

# COMPUTERS-II

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# **ECET-SYLLABUS**

- 1. Operating Systems:** Operating system concepts, functions, types, system calls – process management – CPU scheduling algorithms – deadlocks – memory management – overlays, paging, segmentation, virtual memory, page replacement algorithms – disk scheduling- free space management – allocation methods – disk scheduling algorithms.
- 2. RDBMS:** Need of database systems, data independence, Data models, E-R model – structure of relational database – normal Forms : 1st, 2nd, 3rd and BCNF – SQL – data types, operators, DDL and DML commands – views, sequences, synonyms, indexes and clusters – PL/SQL – data types, control structures, cursor management, exceptions, functions, procedures and packages
- 3. Object Oriented Programming Through C++:** Concept of OOPs - classes and objects Constructors and destructors - arrays, pointers, References - function overloading and operator overloading - inheritance - virtual functions - friend functions - this pointer - i/o manipulators - file and i/o functions.
- 4. Java Programming:** Java - data types, variables, operators, arrays - Classes and objects - methods - constructors, overloading - inheritance - Visibility mode - packages - interfaces - multithreading - exception handling - applets.
- 5. Internet Programming:** Internet fundamentals - HTML, tags, attributes, formatting text - Java script - data types. Operators - control structures- procedures, functions and arrays - PHP - data types variables, operators, control structures, arrays, functions, concept of accessing databases.,

## **Analysis of Previous ECET Papers**

YEAR	OPERATING SYSTEMS	RDBMS	OOPS THROUGH C++	JAVA PROGRAMMING	INTERNET PROGRAMMING
2009	7	12	8	5	5
2010	10	12	8	8	-
2011	7	12	-	15	-
2012	11	15	13	8	8
2013	15	10	10	10	10
2014	15	10	10	8	7
AP-2015	9	11	9	10	10
TS-2015	14	8	11	12	8
AP-2016	11	10	9	9	5
TS-2016	15	7	10	10	5
AP-2017	12	10	4	14	6
TS-2017	14	7	8	11	7
AP-2018	12	10	10	10	10
S-2018	14	8	10	10	8



# OPERATING SYSTEM

- Computer runs with Hardware and Software
- Software is classified into system software and Application software
- System software is sub divided into operating system. Compiler, linker etc.
- Operating System : An operating system is a program that manages the computer hardware. It also provides a basis for application programs and acts as an interface between the user and the computer hardware.
- **Various Operating System :**
  - ♦ Single User Operating System  
Eg : MS DOS
  - ♦ Single User Multitask Operating System (or) Batch Processing System  
Eg : WINDOWS 9X
  - ♦ Multi User Operating System (Time Sharing Systems and Interactive Systems)  
Eg : UNIX
  - ♦ Network Operating System (or) Distributed Systems  
Eg : WIN NT, NOVELL NETWARE
  - ♦ Multi Processor OS (or) Real Time Systems  
Eg : Computers which are used in Military, Satellites, Airforce, Weather forecasting etc
  - ♦ Cloud Computing
- Architecture specifies overall design how the data flow between the task
- In single user OS we use Monolithic architecture
- In Multiuser OS we use layered architecture
- **DISTRIBUTED SYSTEMS :**
  - ♦ A distributed system is a collection of physically separate, possibly heterogeneous computer systems that are networked to provide the users with access to the various resources that the system maintains.
  - ♦ The protocols that create a distributed system can greatly affect that systems utility and popularity

## → **BATCH OPERATING SYSTEM**

- ♦ The Monitor or Batch Operating System is simply a computer program. It relies on the ability of the processor to fetch instructions from various portions of main memory to alternately seize and relinquish control.
- ♦ Batch Processing is execution of a series of programs ("jobs") on a computer without manual intervention.
- ♦ Jobs are set up so they can be run to completion without manual intervention, so all input data is presented through scripts or command line parameters.
- ♦ This is contrast to "online" or interactive programs which prompt the user for such input.
- ♦ A program takes a set of data files as input, process the data, and produces a set of output data files.
- ♦ This operating environment termed as "batch processing" because the input data are collected into batches of files and are processed in batches by the program.

## → **Time sharing Operating System (TSOS) :**

- ♦ In time sharing OS, processor time is shared among multiple users.
- ♦ Multiple users access the system through terminals, with the OS interleaving the execution of each user program in a short burst or quantum of computation.
- ♦ TSOS was the first operating system that supported virtual addressing of the main storage.
- ♦ Time sharing is sharing a computing resource among many users by means of multiprogramming and multitasking
- ♦ It is a mode of operation that allows multiple independent users to share the resources of a multiuser computer system, including the CPU, bus and memory.

## Real Time Operating System :

- ◆ A real time operating system (RTOS) is an operating system intended to serve real-time application requests.
- ◆ A key characteristic of an RTOS is the level of its consistency concerning the amount of time it takes to accept and complete on an applications task ; the variability of jitter.
- ◆ A hard RTOS has less jitter than a soft RTOS. The chief design goal is not high throughput, but rather a guarantee of a soft or hard performance category.
- ◆ An RTOS that can usually or generally meet a deadline in a soft real-time operating system if it can meet a dead line deterministically it is a hard RTOS
- ◆ An RTOS has an advanced algorithm for scheduling key factor in a RTOS are minimal interrupt latency and minimal thread switching latency.

## Operating System Services :

- ◆ User Interface
- ◆ Program Execution
- ◆ File-system manipulation
- ◆ I/O operations
- ◆ Communications
- ◆ Error detection & Response
- ◆ Resource Allocation
- ◆ Accounting
- ◆ Protection and security
- ◆ System Access

There are two fundamental approaches for users to interface with the operating system

- 1) Command Interpreter
- 2) Graphical User Interface

Eg : MS- DOS and UNIX

Eg : Windows, Linix etc.

A portion of the operating system is in main memory. This includes the **kernel or nucleus**, which contains the most frequently used functions in the operating system and at a given time, other portions of the operating system currently in use.

**System Calls :** The system call is the means by which a process requests a specific kernel service. There are several hundred system calls, which can be roughly grouped into 6 categories:

*After garden*  
File system, Process, Scheduling, Socket  
(Networking), Inter Process Communication and  
Miscellaneous.

## Micro Kernel :

- ◆ It provides minimal process and memory management and communication facility
- ◆ The main function is to provide a communication facility between the client program and various services that are also running in user space.
- ◆ The benefit of microkernel is ease of extending the operating system.
- ◆ The first generation microkernels, like, Mach are fat and provide lots of services or multiple ways to do the same thing
- ◆ The second generation micro kernels more follow the "pure" microkernel ideal : kernel; with a very small foot print. Eg : 14 & QNX

## Operating System Components :

- ◆ Processes
- ◆ Memory Management
- ◆ Information protection and Security
- ◆ Scheduling and Resource Management
- ◆ System Structure

The procedure of starting a computer by loading the kernel is known as **booting** the system.

In most computer systems, a small piece of code known as the **boot strap program** or **boot strap loader** locates the kernel, loads it into main memory, and starts its execution.

## Process Management

- ◆ A process is a program in execution
- ◆ Systems consist of a collection of processes : Operating system processes execute system code, and user processes execute user code. All these processes may execute concurrently.
- ◆ A process is more than the program code, which is sometimes known as the **text section**
- ◆ A process generally also include the process stack, data section and heap.

**Process State :** As a process executes, it changes state. The state of a process is defined in part by the current activity of that process.

- ◆ Each process may be in one of the following states.

- ♦ **New** : The process is being created
- ♦ **Running** : Instructions are being executed.
- ♦ **Waiting** : The process is waiting for some event to occur
- ♦ **Ready** : The process is waiting to be assigned to a processor
- ♦ **Terminated** : The process has finished execution

⇒ **PROCESS CONTROL BLOCK (PCB)** :

- ♦ Each process is represented in the operating system by a process control block (PCB) also called a **task control block**.
- ♦ It contains many pieces of information associated with a specific process.
- ♦ A process is a program that performs a single thread of execution.

⇒ **SCHEDULING** :

- ♦ Scheduling is the method by which threads, processes or data flows are given access to system resources (Eg : Processor time, communication bandwidth)
- ♦ The need for a scheduling algorithm arises from the requirement for most modern systems to perform multitasking and multiplexing.

⇒ **PROCESS SCHEDULING** : The process scheduler selects an available process for program execution on the CPU

The main aim of processor scheduling is to assign processes to be executed by the processor or processor over time, in a way that meets system objectives, such as response time, throughput, and processor efficiency.

- ♦ It is used to maximize CPU utilization
- ♦ If there are more processes, the rest will have to wait until the CPU is free and can be rescheduled]

⇒ **Types of Scheduling** :

- ♦ **Long - Term Scheduling** : It determines which programs are admitted to the system for processing. Thus it controls the degree of multiprogramming.
  - I The long-term scheduler, or job scheduler, select processes from the pool and loads them into memory for execution.

**Medium - Term Scheduling** : It is a part of the swapping function. The swapping - in decision is based on the need to manage the degree of multiprogramming.

**Short - Term Scheduling** : It is also known as **CPU scheduling** or **Dispatcher** executes most frequently and makes the fine - grained decision of which process to execute next.

The short - term scheduler is invoked whenever an event occurs that may lead to the blocking of the current process or that may provide an opportunity to preempt a currently running process in favour of another.

Eg : \* Clock Interrupts \* Operating System calls \* I/O Interrupts \* Signals (Eg semaphores)

**I/O Scheduling** : The decision as to which process's pending I/O request shall be handled by an available I/O device

- ♦ An I/O process is one that spends more of its time doing I/O than it spends doing computations.
- ♦ A CPU - bound process, generates I/O requests infrequently using more of its time doing computations.

⇒ **Scheduling Queues**

- ♦ As processes enter the system, they are put into a job queue, which consists of all processes in the system
- ♦ The processes that are residing in main memory and are ready and waiting to execute are kept on a list called the ready queue
- ♦ This queue is generally stored as a linked list.
- ♦ A ready - queue header contains pointers to the first and final PCBs in the list.
- ♦ The list of processes waiting for a particular I/O device is called a device queue
- ♦ A new process is initially put in the ready queue. It waits there until it is selected for execution. or is dispatched.
- ♦ The process could create a new sub process and wait for the sub processes termination.
- ♦ The process could be removed forcibly from the CPU as a result of an interrupt, and be put back in the ready queue.
- ♦ The selection process is carried out by the appropriate scheduler.

Switching the CPU to another process requires performing a state save of the current process and a state restore of a different process. This task is known as a **Context Switch**.

- When a context switch occurs, the kernel saves the context of the old process in its PCB and loads the saved context of the new process scheduled to run.

### PROCESS CREATION :

- A process may create several new processes, via a create-process system call, during the course of execution.
- The creating process is called a parent process, and the new processes are called the children of that process.
- Each of these new processes may in turn create other processes, forming a tree of processes.
- When the OS creates a process at the explicit request of another process, the action is referred to as **process spawning**.
- When a process creates a new process, two possibilities exist in terms of execution :
  - 1) The parent continues to execute concurrently with its children.
  - 2) The parent waits until some or all of its children have terminated.
- There are also two possibilities in terms of the address space of the new process :
  - 1) The child process is a duplicate of the parent process (it has the same program and data as the parent)
  - 2) The child process has a new program loaded into it.

