UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2004/2005 – 1st Year Examination – Semester 2

IT2102: Computer Systems
Multiple Choice Question Paper

30th July, 2005
(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 **50 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 −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 \ 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 formule can be deduced from the k-map given above?

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

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

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

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

(e) $B.D + \overline{A}.\overline{B}.\overline{C}.\overline{D} + \overline{A}.\overline{B}.C.\overline{D} + A.\overline{B}.C.\overline{D}$

2) The statements given below are associated with k-maps. Identify the correct one(s) from among them:

(a) The leftmost column is adjacent to the rightmost column.
(b) Max-term groups may be formed by diagonal connection of cells.
(c) Min-term groups may be formed by vertical or horizontal connection of cells.
(d) Groupings may occur in the size of 2^r, where r = 0, 1, 2, 3,……,n.
(e) The four corners of a 4x4 k-map can be grouped to form a four cell group.

3) Consider the following logic function.

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

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

(a) $A.B + A.C + \overline{A}.B$

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

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

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

(e) $A.C + B.\overline{C} + \overline{A}.C$

4) Consider the following logic function.

$$F = (A + B) + (\overline{A} + \overline{B}) + (\overline{A} + B) + (A + \overline{B})$$

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

(a) 1

(b) $(\overline{A}.B).(A.\overline{B}).(A.B).(\overline{A}.\overline{B})$

(c) 0

(d) $\overline{(\overline{A}.B).(A.\overline{B}).(A.B).(\overline{A}.\overline{B})}$

(e) $(\overline{\overline{A}.B}).(\overline{A.\overline{B}}).(\overline{A.B}).(\overline{\overline{A}.\overline{B}})$

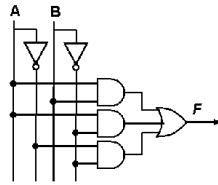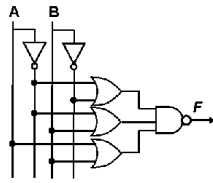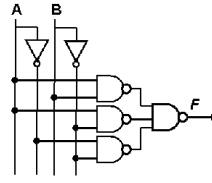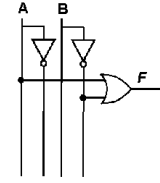5) Figure 1 and (i), (ii) and (iii) represent logic circuits.

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) only	(b) (i) and (ii) only	(c) (iii) only
(d) All	(e) (i) and (iii) only	

6) Consider the following logic function.

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

Which of the logic circuit diagrams provide a similar output to the above logic function F?
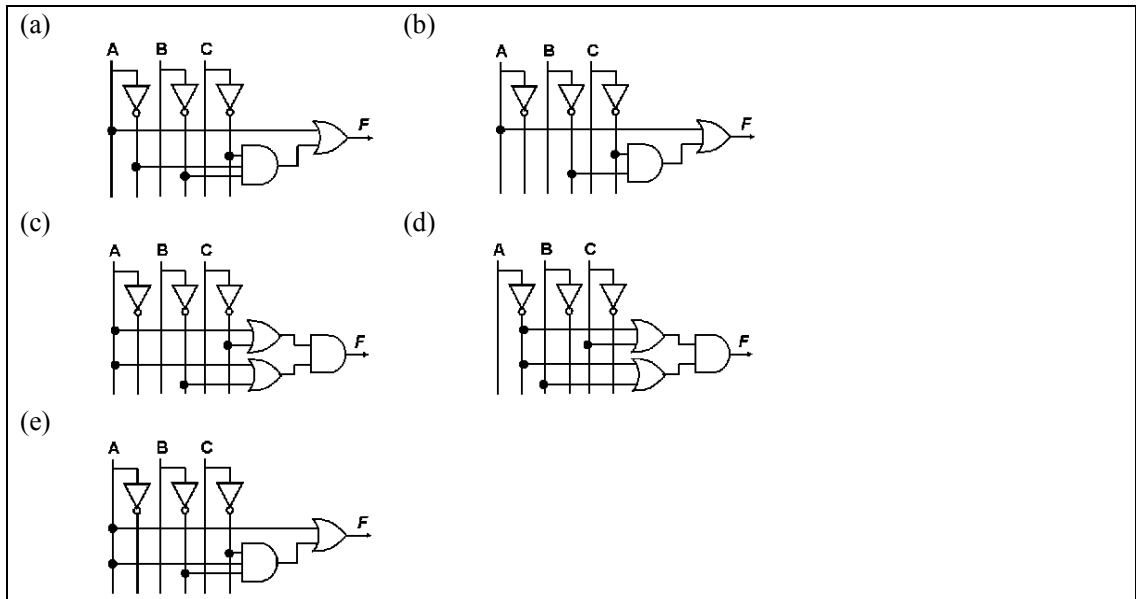
7) The binary number 1011011011101 is equivalent to (consider the decimal, octal and hexadecimal number systems)

