K.S.R. COLLEGE OF ENGINEERING (Autonomous)

SEMESTER – VII

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COURSE / LESSON PLAN SCHEDULE

NAME : K.KARUPPANASAMY
CLASS : IV-B.E ECE - A&B
SUBJECT : 16EC764 / COMPUTER HARDWARE AND INTERFACING

a) TEXT BOOKS :

1. Stephen J.Bigelow, "Troubleshooting, Maintaining & Repairing of PCs", Tata McGraw Hill, 5th Edition, 2008.
2. B.Govindarajulu, "IBM PC and Clones hardware trouble shooting and maintenance", Tata McGraw Hill, 12th Edition, 2008.

b)REFERENCES:

1. Mike Meyers,"Introduction to PC Hardware and Troubleshooting", Tata McGraw Hill,1st Edition,2005.
2. Craig Zacker& John Rourke, "The complete reference: PC hardware", Tata McGraw Hill, 1st Edition, 2007.
3. D.V.Hall, "Microprocessorsand InterfacingProgrammingand Hardware", McGraw Hill, 2nd Edition, 2006.
4. Mueller.S, "Upgrading and repairing PCS", Pearson Education, 21th Edition, 2013.

C)LEGEND:

L - Lecture PPT - Power Point
T - Tutorial BB - Black Board
OHP - Over Head Projector pp - Pages
Rx - Reference Ex - Extra

S. No	Lecture Hour	Topics to be covered	Teaching Aid Required	Book No./Page No
UNIT-I CPU AND MEMORY				
1	L1	CPU essentials - processor modes , modern CPU concepts	OHP	T_{X1}/pp429-431 T_{X1}/pp 431-436
2	L2	Architectural performance features	BB	T_{X1}/pp436-439
3	L3	CPU over clocking , over clocking the system ,over clocking the Intel processors	BB	T_{X1}/pp481-483, T_{X1}/pp 483-486, T_{X1}/pp 487-490
4	L4	Essential memory concepts -memory organizations	BB	T_{X1}/pp 856-857
5	L5	memory packages & modules	BB	T_{X1}/pp 857-872
6	L6	logical memory organizations	OHP	T_{X1}/pp 873-879
7	L7	memory types	BB	T_{X1}/pp 882-885
8	L8	memory techniques	BB	T_{X1}/pp 886-887
9	L9	selecting and installing memory **Multi core Technology**	BB	T_{X1}/pp 890-896
UNIT- II INPUT OUTPUT DEVICES AND PERIPHERALS				
10	L10 L11	Input- Output devices, Keyboard and mouse interfaces	OHP,BB	T_{X1}/pp836-845 T_{X3}/pp644-647 T_{X3}/pp 373-375T_{X3}/pp 376-381
11	L12	Display	BB	T_{X1}/pp 1011-1027
12	L13	Video and LCD displays	BB	T_{X3}/pp411-420
13	L14	CRT controller	PPT	R_{X2}/pp 147-149 R_{X2}/pp 622-627

14 15	L15 L16	Graphics controller, Audio / Video cards	OHP	R_{X1}/pp671-689 R_{X1}/pp 1302-1311
16	L17	Printers	BB	T_{X3}/pp 508-535 R_{X2}/pp 66-72
17	L18	Interface standards, **Scanners**	PPT	R_{X2}/pp 142-147
UNIT – III STORAGE DEVICES				
18 19	L19,L20 L21	Floppy Disks - Controllers and Standards	PPT+OHP	T_{X1}/pp 699-715
20	L22,L23	Hard disks - Formats -Controllers and Interface Standards	OHP	T_{X1}/pp 739-774
21	L24,L25	Optical disks - CDROM disks and drive formats	BB+OHP	T_{X1}/pp 237-269
22	L26	High capacity Magnetic storage techniques - RAID	BB	T_{X1}/pp 537-539 T_{X3}/pp 606-613
23	L27	Magnetic Tapes – Standards **Current Storage Devices**	BB+PPT	T_{X1}/pp 813-820 R_{X3}/pp 465-469
UNIT - IV PC ARCHITECTURE				
24	L28	Operating systems	BB+OHP	T_{X1}/pp52-65 R_{X2}/pp 46-47
25	L29	Boot Process	BB	T_{X1}/pp 72-75
26	L30	BIOS	BB+OHP	T_{X1}/pp 54-54
27	L31 L32	personal computer architecture Motherboard	BB+PPT	T_{X3}/pp 122-126 T_{X1}/pp 1039-1063
29	L33	Chipsets	BB+OHP	T_{X1}/pp 308-311 T_{X3}/pp 149-152
30	L34	Interfacing peripheral devices	BB+PPT	R_{X2}/pp 142-147
31	L35	Device drivers	PPT	http://en.wikipedia.org/wiki/Device_driver
32	L36	Introduction to other personal computers/work stations/Network computers **NVIDA Device drivers**	PPT	http://en.wikipedia.org/wiki/Workstation http://en.wikipedia.org/wiki/Network_Computer
UNIT - V SYSTEM BUS				
33	L37	Buses - Industry standard architecture	BB	T_{X1}/pp 220-236
34	L38, L39	Peripheral component interconnect - Accelerated graphics port	BB+OHP	T_{X1}/pp 232-237
35	L40,L41, L42,L43	I/O bus - communication Interface	BB	T_{X1}/pp 238-268
36	L44	Plug and play Systems	BB+OHP, PPT	T_{X1}/pp 1096-1115
37	L45	Small computer system interface concepts. **Lap/ Note book architecture**		

UNIT I - CPU & MEMORY

PART - A (2 MARKS)

1. What are the three types of busses? (Remembering)(CO1)

i) Data bus ii) Address bus iii) Control bus

2. What are the types of processor modes? (Remembering) (CO1)

To help the OS, we introduce two modes of operation.

User Mode: This is when un trusted processes run by the users are active.

Kernel Mode: This is when trusted processes that comprise the OS are active.

The kernel is literally the centre of the OS, the part that controls all others.
These modes allow the OS to offer a form of protection to the processes:
A bug in user mode, just affects that process. A bug in kernel mode, affects that whole computer.

3. What is meant by circuit size and die size? (Remembering) (CO1)

The **circuit size** or feature size refers to the level of miniaturization of the processor. To make more powerful processors, more transistors are needed. In order to pack more transistors into the same space, they must be continually made smaller and smaller. As processors get faster and denser, power consumption and heat generation become a big concern as well. Circuit size is a major limiting factor in processor speed, largely due to heat generation issues. It also has a major impact on die size.

The **die size** of the processor refers to its physical surface area size on the wafer. It is typically measured in square millimeters (mm^2). The importance of die size is rather obvious: the smaller the chip, the more of them that can be made from a single wafer. A larger die means fewer chips from the same wafer, and thus higher cost overall. A larger die also leads to increased power consumption. The three most important contributing factors to die size are the circuit size in microns, the process technology used and of course, the design of the processor itself.

4. Differentiate between CISC vsRISC CPUs. (Analyzing) (CO1)

CISC stands for Complex Instruction Set Computing. It is used in general purpose desktop and mobile computers. Any number of instructions to be used in the CPU to process instructions, it uses many no of transistors. **Example:** Intel Pentium MMX, AMD K6 devices

RISC stands for Reduced Instruction Set Computing. .It uses limited no of instructions to process a instruction. it requires less no of transistors. It is used in Highend Work Stations.

Example: DEC Alpha, Orion 4600 devices

5. What is the importance of over clocking? (Remembering)(June 2018) (CO1)

Over Clocking is **basically** reconfiguring a pc operating a CPU at higher clock speed than the particular CPU has been specified for.

6. What is meant by super pipelining? (Remembering) (CO1)

Super pipelining is technique that allows the Pentium pro to use out -of- order instruction execution, another method to avoid wasting clock cycles. The Pentium executes on first come first serve basis which means that it waits for all required data to process an earlier instruction instead of processing a later instruction sequencing or standard pipelining, the Pentium wastes what could otherwise be productive clock cycles executing no-op instructions.

7. What is meant by multiprocessing? (Remembering) (CO1)

Multiprocessing means the computer can do multiple processes parallel of each other (at the same time) with no performance degradation.

8. Give details about memory organization? (Understanding) (CO1)

All memory is basically an array organized as rows and columns. Each row is known as an address one million or more addresses might be on a single memory IC.The column represents data bits a typical high density memory IC has 1 bit, but might have 2 or 4 bits, depending on the overall amount of memory required.