If a process terminates (either normally or abnormally), then all its children must also be terminated. This phenomenon, referred to as cascading termination.

A process is independent if it cannot affect or be affected by the other processes executing in the system.

A process is co operating if it can effect or be affected by the other processes executing in the system.

There are several reasons for providing an environment that allows process cooperation.

\* Information sharing \* Computation speedup  
\* Convenience \* Modularity

### Inter Process Communication :

- IPC also referred as inter-thread communication and inter-application communication
- Co operating processes require an inter process communication (IPC) mechanism that will allow them to exchange data and information.
- IPC methods are divided into methods for message passing, Synchronous , shared memory, and remote procedure calls (RPC)
- There are two fundamental models of intr process communication :
  - 1) Shared memory
  - 2) Message passing
- The method of IPC used may vary based on the bandwidth and latency of communication between the threads and type of data being communicated.

Under direct communication, each process that wants to communicate must explicitly name the recipient or sender of the communication.

With indirect communication, the messages are sent to and received from mailboxes, or ports. **Memory tables** are used to keep track of both main (real) and secondary (virtual) memory.

**I/O tables** are used by the operatin system to manage the I/O devices and channels of the computer system.

The operating system may also maintain **file tables**. It provide information about the existences of files, and their location.

Operating system maintain **process tables** to manage processes.

### SOCKETS :

- A socket is defined as an end point for communication.
- A pair of processes communicating over a network employ a pair of sockets - one for each process.
- A socket is identified by an IP address concatenated with a port number.

- + Socket use a client - server architecture.
- THREAD :** A thread is a basic unit of CPU utilization
- Threads are lightweight process and a unit of execution
  - A thread of execution is the smallest unit of processing that can be scheduled by OS
  - An executing instance of a program is called a process.
  - A thread is a subset of process.
- Multi threading :**
- Multi threading refers to the ability of an operating system to support multiple threads of execution within a single process.
  - Threads also play a vital role in remote procedure call (RPC) systems. That RPCs allow interprocess communication by providing a communication mechanism similar to ordinary function or procedure calls.
  - For one process multiple threads are created and those are called as **sibling**.
- Categories of Thread :**
- A multithreaded process achieves concurrency without the overhead of using multiple processes.
- BENEFITS OF MULTITHREADED PROGRAMMING :**
- \* Responsiveness                          \* Resource sharing
  - \* Economy
  - \* Utilization of multiprocessor architecture
- THREAD STATES :**
- An existing windows thread is in one of six states.
- \* Ready                                  \* Stand by                          \* Running
  - \* Waiting                                  \* Transition
  - \* Terminated
- As a default, the micro kernel uses the policy of soft affinity in assigning threads to processors : The dispatcher tries to assign a ready thread to the same processor it last ran on.
  - It helps reuse data still in that processor's memory caches from the previous execution of the thread.
  - It is possible for an application to restrict its thread execution to certain processors (hard affinity)
- Support for threads may be provided either at the user level, for user threads, or by the kernel for kernel threads. There must exist a relationship between user threads and kernel threads. There are 3 common ways of establishing this relationship
- 1) Many - to - One Model      2) One-to-one model      3) Many - to - Many Model .
- THREAD LIBRARIES :**
- A thread library provides the programmer an API for creating and managing threads.
  - There are two primary ways of implementing a thread library
  - The first approach is to provide a library entirely in user space with no kernel support.
  - All code and data structures for the library exist in user space.
  - The second approach is to implement a kernel-level library supported directly by the operating system. In this case, code and data structures for the library exist in kernel space.
- Thread cancellation is the task of terminating a thread before it has completed.
- A thread that is to be cancelled is often referred to as the target thread. Cancellation of a target thread may occur in two different scenarios :
- i) Asynchronous cancellation
  - ii) Deferred cancellation
- Symmetric multiprocessing is a method of organizing a multiprocessor system such that any process (or thread) can run on any processor, this includes kernel code and processes.
- Race Condition :** A race condition occurs when multiple processes or threads read and write data items so that the final result depends on the order of execution of instructions in the multiple processes.
- In **non-preemptive scheduling**, once the CPU has been allocated to a process, the process keeps the CPU until it releases the CPU either by terminating or by switching to the waiting state. Otherwise it is **pre-emptive scheduling**
- The interval from the time of submission of a process to the time of completion is called **turn-around time**.

- The time the process waits in the ready queue is called **waiting time**
- The interval from the time of submission to the first time the process responds is called **response time**
- **Process Synchronization**
  - Making co-operating processes to execute in an orderly way is called process synchronization.
  - Each process has a segment of code, called the **critical section**, in which the process may be changing common variables.
- **Page Fault :**
  - The main functions of paging are performed when a program tries to access pages that are not currently mapped to physical memory (RAM). This situations known as **page fault**.
  - The set of pages that a process is currently using is called its **working set**
  - If the entire working set is in memory, the process will run without causing many faults until it move into another execution.
- **Semaphore :**
  - A semaphore is a variable or abstract data type that provides a simple but useful abstraction for controlling access by multiple processes to a common resource in a parallel programming environment.
  - Semaphores are a useful tool in the prevention of race conditions
  - Semaphore is a **synchronization tool**. There are two types of semaphores.
    1. Semaphores which allow on arbitrary resource count are called **counting semaphores**
    2. Semaphores which are restricted to the values 0 and 1 (or locked / unlocked, un available / available) are called **binary semaphores**.
- **CPU - I/O BURST CYCLE :**
  - The success of CPU scheduling dependson an observed property of processes : Process execution consists of a cycle of CPU execution and I/O wait.
  - Processes alternate between these two states.
  - Process execution begins with a CPU burst. That is followed by an I/O burst, which is followed by another CPU burst, then another I/O burst, and so on.
  - A CPU - bound program might have a few long CPU bursts. This distribution can be important in the selection of an appropriate CPU - scheduling algorithm

#### **SPOOLING :**

- Acronym for simultaneous peripheral operations on-line
- Spooling refers to putting jobs in a buffer a special area in memory or on a disk where a device can access them when it is ready
- Spooling is useful because devices access data at different rates.
- The buffer provides a waiting station where data can rest while the slower device catches up.

#### **BUFFER :**

- A buffer is a region of memory used to temporarily hold data while it is being moved from one place to another.
- Buffers are typically used when there is a difference between the rate at which data is received and the rate at which it can be processed.
- Buffers can be implemented in either hardware or software but mostly in software.

#### **DEADLOCK :**

- Deadlock can be defined as the permanent blocking of a set of processes that either compete for system resource or communicate with each other.
- A set of process is deadlocked when each process in the set is blocked awaiting an event (typically the freeing up of some requested resource) that can only be triggered by another blocked process in the set.
- Deadlock is permanent because none of the events is ever triggered.
- All deadlocks involve conflicting needs for resources by two or more processes.

#### **The conditions for Deadlock :**

- 1) **Mutual Exclusion :** Only one process may use a resource at a time. No process may access a resource unit that has been allocated to another process.

- 2) **Hold and Wait** : A process may hold allocated resource while awaiting assignment of other resources.
- 3) **No Preemption** : No resource can be forcibly removed from a process holding it.
- 4) **Circular Wait** : A closed chain of processes exists, such that each process holds at least one resource needed by the next process in chain.

### **DEADLOCK PREVENTION :**

Deadlock Prevention provides a set of methods for ensuring that at least one of the necessary conditions cannot hold. These methods prevent deadlocks by constraining how requests for resources can be made.

The strategy of deadlock prevention is simply put, to design a system in such a way that the possibility of deadlock is excluded.

We can view deadlock prevention methods as falling into two classes.

1) An indirect method of deadlock prevention is to prevent the occurrence of one of the three necessary conditions.

- 1) Mutual Exclusion      2) Hold and wait
- 3) No preemption

A direct method of deadlock prevention is to prevent the occurrence of a circular wait.

### **DEADLOCK AVOIDANCE :**

- ♦ Deadlock avoidance, allows the three necessary conditions but makes judicious choices to assure that the deadlock point is never reached.
  - ♦ Deadlock avoidance requires that the operating system be given advance additional information concerning which resources a process will request and use during its lifetime.
  - ♦ Banker's algorithm is used for deadlock avoidance.
- There are two approaches to deadlock avoidance :
- ♦ Do not start a process if its demands might lead to deadlock
  - ♦ Do not grant an incremental resource request to a process if this allocation might lead to deadlock.

### **Methods for Handling Deadlocks :**

We can deal with the deadlock problem in one of three ways.

- ♦ We can use a protocol to prevent or avoid deadlocks ensuring that the system will never enter a deadlock state.
- ♦ We can allow the system to enter a deadlock state, detect it and recover.
- ♦ We can ignore the problem altogether and pretend that deadlock never occurs in the system.

### **Resource Allocation Denial :**

- ♦ The strategy of resource allocation denial, referred to as the banker's algorithm, was first proposed in [DIJK 65]
- ♦ At any time a process may have zero or more resources allocated to it.
- ♦ The state of the system reflects the current allocation of resource to processes, thus, state consists of the two vectors, resource and available and two matrices, claim and allocation.
- ♦ A **safe state** is one in which there is at least one sequence of resource allocations to processes that does not result in a deadlock.

An **unsafe state** is a state that is not safe.

### **DEADLOCK DETECTION :**

- ♦ Deadlock detection strategies do not limit resource access or restrict process actions.
- ♦ With deadlock detection, requested resources are granted to processes whenever possible.
- ♦ Periodically, the OS performs an algorithm that allows it to detect the circular wait condition.

### **RECOVERY FROM DEADLOCK :**

Once deadlock has been detected, some strategy is needed for recovery.

There are two options for breaking a deadlock.

- 1) Simply to abort one or more processes to break the circular wait.
- 2) Preempt some resources from one or more of the deadlocked processes.

### **ADDRESS BINDING**

- ♦ The program resides on a disk as a binary executable file.

- ♦ The processes on the disk that are waiting to be brought into memory for execution form the input queue.
- ♦ Address may be represented in different ways during loading the program into main memory.
- ♦ Address in the source program are generally symbolic. A compiler will typically bind these symbolic address to relocate address

The binding of instructions and data to memory addresses can be done at any step along the way :

- 1) Compile Time
- 2) Load Time
- 3) Execution Time

An address generated by the CPU is commonly referred to as a **logical address**.

An address seen by the memory unit—that is, the one loaded into the memory, address register of the memory is commonly referred to as a **Physical address**.

The run-time mapping from virtual to physical address is done by a hardware device called Memory-management unit (MMU)

With Dynamic Loading a routine is not loaded until it is called.

♦ This method is particularly useful when large amounts of code are needed to handle infrequently such as error routines.

Dynamic loading does not require special support from the OS.

**MEMORY MANAGEMENT** : One of the most important and complex tasks of an operating system is memory management.

Memory management involves treating main memory as a resource to be allocated to shared among a number of active processes.

The basic tools of memory management are paging and segmentation.

#### **Memory Management Techniques :**

**Fixed Partitioning** : Main memory is divided into a process may be loaded into a partition of equal or greater size.

**Dynamic Partitioning** : Partitions are created dynamically, so that each process is loaded into a partition of exactly the same size as that process.