(a) 16DD	(b) 13335	(c) 16CC
(d) 5855	(e) 5851	

8) The decimal number 6949 is equivalent to (consider the binary, octal and hexadecimal number systems)

(a) 1010010011011	(b) 17449	(c) 1F23
(d) 1101100100101	(e) 17445	

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9) The result of the addition of the binary numbers 1101.111 and 1100.010 is

(a) 11011.111	(b) 11010.111	(c) 11010.001
(d) 11011.010	(e) 11011.111	

10) Which binary number in the form of two's compliment is the result of the subtraction of binary number 1110101 from the binary number 1000011?

|		
(a) 1001101	(b) 1001110	(c) 1001101
(d) 1110010	(e) 01110101	

11) The result of the division of the binary number 101101011 by the binary number 1011 is

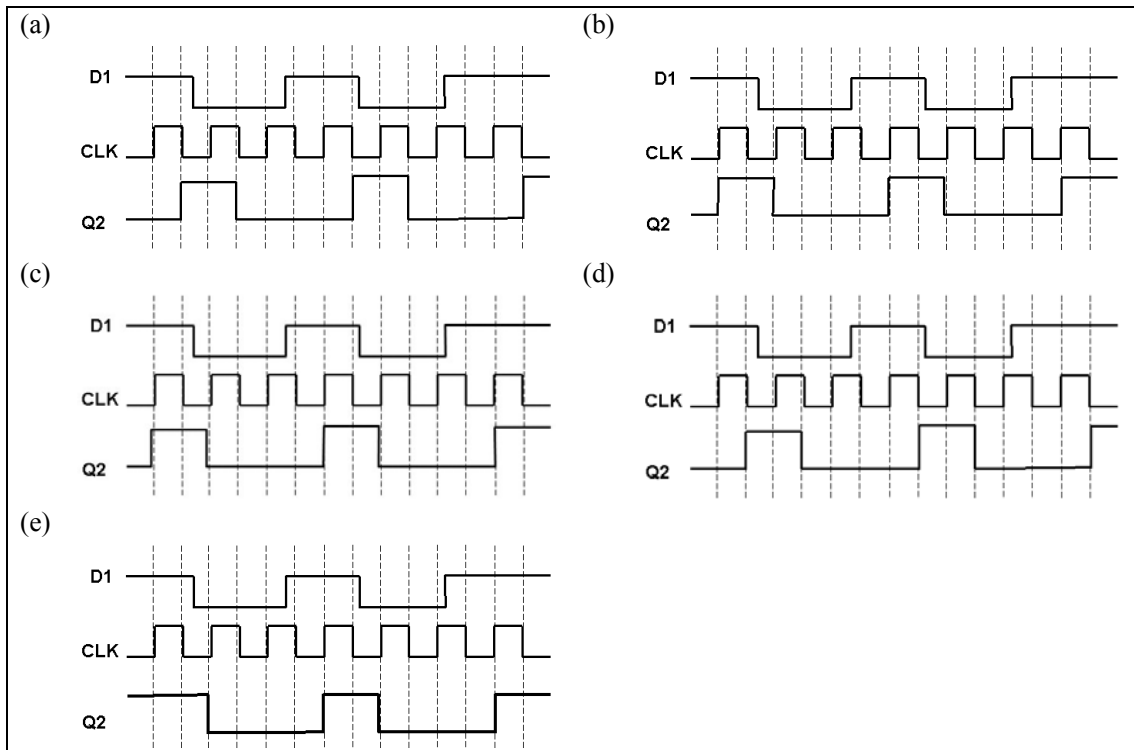|		
(a) 100001	(b) 100110	(c) 111101
(d) 110010	(e) 100010	