9. What is pipelining? (Remembering) (CO1)

Pipelining: It allows a new instruction to start processing while a current instruction is still being is processed. This way CPU an actually works in several instructions during the same clock cycle.

10. What are the parameters related to CPU essentials? (Remembering) (CO1)

i. Buses- Data bus, address bus and control bus.
ii. Processor modes – Real mode, protected mode and Virtual real mode.

11. What are the concepts needed to work with today's PCs? (Remembering) (CO1)

i. Complex Instruction Set Computing (CSIC) VS Reduced Instruction Set Computing (RISC)
ii. Circuit Size and Die Size iii. Processor Speed iv. Versions and Steps
v. Processor power and management vi. Processor cooling vii. System Clocks
viii. Processor Packages ix. The P-Rating System

12. List some of the performance enhancing features found in a modern microprocessor. (Remembering) (Nov 2012) (CO1)

i.Superscalar Architecture ii.pipelining iii. Superpipeling
iv. Speculative Execution and Branch Prediction v. Dynamic Execution
vi.Register renaming and write buffers vii.Multiprocessing viii. MMX
ix. Multimedia Extensions x.3DNOW xi.SSE and SSE-II

13. What do you mean by CPU over clocking? (Remembering) (CO1)

The over clocking as a means of maximizing the performance of an existing CPU.Over clocking is the practice of reconfiguring a PC to operate at a higher clock speed than the particular CPU has been specified for. A system can be reconfigured to over clock a CPU in a matter of minutes simply by changing one or two jumpers on the motherboard.

14. What are the four critical elements of any PC that influence over clocking? (Remembering) (CO1)

i. Motherboard ii. System RAM ii. The CPU and iv. CPU Cooling.

15. What are the three basic steps requires to change the over clocking the system? (Remembering) (CO1)

i. Change the bus speed ii. Change the multiplier and iii. Change the supply voltage.

16.What are the different types of memory Packages? (Remembering)(CO1)(Dec 2015)

i.DIP(Dual Inline Package) ii.SIP (Single Inline Package) iii.SOJ(Small-Outline"j" Lead) iv.TSOP(Thin, Small-Outline Package) v.CSP(Chip Scale Package)

17. What are the different types of memory modules? (Remembering) (CO1)

i.SIMM(Single In-line Memory Module) ii.DIMM(Dul In-line Memory Module) and iii.RIMM (Rambus In-line Memory Module).

18.Classify different types of computer memory in use for memory organization.(Understanding)(June 2018) (CO1)

i. Conventional Memory ii Extended Memory (XMS)
iii. Expanded Memory (EMS) iv. UpperMemoryArea(UMA) v.High memory

19.What are the different types of memory? (Nov/Dec-2011, June 2016) (Remembering) (CO1)

i. BERO(Burst Extended Data Output RAM) ii.CDRAM(Cached RAM)
iii.DRAM(Dynamic Random Access Memory) iv. DDR SDRAM
v.EDO RAM(Extended Data Out RAM) vi.EDRAM(Enhanced DRAM)
vii. FPM DRAM(Fast –Page DRAM) viii.PC100/PC133 SDRAM
ix.SDRAM(Synchronous or Synchronized DRAM) x. RDRAM (Rambus DRAM)
xi.WRAM(Windows RAM). xii. SGRAM(Synchronous Graphics RAM)
xiii.VRAM(VideoRandomAccessMemory) xiv. SRAM(StaticRandomAccessMemory)

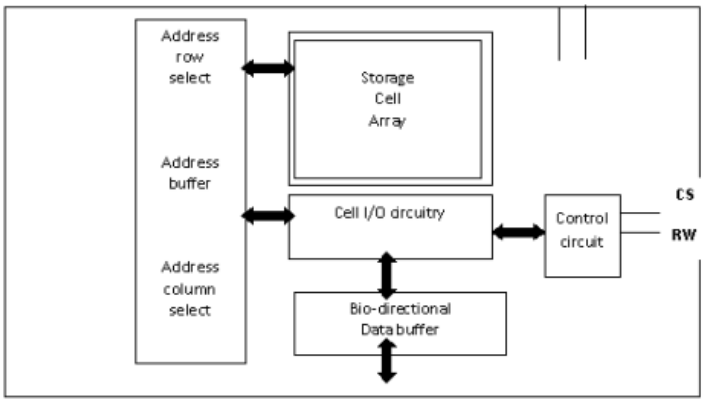
20. What are the four popular memory architecture in PCs? (Remembering) (CO1)

i. Paged memory ii. Interleaved memory iii. Memory Cache & iv Shadow Memory.

21. What is SIMM? (Remembering) (CO1) (Nov/Dec-2010)

A **SIMM**, or **single in-line memory module**, is a type of memory module containing random access memory used in computers. The first variant of SIMMs has 30 pins and provides 9 bits of data. The second variant of SIMMs has 72 pins and provides 32 bits of data (36 bits in parity versions).

22. Draw the block diagram of basic memory chip? (Remembering)



23. What are the advantages of protected mode? (Remembering) (CO1) (Nov/Dec2010)

Advantages of protected mode:

1. The protected mode offers full access to all of the systems memory
2. The protected mode has the ability to multi task, meaning that the os can manage the execution of multiple programs simultaneously.
3. The protected mode offers support for virtual memory, which allows the system to use the Hard disk to emulate additional system RAM when needed.
4. The protected mode offers faster(32/64 bit)access to memory and faster 32 bit drivers to Handle I/O transfers.

24. What are the general classifications of chassis? (Remembering) (CO1) (Nov/Dec 2010)

A computer case (also known as a computer chassis, cabinet, box, tower, enclosure, housing, system unit or simply case) is the enclosure that contains most of the components of a computer (usually excluding the display, keyboard and mouse).

Computer cases can be broadly classified into 2 different categories:

1. Desktop Case.
2. Tower Cases:
    1. Mini-sized Tower Cases
    2.Mid-sized Tower Cases
    3.Full-sized Tower Cases

25. List the typical failures associated with CPU over clocking.(Understanding) (CO1)(Nov/Dec-2009)

- Increasing the operation frequency of a component will usually increase its thermal output in a linear fashion, while an increase in voltage usually causes heat to increase quadratically. Excessive voltages or improper cooling may cause chip temperatures to rise almost instantaneously, causing the chip to be damaged or destroyed.
- More common than hardware failure is incorrect or unstable operation, which may require the computer to be restarted frequently and can cause loss of data, which may be relatively small or can destroy the entire file system.
- Exotic cooling methods used to facilitate over clocking such as water cooling are more likely to cause damage if they malfunction. Sub-ambient cooling methods such as phase-change cooling or liquid nitrogen will cause water condensation, which will cause damage unless controlled.
- Some products claiming to be intended specifically for over clocking do not serve any usual purpose and are simply a waste of resources; for example, additional cooling devices for components that do not run excessively hot

26. Differentiate between virtual and flash memory(Analyzing)(CO1)(Nov/Dec-2011, 2012)

Cache (pronounced *cash*) memory is extremely fast memory that is built into a computer's central processing unit (CPU), or located next to it on a separate chip. The CPU uses cache memory to store instructions that are repeatedly required to run programs, improving overall system speed. The advantage of cache memory is that the CPU does not have to use the motherboard's system bus for data transfer. Whenever data must be passed through the system bus, the data transfer speed slows to the motherboard's capability. The CPU can process data much faster by avoiding the bottleneck created by the system bus.

Flash memory (sometimes called "flash RAM") is a type of constantly-powered nonvolatile memory that can be erased and reprogrammed in units of memory called *blocks*. It is a variation of electrically erasable programmable read-only memory (EEPROM) which, unlike flash memory, is erased and rewritten at the byte level, which is slower than flash memory updating. Flash memory is often used to hold control code such as the basic input/output system (BIOS) in a personal computer. When BIOS needs to be changed (rewritten), the flash memory can be written to in block (rather than byte) sizes, making it easy to update. On the other hand, flash memory is not useful as random access memory (RAM) because RAM needs to be addressable at the byte (not the block) level.

26. Summarize the potential pit falls of over clocking. (Analyzing)(CO1)(Dec 2015)

Intermittent operation The added heat produced in the CPU can result in internal signal errors (a lost bit or shift of signal timing), which can easily cause the PC to crash—forcing you to power down the system until the CPU cools.

Shortened life span This is another heat-related problem. Rather than an immediate failure, excessive heat can shorten a CPU's life through a process of *electromigration*. Rather than a CPU working for ten years, it may work for only two years or five years (it's impossible to say for certain).