**Simple Paging** : Main memory is divided into a number of equal-size frames. Each process is divided into a number of equal - size pages of the same length as frames. A process is loaded by adding all of its pages into available, not necessarily contiguous, frames.

**Simple Segmentation** : Each process is divided into a number of segments. A process is loaded by loading all of its segments into dynamic partitions that need not be contiguous.

**Virtual - Memory Paging** : As with simple paging, except that it is not necessary to load all of the pages of a process. Non resident pages that are needed are brought in later automatically.

#### **SWAPPING :**

- ♦ A process must be in memory to be executed. A process can be swapped temporarily out of memory to a backing store and then brought back into memory for continued execution.
- ♦ Swapping requires a **backing store**.
- ♦ A variant of the swapping policy is used for priority - based scheduling algorithms.

**Dynamic storage Allocation Problem** : Which concerns how to satisfy a request of size  $n$  from a list of free holes.

The first-fit, Best-fit and worst - fit strategies are the ones most commonly used to select a free hole from the set of available holes.

Both first-fit and Best-fit strategies for memory allocation suffer from **external fragmentation**. Solution to the problem of external fragmentation is **compaction**

**Virtual memory segmentation** : As with simple segmentation, except that it is not necessary to load all of the segments of a process. Non resident segments that are needed are brought in later automatically.

**Internal Fragmentation** : The phenomenon, in which there is wasted space internal to a partition due to the fact that the block of data loaded is smaller than the partition, is referred to as internal fragmentation.

**External fragmentation** : It is indicating that the memory that is external ot all partitions becomes increasingly fragmented. One technique for overcoming external fragmentation is compaction.

- ♦ **Fixed Partitioning :** A fixed partitioning scheme limits the number of active processes and may use space inefficiently if there is a poor match between available partition sizes and process sizes.
  - ♦ **Dynamic Partitioning :** A dynamic partitioning scheme is more complex to maintain and includes the overhead of compaction.
  - ♦ **Buddy System :** In a buddy system, memory blocks are available of size
    - where smallest size block that is allocated
    - Largest size block that is allocated
  - A **logical address** is a reference to a memory location independent of the current assignment of data to memory.
  - A **relative address** is a particular example of logical address, in which the address is expressed as a location relative to some known point.
  - A physical address or absolute address, is an actual locating in main memory.
- ⇒ **PAGING :**
- ♦ The main memory is partitioned into equal fixed-size chunks that are relatively small and each process is also divided into small fixed-size chunks of the same size.
  - ♦ Then the chunks of a process, known as Pages, could be assigned to available chunks of memory, known, as **frames**, or **page frames**.
  - ♦ Every address generated by CPU is divided into two parts : **Page number (P)** and a **Page offset (d)**
  - ♦ Operating system maintains a **Page table** for each process. The page table shows the frame location for each
- ⇒ **SEGMENTATION :**
- ♦ A user program can be subdivided using segmentation in which the program and its associated data are divided into a number of segments. Each segment has a name and a length.
  - ♦ Segmentation eliminates internal fragmentation but it suffers from external fragmentation.
  - ♦ Each segment table entry would have to give the starting address in main memory of the corresponding segment.
- ♦ When a process enters the running state, the address of its segment table is loaded into a special register used by the memory-management hardware.
- ⇒ **LINKING :** The function of a linker is to take as input a collection of object modules and produce a load module, consisting of an integrated set of programs and data modules, to be passed to the loader.
- ⇒ **Linkage Editor :** The nature of this address linkage will depend on the type of load module to be created and when the linkage occurs.
- ⇒ **Virtual Memory :** Virtual memory allows for very effective multiprogramming and relieves the user of the unnecessary tight constraints of main memory.
- ♦ With virtual memory, all address references are logical reference that are translated at run time to real address.
  - ♦ This allows a process to be located anywhere in main memory and for that location to change over time.
  - ♦ Virtual memory allows a process to be broken up into pieces. Virtual memory can allow pages to be shared during process creation with the fork ( ) system call, thus speeding up process creation.
  - ♦ Two basic approximates to providing virtual memory are paging and segmentation.
  - ♦ It also possible to combine segmentation and paging in a single memory-management scheme.
  - ♦ A Virtual memory management scheme requires both hardware and software support.
- THRASHING :** The high paging activity is called thrashing. A process is thrashing if it is spending more time paging than executing.
- ♦ Locality Model is used to prevent thrashing.
- Principle of locality** states that program and data references within a process tend to cluster. The page number (n) field is longer than the frame number field (m) [ n > m ]
- A number of design issues relate to OS support for memory management
- 1) Fetch Policy :**
- ♦ The fetch policy determines when a page should be brought into main memory.
  - ♦ The two common alternatives are

i) **Demand Paging** : A page is brought into main memory only when a reference is made to a location on that page.

ii) **Prepaging** : Pages other than the demand by a page fault are brought in

2) Placement Policy

3) Replacement Policy

4) Resident set management

5) Cleaning Policy

6) Load Control

♦ A **Lazy Swapper** never swaps a page into memory unless that page will be needed.

♦ A swapper manipulates entire processes, whereas a **pager** is concerned with the individual pages of a process. Thus we use pager, rather than swapper, in connection with demand paging.

When the bit is set to "valid", the associated page is both legal and in memory.

If the bit is set to "invalid", the page either is not valid (i.e, not in the logical address space of the process) or is valid but is currently on the disk.

Access to a page marked invalid causes a **Page-fault trap**.

**Reentrant code** (or Pure Code) is non-self-modifying code ; it never changes during execution. Thus, two or more processes can execute the same code at the same time.

#### ⇒ **HASHED PAGE TABLE :**

♦ A common approach for handling address spaces larger than 32 bits is to use a hashed page table, with the hash value being the virtual page number.

♦ Each entry in the hash table contains a linked list of elements that hash to the same location (to handle collisions).

♦ Each element consists of three fields :

- 1) the virtual page number
- 2) the value of the mapped page frame and
- 3) a pointer to the next element in the linked list.

♦ An approach for handling address space of 64-bit is to use a clustered page tables:

#### ⇒ **INVERTED PAGE TABLES :**

♦ An inverted page table has one entry for each real page (or frame) of memory.

♦ Each entry consists of the virtual address of the page stored in that real memory location,

with information about the process that owns that page.

**Copy - on - Write** which works by allowing the parent and child processes initially to share the same pages.

**Zero-fill-on demand pages** have been zeroed out before being allocated, thus erasing the previous contents.

#### ⇒ **STORAGE MANAGEMENT :**

♦ Since main memory is usually too small to accommodate all the data and programs permanently, the computer system must provide secondary storage to back up main memory.

♦ Modern computer systems use disks as the primary on-line storage medium for information.

♦ The file system provides the mechanism for on-line storage of and access to both data and programs residing on the disks.

#### ⇒ **FILE SYSTEM :**

♦ The file system permits users to create data collections, called files, with desirable properties such as

- 1) Long - term existence
- 2) Sharable between processes
- 3) Structure

♦ Any file system provides not only a means to store data organized as files, but a collection of functions that can be performed on files

- 1) Create      2) Delete      3) open
- 4) close      5) Read      6) Write

#### File Structure :

Four terms are in common use when discussing files :

- |           |             |
|-----------|-------------|
| 1) Field  | 2) File     |
| 3) Record | 4) Database |

#### File Management Systems :

♦ A file management system is that set of system software that provides services to users and applications in the use of files.

♦ The only way that a user or application may access files is through the file management system.

♦ The lowest level, the I/O control, consists of **device drivers** and interrupt handlers to transfer information between the main memory and the disk system.

## PRACTICE SET - I

The **basic file system** needs only to issue generic commands to the appropriate device drivers to read and write physical blocks on the disk.

The **file-organization module** knows about files and their logical blocks as well as physical blocks.

The file-organization module also includes the free-space manager, which tracks unallocated blocks and provides these blocks to the file-organization module when requested.

The **logical file system** manages metadata information. It also responsible for protection and security

A **file-control block (FCB)** contains information about the file, including ownership, permissions, and location of the file contents.

A **boot control Block** (per volume) can contain information needed by the system to boot an OS from that volume.

In UFS ( Unix file system). It is called the **boot block** ; in NTFS, it is the **partition boot sector**.

### ⇒ **PARTITION AND MOUNTING :**

♦ A disk can be sliced into multiple positions or a volume can span multiple partitions on multiple disks.

♦ Each partition can be either “raw”, containing no file sy system, or “cooked”, containing a file system.

♦ **Raw disk** is used where no file system is appropriate.

♦ The **root partition**, which contains the OS Kernel and sometimes other system files, is mounted at boot time.

**Allocation Methods :** Three major methods of allocating disk space are in wide use :

1) Contiguous                  2) Linked

3) Indexed

### Bit Vector :

♦ The free-space list is implemented as a **bit map** or **bit vector**. Each block is represented by 1 bit

♦ If the block is free, the bit is 1 ; if the block is allocated, the bit is 0.

01. Page fault occurs when  
1) Page is corrupted by application software  
2) The page is in main memory  
3) The page is not in main memory  
4) One tries to divide a number by 0
02. If the property of locality of reference is well pronounced in a program  
1) The number of page faults will be more  
2) The number of page faults will be less  
3) The number of page faults will remain same  
4) Execution will be faster
03. A memory page containing heavily used variable that was initialized very early and is in constant, is removed when \_\_\_\_\_ page replacement algorithm was used  
1) LRU    2) FIFO    3) LFU    4) None
04. Preemptive scheduling is the strategy of temporarily suspending a running process  
1) Before the CPU time slice expires  
2) To allow starving process to run  
3) When it requests I/O  
4) None
05. \_\_\_\_\_ Disk scheduling policy is to select the disk I/O request that requires the least movement of the disk arm from its current position.  
1) FIFO                         2) Random  
3) SSTF                         4) SCAN
06. C-SCAN means  
1) Complete SCAN  
2) Concurrent SCAN  
3) Circular SCAN  
4) Coherent SCAN
07. A closed chain of processes exists, such that each process holds at least one resource needed by next process in the chain” is stated by \_\_\_\_\_ condition  
1) Mutual Exclusion    2) Hold and Wait  
3) No Preemption        4) Circular wait
08. ‘No resource can be forcibly removed from a purpose holding it”. is stated by \_\_\_\_\_ condition of deadlock  
1) Mutual Exclusion    2) Hold and wait  
3) No preemption        4) Circularwait
09. A partitioned data set is most used for  
1) a program or source library  
2) Storing program data