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

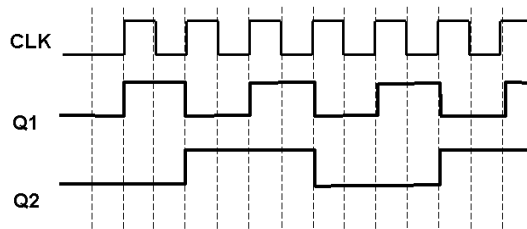|		
(a) 1111.111	(b) 1111.110	(c) 10000.111
(d) 1111.001	(e) 10000.001	

13) Consider the following circuit diagram showing the connection of two D-flip-flops.
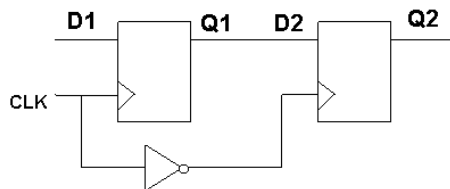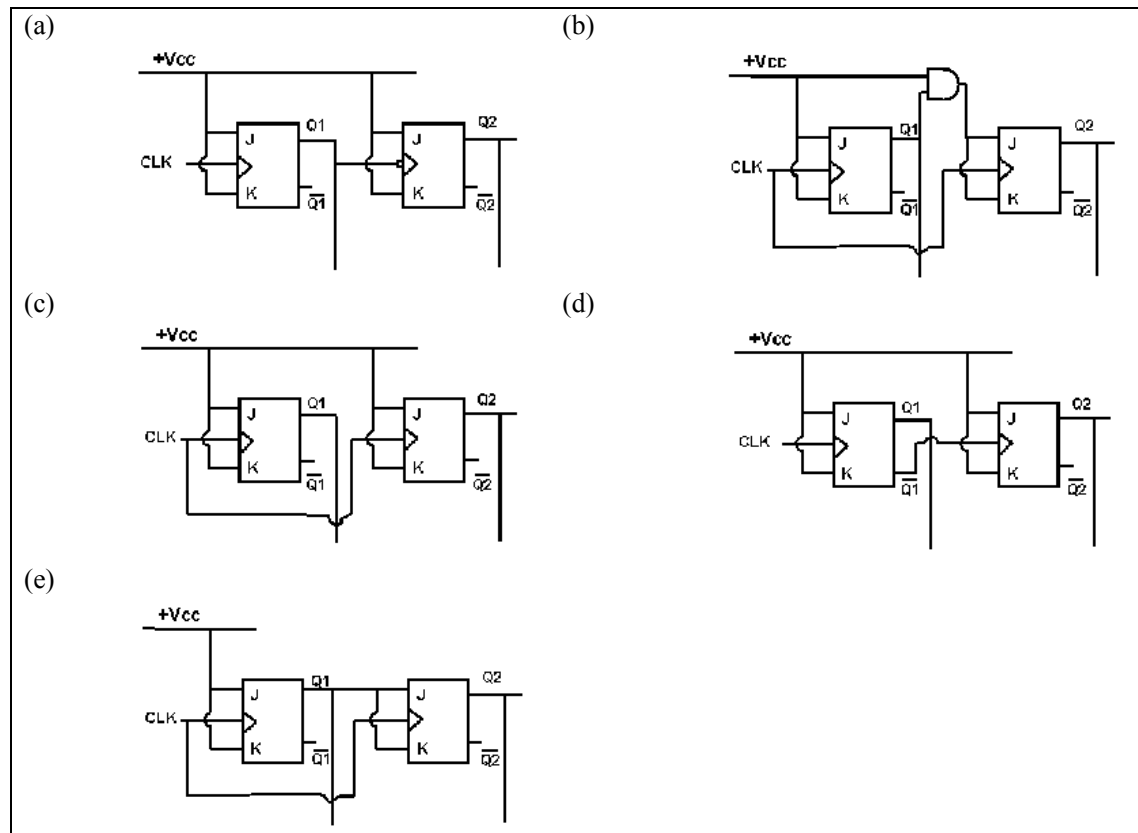

Which of the following diagrams illustrate the correct wave form for the output Q2?