Outright failure A CPU is designed to operate from -25 to 80 degrees C. If the CPU is not cooled properly, the CPU die can exceed its maximum working temperature and fail. Though there are millions of transistors on a modern CPU, it only takes the failure of one or two to destroy a CPU.

27. What are the requirements of over clocking?(Remembering) (June 2016)

1. CPU 2.Motherboards 3.RAM 4. CPU cooling

PART - B (16 MARKS)

1**.** Processors are capable of operating in several different modes- explain any three processor modes**(Remembering)(CO1)(Nov/Dec-2012,June2018)**

2.What are the different factors which summarize the modern concept of CPU?**(Remembering)**

3. Describe the Architectural performance features? **(CO1) (Creating)(Nov/Dec-2011)(Dec 2015)**

4. Explain the concept of CPU over clocking? **(Remembering) (Nov/Dec-2011, 2012,Dec 2015,June 2016,June 2018)(CO1)**

5. What are the five package styles normally used from memory devices?**(CO1) (Remembering)**
6. Explain the three types of memory modules? **(CO1) (Nov/Dec-2012, June 2016)(Remembering)**
7. Explain the Logical memory Organization?**(CO1) (Remembering)(Nov/Dec 2010,Nov/Dec-2011,June 2016)**
8. Explain some of the current memory architecture and major issues surround them? **(CO1) (Evaluating) (Nov/Dec-2012)**
9. List out the traditional memory types and specialized memory devices. **(CO1)(Analyzing) (Dec 2015)**
10. Write the procedure for selecting and installing memory? **(Analyzing) (CO1)**
11. (a) (i) Discuss the importance features of the Pentium4 microprocessor**. (Creating)(Nov/Dec 2007)(CO1)**
(ii) Explain how the CPU, the motherboard, system RAM and CPU cooling influence CPU Overclocking. **(Evaluating)(CO1)**
(b) (i) Explain the different types of memory modules used in the PC.**(Remembering) (CO1)**
(ii) Explain the different types of specialized memory devices that have been tailored to Serve specific functions in the PC. **(Evaluating)(June 2018) (CO1)**
12.a) i)Describe theperformance enhancing features found in a modern microprocessor.**(Creating)(Nov2009) (CO1)**
ii) Explain the CPU over clocking. **(Remembering)(CO1)**
b) i) Explain the briefly the different memory types. **(Remembering)(CO1)**
ii) Explain the popular memory architectures that you will probably encounter in almost all systems. **(Evaluating)(CO1)**
13. Explain the essential components and its concepts **(Remembering)(CO1)(Nov/Dec 2010)**

UNIT- II I/O AND VIDEO PERIPHERALS

PART - A (2 MARKS)

1. What are the modes supported by the printer controller? (Remembering) (CO2)
Printer Controller supports two modes. Those are 1.Programme Mode 2.Interrupt Mode
2. What are the types of CRT display controllers available? (Remembering) (CO2)
1. Monochrome Display adapter 2.Color Graphics Display Adapter
3. What are the modules in printer? (Remembering) (CO2)
1. Printer-head mechanism 2.Carriage-movement mechanism 3.Paper feed mechanism 4.Control electronics 5.Interface logic 6.Power supply.
4. What are the different types of printers available in market? (Remembering) (CO2)
1. Drum printer 2.Thermal printer 3.Dot matrix printer 4.Inkjet printers 5.Laser printer 6.LED printers.
5. Whatare the printer characteristics? (Remembering)(June 2018)(CO2)
1. SPEED specified as CPS, LPM.it indicates how fast a printer works.
2. QUALITYspecified as Draft, NLQ/LQP.this implies how good the shape of the printed character is.
3. CHARECTERSETindicating the total number of data characters and control charactersrecognizedby the printer.
4. INTERFACEspecifying whether the printer recievescharecter from the printer in parallel from or in serial form.
5. BUFFERSIZEindicating how many data character can be stacked in the printer buffer memory printing.
6. PRINTmechanism specified as impact on all printer types.
7. PRINTMODEspecified as serial or parallel
8. PRINTSIZEspecified as character size and number of character per line
9. PRINT DIRECTION specified as uni or bi directional logic seeking.
6. What are the signals in keyboard interface? (Remembering) (CO2)
1. Keyboardclock (KBCLOCK) 2.the keyboard data (KBDATA) 3.signal ground
7. What are the resolve contention between CPU and CRTC? (Analyzing) (CO2)
1. Non –Display time access 2.Interlaced Memory Access
8. Define key matrix? (Remembering) (CO2)
A pcskeyboardessentiality an array of separate switches arranged on a grid called key matrix.
9. What is scan code?(Remembering) (CO2)
The processor in the keyboard reads the key matrix to determine which key is being depressed and converts that key value into scan code.
10. What is make code? (Remembering) (CO2)
When we press the key, the key board processor transmits the scan code of that key to the key board controller on the motherboard. This code is known as make code.

11. What is break code? (Remembering) (CO2)

When you release the key the processor transmits the scan code value plus 80h.this code is called the break code.

12. Whatare the different types of interface in pointing devices? (Remembering) (CO2)

1. Serial Port connections 2.Paralle Port connections 3.BUSconnections 4. Motherboard connections 5.USB connections

13. What is the use of mice? (Remembering)(CO2)

A mice is nothing but a pointing device. A user can specify a location on the computer display by "pointing" to it with movable cursor.

14. What is the use of video adapter's and different names of Video Adapter?(Remembering)(CO2)

The video adapters are interface between your computer and your monitor. It will increase the screen resolution and color depth of the monitor.

MDA- Monochrome Display Adapter **VGA** Video Graphic Array.
EGA EnhancedGraphic Adapter **CGA** Color Graphic Adapter.
SVGA Super Video Graphic Array. **XGA** Extended Graphic Array.

15. What is CRTC? (Remembering) (CO2)

Cathode Ray Tube Controller, generates the video timings and reads video data from a RAM attached to the CRTC, to output it via an external character generator ROM, (for text modes) or directly, (for high resolution graphics modes) to the video output shift register. Because the actual capabilities of the video generator depend to a large degree on the external logic, video generator based on a CRTC chip can have a wide range of capabilities. From very simple (text mode only) systems to very high resolution systems supporting a wide range of colours. Sprites however are normally not supported by these systems.

16.What is the meaning of Graphics Controller? (Remembering)(CO2)

A chip, also known as a **graphics coprocessor**, similar to a microprocessor ordinarily found on graphics accelerator cards. It processes the graphics to create dots and lines on-screen.

17.Define the video card? (Remembering) (CO2)

A video card, video adapter, graphics-accelerator card, display adapter or graphics card is an expansion card whose function is to generate and output images to a display. Many video cards offer added functions, such as accelerated rendering of 3D scenes and 2D graphics, video capture, TV-tuner adapter, MPEG-2/MPEG-4 decoding, FireWire, light pen, TV output, or the ability to connect multiple monitors (multi-monitor). Other modern high performance video cards are used for more graphically demanding purposes, such as PC games.

18.Define the soundcard?(Remembering) (CO2)

A **sound card** (also known as an **audio card**) is a computerexpansion card that facilitates the input and output of audio signals to and from a computer under control of computer programs. Typical uses of sound cards include providing the audio component for multimedia applications such as music composition, editing video or audio, presentation, education, and entertainment (games). Many computers have sound capabilities built in, while others require additional expansion cards to provide for audio capability.

19. What is LCD? (Remembering) (CO2)

A **liquid crystal display** (**LCD**) is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs do not emit light directly. LCDs therefore need a light source and are classified as "passive" displays. Some types can use ambient light such as sunlight or room lighting. There are many types of LCDs that are designed for both special and general uses. They can be optimized for static text, detailed still images, or dynamic, fast-changing, video content. They are used in a wide range of applications including: computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc..

20.Whatis mean by video display& its types? (Remembering) (CO2)

A device that accepts video signals from a computer and provides information in a visual form.

- Cathode ray tube (CRT)
    - Storage tube
- Bistable display
- Electronic paper
- Nixie tube displays
- Vector display
- Flat panel display
- Vacuum fluorescent display (VF)
- Light-emitting diode (LED) displays
- Electroluminescent display (ELD)
- Plasma display panels (PDP)
- Liquid crystal display (LCD)

- HPA display
- Thin-film transistor displays (TFT)

- Organic light-emitting diode displays (OLED)
- Surface-conduction electron-emitter display (SED) (experimental)
- Laser TV (forthcoming)
- Carbon nanotubes (experimental)
- Nanocrystal displays (experimental), using quantum dots to make vibrant, flexible screens.