- 3) Storing back up information  
4) tearing ISAM files
- The first-fit, best-fit and the worst - fit algorithm can be used for  
 1) Contiguous allocation of memory  
 2) Linked allocation of memory  
 3) indexed allocation of memory  
 4) all of the above
11. In a multiprogramming environment  
 1) the processor executes more than one process at a time  
 2) the programs are developed by more than one person  
 3) more than one process is resident in memory  
 4) a single user can execute many programs in the same time
12. Which of the following page replacement algorithm suffers from Belady's anomaly  
 1) Optimal replacement  
 2) LRU  
 3) FIFO  
 4) both optimal replacement and FIFO
13. In a two pass assembler the object code generating is done during the  
 1) second pass                  2) first pass  
 3) zeroth pass  
 4) not done by the assembler
14. In a two pass assembler adding literals to literals so literal table and address resolution of focal symbols are done during  
 1) first pass and second pass respectively  
 2) both second pass  
 3) second pass and first respectively  
 4) both first pass
15. Translator for low level programming language were termed as  
 1) Assembler                  2) Compiler  
 3) Linker                  4) Loader
16. Load address for the first word of the program is called  
 1) Linker address origin  
 2) load address origin  
 3) Phase library                  4) absolute library
17. Symbolic names can be associated with  
 1) Information                  2) data or instruction  
 3) operand                  4) mnemonic operation
18. The "blocking factor" of a file is  
 1) The number of blocks accessible to a file  
 2) The number of blocks allocated to a file
19. 3) The number of logical records in one physical record                  4) None of the above  
 An operating system contains 3 user processes each requiring 2 units of resource R. The minimum number of units of R such that no deadlocks will ever arise is  
 1) 4                  2) 3.                  3) 5.                  4) 6.
20. Locality of reference implies that the page reference being made by a process  
 1) will always be to the page used in the previous page reference  
 2) is likely to be the one of the pages used in the last few page references  
 3) will always be to one of the pages existing in memory  
 4) will always lead to a page fault
21. Which of the following is not a key piece of information, stored in single page table entry, assuming pure paging and virtual memory  
 1) Frame number  
 2) A bit indicating whether the page is in physical memory or on the disk  
 3) A reference for the disk block that stores the page  
 4) None of the above
22. Which amongst the following is not a valid page replacement policy ?  
 1) LRU policy (Least Recently Used)  
 2) FIFO policy (First in first out)  
 3) RU policy (Recurrently used)  
 4) Optimal page replacement policy
23. Jobs which are admitted to the system for processing is called  
 1) long-term scheduling  
 2) short - term scheduling  
 3) medium-term scheduling  
 4) queuing
24. Virtual memory is  
 1) simple to implement  
 2) used in all major commercial operating systems  
 3) less efficient in utilization of memory  
 4) useful when fast I/O devices are not available
25. Page stealing  
 1) is a sign of efficient system  
 2) is taking page frames other working sets  
 3) should be the tuning goal  
 4) is taking larger disk spaces for pages paged out

- Amit Patel*
26. The memory allocation scheme subject to "external" fragmentation is  
 1) segmentation      2) swapping  
 3) pure demand paging  
 4) multiple fixed contiguous partitions
27. Page fault occurs when  
 1) the page is corrupted by application software  
 2) the page is in main memory  
 3) the page is not in main memory  
 4) one tries to divide a number by 0
28. Overlay is  
 1) a part of an operating system  
 2) a specific memory location  
 3) a single contiguous memory that was used in the olden days for running large programs by swapping  
 4) overloading the system with many user files
29. Determine the number of page faults when reference to pages occur in order -1, 2, 4, 5, 2, 1, 2, 4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages 1 and 2, with page 1 having been brought earlier than page 2. (Assume LRU algorithm is used)  
 1) 3      2) 5      (3) 4  
 4) none of the above
30. Concurrent processes are processes that  
 1) do not overlap in time  
 2) overlap in time  
 3) are executed by a processor at the same time  
 4) none of the above
31. Supervisor call  
 1) is a call made by the supervisor of the system  
 2) is a call with control functions  
 3) are privileged calls that are used to perform resource management functions, which are controlled by the operating system  
 4) is a call made by someone working in root directory
- (32) Fence register is used for  
 1) CPU protection      2) memory protection  
 3) file protection      4) all of the above
33. Which of the following is a service not supported by the operating system?  
 1) Protection      2) Accounting  
 3) Compilation      4) I/O operation
34. The first fit, best-fit and the worst-fit algorithms can be used for  
 1) contiguous allocation of memory  
 2) linked allocation of memory  
 3) indexed allocation of memory  
 4) all of the above
35. Which of the following is single-user operating system?  
 1) MS - DOS      2) UNIX      3) OS/2  
 4) None of these
36. Which of the following are true?  
 1) A re-entrant procedure can be called any number of times  
 2) A re-entrant procedure can be called even before the procedure has not returned from its previous call  
 3) Re-entrant procedures cannot be called recursively  
 4) None of these
37. A state is safe if the system can allocate resources to each process (up to its maximum) in some order and still avoid deadlock.  
 1) Deadlocked state is unsafe  
 2) Unsafe state may not be lead to a deadlock situation  
 3) Unsafe state must lead to a deadlock situation  
 4) None of these
38. The size of the virtual memory depends on the size of the  
 1) data bus  
 2) main memory  
 3) address bus      4) none of the above
- (39) In which of the following scheduling policies does context switching never take place?  
 1) Round-robin  
 2) Shortest job first  
 3) Pre-emptive      4) None of these
40. In which of the following directory systems, is it possible to have multiple complete paths for a file, starting from the root directory?  
 1) Single-level directory  
 2) Two-level directory  
 3) Tree structured directory  
 4) Acyclic graph directory
41. Suppose that a process is in "BLOCKED" state waiting for some I/O service. When the service is completed, it goes to the  
 1) RUNNING state      2) READY state  
 3) SUSPENDED state  
 4) TERMINATED state

42. In a system that does not support swapping
- the compiler normally binds symbolic addresses (variables) to relocatable addresses
  - the compiler normally binds symbolic addresses to physical addresses
  - user programs can implement dynamic loading without any special support from the operating system or the hardware
  - None of these
43. To obtain better memory utilization, dynamic loading is used. With dynamic loading, a routine is not loaded until it is called. For implementing dynamic loading
- special support from hardware is essential
  - special support from operating system is essential
  - special support from both hardware and operating system are essential
  - user programs can implement dynamic loading without any special support from the operating system or the hardware
44. Which of the following is true ?
- The linkage editor is used to edit programs which have to be later linked together
  - The linkage editor links object modules during compiling or assembling
  - The linkage editor links object modules and resolves external references between them before loading
  - The linkage editor resolves external references between the object modules during execution time
45. Which of the following application is well suited for batch processing
- Process control
  - Video game control
  - Preparing pay bills of employees
  - None of these
46. Locality of reference implies that the page reference being made by a process
- will always be to the page used in the previous page reference
  - is likely to be one of the pages used in the last few page references
  - will always be one of the pages existing in memory
  - will always leads to a page fault
47. An operating system uses Shortest Remaining Time first (SRT) process scheduling algorithm. Consider the arrival times and execution times for the following processes :
48. The essential content(s) in each entry of a page table is/are
- virtual page number
  - page frame number
  - both virtual page number and page frame number
  - access right information
49. A multilevel page table is preferred in comparison to a single level page table for translating virtual address to physical address because
- it reduces the memory access time to read or write a memory location
  - it helps to reduce the size of page table needed to implement the virtual address space of a process
  - it is required by the translation look aside buffer.
  - it helps to reduce the number of page faults in page replacement algorithms
50. Which of the following statements are true ?
- I. Shortest remaining time first scheduling may cause starvation
- II. Preemptive scheduling may cause starvation
- III. Round robin is better than FCFS in terms of response time
- I only
  - I and II only
  - II and III only
  - I, II and III
51. What is the correct matching for the following pairs?
- |                         |                |
|-------------------------|----------------|
| A) Disk scheduling      | 1) Round robin |
| B) Batch Processing     | 2) SCAN        |
| C) Time sharing         | 3) LIFO        |
| D) Interrupt processing | 4) FIFO        |
- A-3, B-4, C-2 and D-1
  - A-4, B-3, C-2 and D-1
  - A-2, B-4, C-1 and D-3
  - A-2, -1, C-4 and D -3
52. Dirty bit for a page in a page table
- helps avoid unnecessary writes on a paging device
  - helps maintain LRU information
  - allows only read on a page
  - none of the above

- Akhil*
53. In a multiprogramming environment  
 1) the processor executes more than one process at a time  
 2) the programs are developed by more than one person  
 3) more than one process resides in the memory  
 4) a single user can execute many programs at the same time
54. Which of the following scheduling policy is well suited for a time-shared operating system ?  
 1) Shortest job first    2) Round robin  
 3) First - come - first - serve  
 4) Elevator
55. A memory page containing a heavily used variable that was initialized very early and is in constant use is removed, when the page replacement algorithm used is  
 1) LRU    2) FIFO    3) LFU  
 4) none of the above
03. Suppose that a process is in blocked state waiting for some I/O service. When the service is completed, it goes to the \_\_\_\_\_ state  
 1) Running                  2) Ready  
 3) Suspended                4) Terminated
04. Real time systems are  
 1) Primarily used on mainframe computers  
 2) Used for Monitoring events as they occur  
 3) Used for program development  
 4) Used for real time interactive users
05. Memory management is  
 1) Not used in Modern Operating system  
 2) Replaced with virtual memory on concurrent systems  
 3) Not used on multi programming systems  
 4) Critical for even the simplest operating systems
06. In Preemptive mode, the currently running process may be interrupted and moved to \_\_\_\_\_ state  
 1) Ready                    2) Blocked  
 3) Suspended                4) Terminated

### PRACTICE SET - I KEY

01-3	02-2	03-2	04-1	05-3
06-3	07-4	08-3	09-2	10-1
11-3	12-3	13-1	14-4	15-1
16-2	17-2	18-3	19-1	20-2
21-3	22-3	23-1	24-2	25-2
26-1	27-3	28-3	29-3	30-2
31-3	32-2	33-3	34-1	35-1
36-2	37-1	38-3	39-2	40-4
41-2	42-1	43-4	44-3	45-3
46-2	47-	48-2	49-2	50-4
51-3	52-1	53-3	54-2	55-2

### PRACTICE SET - II

01. Virtual Memory is \_\_\_\_\_  
 1) An Extremely Large Main Memory  
 2) An Extremely Large Secondary Memory  
 3) An illusion of Extremely Large Memory  
 4) A type of Memory used in super computers
02. The size of the virtual memory depends on  
 1) The size of data bus  
 2) The size of main memory  
 3) The size of address bus  
 4) None

07. The pieces or chunks of program that are in variable length are called \_\_\_\_\_  
 1) Pages                    2) Blocks  
 3) Segments                4) Functions
08. \_\_\_\_\_ in the actual location in main memory?  
 1) Relative address        2) logical address  
 3) physical address       4) none
09. Fixed partitioning suffers from \_\_\_\_\_ issue  
 1) internal fragmentation  
 2) external fragmentation  
 3) compaction               4) none
10. Fragmentation of the file system  
 1) Occurs only if the system is used improperly  
 2) Can always be prevented  
 3) Can be temporarily moved by compaction  
 4) Is a characteristic of all file systems
11. Overlay is \_\_\_\_\_  
 1) A part of an Operating system  
 2) A single memory location  
 3) A single contiguous memory that is used in olden days for running large program by swapping  
 4) overloading the system with many user files



