

Review Questions on "WIntel" Computer Hardware

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1. What is the difference between the earlier **Interrupt Address Table** and the (current) **Interrupt Descriptor Table**?

2. Calculate the bandwidth of each of the following buses:

Bus Name	Cycle Rate (MHz)	Width (bits)	Bandwidth (MB/sec)
Original PC	4.77	8	
PC/AT (ISA)	8.33	8 or 16	
Micro Channel Architecture (MCA)	20 or 40	16 or 32	
EISA	8.33	32	
VESA Local (VL)	33.33	32	
PCI (early version)	33.33	32	
PCI (later version)	66.66	64	
Accelerated Graphics Port (AGP)	133.33	64	

3. What operations are performed on a floppy disk by the formatting program?

4. What additional operations are carried out if the floppy disk is formatted as **Bootable**?

5. What are the principal performance areas that can lead to floppy drive malfunction?

6. Calculate the capacity of each of the following hard disk drives:

Answer:

Number of Tracks	Number of Heads	Sectors/ Track	Bytes	Mbytes	Gbytes
855	7	17	52,093,440	49.68	

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1,024	5	26	68,157,440	65	
900	15	17	117,503,984	112.06	
1,023	15	17	133,562,868	127.4	
4,096	18	72	2,717,908,992	2,592	

7. What is **zone bit recording**?
8. What are the three modes in which BIOS can support a hard drive?
9. What are the three principal commands of the DEBUG utility, and what does each of them do?
10. For each disk drive, calculate the number of clusters and the size of the FAT.

Answer:

Number of Tracks	Number of Heads	Sectors/Track	Bytes	Cluster Size	# of Clusters	Sectors in FAT
855	7	17	52,093,440	2,048		
1,024	5	26	68,157,440	2,048		
900	15	34	235,007,968	4,096		
2,048	15	34	1,069,567,520	16,384		
4,096	15	64	2,013,265,920	32,768		

*There appears to be an arithmetic error here. Why?

Answers to Selected Questions:

1. What is the difference between the earlier **Interrupt Address Table** and the (current) **Interrupt Descriptor Table**?

Answer: See Andrews page 122.

2. Calculate the bandwidth of each of the following buses:

Answer:

Bus Name	Cycle Rate (MHz)	Width (bits)	Bandwidth (MB/sec)
Original PC	4.77	8	2.39
PC/AT (ISA)	8.33	8 or 16	8.33 or 16.66
Micro Channel Architecture (MCA)	20 or 40	16 or 32	
EISA	8.33	32	33.33
VESA Local (VL)	33.33	32	133.33
PCI (early version)	33.33	32	133.33
PCI (later version)	66.66	64	533.33
Accelerated Graphics Port (AGP)	133.33	64	1,066.66

3. What operations are performed on a floppy disk by the formatting program?

Answer:

Delimits and marks Tracks and Sectors (all written with F6h).
Creates the **master boot record**.
Creates the **File Allocation Table (FAT)** — two copies.
Creates the **root directory**.

4. What additional operations are carried out if the floppy disk is formatted as **Bootable**?

Answer:

For DOS/Windows 3.1/3.11/95/98, three files are also copied to the disk:

MSDOS.SYS
IO.SYS
COMMAND.COM

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5. What are the principal performance areas that can lead to floppy drive malfunction?

Answer:

Azimuth skew
Hub Centering
Hysteresis
Radial Alignment
Rotational Speed
Sensitivity

6. Calculate the capacity of each of the following hard disk drives:

Answer:

Number of Tracks	Number of Heads	Sectors/Track	Bytes	Mbytes	Gbytes
855	7	17	52,093,440	49.68	
1,024	5	26	68,157,440	65	
900	15	17	117,503,984	112.06	
1,023	15	17	133,562,868	127.4	
4,096	18	72	2,717,908,992	2,592	2.53

7. What is **zone bit recording**?

Answer: See Andrews, page 198.

8. What are the three modes in which BIOS can support a hard drive?

Answer: CHS or Normal Mode, Large Mode, and LBA (Logical Block Address) Mode

9. What are the three principal commands of the DEBUG utility, and what does each of them do?

Answer: **Load**, **Dump**, **Enter**, and **Write**. For explanation of their usage, see Andrews' Table 5-1 on page 203.

10. For each disk drive, calculate the number of clusters and the size of the FAT.

Answer:

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Number of Tracks	Number of Heads	Sectors/Track	Bytes	Cluster Size	# of Clusters	Sectors in FAT
855	7	17	52,093,440	2,048	25,437*	100
1,024	5	26	68,157,440	2,048	33,280	130
900	15	34	235,007,968	4,096	57,375	225
2,048	15	34	1,069,567,520	16,384	32,640	128
4,096	15	64	2,013,265,920	32,768	61,440	240

*There appears to be an arithmetic error here. Why?