Head-mounted display

21. Define aperture grilles. (Remembering) (CO2) (Nov/Dec 2010)

Aperture Grille (**tension mask**) is one of two major technologies used to manufacture color cathode ray tube (CRT) televisions and computer displays; the other is shadow mask.

22. What is color purity? (Remembering) (CO2) (Nov/Dec 2010)

Absence of undesired colors in the spot produced on the screen by each beam of a television color picture tube.

23. What is color depth? (Remembering) (CO2)

Color Depth or **bit depth** is the number of bits used to represent the color of a single pixel in a bitmapped image or video frame buffer. This concept is also known as **bits per pixel** (bpp), particularly when specified along with the number of bits used. Higher color depth gives a broader range of distinct colors.

Color depth is only one aspect of color representation (formally, the gamut: which colors can be expressed), expressing how finely *levels* of color can be expressed (formally, gamut depth); the other aspect is how *broad* a range of colors can be expressed. The RGB color model, as used below, cannot express many colors, notably saturated colors such as yellow. Thus, the issue of color representation is not simply "sufficient color depth" but also "broad enough gamut".

24. List the advantages of LED over LCD.(Analyzing) (CO2) (Nov/Dec2011)

I. LCD Blur Reduction
II. Improved Dynamic Contrast Ratio
III. Improved (larger) Color Gamut for more Lifelike Images
IV. Improved Reliability
V. Lower Power Consumption
VI. Environmental Benefits

25. List the disadvantages of CRT Controller. (Remembering) (CO2) (Nov/Dec 2011)

 Large size and weight, especially for bigger screens (a 20-inch (51 cm) unit weighs about 50 lb (23 kg)) High power consumption. On average, LCD monitors consume 50-70% less energy than CRT monitors. Generates a considerable amount of heat when running Geometric distortion caused by variable beam travel distances Can suffer screen burn-in Produces noticeable flicker at low refresh rates Small color displays, less than 7 inches diagonal measurement, are relatively costly. *The *maximum practical size* for CRTs is around 24 inches for computer monitors; most direct view CRT televisions are 36 inches or smaller, with regular-production models limited to about 40 inches

26. Compare mechanical and membrane type key boards.(Analyzing)(CO2)(Dec 2015)

Mechanical switch keyboard

1. Expensive(each key has a switch)
2. Greater tactility
3. Audible click when typing
4. 20 to 50 million strokes

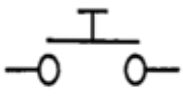
Membrane switch keyboard

1. Economical(one membrane = less parts)
2. Less tactility
3. Quiet
4. 1 to 10 million stokes

27. Draw the block diagram of key switch and mention its type.(Remembering)(CO2)(June 2016)

Types 1. Mechanical switch 2. Membrane switch

Block Diagram



Schematic symbol

28. Difference between daisy wheel printer and dot matrix printer.(Analyzing)(CO2)

Daisy wheel printer:

Daisy wheel printers are very similar to typewriters. The print element is a flat spoke wheel with characters embossed along the outer edge of spokes flat. The element spins rapidly, pausing only to allow the printing hammer time to strike the character against the ribbon or paper. Daisy wheel printers are letter quality printers but they tend to be slow and print at the rate of 25-55 cps.

Dot matrix printer:

Dot matrix printers produce images by striking and inked ribbon with tiny pins on a print head that passes over the page a line at a time. The main component of dot matrix printer is a print head that has the rows of electromagnetically activated pins, which create tiny dots on output media. Dot matrix printers are popular as they are inexpensive and have print speed of 100-600 cps.

PART - B (16 MARKS)

1. Describe the functionality of graphics controller? **(Creating) (CO2)**
2. Write short notes on audio and video cards with examples? **(Remembering) (CO2)**
3. Illustrate the printers types and its working nature. **(Understanding) (CO2) (Nov/Dec-2012,June 2018)**
4. Discuss the functionality of CRT controller? **(Creating) (CO2)(Nov/Dec-2011,Nov/Dec-2012,June 2016,June 2018)**
5. How to trouble shoot a CRT and color monitor?**(Evaluating)(CO2)**(**Nov/Dec 2010**)
6. Explain in detail about the mouse interface?**(Remembering) (CO2)(Nov/Dec-2011, 2012) (Dec 2015)**
7. Illustrate the keyboard interface with a example? **(Understanding) (CO2)(Nov/Dec-2011) (Nov/Dec-2012)(Dec 2015)**
8. Explain in detail about color monitor with neat diagram**(Remembering) (CO2)**(**Nov/Dec 2010**)
9. Discuss in brief about graphics controller? **(Creating) (CO2) (Nov/Dec-2011)**
10. Explain in detail about I/O devices.**(Remebering)(CO2)(June 2016)**
11. Describe the structures of video and LCD display.**(Creating)(Dec 2015)(June 2016)**

UNIT – III STORAGE DEVICES

PART - A (2 MARKS)

1. What is Pits and Land? (Remembering) (June 2018)(CO3)

In the CD /DVD ROM consist of these pits and land. When the data reading time a beam of light off the surface of disk and the sensor reads the reflected light. The surface of the disc consists of smooth area called land and rough area called as pits.

2. What is the mean by RAID? (Remembering) (CO3) (**Nov/Dec 2010**)

RAID- Redundant Array of Independent Disks. It is an easy and relatively inexpensive way to keep a system up running all the time. These are the different levels from RAID0-RAID7.

3. Whatare the types of erase techniques available in floppy disk? (Remembering) (CO3)

In floppy disk two types of erase techniques are available

1. Straddle erase 2.tunnel erase

4. What is the difference between the erase techniques in floppy disks?(Analyzing) (CO3)

Tunnel erase head, the erase operations is done after the write operation. In the straddle erase head, both are done simultaneously.

5. What are the electro mechanicalsubsystems in a hard disk types? (Remembering) (CO3)

1. read/write head 2.disks 3.spindle motor 4.position mechanism 5.air filters 6. Air circulation system

6. How the data is organized in hard disk? (Evaluating) (CO3)

A hard disk drive consists of magnetic tracks on which data is recorded. A track is subdivided into a number of sectors. Data is recorded on each sector.

7. What are the functions of FDC-IC? (Remembering) (CO3)

The functions as : 1.Genrating MFM format for the data to be recorded.

2. Decoding and executing commands, such as seek, read &format etc
3. Error detection by CRCC generating/checking
4. Datasynchronization.

8. What is the purpose of data bus? (Remembering) (CO3)

The purpose of the Data Bus: 1. CPU sends command to the HDC
2. CPU sends command parameters to the HDC 3.HDC sends status to the CPU

9.What are the information stored in sector buffer ? (Remembering)(CO3)

Sector buffer store the following information:1.Disk format information for a format command.
2.Drivecharectristics for a set parameters command.

10.What are the steps involved in installing a new hard disk? (Remembering) (CO3)

The steps involved in installing a new hard disk:

1.Physicalformatting (Low level formatting) 2.Partitionging. 3.LogicalFormating

11. What is meant by tracks, cylinders and sectors? (Remembering) (CO3)(Nov/Dec-2012)

In disk every concentric circle on a platter is known as **Track.** In disk every concentric circle on a platter is known as Track, and each surface is also spilt into pie-shaped wedges. The part of a track with in one of the wedge is called **Sector.** Each sector stores 512 bytes data. the number of tracks and sectors is the same for each surface of each platter in a particular hard drive. Each track is part of a **cylinder**.

12.What are the types of floppy disks? (Remembering) (CO3)

Floppy disks in 8 inch, 5¼ inch and 3½ inch forms mostly used before one decade.they have now been superseded by USB flash drives, external hard disk drives, CDs, DVDs, and memory cards.

13. What is Platter? (Remembering) (CO3)

In the entire storage devices platter will be present. where floppy disks use magnetic material applied over a thin, flexible substrate of Mylar, hard drive use rugged, solid substrates called platter.

14.What is mean by Magnetic Tape? (Remembering) (CO3)

Magnetic tape is a medium for magnetic recording, made of a thin magnetizable coating on a long, narrow strip of plastic. Most audio, video and computer data storage is this type.

15. What is magnetic media? (Remembering) (CO3)

Media is physical material that actually holds recorded information. In a floppy disk, the media is a small Mylar disk coated with a precisely formulated magnetic material often referred to as the Oxide layer.

16.Define retentivity? (Remembering) (CO3)

The ability of media to retain its magnetic information is known as retentivity.