- Ashvin Galan*
30. A public key encryption system  
 1) Allows only the correct receiver to decode the data  
 2) Allows only one to decode the transmission  
 3) Allows only the correct sender to decode the data  
 4) Does not encode the data before transmitting it.
31. Spatial locality refers to the problem that once a location is referenced  
 1) it will not be referenced again  
 2) it will be referenced again  
 3) a nearby location will be referenced soon  
 4) none of these
32. Which of the following is an example of a SPOOLED device ?  
 1) The terminal used to enter the input data for program being executed  
 2) The secondary memory device in a virtual memory system  
 3) A line printer used to print the output of a number of job  
 4) None of the above
33. The page replacement policy that sometimes leads to more page faults when the size of the memory is increased is  
 1) FIFO                            2) LRU  
 3) no such policy exists  
 4) none of the above
34. The only state transition that is initiated by the user process itself is  
 1) block                            2) dispatch  
 3) wakeup  
 4) none of the above
35. Working set (t,k) at an instant of time, t, is the set of  
 1) k future references that the operating system will make  
 2) future references that the operating system will make in the next 'k' time units  
 3) k references with high frequency  
 4) pages that have been referenced in the last k time units
36. In Round Robin CPU scheduling, as the time quantum is increased, the average turn around time  
 1) increases                      2) decreases  
 3) remains constant  
 4) varies irregularly
37. Which of the following is true ?  
 1) Overlays are used to increase the size of physical memory  
 2) Overlays are used to increase the logical address space  
 3) When overlays are used, the size of a process is not limited to the size of physical memory  
 4) Overlays are used whenever the physical address space is smaller than the logical address space
38. In partitioned memory allocation scheme, the  
 1) best fit algorithm is always better than the first fit algorithm  
 2) first fit algorithm is always better than the best fit algorithm  
 3) superiority of the first fit and best-fit algorithms depend on the sequence of memory requests  
 4) none of the above
39. Cascading termination refers to termination of all child processes before the parent terminates  
 1) normally  
 2) abnormally  
 3) normally or abnormally  
 4) none of the above
40. For implementing a multiprogramming operating system  
 1) special support from processor is essential  
 2) special support from processor is not essential  
 3) cache memory must be available  
 4) more than one processor must be available

### PRACTICE SET - II KEY

01-3	02-3	03-2	04-4	05-2
06-1	07-3	08-3	09-1	10-3
11-3	12-3	13-2	14-1	15-2
16-2	17-4	18-1	19-4	20-2
21-4	22-1	23-3	24-2	25-2
26-3	27-4	28-4	29-2	30-1
31-3	32-3	33-1	34-1	35-2
36-4	37-2	38-3	39-3	40-2

## PRACTICE SET - III

01. Fragmentation is  
 1) Dividing the Secondary memory into equal size fragments  
 2) Dividing the main memory into equal size of fragments  
 3) Fragments of memory words used in a page  
 4) fragments of memory unused in a page
02. Dirty bit is used to show the  
 1) Page with corrupted the  
 2) Wrong page in memory  
 3) Page that is modified after being loaded into cache memory  
 4) None of the above
03. Banker's algorithm is the strategy used for  
 1) Deadlock Detection  
 2) Deadlock Prevention  
 3) Deadlock Avoidance  
 4) Deadlock Recovery
04. CPU scheduling determines which programs are admitted to the system for processing.  
 1) Long term                  2) Medium Term  
 3) I/O                          4) Short Term
05. The page replacement policy that sometimes leads to more faults when the size of the memory is increased is  
 1) FIFO    2) LRU    3) No such policy exists  
 4) None
06. critical region is  
 1) A part of the operating system which is not allowed to be accessed by any process  
 2) A set of instructions that across common shard resource which exclude one another in time  
 3) The portion of them an memory which can be accessed only be one process at a time  
 4) none of the above
07. The output of Lexical analyzer is  
 1) a set regular expressions  
 2) syntax tree                  3) set of tokens  
 4) string of characters
08. Output in an Assembler is  
 1) source code                  2) assembly code  
 3) intermediate code          4) machine code
09. An assembler is  
 1) programming language dependent  
 2) syntax dependent  
 3) machine dependant  
 4) data dependant
10. Which of the following is not a fundamental process state  
 1) ready                        2) terminated  
 3) executing                    4) blocked
11. 'LRU' page replacement policy is  
 1) Last Replaced Unit      2) Last Restored Unit  
 3) Least Recently Used     4) Least Required Unit
12. Which of the following loader is executed when a system is first turned on or restarted  
 1) Boot loader  
 2) Compile and Go loader  
 3) Bootstrap loader          4) Relating loader
13. Poor response time is usually caused by  
 1) Process busy              2) High I/O rates  
 3) High paging rates  
 4) Any of the above
14. "Throughput" of a system is  
 1) Number of programs processed by it per unit time  
 2) Number of times the program is invoked by the system  
 3) Number of requests made to a program by the system    4) None of the above
15. Nested Macro calls are expanded using the  
 1) FIFO rule (First in first out)  
 2) LIFO (Last in Fist out)  
 3) FILO rule (First in last out)  
 4) None of the above
16. A linker program  
 1) places the program in the memory for the purpose of execution  
 2) relocates the program to execute from the specific memory area allocated to it.  
 3) links the program with other programs needed for its execution  
 4) interfaces the program with the entities generating its input data.
17. Which scheduling policy is most suitable for a time-shared operating system  
 1) Shortest-job First    2) Elevator  
 3) Round-Robin  
 4) First-Come-First-Serve
18. A critical section is a program segment  
 1) which should run in a certain specified amount of time  
 2) which avoids deadlocks  
 3) Where shared resources are accessed.  
 4) which must be enclosed by a pair of semaphore operations, P and V.

- Akhilesh*
- |  |  |
|--|--|
| 19. TII stands for<br>1) Table of incomplete instructions<br>2) table of information instructions<br>3) translation of instructions information<br>4) translation of information instruction   | 30. File record length<br>1) Should always be fixed<br>2) Should always be variable<br>3) Depends upon the size of file<br>4) Should be chosen to match the data characteristics   |
| 20. The field that contains a segment index or an internal index is called<br>1) target datum      2) target offset<br>3) segment field      4) fix dat  | 31. If the property of locality of reference is well pronounced in a program<br>1) the number of page faults will be more<br>2) the number of page faults will be less<br>3) the number of page faults will remain the same<br>4) none of these          |
| 21. A program in execution is called<br>1) process      2) function<br>3) CPU      4) Memory   | 32. At a particular time of computation, the value of counting semaphore is 7. Then 20 P operations and 'x' V operations were completed on this semaphore. If the final value of the semaphore is 5, x will be<br>1) 15      2) 22      3) 18      4) 13 |
| 22. SSTF stands for<br>1) Shortest-seek-time-first scheduling<br>2) small-small-time-first<br>3) simple-seek-time-first scheduling<br>4) small-simple-time-first                               | 33. Sector interleaving in disks is done by<br>1) the disk manufacturer<br>2) the disk controller card<br>3) the operating system<br>4) none of the above  |
| 23. Before proceeding with its execution, each process must acquire all the resources it needs is called<br>1) hold and wait      2) No pre-emption<br>3) circular wait      4) starvation     | 34. Memory protection is of no use in a<br>1) single user system<br>2) non-multiprogramming system<br>3) non-multitasking system<br>4) none of the above   |
| 24. Resolution of externally defined symbols is performed by<br>1) Linker      2) Loader<br>3) Compiler      4) Editor   | (35) Disk scheduling involves deciding<br>1) which disk should be accessed next<br>2) the order in which disk access requests must be serviced<br>3) the physical location where files should be accessed in the disk<br>4) none of the above            |
| 25. Relocatable programs<br>1) cannot be used with fixed partitions<br>2) can be loaded almost anywhere in memory<br>3) do not need a linker<br>4) can be loaded only at one specific location |  |
| 26. To avoid race condition, the maximum number of processes that may be simultaneously inside the critical section is<br>1) zero      2) one<br>3) two      4) more than two                  |  |
| 27. In which of the following page replacement policies Balady's anomaly occurs ?<br>1) FIFO      2) LRU      3) LFU      4) NRU   |  |
| 28. _____ is a technique of temporarily removing inactive programs from the memory of computer system<br>1) Swapping      2) Spooling<br>3) Semaphore      4) Scheduler                        |  |
| 29. _____ is a technique of improving the priority of process waiting in Queue for CPU allocation<br>1) Starvation      2) Ageing<br>3) Revocation      4) Relocation                          |  |

### PRACTICE SET - III KEY

01-4	02-3	03-3	04-1	05-1
06-2	07-3	08-4	09-3	10-4
11-3	12-3	13-4	14-1	15-2
16-3	17-3	18-3	19-1	20-1
21-1	22-1	23-1	24-1	25-2
26-2	27-1	28-1	29-2	30-4
31-2	32-3	33-3	34-4	35-2

## SELF TEST

01. Scheduling is  
 1) Allowing jobs to use the processor  
 2) Unrelated to performance consideration  
 3) Not required in uni processor systems  
 4) The same regardless of the purpose of the system
02. Object code  
 1) is ready to execute  
 2) is the output of compilers but not assemblers  
 3) must be loaded before execution  
 4) must be rewritten before execution
03. \_\_\_\_\_ is a collection of related fields.  
 1) file                          2) database  
 3) record                        4) none
04. The time it takes for the beginning of the sector to reach the head is known as \_\_\_\_\_  
 1) Access time                2) Seek time  
 3) Rotational Delay           4) Disk time
05. RAID stands for \_\_\_\_\_  
 1) Reduced Array of Independent Disks  
 2) Redundant Array of Integrated Disks  
 3) Redundant Array of Inexpensive Disks  
 4) Reduced Array of Inexpensive Disks
06. Dynamic partitioning suffers from \_\_\_\_\_ issue  
 1) Internal fragmentation  
 2) External fragmentation  
 3) Compaction                    4) None
07. File record length  
 1) should always be fixed  
 2) should always be variable  
 3) depends upon the size of the file  
 4) should be chosen to match the data characteristics
08. Dijkstra's banking algorithm in an operating system solves the problem of  
 1) deadlock avoidance  
 2) deadlock recovery            3) Mutual Exclusion  
 4) Contextswitching
09. Necessary conditions for deadlock are  
 1) non preemption and circular wait  
 2) mutual exclusion and partial location  
 3) both 1 and 2  
 4) none of the above
10. Which of the following is a service not supported by the operating system  
 1) Protection                    2) Accounting  
 3) Compilation                  4) I/O operation
11. The page replacement policy that sometimes leads to more page faults when the size of the memory is increased is  
 1) FIFO                        2) LRU  
 3) No such policy exists     4) None of the above
12. Memory protection is normally done by  
 1) The processor and the associated hardware  
 2) The operating system  
 3) The compiler                4) The user program
13. The scheduling in which CPU is allocated to the process with least CPU-burst time is called  
 1) Priority Scheduling  
 2) Shortest job first Scheduling  
 3) Round Robin Scheduling  
 4) Multilevel Queue Scheduling
14. The term 'page traffic' describes  
 1) number of pages in memory at a given instant  
 2) number of pages required to be brought in at a given page request  
 3) the movement of pages in and out of memory  
 4) number of pages of executing programs loaded in memory.
15. The 'turn-around' time of a user job is the  
 1) time since its submission to the time its results become available  
 2) time duration for which the CPU is allotted to the job  
 3) total time taken to execute the job  
 4) time taken for the job to move from assembly phase to completion phase
16. Memory utilization factor shall be computed as follows  
 1) memory in use/allocated memory  
 2) memory in use/total memory connected  
 3) memory allocated / free existing memory  
 4) memory committed / total memory available
17. Program 'preemption' is  
 1) forced de allocation of the CPU from a program which is executing on the CPU  
 2) release of CPU by the program after completing its task  
 3) forced allotment of CPU by a program to itself  
 4) a program terminating itself due to detection of an error.
18. \_\_\_\_\_ is the time required by a sector to reach below read/write head  
 1) Seek Time                    2) Latency Time  
 3) Access Time                4) None

