The standard parallel port has 15 connections.

- 44) The following data is provided about a hard disk.

Number of cylinders = 65,356
Number of heads = 12
Number of sectors = 63
Size of a sector = 512 bytes
Number of discs = 6

What is the capacity of this particular hard disk?

- | | | |
|----------------|----------------|-----------|
| (a) 25.297 GB | (b) 151.785 GB | (c) 25 GB |
| (d) 141.360 GB | (e) 23.560 GB | |

- 45) Following are some statements associated with RAID. Identify the correct statement(s) from among them.

- | |
|---|
| (a) RAID 1 is referred to as “Mirroring”.
(b) RAID 4 is similar to RAID 3 except data is written in smaller blocks to the independent drives.
(c) One drive is adequate for the RAID 1 operation.
(d) RAID 5 is blocked data with double distributed parity.
(e) RAID 3 is an adaptation of RAID level 0 with parity information. |
|---|

- 46) Following are some statements associated with computer Input and Output devices. Identify the correct statement(s) from among them.

- | |
|---|
| (a) The feedback-joystick is used only as an input device.
(b) Ink-jet printers provide better quality printouts than colour laser printers.
(c) The touch screen is an input/output device.
(d) Plotters can only be used to provide printouts of one single colour.
(e) The light pen can identify the screen location to the computer. |
|---|

- 47) Column A contains some key words associated with hard drive technology. A word from Column A has to be matched with the most appropriate phrase from Column B.

- | | Column A | Column B |
|-------|--------------------------|--|
| (i) | Network Protocol | A Software that enables resources to be shared with other PCs and controls access to shared resources. |
| (ii) | Network Client | B A LAN protocol |
| (iii) | Network Operating System | C A common set of communications rules |
| (iv) | IRDA | D A method of connection between computers |
| (v) | Ethernet | E Software that enables computers to access other computers with shared resources. |

The correct matching is:

- | | | | | | |
|-----|---------|----------|-----------|----------|---------|
| (a) | (i) & D | (ii) & A | (iii) & E | (iv) & B | (v) & C |
| (b) | (i) & E | (ii) & E | (iii) & A | (iv) & B | (v) & D |
| (c) | (i) & C | (ii) & E | (iii) & A | (iv) & D | (v) & B |
| (d) | (i) & C | (ii) & A | (iii) & E | (iv) & B | (v) & D |
| (e) | (i) C | (ii) & D | (iii) & E | (iv) & A | (v) & B |

48) Which of the following are modern motherboard form factors.

- | | | |
|-------------|---------------|---------|
| (a) NLX | (b) Micro-ATX | (c) LPX |
| (d) Baby-AT | (e) Flex-ATX | |

49) Following are some statements associated with Networks. Identify the correct statement(s) from among them.

- | |
|--|
| (a) The Intranet use special programs instead of web browsers and the ICP/IP protocol. |
| (b) Unlike the Internet, the content is restricted to authorized company users only. |
| (c) Home Area networks and Local Area Network use different hardware components. |
| (d) Intranets are not essentially private. |
| (e) Intranets that share a portion of their content with customers, suppliers, or other businesses, but not with the general public, are called extranets. |

50) Following are some statements associated with POST. Identify the correct statement(s) from among them.

- | |
|--|
| (a) POST stands for Power On System Test. |
| (b) The POST detected errors are sometimes called “fatal errors” since they prevent the system form booting. |
| (c) BIOS POST may give error messages in the form of displayed massages or beep codes. |
| (d) POST diagnosis is the more accurate than disk based diagnostic software. |
| (e) The POST is a program included in all operating systems. |