17.Define coercitivity? (Remembering) (CO3)

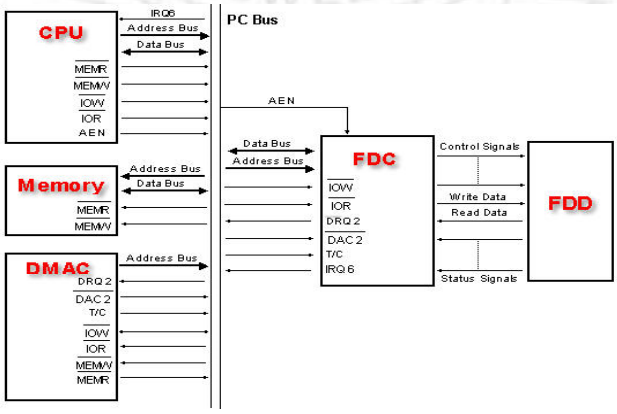
Coercitivity is the strength with which magnetic particles resist change.

18. What is meant by latency and seek time?(Analyzing) (CO3)

Latency: is the amount of time that it takes for the platter spin, bringing the sector to the right position. The faster the platter spin, the lower the latency.

Seek Time: is the amount of time that the drive takes to move the heads from one track to another, measured in milliseconds. This is a measure of speed at which the actuator physically moves the heads across the surface of the platters

19 Draw the Block diagram of FDC communication with the CPU and the FDD.(Understanding)(June 2018)(CO3)



20. What is meant by storage device? (Remembering)(CO3)

A storage device is a hardware device designed to store information. There are two types of storage devices used in computers; a 'primary storage' device and a 'secondary storage' device.

21. What are the features of winchester technology hdd? (Remembering) (CO3)

The features of wenchesterhdd:

1.Read/write heads and disks are contained in a sealed encloser.

2.The head diles very close to the hard disk less than 19 microinches.

3.The heads park on the parking Zone when the disk is not rotating.They take off and fly on a thin layer of air when the disk starts.No data is written in the landing Zone.

4.The surface of the disk is lubricated to prevent damage to heads or track.

22.What is FAT 32? (Remembering) (CO3) (**Nov/Dec 2010**)

It is a system of allocating disk files from Microsoft, using values of 32 bits instead of 16 bit values for FAT entries. The FAT32 file system enables partition sizes of anything up to 2 terabytes (TB).

23.What is SDRAM? (Remembering) (CO3) (**Nov/Dec 2010**)

DRAM is another of those powerful acronyms that describes a lot more than it sounds like it does. The letters stand for **Synchronous Dynamic Random Access Memory,** and it is a fast method of delivering computing capacity. SDRAM can run at 133 Mhz, which is much faster than earlier RAM technologies

24. Compare floppy disk and optical disk. (Analyzing) (CO3) (Nov/Dec-2011)

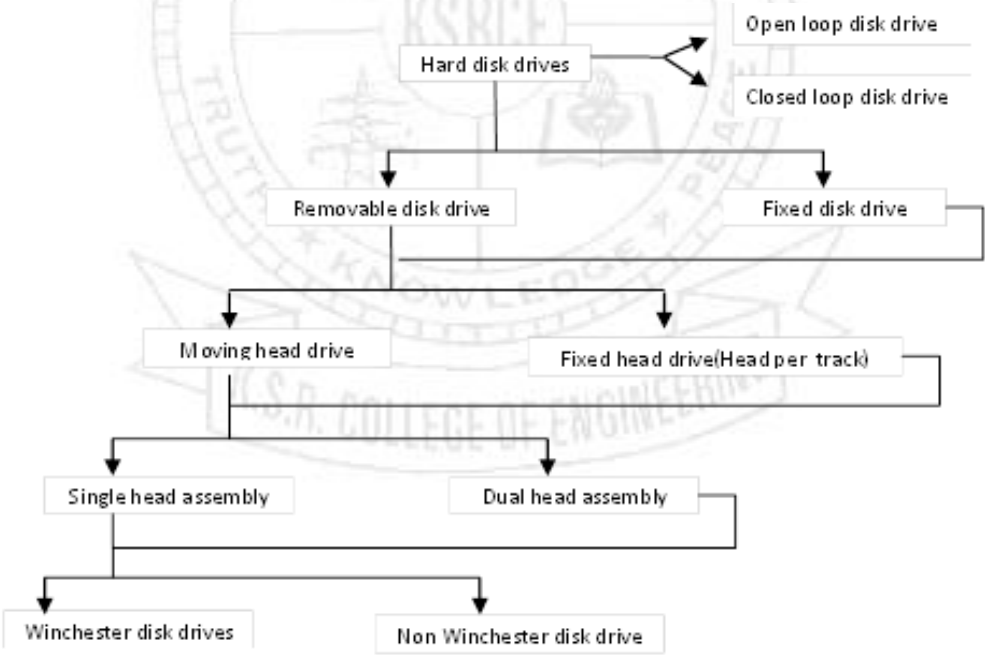
A **floppy disk** is a disk storage medium composed of a disk of thin and flexible magnetic storage medium, sealed in a rectangular plastic carrier lined with fabric that removes dust particles.Floppy disks, initially as 8-inch (200 mm) media and later in 5.25-inch (133 mm) and 3.5-inch (89 mm) sizes

A optical disc (OD) is a flat, usually circular disc which encodes binary data (bits) in the form of pits (binary value of 0 or off, due to lack of reflection when read) and lands (binary value of 1 or on, due to a reflection when read) on a special material on one of its flat surfaces. Optical discs are usually between 7.6 and 30 cm (3 to 12 in) in diameter, with 12 cm (4.75 in) being the most common size. A typical disc is about 1.2 mm (0.05 in) thick, while the track pitch (distance from the center of one track to the center of the next) is typically 1.6 µm

25. Justify if the magnetic tapes have more storage capacity (Evaluating) (CO3)(Nov/Dec-2012)(Nov/Dec-2011)

Magnetic tape data storage uses digital recording on to magnetic tape to store digital information. Modern magnetic tape is most commonly packaged in cartridges and cassettes. The device that performs actual writing or reading of data is a tape drive. When storing large amounts of data, tape can be substantially less expensive than disk or other data storage options. Tape storage has always been used with large computer systems. Modern usage is primarily as a high capacity medium for backups and archives. As of 2011, the highest capacity tape cartridges (T10000C) can store 5 TB of uncompressed data.

26. Draw the types of hard disk drives? (Remembering) (CO3)



27. What are the four necessary conditions to set the floppy jumpers? (Evaluating)(CO3)(Nov/Dec 2010)

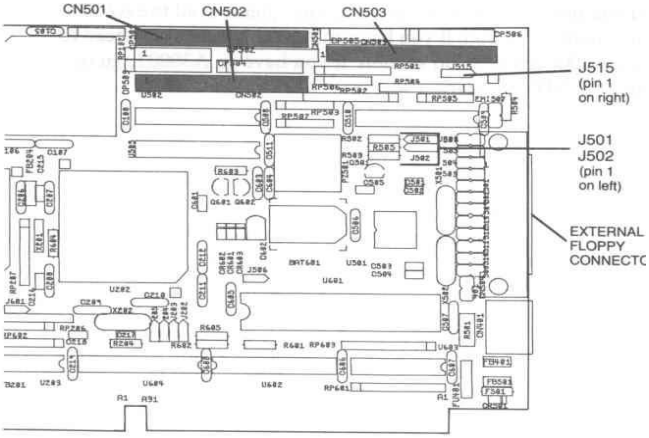
Once you have decided what type(s) of floppy drive(s) you will use with the Bridgeboard, you may need to set certain jumpers to inform the system of your setup. You should set the jumper(s) before installing the Bridgeboard in your Amiga.

The jumper locations are shown on the diagram below:If you are using a shared drive, you must set jumper 515 correctly. By default, the jumper will be set on pin 1 and 2 to indicate that drive DF0: is selected as the shared drive. If you wish to share drive DF1:, move the jumper so that it is covering pins 2 and 3.If you are using an internal 3.5-inch or 5.25-inch disk drive for PC use only, jumpers 501 and 502 must be set correctly. If you are using a PC drive(s), jumpers must be set on pin 1 and 2 of both J501 and J502.If you are using Amiga drive(s),

move the jumpers so that they are covering pins 2 and 3 of J501 and J502. Remember, if you are using two internal drives, they must both be the same type - either PC or Amiga

Floppy Drive Jumper Settings		
Drive	**Jumper**	**Setting**
Sharing drive DF0	J515	Pins 1 & 2
Sharing drive DF1	J515	Pins 2 & 3
Internal PC drive	J501 J502	Pins 1 & 2 Pins 1 & 2
Internal Amiga drive	J501 J502	Pins 2 & 3 Pins 2 & 3

Fig 1



Other Jumpers

Floppy drives may have a jumper on them to control Drive Select. Standard PC floppy drives are always set as DS1, and need not be adjusted. Amiga floppy drives have a jumper to set them for DF0: (DS0 position) or DF1: (DS1 position). If you are using an Amiga floppy drive as a shared drive, the jumper should be set at the DS1/DF1: position. See your floppy drive manual for details on setting the jumper.