- 19.** Fragmentation is  
 1) dividing the secondary memory into equal sized fragments  
 2) dividing the memory into equal - sized fragments  
 3) fragments of memory words used in a page  
 4) fragments of memory words unused in a page
- 20.** Which of the following are real - time systems ?  
 1) An online railway reservation system  
 2) A process control system  
 3) Payroll processing system  
 4) None of these
- 21.** Dijkstra's banking algorithm in an operating system solves the problem of  
 1) deadlock avoidance  
 2) deadlock recovery  
 3) mutual exclusion  
 4) context switching
- 22.** Critical region is  
 1) a part of the operating system which is not allowed to be accessed by any process  
 2) a set of instruction that access common shared resource which exclude one another in time  
 3) the portion of the main memory which can accessed only by one process at a time  
 4) none of the above
- 23.** Kernel is  
 1) considered as the critical part of the operating system  
 2) the software which monitors the operating system  
 3) the set of primitive functions upon which the rest of operating system functions are built up  
 4) none of the above
- 24.** With a single resource, deadlock occurs  
 1) if there are more than two processes competing for the resource  
 2) If there are only two processes competing for that resource  
 3) if there is a single processes competing for that resource  
 4) none of the above
- 25.** Necessary conditions for deadlock are  
 1) non-preemption and circular wait  
 2) Mutual exclusion and partial allocation  
 3) both 1 and 2      4) none of the above
- 26.** Pre-emptive scheduling is the strategy of temporarily suspending a running process  
 1) before the CPU time slice expires  
 2) to allow starving processes to run  
 3) when it requests I/O  
 4) none of the above
- 27.** Mutual exclusion problem occurs  
 1) between two disjoint processes that do not interact  
 2) among processes that share resources  
 3) among processes that do not use the same resource  
 4) none of the above
- 28.** In paged memory systems, if the page size is increased, then the internal fragmentation generally  
 1) becomes less      2) becomes more  
 3) remains constant  
 4) none of the above
- 29.** An operating system contains 3 user processes each requiring 2 units of resource R. The minimum number of units of R such that no deadlock will ever occur is  
 1) 3      2) 4      3) 5      4) 6
- 30.** In a time-sharing operating system, when the time slot given to process is completed, the process goes from the RUNNING state to the  
 1) BLOCKED state  
 2) READY state      3) SUSPENDED state  
 4) TERMINATED state
- 31.** Semaphores are used to solve the problem of  
 1) race condition  
 2) process synchronization  
 3) process condition  
 4) none of these
- 32.** Dirty bit is used to show the  
 1) page with corrupted data  
 2) wrong page in the memory  
 3) page that is modified after being loaded into cache memory  
 4) page that is less frequently accessed
- 33.** Thrashing  
 1) reduces page I/O  
 2) decreases the degree of multiprogramming  
 3) implies excessive page I/O  
 4) Improves the system performance
- 34.** In which one of the following page replacement policies. Belady's anomaly may occur ?  
 1) FIFO      3) Optimal      3) LRU      4) MRU

- 35.** When an interrupt occurs, an operating system  
 1) ignores the interrupt  
 2) always changes the state of the interrupted process after processing the interrupt  
 3) always resumes execution of the interrupted process after processing the interrupt  
 4) may change the state of the interrupted process to "blocked" and schedule another process

**ECET -2010**

- 08.** Allocate and free main memory is a type of system call for

1) Process control    2) File Management

3) Information Maintenance

4) Device Management

- 09.** Attach or detach remote devices is the following type of system call

1) Process control    2) Device Management

3) File Management    4) Communications

- 10.** The fork system call in UNIX

1) Creates new process

2) Invokes job scheduler

3) Invokes CPU scheduler

- 11.** Mail box provides

1) Direct communication for IPC

2) Indirect communication for IPC

3) Process cooperation

4) Process scheduling

- 12.** Disadvantages of the fixed partitioning of memory is

1) Internal fragmentation

2) Internal segmentation

3) External monitoring

4) External segmentation

- 13.** Select the method which is not used for free space management

1) Linked list                  2) Bit vector

3) Counting                  4) Inverted list

- 14.** The following algorithm is also called elevator algorithm:

1) SSTF scheduling    2) SCAN scheduling

3) LOOK scheduling    4) FCFS scheduling

- 15.** The following disk scheduling algorithm performs better for systems that place heavy load on the disc

1) C-SCAN                  2) SSTF

3) FCFS                  4) LOOK

- 16.** Which of the following page replacement algorithms exhibits belady's anomaly

1) FIFO    2) LRU    3) LFU

4) Optimal page Replacement

- 17.** To avoid race condition the number of processes that can be allowed to be simultaneously inside the critical section is

1) 0    2) All    3) 1    4) 3

**SELF TEST KEY**

01-1	02-3	03-3	04-3	05-3
06-2	07-4	08-1	09-3	10-3
11-1	12-2	13-2	14-3	15-3
16-2	17-1	18-2	19-4	20-2
21-1	22-2	23-3	24-4	25-3
26-1	27-2	28-2	29-2	30-2
31-2	32-3	33-3	34-1	35-4

**PREVIOUS ECET BITS**

**ECET-2009**

- 01.** One of the true problems with priority scheduling is  
 1) Aging                  2) Decrease in throughout  
 3) Starvation                  4) Context switch overhead
- 02.** One a disk with 8 records per track where a file is stored starting at track 0, record 14 is found on track  
 1) 0    2) 1    3) 2    4) 3
- 03.** Which of the following page replacement algorithm is expensive to implement?  
 1) FIFO    2) LRU    3) LFU    4) aging
- 04.** In round robin scheduling usage of CPU can be less effective if  
 1) Short quantum    2) Long quantum  
 3) Small queue size    4) Long queue size
- 05.** Given a record size of 120 and block size of 1200, what is the blocking factor?  
 1) 10    2) 15    3) 20    4) 25
- 06.** Threads belonging to the same process share  
 1) Stack                  2) Data section  
 3) Register set                  4) Thread ID
- 07.** Most deadlock in operating systems develop because of normal contention of  
 1) Dedicated resource    2) Processors  
 3) Main memory    4) Device drivers

- 13.** Select the method which is not used for free space management

1) Linked list                  2) Bit vector

3) Counting                  4) Inverted list

- 14.** The following algorithm is also called elevator algorithm:

1) SSTF scheduling    2) SCAN scheduling

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- 15.** The following disk scheduling algorithm performs better for systems that place heavy load on the disc

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- 16.** Which of the following page replacement algorithms exhibits belady's anomaly

1) FIFO    2) LRU    3) LFU

4) Optimal page Replacement

- 17.** To avoid race condition the number of processes that can be allowed to be simultaneously inside the critical section is

1) 0    2) All    3) 1    4) 3

*Amin Amin Amin*

**ECET -2011**

18. Which of the following are shared between a parent process and a child process?  
1) External variables  
2) Local variables    3) Pointer variables  
4) Pipes
19. \_\_\_\_\_ removes a deadlock by aborting some processes so that other processes involved in the deadlock can resume their operation  
1) Deadlock resolution  
2) Deadlock detection  
3) Deadlock occurrence  
4) Deadlock avoidance
20. The sleeping barber problem is an example of  
1) deadlock              2) starvation  
3) semaphore            4) live lock
21. Interrupt disabling is not possible in a \_\_\_\_\_  
1) uniprocessor architecture  
2) multiprocessor architecture  
3) multiprogramming architecture  
4) uniprogramming architecture
22. A user process enters kernel mode by issuing a \_\_\_\_\_ when an exception is generated  
1) program              2) routine  
3) handler              4) system call
23. Round Robin is the preemptive version of  
1) FIFO    2) LCFS    3) SJF    4) FCLS
24. \_\_\_\_\_ are used to keep track of both main and secondary memory  
1) Process tables      2) File tables  
3) Memory tables      4) I/O tables

**ECET -2012**

25. What is meant by a Process ?  
1) A program written in high level language and stored on the disk  
2) A program is execution  
3) A job stored in the secondary memory  
4) A job available in the main memory
26. A computer system cannot boot if the \_\_\_\_\_ is not available on it  
1) Loader              2) Linker  
3) Interpreter          4) Operating System
27. What is the use of Job Control Language (JCL) statements?  
1) Allocate the CPU to a job  
2) Read the input from one device to another device
28. 3) Inform the OS, the start and end of a job in a batch  
4) For managing the memory  
Which strategy allows the processes that are logically runnable to be temporarily suspended?  
1) Shortest Job First  
2) First come First served  
3) Non-preemptive scheduling  
4) Round Robin
29. \_\_\_\_\_ algorithm executes the shortest job first that has entered the queue of jobs  
1) FIFO              2) SJF  
3) Round Robin      4) LIFO
30. Fragmentation of the file system can be temporarily avoided by  
1) Thrashing           2) CPU scheduling  
3) Compaction        4) I/O devices scheduling
31. What is a page fault?  
1) An error that occurs while a program accesses a page in the memory  
2) An access to a page that is currently not available in the memory  
3) A reference to a page of another program  
4) An error which is page specific
32. Belady's Anomaly is a behaviour of \_\_\_\_\_ page replacement algorithm.  
1) Optimal            2) LRU  
3) Circular FIFO    4) FIFO
33. What is the special software used to create a job queue?  
1) Device driver      2) Spooler  
3) Linker              4) Loader
34. Which of the following is an advantage of virtual memory?  
1) Processes can be given priority  
2) Programs larger than the physical memory size can be run  
3) Faster access to memory on an average  
4) Linker can assign addresses independent of where the program will be loaded in physical memory
35. Which of the following is an advantage of memory interleaving?  
1) A large memory is obtained  
2) A non-volatile memory is obtained  
3) The cost of the memory is reduced  
4) Effective speed of the memory is increased

**ECET -2013**

36. The LRU algorithm \_\_\_\_\_  
 1) Pages out pages that have been used recently  
 2) Pages out pages that have not been used recently  
 3) Pages out pages that have been least used recently  
 4) Pages out pages that used least in the given
37. Thrashing can be avoided if \_\_\_\_\_  
 1) The pages, belonging to the working set of program, are in the main memory  
 2) The speed of I/O process is increased  
 3) The speed of CPU is increased  
 4) The capacity of memory is decreased
38. In which of storage placement strategies a program is placed in the largest available hole in the memory  
 1) Best fit 2) First fit  
 3) Large fit 4) Worst fit
39. PCB represents for \_\_\_\_\_  
 1) Process Control Block  
 2) Program Control Block  
 3) Process Count Block  
 4) Program Count Block
40. In which of the following memory management technique the problem of internal fragmentation is present  
 1) Segmentation 2) Paging  
 3) Both paging and segmentation  
 4) Neither paging nor segmentation
41. Name of the I/o scheduling algorithm that moves the head in one direction until all requests have been serviced and then reverse.  
 1) FCFS 2) C-SCAN  
 3) SCAN 4) Greedy
42. The cylinder skew problem is concerned with which of the following ?  
 1) Semaphore 2) Thrashing  
 3) Interleaving 4) Deadlock
43. Which of the following is a free space management technique.  
 1) Paging 2) Bitmap  
 3) Segmentation 4) Demand paging
44. Round robin scheduling is essentially the preemptive version of \_\_\_\_\_  
 1) FIFO 2) Shortest job first  
 3) Shortest remaining  
 4) Longest time first