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14) Consider the following output.

Which of the circuits provide a similar output to that illustrated above?

15) The sign-magnitude representation of the binary number -1.11 is

(a) 1 0000000000000000000001   11000000
(b) 0 0111111111111111111111   11000000
(c) 1 00000001   11000000000000000000000
(d) 1 01111111   11000000000000000000000
(e) 0 01111111   11000000000000000000000

16) Given below are some statements associated with the registers of a CPU. Identify the correct statement(s) from among them.

(a) The Program Counter (PC) holds the memory address of the instruction in execution.
(b) Only Op-Code is transferred to the Control Unit.
(c) An instruction in the Instruction Register (IR) consists of the Op-Code and the Operand.
(d) The value of the Program Counter (PC) is incremented by 1 once its value has been read to the Memory Address Register.
(e) The instruction is transferred to the Memory Buffer Register (MBR) from the Main Memory before it is transferred to the Instruction Register (IR).

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

    (i)   difference engine
    (ii)   analytical engine
    (iii)   abacus
    (iv)   John Eckert
    (v)   John Atanasoff

One of the earliest calculating devices on record is the ……**A**……, which has been known to be widely used more than two thousand years ago. The first mechanical computer the ….**B**……, which was followed by the …**C**…. were invented by Charles Babbage. The first vacuum tube computer was invented by ……**D**…followed by the ENIAC invented by ….**E**…… and John Mauchly.

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

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

(a) The P6 (686) called the Pentium Pro processor was introduced in 1996.
(b) The EDVAC and the UNIVAC were the first commercially available computers.
(c) Intel's first semiconductor 1Kb memory was capable of storing 1024 bytes.
(d) Intel directly integrated the Level 2 cache into their processors in 1998.
(e) The forth generation computers incorporate microprocessors in their design.

19) Which of the following are the types of computer chassis available?

(a) Full tower	(b) Slimline	(c) Mega tower
(d) Deskpro	(e) Macro tower	

20) Following are some statements associated with processor slots and sockets. Identify the correct statement(s) from among them.

(a) Socket 7 supports Intel Pentium, Pentium MMX, AMD K7 and Cyrix 6x86.
(b) Socket 603 supports Intel Pentium 4 processors.
(c) Slot 1 supports Intel Pentium III processors and Intel Celeron processors.
(d) Socket 370 supports Intel Pentium III processors and Intel Celeron processors.
(e) Slot A supports the original AMD Duron processors.

21) Given below are some statements associated with computer memory. Identify the correct statement(s) from among them.

(a) A 168-pin DIMM has a data bus width of 128 bits.
(b) A 72-pin EDO SIMM has a data bus width of 64 bits.
(c) Some AMD Athlon motherboards have Level 3 cache memory.
(d) DDR SDRAM DIMMs and RDRAM RIMMs are interchangeable since they have the same data bus width.
(e) Main memory is typically installed as single inline memory modules, dual inline memory modules and Rambus inline memory modules.

22) Given below are some statements associated with the Width parameter of processors. Identify the correct statement(s) from among them.

> (a) All Intel Pentium to Pentium IV processors have an 8 byte data I/O bus.
> (b) In Pentium processors, the internal data is of the same width as the data I/O bus.
> (c) A 20-bit address bus can access up to 1024 MB of memory.
> (d) The internal data bus are the wires which transfer data inside the processor.
> (e) The data I/O buses of the AMD Athlon and Duron processors read and write memory at the rate of 64 bits at a time.

23) Following are some statements associated with processor modes. Identify the correct statement(s) from among them.

> (a) The Virtual DOS machine in a DOS Windows environment is related to the Virtual mode of the processor.
> (b) The Protected mode of the processor deals with 32-bit instructions.
> (c) Virtual mode is used to support the backward compatibility of software.
> (d) Virtual mode is when a 32-bit program runs within a 16-bit environment.
> (e) Processors running on Virtual mode can access only up to 1MB of memory.