There is also a jumper on the Amiga motherboard for indicating the number of internal drives in use. It should be set as normal for the number of Amiga floppies (including a shared floppy drive if any). If you are using a dual-speed Amiga floppy drive, consult its user guide for special information on this jumper.

28. Difference between hard sector format and soft sector format. (Analyzing)(June 2016)

Hard sector format:

Hard sectoring in a magnetic or optical data storage device is a form of sectoring which uses a physical mark or hole in the recording medium to reference sector locations.

Soft sector format:

A soft-sectored disk is a disk that has had its sectors mapped with a software program instead of a physical separation created on the disk.

29. Mention some special types of disk drive.(Remembering)(June 2016)

1.Hard Drives
2.Floppy Drives
3.CD-ROM CD-R CD-RW
4.DVD-ROM DVD-R DVD+R DVD-RW
5.Blue Ray
6.Removable Drives

PART - B (16 MARKS)

1. Explain about Data and Disk Organization of Floppy Disk and is interface **(Remembering) (CO3)(Dec 2015) (June 2018)**
2. Discuss the function of different RAID modes. **(Creating) (CO3)(Nov/Dec 2007) (Nov/Dec-2012) (June 2018)**
3. Explain the data formats of hard disk and CD formats? **(Remembering) (CO3) (Nov/Dec-2012) (June 2018)**
4. Describe the Hard Disk Controllerin detail? **(CO3) (Understanding) (Nov/Dec-2012)**
5. Illustratethe magnetic tape standards. **(Understanding) (CO3)**
6. Writeshort notes on Floppy Disk Controller? **(Remembering)(CO3)(Nov/Dec-2012)**

7. Describe the hard disk controller in detail? **(Remembering) (CO3) (Nov/Dec-2011)**
8. Explain floppy and LS 120 trouble shooting**(Remembering) (CO3)(Nov/Dec 2010)**
9**.** Explain in detail about the high capacity magnetic storage techniques with necessary diagrams?**(Understanding)(CO3) (Nov/Dec-2011)(Dec 2015)(June 2016)**
10**.** Detail description about the CD ROM standards and its characteristics**.(Creating)(Dec 2015)(June 2016)**
11**.** Write short notes on optical disk.(**Remembering)(Dec 2015)(June 2016)**

UNIT - IV PC ARCHITECTURE

PART - A (2 MARKS)

1. List out the advantages of CHIPSET. (Remembering)(CO4)

With the use of these custom –made chips(ASICs) PCs were able to drop their chip count, reduce construction costs, improve reliability and reduce power requirements.

2 Which device is called North Bridge? (Remembering) (CO4)

In a chipset, one chip is usually responsible for interfacing the CPU, main memory, local bus and the main system bus. This principle device is often called the North Bridge Chip.

3. Which device is called South Bridge? (Remembering) (CO4)

The ports and buses generally operate at speeds that are far slower than the front side bus, system support is provided through a second chip typically called the South Bridge. It handles the System peripherals and I/O bus operation.

4. Illustrate the function of BIOS/Define BIOS. (Understanding) (CO4)(Nov/Dec-2010, 2012)

The main functions of BIOS is 3 steps: 1) Post 2) Setup 3) System service routine

POST stands power on self test.

it checks the all devices and initialization of a each device which is connected to system.

SETUP it checks the configurations of CMOS and its routines to be initialized.

SYSTEM SERVICE ROUTINES are set off individual functions that at form the layer between hardware and the operating system.

5. Recall the two types of bridges in chipsets? (Remembering) (CO4)

i) South Bridge ii) North Bridge

6. What are chipsets? (Remembering) (CO4)

A chipset is a set of highly optimized, tightly inter-related IC's which, taken together, handle virtually all of the support functions for a mother board. As new CPU and hardware features are crammed in to a PC, new chip sets must be developed to implement those functions.

7. Summarize functions of BIOS when system turns on. (Understanding)(June 2018) (CO4)

When you turn on your computer, the BIOS does several things. This is its usual sequence:

1. Check the CMOS Setup for custom settings
2. Load the interrupt handlers and device drivers
3. Initialize registers and power management
4. Perform the power-on self-test (POST)
5. Display system settings
6. Determine which devices are bootable
7. Initiate the bootstrap sequence

8. What is operating system?and mention the differentoperating systems. (Remembering) (CO4)

The OS is a collection of different programs for performing the following functions

1. Handling user requests for various services. 2.scheduleing of programs.
3.I/O operations 4.Managing the hardware units.

Operating system types:

1. batchos 2.interactive os 3.time sharing os 4.multi tasking/multiprogramming os 5.real time os 6.multi process os

9. Compare Northbridge, Southbridge.(Analyzing) (CO4)

Northbridge: It connects the CPU's FSB to the high speed components of the system. It connects like Ram, AGP ports and other high speed peripherals.

Southbridge: It's responsible for interconnecting the CPU to the slower components of the system. Devices managed this chip includes IDE ports, USB ports, ISA ports.

10.Outline the function of POST. (Understanding) (CO4) (Nov/Dec-2010, 2012)

POST stands for - Power OnSelf Test. This is function of ROMBIOS chip.

When power is applied to CPU the first thing that it does is to execute the code located in memory address FFFFO(hex).this is the first line of post routine it is known as boot process. The first step of POST process is to perform a systems check to make sure all components are working are properly functioning. If anything fails it will send series of beeps to system speakers to inform the user that something has failed. The next step BIOS is plug and play or not. The PnP BIOS will scan for i/o addresses, IRQ lines and DMA channels needed.

11. List out the major steps involvedin boot process. (Remembering) (CO4) (Nov/Dec-2011)

The major steps involved in boot process:

1. Applying power 2.the bootstrap 3.core tests 4.post
5. find in the os 6.loading the os 7.establishing the environment

12.Illustrate the points to check the upgrading of motherboard.(Understanding) (CO4)

i). Compare features ii)Check dimension &mounting iii)Check CPU &Slot Location iv).Consider collateral upgrades v). Pros and cons of processor card upgrades vi).Pros and cons of traditional upgrades
vii) Pros and cons of daughter card upgrades viii) Check the costs

13.What is mother board?(Remembering)(June 2018) (CO4)

A computer motherboard is nothing but the circuit board or the circuit which controls the entire functioning of the computer. All the components that form your computer are connected to the computer motherboard. The computer processor, which is the most important component of your computer, is mounted on the computer motherboard. All other components like the computer keyboard, computer monitor,computer mouse, hard drives, etc., are all connected to the computer motherboard through cables.

14. Compare active, passive and modular motherboard. (Analyzing) (CO4)

S.No.	Active Motherboard	Passive Motherboard	Modular Motherboard
1.	Sophisticated Chips running on the motherboard	Little more than a board containing interconnecting slots. No major chips on the backplane.	More upgradable , serviceable and manufacturers often experiment with modular motherboard
2.	Comprehensive nature	Major components are fabricated onto a board that plays into one of the backplane slots.	Major chips on a replicable card .
3.	Difficult to upgrade	High performance architecture like PCI or AGP are not available.	It is not a popular motherboard because of today's motherboard support varity of CPU versions &RAM.

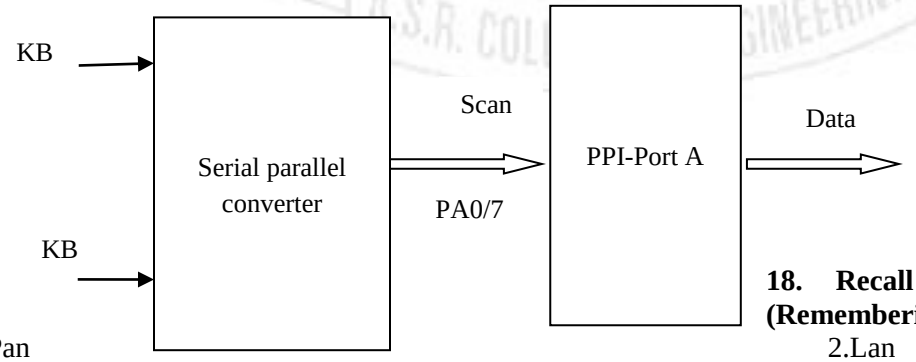
15. List out the types of mother boards based on dimensions. (Remembering) (CO4)

1.ATX 2.Baby AT 3. Full AT

16. Define computer network. (Remembering) (CO4)

A **computer network**, often simply referred to as a **network**, is a collection of computers and devices connected by communications channels that facilitates communications among users and allows users to share resources with other users. Networks may be classified according to a wide variety of characteristics.