45. The mechanism that bring a page into memory only when it is needed is called  
 1) Segmentation 2) Fragmentation  
 3) Demand Paging 4) Page Replacement

46. Which of the following disk scheduling techniques has a drawback of starvation ?  
 1) SCAN 2) SSTF  
 3) FCFS 4) LIFO

47. Virtual memory is \_\_\_\_\_  
 1) An extreme large main memory  
 2) An extreme large secondary memory  
 3) An illusion of extreme large main memory  
 4) An extension of secondary memory

48. The essential content in each entry of a page table is  
 1) Virtual page number  
 2) Page frame number  
 3) Both virtual page number and page frame number  
 4) Access right information

49. Which of the following algorithm is the solution of critical - section problem which contains concurrent processes ?  
 1) SJF algorithm  
 2) Lamport's bakery algorithm  
 3) Leu algorithm  
 4) Banker's algorithm

50. To avoid race conditions, the number of processes may be simultaneously inside their critical section is  
 1) 1 2) 2 3) 16 4) 32

**ECET -2014**

51. Which one of the following is not a Real time operating system ?  
 1) VxWorks 2) Windows CE  
 3) RTLinux 4) Palm OS
52. To access the service of operating system, the interface is provided by the  
 1) System calls 2) API  
 3) Library  
 4) Assembly instructions
53. What is a long-term scheduler ?  
 1) It selects which process has to be brought into the ready queue  
 2) It selects which process has to be executed next and allocates CPU  
 3) It selects which process to remove from memory by swapping  
 4) It selects which process has to be brought into the Blocked process

54. Time quantum is defined in  
 1) Shortest job scheduling algorithm  
 2) Round robin scheduling algorithm  
 3) Priority scheduling algorithm  
 4) Multilevel queue scheduling algorithm
55. The strategy of making process that are logically runnable to be temporarily suspended is called :  
 1) Non preemptive scheduling  
 2) Preemptive scheduling  
 3) Shortest job first  
 4) First come first served
56. The most optimal scheduling algorithm is :  
 1) FCFS - First Come First Served  
 2) SJF - Shortest Job First  
 3) RR - Round Robin  
 4) LCFS - Last Come First Serve
57. Consider the following set of processes, the length of the CPU burst time given in milliseconds :
- | Process | Burst time |
|---------|------------|
| P1      | 6          |
| P2      | 8          |
| P3      | 7          |
| P4      | 3          |
- Assuming the above process being scheduled with the SJF scheduling algorithm :  
 1) The waiting time for process P1 is 3ms.  
 2) The waiting time for process P1 is 0ms  
 3) The waiting time for process P1 is 16ms  
 4) The waiting time for process P1 is 9ms
58. Which one of the following is the deadlock avoidance algorithm ?  
 1) Banker's algorithm  
 2) Round - robin algorithm  
 3) Elevator algorithm  
 4) Karn's algorithm
59. In fixed sized partition, the degree of multiprogramming is bounded by \_\_\_\_\_  
 1) The number of partitions  
 2) The CPU utilization  
 3) The memory size      4) BOIS
60. A process refers to 5 pages, A,B,C,D,E, in the order : A,B,C,D,A,B,E,A,B,C,D,E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is :  
 1) 8    2) 10            3) 9    4) 7
61. Consider a disk queue with requests for I/O blocks on cylinders :  
 98, 183, 37, 122, 14, 124, 65, 67  
 Considering FCFS (first cum first served) scheduling, the total number of head movements is, if the disk head is initially at 53 :  
 1) 600    2) 620            3) 630    4) 640
62. On systems where there are multiple operating system, the decision to load a particular one is done by :  
 1) Boot leader                2) Boot strap  
 3) Process control block    4) File control block
63. The scheduler which determines when processes are to be suspended and resumed.  
 1) Short- term scheduler  
 2) Long-term scheduler  
 3) Medium - term scheduler  
 4) Job scheduler
64. Which of the following is not a disk scheduling algorithm.  
 1) SSTF                        2) C-SCAN  
 3) SRTF                        4) LOOK
65. A running program requests the service from the kernel of the operating system using a \_\_\_\_\_  
 1) System call  
 2) Function call  
 3) Procedure call            4) Remote call
- AP-ECET - 2015**
66. Files of windows operating system are stored in the following folder  
 1) administrative tools    2) program files  
 3) control panel            4) system 32
67. The following is not a process state  
 1) ready  
 2) communicating    3) running    4) blocked
68. A process is  
 1) a subset of associated threads  
 2) a super set of associated threads  
 3) totally independent of threads  
 4) a hardware feature
69. Internal fragmentation results when  
 1) segmented memory management is used  
 2) paged memory management is used  
 3) cache management is used  
 4) RAID disks are used
70. In segmented memory management, the physical address is computed by  
 1) adding base address of a code segment to the offset of the data segment  
 2) adding all logical addresses

- 3) adding segment offset to the segment base address  
4) accessing free space list
- Elevator algorithm is used in  
1) CPU scheduling  
2) deadlock prevention  
3) disk interface 4) cache management
- The following is not an operating system service  
1) program execution  
2) controlling I/O devices  
3) user interface 4) debugging
- All modern operating systems are  
1) multi threading 2) open source  
3) single user 4) debugging
- Configuration information in windows operating system is located in  
1) .sys file  
2) CMOS memory  
3) track 0 of the hard disk 4) the registry
- TS - ECET - 2015**
- Which of the following scheduling policies is best suitable for time shared operating systems  
1) first come first serve  
2) round robin  
3) Shortest job first 4) largest job first
- A critical section is a part of a program  
1) that should run in a certain specified amount of time  
2) that avoids deadlocks  
3) where shared resources are accessed  
4) that is a critical part of the operating system
- Which among the following is NOT a valid page replacement policy  
1) least recently used 2) first in first out  
3) optimal page replacement policy  
4) rarely used
- A process is a  
1) program in main memory  
2) program in secondary memory  
3) method 4) program in execution
- To avoid race condition, the maximum, the maximum number of processes that may be simultaneously inside the critical section is  
1) zero 2) one  
3) two 4) more than two
- "External" fragmentation occurs in  
1) segmentation 2) swapping  
3) pure demand paging 4) paging
- In which of the following page replacement policies Belady's anomaly occurs  
1) SFU 2) LRU 3) LFU 4) FIFO
- Which of the following techniques is used for increasing the priority of a waiting process  
1) revocation 2) aging  
3) relocation 4) swapping
- Using LRU algorithm, find the number of page faults that occur when references to the pages occur in the order 1, 2, 4, 5, 2, 1, 2, 3. Assume that the main memory can accommodate 3 pages and memory already has pages 1 and 2 in it. Page 1 is brought earlier than page 2.  
1) 2 2) 3 3) 4 4) 5
- Overlaying is a  
1) method to increase the size of the main memory  
2) programming method that allows programs to be larger than the computer's main memory  
3) a method to increase logical memory  
4) a method to increase both main memory and logical memory
- Dirty bit is used to indicate  
1) page that is rarely accessed  
2) page with corrupted data  
3) page with unused data  
4) page that is modified after being loaded into cache memory
- Context switching never takes place in  
1) round robin scheduling  
2) pre-emptive scheduling  
3) first come first serve scheduling  
4) preemptive shortest job first scheduling
- Thrashing occurs due to  
1) decrease in degree of multiprogramming  
2) increase in degree of multiprogramming  
3) increase in size of virtual memory  
4) decrease in size of virtual memory
- Computer system has 6 units of resource type R, which are shared by n competing processes. Each process may need 3 units of resource of type R. What is the maximum value of n for which the system is guaranteed to be deadlock-free  
1) 1 2) 2 3) 3 4) 4

AP - ECET - 2016

89. In time sharing operating system, when the time slot given to a process is completed, the process goes from RUNNING state to \_\_\_\_\_ state  
1) BLOCKED      2) SUSPENDED  
3) TERMINATED    4) READY
90. Dirty bit is used to show the  
1) page with corrupted data  
2) wrong page in the memory  
3) page that is modified after being loaded into cache memory  
4) page that is less frequently accessed
91. In which one of the following page replacement policies, belady's anomaly may occur  
1) FCFS            2) SJF  
3) round-robin     4) priority
92. If there are 32 segments, each of size 1 kbytes, then the logical address should have  
1) 13 bits        2) 14 bits  
3) 15 bits        4) 16 bits
93. Thrashing  
1) reduces page I/O  
2) decreases the degree of multiprogramming  
3) implies excessive performance  
4) improves the system performance
94. Windows 98 operating system is a  
1) single user system    2) multi user system  
3) single tasking system  
4) multi tasking system
95. In semaphore when the order of processes that are waiting to be removed from the queue is first in first out (FIFO) then it is called \_\_\_\_\_ semaphore  
1) weak            2) strong  
3) binary          4) counted
96. Which of the following is a service not supported by the operating system  
1) protection      2) memory protection  
3) compilation     4) I/O operation
97. Page fault occurs due to the following  
1) the page is in main memory  
2) the page is not in main memory  
3) one tries to divide a number by 0  
4) the page is corrupted by application software
98. Let the page fault service time to 10ms in a computer with average memory access time being 20 ns. If one page fault is generated for every  $10^6$  memory accesses, what is the effective access time for the memory  
1) 21ns    2) 23ns    3) 30ns    4) 35ns

99. An operating system contains 3 user processes each requiring 2 units of resource R. The minimum number of required units of R such that no deadlock will ever occur is  
1) 4      2) 3      3) 5      4) 6

TS - ECET - 2016

100. The sequence of page addresses generated by a program is 7, 0, 1, 2, 0, 3, 0, 4, 2 and 3. This program is to be executed on a system with main memory size of 3 pages. If first in first out (FIFO) page replacement algorithm is used, then how many number of page faults occur  
1) 10      2) 9      3) 11      4) 12
101. An operating system uses shortest remaining time (SRT) process scheduling algorithm. Consider the arrival times and execution times for the following processes
- | process | execution time | arrival time |
|---------|----------------|--------------|
| P1      | 20             | 0            |
| P2      | 25             | 15           |
| P3      | 10             | 30           |
| P4      | 15             | 45           |
- What is the total waiting time for process P2  
1) 15      2) 5      3) 40      4) 55
102. Consider a system with Logical address space as 256 M words and physical address space as 512 K words and physical space as 2K words. Then, find the number of pages  
✓ 1) 128K      2) 120K  
3) 130K      4) 140K
103. A critical section is a program segment  
1) which should run in a certain specified amount of time  
2) which avoids deadlocks  
3) where shared resources are accessed  
4) which must be enclosed by a pair of semaphores operation
104. Which of the following memory allocation scheme suffers from external fragmentation  
1) paging      2) segmentation  
3) swapping    4) pure demand paging
105. Consider a job scheduling problem with 4 jobs J<sub>1</sub>, J<sub>2</sub>, J<sub>3</sub>, J<sub>4</sub> and corresponding deadlines (d<sub>1</sub>, d<sub>2</sub>, d<sub>3</sub>, d<sub>4</sub>) = (4, 2, 4, 2). Which of the following is not a feasible schedule without violating any job dead line  
1) J<sub>2</sub>, J<sub>4</sub>, J<sub>1</sub>, J<sub>3</sub>      2) J<sub>4</sub>, J<sub>1</sub>, J<sub>2</sub>, J<sub>3</sub>  
3) J<sub>4</sub>, J<sub>2</sub>, J<sub>3</sub>, J<sub>1</sub>      4) J<sub>4</sub>, J<sub>2</sub>, J<sub>1</sub>, J<sub>3</sub>