24) Given below are some statements associated with Cache memory. Identify the correct statement(s) from among them.

> (a) Cache memory is used to overcome the lack of speed of the main memory compared to the speed of the processor.
> (b) The Level 1 cache is always faster than the Level 2 cache.
> (c) The Level 2 cache is used to mitigate the dynamic slowdown every time a Level 1 cache miss occurs.
> (d) Level 2 cache comes as onboard only.
> (e) In modern day computers, the Level 2 cache is considered an internal cache.

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

> (a) There are no problems which could arise by overclocking the processor since there is always a margin allowed by the processor manufacturers.
> (b) A single cycle is the smallest element of time for the processor.
> (c) Jumpers can be used to set the speed at which the motherboard functions.
> (d) All modern processors after the 486DX run at some multiple of the motherboard speed.
> (e) Overclocking cannot be achieved by changing the voltage of the CPU.

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

> (a) Proprietary form factors are not recommended since they cause problems when upgrading.
> (b) The standard ATX power connector has 20 pins.
> (c) The NLX was designed to replace the non-standard LPX.
> (d) The ATX specification only allows the power supply fan to blow inwards, causing pressure inside the casing and thereby preventing dust from entering the system.
> (e) The mini-ATX and micro-ATX are two different form factors.

27) Identify the obsolete motherboard form factors from the following.

> (a) Baby-AT   (b) Full-size-AT   (c) NLX
> (d) LPX   (e) Micro-ATX

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 423
      (ii)   Socket 478
      (iii) Socket 462
      (iv) Slot 1
      (v)   Socket 7

28) Another name for Socket A, which supports the AMD Athlon and Duron processors, is …………….

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

29) The Pentium IV processors over 2GHz are supported by ……………………….

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

30) The original Pentium IV processor is supported by ………………….., which was introduced in October 2000.

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

31) Automatic voltage setting feature is not available on ………………. and earlier motherboard processor designs.

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

32) …………… supports Pentium II, Pentium III and Celeron processors.

(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) ISA is an 16MHz 8-bit bus.
(b) PCI is a 16MHz 32-bit bus.
(c) The modern processor bus is 128-bit wide and runs at 66MHz, 100MHz, 133MHz, 266MHz, 400MHz and 533MHz.
(d) AGP is listed as AGP 1x, AGP 2x, AGP 4x and AGP 8x according to their bus speeds which are multiples of 66MHz.
(e) The Processor bus is also known as the Front Side bus.

34) What are the requirements for Plug and Play (PnP) to function in a computer system?

(a) Plug and Play BIOS	(b) PCI bus	(c) Plug and Play operating system
(d) Plug and Play hardware	(e) Plug and Play CMOS	

35) What are the possible BIOS sources?

(a) Adapter card ROM	(b) Network	(c) PCMCIA cards
(d) Motherboard ROM	(e) Loaded to RAM from a disk	

36) Given below are some statements associated with the BIOS and the CMOS. Identify the correct statement(s) from among them.

(a) The BIOS settings are stored in the CMOS.
(b) SCSI adapters have their own BIOS.
(c) A battery provides power to the CMOS.
(d) The CMOS chip got its name from the technology used to manufacture it.
(e) The CMOS is referred to as the NVRAM.

37) Given below are some statements associated with computer memory. Identify the correct statement(s) from among them.

(a) The cost of SRAM is less than that of DRAM.
(b) DRAM uses a cluster of transistors to store each bit of data.
(c) Data on a DRAM needs to be refreshed every 15 milliseconds.
(d) The density of SRAM is higher than that of DRAM.
(e) The access time of DRAM is less than that of SRAM.

38) Following are some statements associated with IDE bus versions. Identify the correct statement(s) from among them.

(a) The last Parallel AT Attachment version is ATA-8.
(b) SATA is the latest available version of the IDE bus.
(c) The abbreviation SATA stands for Super-AT Attachment.
(d) Parallel ATA is IDE based on 16-bit ISA.
(e) Ultra-DMA is an improved version of parallel ATA.

39) Given below are some statements associated with IDE cables. Identify the correct statement(s) from among them.