17. Draw the keyboard interface diagram.(Remembering) (CO4)



Key board interface

18. Recall the types of networks. (Remembering) (CO4)

1.Pan 2.Lan 3.Han 4.Wan 5.Gan 6.Vpn

19. What is meant by work station? (Remembering)(CO4)

A **workstation** is a high-end microcomputer designed for technical or scientific applications. Intended primarily to be used by one person at a time, they are commonly connected to a local area network and run multi-useroperating systems. The term *workstation* has also been used to refer to a mainframe computer terminal or a PC connected to a network.

20.What is meant by PC?(Remembering) (CO4)

A PC is a microcomputer. A PC is a single-user system, designed to fit on a desk-top.

21. What is IO SYS? (Remembering) (CO4) (Nov/Dec-2010)

IO.SYS is an essential part of MS-DOS and Windows 9x. It contains the default MS-DOS device drivers (hardware interfacing routines) and the DOS initialization program

22. List the features of PC-DOS 7.0. (Remembering) (CO4) (Nov/Dec-2010)

The features include (for PC DOS 7):

- online help
- edit large text files
- draw boxes around text
- mouse and menu support
- record and play keystroke macros
- change case within a marked area
- access multiple files in multiple panes
- syntax-directed editing of C and REXX
- add and multiply numbers in a marked area
- locate and make a change globally within a file
- select text and move, copy, overlay, or delete it
- copy and move text from one file into another file

E for PC DOS consists of four files:

- E.EXE -- the executable program itself, (v3.13 in PC DOS 7)
- E.EX -- pre-compiled profile for E's behavior
- E.INI -- text file allowing modification of a few E.EX defaults
- EHELP.HLP -- text file used for E's **F1** key help in Browse (read-only) mode

23. Summarize the two types of motherboard connectors. (Understanding) (CO4)(Nov/Dec-2010)

Most motherboards have the following connectors:

- A serial port, for connecting old peripherals;
- A parallel port, mainly for connecting old printers;
- USB ports (1.1, low-speed, or 2.0, high-speed), for connecting more recent peripherals;
- **RJ45 connector** (called *LAN* or *ethernet port*) used for connecting the computer to a network. It corresponds to a network card integrated into the motherboard;
- **VGA connector** (called *SUB-D15*), for connecting a monitor. This connector interfaces with the built-in graphics card;
- **Audio plugs** (*Line-In*, *Line-Out* and *microphone*), for connecting sound speakers or a hi-fi system, as well as a microphone. This connector interfaces with the built-in sound card

24. Define CMOS. (Remembering) (CO4) (Nov/Dec 2010)

CMOS - Complementary metal-oxide semiconductor. Semiconductors are made of silicon and germanium, materials which "sort of" conduct electricity. The CMOS IC is the most popular type of digital IC because of its low power usage and high immunity to noise.

25. What is the use of system configuration utility in Windows 98.(Remembering) (CO4)(Nov/Dec 2010)

- ❖ System Configuration Utility (Msconfig.exe) replaces Sysedit from previous Windows versions and automates the routine troubleshooting steps that Microsoft Technical Support engineers use when diagnosing issues with the Windows 98 configuration. This tool permits you to modify the system configuration through a process of elimination with check boxes, reducing the risk of typing errors associated with Notepad and Sysedit.
- ❖ The System Configuration Utility provides a graphical interface for configuring the Windows 98 startup environment. System Configuration Utility lets you troubleshoot by creating a clean environment to test against. If a problem is not reproducible after performing a Diagnostic startup, a process of elimination can be used to identify the source of the issue.
- ❖ System Configuration Utility also can create a backup copy of your system files before you begin a troubleshooting session. Create backup copies of your system files to ensure that the modifications made during your troubleshooting session can be reversed.
- ❖ After visiting MSInfo to identify support issues, try using Safe Mode to isolate the problem. From here you can go to MSConfig to remove any variables involved.

26. What is meant by device driver?(Remembering) (CO4) (Nov/Dec-2011)

- A device driver is a program that controls a particular type of device that is attached to your computer. There are device drivers for printers, displays, CD-ROM readers, diskette drives, and so on
- A driver typically communicates with the device through the computer bus or communications subsystem to which the hardware connects. When a calling program invokes a routine in the driver, the

driver issues commands to the device. Once the device sends data back to the driver, the driver may invoke routines in the original calling program. Drivers are hardware-dependent and operating-system-specific.

27. Define BIOS Shadowing.(Remembering)(CO4) (June 2016)

The process of the contents of the ROM being copied to the RAM allowing the computer to access that information quicker is referred to as a BIOS shadow. This process is also known as Shadow BIOS ROM, Shadow Memory and Shadow RAM.

PART - B (16 MARKS)

1. Discuss the major responsibilities of North Bridge and South Bridge with neat diagram. **(Creating) (CO4)(Nov/Dec-2012)**
2. a) i)Describe the role of chip set in a system ii)Explain about Device Drivers.
   b)i) Explain the boot process.**(Understanding) (CO4)(Nov/Dec-2012, Nov/Dec-2009)(Dec 2015) (June 2016)**
3. Elaborate the functions of each blocks in personal computer architecture. **(Creating) (CO4)**
4. Illustrate the personal computer, work stations and network computers?**(Understanding) (CO4) (Nov/Dec-2012)**
5. Discucss a trouble shooting amother board and upgrading a mother board.**(Creating) (CO4)** (**Nov/Dec-2010)**
6. Explain the variousstandards in PC architecture.**(Understanding) (CO4)**(**Nov/Dec-2010)**
7. What is BIOS? Explain in detail about BIOS booting steps in INTEL processors? **(Remembering)(CO4) (Nov/Dec-2011, 2012)(Dec 2015)**
8. Explain in detail about architecture of AMD motherboard with neat diagrams. **(Understanding) (CO4) (Nov/Dec-2011)(Dec 2015) (June 2018)**
9. Discuss the issues present in BIOS shortcoming and compatibility problems.**(CO4)(Creating)(June 2016)**

UNIT - V SYSTEM BUS

PART - A (2 MARKS)

1. Summarize the three things needed to use for pnp? (Understanding) (June 2018) (CO5)

1. The PC has to be ready to do PnP. 2. The adapter card has to enabled for PnP
3. The OS must be able to support PnP.

2.Compare the general difference between AGP and PCI. (Understanding) (CO5)

PCI stands for '**Peripheral Component Interconnect**'. PCI as a technology to connect graphics cards to a computer's motherboard. PCI is still used to connect other devices like Ethernet and sound cards.

AGP stands for '**Accelerated Graphics Port**'. AGP interface can actually use your computer's standard memory as well as the video memory to help boost video performance. AGP slots provide a dedicated link between the card and the CPU and thus providing faster communication between them.

3. Interpret the features of PCI bus? (Understanding) (CO5) (Nov/Dec-2011)

- 32 bit PCI bus with Plug and Play (PnP) features.
- Eight RS232 ports or RS422/RS485 ports for asynchronous communications.
- Suitable for SCO UNIX, Linux, MS/DOS, Windows NT/2000/XP, Windows 95/98ME, MS/WINDOWS, OS/2 ... etc.
- Pentium hardware compatibles.
- Baud rate up to 115200 for normal speed mode and up to 460K for high speed mode.
- Provides 16550 or 16650 port that contains FIFO for each port.
- Up to 4 boards be installed in one computer system.
- Software compatible with PCCOM98/2000/XP.
- Operating temperature 0 to 60
- Professional serial COM technology technical support and design.

4. What is meant by bus and recall its purpose. (Remembering) (CO5)(Nov/Dec 2010)

A **bus**, in computing, is a set of physical connections (cables, printed circuits, etc.) which can be shared by multiple hardware components in order to communicate with one another.