(a) An IDE cable may have 40 pins.
(b) An IDE cable's 20th pin is disabled
(c) An IDE cable may have 80 pins.
(d) Pin 1 and pin 40 are adjacent to each other in an IDE cable.
(e) The highlighted wire indicates pin 1 in an IDE cable.

40) Following are some statements associated with a Dual-drive ATA configuration. Identify the correct statement(s) from among them.

(a) Only the drive that needs to be set as Master is configured as CS.
(b) A jumper in the Jumper Park (PK) position is identified as CS.
(c) Both drives receive all commands from the system.
(d) A drive can work as a Master drive, Slave drive or Cable Select drive.
(e) In a Cable Select (CS) configuration, the drive that receives signals on pin-28 becomes the Master Drive.

41) Following are some statements associated with a Small Computer System Interface (SCSI). Identify the correct statement(s) from among them.

> (a) SCSI Ultra5 has a faster data transfer rate than parallel ATA/IDE.
> (b) Systems with an SCSI driver are easy to upgrade since any third-party SCSI drive will plug-in and function.
> (c) The SCSI is a high speed parallel bus.
> (d) The maximum number of devices on an 8-bit SCSI bus is 256.
> (e) The SCSI host adapter card in the computer is not a SCSI ID.

42) Following are some statements associated with FireWire and USB interfaces. Identify the correct statement(s) from among them.

> (a) Increasing the clock-speed in a serial connection is much easier than in a parallel connection.
> (b) The FireWire high-speed communication port is also referred to as the IEEE 1395 or the i.Link port.
> (c) The FireWire port is a high-speed serial communication port.
> (d) USB supports Plug and Play technology.
> (e) Serial connections have severe problems due to crosstalk between data wires.

43) Following are some statements associated with Serial and Parallel interfaces. Identify the correct statement(s) from among them.

> (a) The standard parallel port has a 4-bit data input and a 4-bit data output.
> (b) Parallel ports can transfer 4 bits at a time.
> (c) The standard serial ports have synchronous communication.
> (d) COM port is another name for the standard serial port.
> (e) IEEE 1284 is a parallel port standard.

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

Number of cylinders = 16,384
Number of heads = 80
Number of sectors = 63
Size of a sector = 512 bytes
Number of discs = 40

What is the capacity of this particular hard disk?

(a) 21.139 GB	(b) 40 GB	(c) 39.375 GB
(d) 19.688 GB	(e) 42.279 GB	

45) Consider the following four operations.

RAID 0	RAID 1	RAID 3	RAID 5
(i)	(ii)	(iii)	(iv)

The operation of mirroring the image of one hard disk to another is done by

(a) (i) only.	(b) (ii) only.	(c) (ii), (iii) and (iv) only.
(d) (iii) and (iv) only.	(e) All.	

46) Following are some statements associated with computer Outputs. Identify the correct statement(s) from among them.

> (a) The modem is an output device.
> (b) Hardcopy refers to a printed output.
> (c) Text, graphics, sound and video are the only types of outputs.
> (d) A copy stored in the hard disk is referred to as a hardcopy.
> (e) A copy on a CD falls into the softcopy category since it can be displayed or is in audio/video form.

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

	Column X		Column Y
(i)	Rotational latency time	A	Moves the arms with the read/write heads
(ii)	Actuator	B	The time to wait for a particular sector
(iii)	Spindle	C	Average time to locate a cylinder and a specific sector on the drive and begin reading/writing
(iv)	Seek time	D	Average time to locate a cylinder on the drive
(v)	Access time	E	Rotates the discs

The correct matching is:

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

48) Which of the following connectors can be used to connect a computer to a Local Area Network?

> (a) RJ-45   (b) RJ-11   (c) DB-50
> (d) RJ-12   (e) DB-15

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

> (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.

50) Which of the following tests can be used to identify problems when software does not run correctly?

> (a) Check to see whether the latest drivers are installed.
> (b) Reseating the memory modules (SIMMs, DIMMs or RIMMs).
> (c) Scan the system for viruses using the latest antivirus software.
> (d) Remove bootable floppy disks from the floppy drive.
> (e) Clear the CMOS settings and run Setup.

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