The purpose of buses is to reduce the number of "pathways" needed for communication between the components, by carrying out all communications over a single data channel. This is why the metaphor of a "data highway" is sometimes used.

5. What are the types of buses and explain. (Remembering) (CO5)

Here are generally two buses within a computer:

- The **internal bus** (sometimes called the *front-side bus*, or *FSB* for short). The internal bus allows the processor to communicate with the system's central memory (the RAM).
- The **expansion bus** (sometimes called the *input/output bus*) allows various motherboard components (USB, serial, and parallel ports, cards inserted in PCI connectors, hard drives, CD-ROM and CD-RW drives, etc.) to communicate with one another. However, it is mainly used to add new devices using what are called expansion slots connected to the input/outpur bus.

6. What is (ISA) Industry standard architecture? (Remembering) (CO5)

The original version of the ISA bus (*Industry Standard Architecture*) that appeared in 1981 with PC XT was an 8-bit bus with a clock speed of 4.77 MHz.

The ISA bus permitted bus mastering, i.e. it enabled controllers connected directly to the bus to communicate directly with the other peripherals without going through the processor. One of the consequences of *bus mastering* is direct memory access (DMA). However, the ISA bus only allows hardware to address the first 16 megabytes of RAM. Up until the end of the 1990s, almost all PC computers were equipped with the ISA bus, but it was progressively replaced by the PCI bus, which offered a better performance.

7. What is (PCI) peripheral component Interconnect? (Remembering) (CO5)

The PCI bus (*Peripheral Component Interconnect*) was developed by Intel on 22 June 1992. Contrary to the VLB bus, it is not so much a traditional local bus but rather an intermediate bus located between the processor bus (*Northbridge*) and the I/O bus (*Southbridge*).

8. What is (AGP) Accelerated Graphics port? (Remembering) (CO5)

The AGP bus is directly linked to the processor's **FSB (***Front Side Bus*) and uses the same frequency, for increased bandwidth. The AGP interface was developed specifically to connect with the video card, by opening a direct memory access (**DMA**) channel to the graphics board, bypassing the input-output controller. Cards which employ this graphics bus theoretically require less on-board memory; because they can directly access graphical data (such as textures) stored in central memory, their cost is hypothetically lower.

9. What is SCSI? (Remembering) (CO5) (Nov/Dec 2010)

The **SCSI** standard (*Small Computer System Interface*) is an interface used to connect several different types of peripherals to a computer via a card, known as the **SCSI adaptor** or **SCSI controller** (generally connected using a PCI connector).

The number of peripherals that can be connected depends on the width of the SCSI bus. With an 8-bit bus, 8 physical units can be connected and 16 for a 16-bit bus. Since the SCSI controller represents a separate physical unit, the bus can therefore accommodate 7 (*8-1*) or 15 (*16-1*) peripherals.

10. Classifythe PNP devices. (Analyzing) (CO5)(June 2016)

1) ISA bus cards 2) Micro Channel (MCA) bus cards 3) PCI bus cards
4) PC Card Devices 5) SCSI Controller Devices 6) Serial Port Devices
7) Parallel Port Devices 8) VESA local bus (VLB) cards 9) IDE Devices

11. Illustrate the purpose of PNPBIOS. (Understanding) (CO5)

A PNP system requires PNPBIOS –especially at boot itme.because PnP devices initializes in the inactive state by default, the PNP bios is needed to initialize the core PNP devices to complete the POST and launch the operating system

12. Analyze the upgrading solutions (tips) for SCSI. (Analyzing) (CO5)

1) Add only add one SCSI device at a time.2) Record the host adapter's resources.
3) Use good quality cabling.

13. Name the signal wiring techniques for SCSI. (Remembering) (CO5)

1) Single – Ended. 2) Differential – Ended.

14. Differentiate AGP and PCI. (Analyzing) (CO5)

- Deeply pipelined memory read and writes opertions.This hides Memory access latency.
- Demultiplexing of the address and data on the bus, allowing almost100 percent bus efficiency.
- New AC timing for the 3.3V electrical specification that provides for one or two data transfer per 66MHZ clock cycles, allowing for real data throughput in excess of 500MB/s.

- A new low-voltage electrical specification that allows four data transfer per 66MHZ clock cycle, providing real data throughput of over 1GB/s.
- The bus slot defined for AGP uses a new connector body that is not compatible with the PCI and AGP boards are not mechanically interchangeable.

15. Recall the types of ISA buses. (Remembering) (June 2018) (CO5)

1) 8 – BIT ISA. 2) 16– BIT ISA.

16. Interpret the major functions that must be handled by operating system for the PNP components? (Understanding) (CO5)

- Identification of installed devices.
- Determination of devices resource requirement.
- Creation of a complete system configuration, eliminating all resource conflicts.
- Loading of device drivers, Notification of configuration changes.

17. How many SCSI standard device types are available? (Remembering) (CO5)

1) Random access devices 2) Read only random access devices 3) Printers
4) WORM (write once read many) 5) Sequential access 6) Processors.

18. Give a set of SCSI communication examples. (Understanding) (CO5)

Bus free phase: The system is idle.
Arbitration phase: A device takes control is selected.
Select phase: The desired device is selected.
Message – out phase: The target set up data transfer.
Command phase: Commands are exchanged between the target and initiator.
Data-in phase: Data is exchanged between target and initiator.
Status phase: Results of the exchange are reported.
Message – in phase: Devices report that the exchange is complete.
Bus free: The system is idle.

19. What is PCI EXPRESS? (Remembering) (CO5)

PCI Express is a new high speed I/O bus .PCIEXPRESS1.0, PCIEXPRESS 2.0, PCIEXPRESS2.1& PCIEXPRESS 3.0 are four versions of PCI express. Themax data rate as 8gigabits/sec.

20. Outline the purpose of plug and play device. (Understanding) (CO5)(Nov/Dec-2012, 2011)

The ISA bus is interface simple and cheap but it requires the use of set of IRQ.the previous adapter cards designed for micro channel (MCA), EISA or ECI also IRQ wires.however, the reset of the interface to advanced bus structure is expensive. The solution to this problem is a new arrangement called PnP.

21. List out the advantages of plug and play devices. (Remembering) (CO5)(Nov/Dec-2010, 2012)

The PC is easier to use since users do not have to worry about switches, jumpers, hardware conflicts or loading drivers manually. Supports a wide range of device types.

- For PC vendors, Plug and Play can provide cost reductions. As many as 50% of technical support calls result from installation and configuration problems. By making operations easier and automatic, manufacturers can achieve lower support costs and pass these saving to their user. Dynamically loads, initializes, and unloads drivers.
- Plug and Play provides a common platform that enables PC vendors to develop innovative features and differentiate their products from others.
- Notifies other drivers and applications when a new device is available.
- In conjunction with power management, handles stop and start processes for devices during hibernation, standby, and startup and shutdown operations.

22. Give any four advantages of 16 bit ISA over 8 bit ISA.(Remembering)(CO5)(June 2016)

- 16 bit data bus
- 24 bit address bus
- Five interrupts and four DMA channels
- MHz clock speed

PART - B (16 MARKS)

1. Discuss in detail about 8-bit ISA and 16-bit ISA buses. **(Creating) (CO5) (Nov/Dec-2012)**
2. Draw the PCI expansion bus diagram and explain.**(Understanding) (CO5) (Nov/Dec-2012)**
3. Draw&explainthe block diagram of AGP interface and connector and compare it with PCI. **(Understanding) (CO5) (June 2018)**

4. a) Elaborate the functions of the following: a) i) USB. ii) PCI. b) i) ISA. ii)SCSI**(Creating)(CO5) Nov/Dec-2009(Nov/Dec-2012)(Dec 2015) (June 2018)**

5. (a) Evaluate the functions of the signals on a PCI bus.**(Evaluating) (CO5)** (**Nov/Dec-2009**)**(June 2016)**

(b) Explain briefly the following1) Plug and Play devices 2) SCSI Concepts**(Understanding) (CO5)(Nov/Dec-2012)(Dec 2015)(June 2016)**

6. List out PnP devices types and identification also explain about PnP BIOS, PnP OS and mention essential elements (overview) of PnP. **(Remembering)(June 2018) (CO5)**

7. Discuss in detail about the current PCstandards and its architecture.**(Creating) (CO5) (Nov/Dec 2010)(Nov/Dec 2011)**

8. Explain the Bus standards adopted in PCS. **(Understanding) (CO5)(Nov/Dec 2010)**

9**.** Discuss the recent trends in PC architecture design?**(Creating) (CO5)(Nov/Dec 2011)**