123. Which of the following is the visible portion of operating system  
 1) deadlock handler  
 2) process scheduler  
 3) file system  
 4) memory management
124. Which of the following disc scheduling algorithm may suffer from belady's  
 1) FIFO                          2) LRU  
 3) MFU                          4) LFU
125. Which of the following approach may be invoked periodically to test for the deadlock  
 1) deadlock avoidance  
 2) deadlock prevention  
 3) deadlock detection  
 4) deadlock ignorance
126. The primary job of operating system is  
 1) manage commands  
 2) manage users  
 3) manage programs  
 4) manage resources —
- TS - ECET - 2017**
127. For a particular code to be shareable, it should be \_\_\_\_\_  
 1) serially executing code  
 2) reusable code  
 3) reentrant code  
 4) reducible code
128. Dijkstra's bankers algorithm in an operating system solves the problem of \_\_\_\_\_  
 1) deadlock avoidance  
 2) deadlock detection  
 3) mutual exclusion            4) page replacement
129. At a particular time of computation the value of a counting semaphore is 5. Then 20P operations and 18V operations are performed on that semaphore. What is the final value of the semaphore  
 1) 2                            2) 3                            3) -2                            4) -3
130. When the result of a computation depends on the speed and order of execution of processes involved, then it is said to be a \_\_\_\_\_  
 1) deadlock                    2) critical section  
 3) race condition              4) memory leak
131. During context switching which of the following need not be saved  
 1) general purpose registers  
 2) program counter  
 3) stack pointer  
 4) translation-look-aside buffer
132. The root directory of a file system should be placed \_\_\_\_\_  
 1) at a fixed address in main memory  
 2) at a fixed location in the file system
133. Using a larger block size in a file system leads to \_\_\_\_\_  
 1) better disk throughput but poorer disk space utilization  
 2) better disk throughput and better disk space utilization  
 3) poorer disk throughput but better disk space utilization  
 4) poorer disk throughput and poorer disk space utilization
134. In which one of the following replacement algorithms, belady's anomaly may occur  
 1) optimal                    2) LRU  
 3) MFU                        4) FIFO
135. Consider a machine with 64MB physical memory and 32-bit virtual address space. If the page size is 4KB and one page table entry occupies 4-bytes, what is the size of the page table  
 1) 4MB                        2) 8MB                        3) 16MB                        4) 2MB
136. Where does swap space reside  
 1) RAM                        2) ROM  
 3) DISK                        4) cache memory
137. Sector interleaving in a disk is done by \_\_\_\_\_  
 1) the disk manufacturer  
 2) disk controller  
 3) the operating system  
 4) the user
138. Which one of the following methods, for storing free block information, require additional space to be reserved  
 1) bit vector                    2) linked list  
 3) grouping                    4) counting
139. Which of the following disk scheduling algorithm gives the best throughput  
 1) FCFS                        2) SCAN  
 3) LOOK                        4) SSTF
140. In UNIX traditional scheduling \_\_\_\_\_  
 1) a CPU-bound process is given higher priority than an I/O bound process  
 2) an I/O bound process is given higher priority than a CPU-bound process  
 3) both CPU-bound and I/O-bound processes are given equal priority  
 4) it depends on the current load on the system
- AP - ECET - 2018**
141. The processes that are residing in main memory and are ready and waiting to execute are kept on a list called  
 1) job queue                    2) ready queue  
 3) execution queue            4) process queue

142. Processes are executed in the sequence they arrive if \_\_\_\_\_ rule sequences the jobs.  
 1) earliest due date  
 2) slack time remaining  
 3) first come first served  
 4) critical ratio
143. A system program that combines the separately compiled modules of a program into a form suitable for execution is  
 1) assembler  
 2) linking loader  
 3) cross compiler  
 4) load and go
144. In which addressing mode the contents of a register specified in the instruction are first decremented, and then these contents are used as the effective address of the operands  
 1) index addressing  
 2) indirect addressing  
 3) auto increment  
 4) auto decrement
145. A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_ to ensure that a circular wait condition can never exist  
 1) resource allocation state  
 2) system storage state  
 3) operating system  
 4) resources
146. The disadvantage of invoking the detection algorithm for every request is:  
 1) overhead of the detection algorithm due to consumption of memory  
 2) excessive time consumed in the request to be allocated memory  
 3) considerable overhead in computation time  
 4) either deadlock exists or system is in a safe state
147. A ..... on free space management has the advantage that it is relatively easy to find one or a contiguous group of free blocks  
 1) bit table  
 2) chained free portion  
 3) indexing  
 4) free block list
148. The memory which allocates space for DOS and application is called \_\_\_\_\_  
 1) expanded memory  
 2) cache memory  
 3) virtual memory  
 4) conventional memory
149. Which of the following statements is false  
 1) you can find deleted files in recycle bin  
 2) you can restore any files in recycle bin if you ever need  
 3) you can increase free space of disk by sending files in recycle bin  
 4) you can right click and choose empty recycle bin to clean it at once
150. Which menu bar selection would you access to open file  
 1) option  
 2) help  
 3) view  
 4) tool
151. The primary purpose of an operating system is  
 1) to make the most efficient use of the computer hardware  
 2) to allow people to use the computer  
 3) to keep systems programmers employed  
 4) to make computers easier to use
152. Which of the following is an example of a real time operating system?  
 1) lynx  
 2) MS DOS  
 3) windows XP  
 4) RT linux

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153. The number of processes completed per unit time is known as \_\_\_\_\_  
 1) output  
 2) throughput  
 3) efficiency  
 4) capacity
154. Which one of the following is a synchronization tool  
 1) thread  
 2) pipe  
 3) monitor  
 4) socket
155. Choose the set of algorithms for disk scheduling  
 1) FCFS, LRU, MFU, optimal  
 2) FCFS, SCAN, SSTF, C-Look  
 3) FCFS, SJF, round robin, priority  
 4) SJF, multilevel queue, short-term, second chance
156. A semaphore is a shared integer variable  
 1) that cannot drop below zero  
 2) that cannot be more than zero  
 3) that cannot drop below one  
 4) that cannot be more than one
157. For what purpose is baker's algorithm used  
 1) deadlock ignorance  
 2) deadlock prevention  
 3) deadlock avoidance  
 4) deadlock detection

158. The circular weight condition which can cause a dead-lock can be prevented by defining a/an ordering of resource types  
 1) arbitrary                    2) random  
 3) hexagonal                    4) linear
159. \_\_\_\_\_ scheduler determines which programs are admitted to the system for processing  
 1) daisy chaining              2) long-term  
 3) DMA                         4) I/O
160. The least recently used policy (LRU) replaces the page in memory that has not been referenced for the \_\_\_\_\_ time  
 1) shortest                    2) medium  
 3) average                    4) longest
161. \_\_\_\_\_ devices transfer data in and out as a stream of bytes  
 1) block-oriented             2) stream-oriented  
 3) CPU-oriented              4) memory-oriented
162. A process transfers data to (or from) one buffer while the operating system empties (or fills) the other buffer is called \_\_\_\_\_  
 1) FIFO                        2) buffer extension  
 3) buffer swapping            4) buffer latency
163. For a disk I/O, the time it takes for the beginning of the sector to reach the head is known as \_\_\_\_\_  
 1) seek time                  2) rotational delay  
 3) access time                4) through-put
164. The processes that are residing in the main memory and are waiting to execute are kept on a list called \_\_\_\_\_  
 1) job queue                  2) ready queue  
 3) wait queue                 4) device queue
165. Runtime mapping from virtual to physical address is done by \_\_\_\_\_  
 1) CPU                        2) compiler            3) PCI  
 4) memory management unit
166. A local replacement policy chooses only among the \_\_\_\_\_ pages of the process that generate the page fault in selecting a page to replace  
 1) global                     2) resident  
 3) non-resident              4) abstract

### PREVIOUS ECET BITS KEY

01-3	02-2	03-1	04-3	05-1
06-1	07-1	08-1	09-4	10-1
11-2	12-1	13-4	14-2	15-1
16-1	17-3	18-1	19-2	20-3
21-1	22-4	23-1	24-3	25-2
26-4	27-3	28-4	29-2	30-3
31-2	32-4	33-2	34-2	35-4
36-3	37-1	38-4	39-1	40-2
41-3	42-3	43-2	44-1	45-3
46-2	47-3	48-2	49-2	50-1
51-4	52-1	53-1	54-2	55-2
56-2	57-1	58-1	59-1	60-3
61-4	62-1	63-3	64-3	65-1
66-4	67-2	68-2	69-2	70-3
71-3	72-4	73-1	74-4	75-2
76-3	77-4	78-4	79-2	80-1
81-4	82-2	83-3	84-2	85-4
86-3	87-2	88-2	89-4	90-3
91-1	92-3	93-2	94-2	95-3
96-3	97-2	98-3	99-1	100-2
101-1	102-1	103-3	104-2	105-1
106-1	107-3	108-1	109-2	110-3
111-1	112-1	113-1	114-1	115-4
116-4	117-3	118-1	119-1	120-3
121-2	122-4	125-3	126-4	127-3
128-1	129-2	130-3	131-4	132-2
133-1	134-4	135-1	136-3	137-3
138-1	139-4	140-2	141-2	142-4
143-3	144-3	145-3	146-1	147-2
148-1	149-1	150-2	151-1	152-1
153-2	154-3	155-1	156-1	157-3
158-2	159-2	160-1	161-2	162-3
163-3	164-2	165-1	166-1	

PUT YOUR FULL EFFORTS  
 DON'T WORRY ABOUT RESULTS  
 THEY ARE BOUND TO COME  
 TO YOU

SPACE FOR IMPORTANT NOTESSPACE FOR IMPORTANT NOTES

"C" Read running

FCS (Non-preemptive) - Round robin

Process	Arrival time(A)	Wait time	CT	Completion time		Waiting time	Response time
				Turnaround time	Completion time		
P <sub>1</sub>	2	2	4	2	4	0	0
P <sub>2</sub>	0	1	1	1	1	0	0
P <sub>3</sub>	2	3	7	5	7	2	2
P <sub>4</sub>	3	5	12	9	12	4	4
P <sub>5</sub>	4	4	16	12	16	8	8

P <sub>2</sub>	P <sub>1</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>
0	1	2	4	12

↓ Response time

Turnaround time = Completion time - Arrival time

$$TAT = WT + BT$$

$$WT = TAT - BT$$

for response time

for

$$P_3 = 4 - 2$$

$$\boxed{P_3 = 2}$$

for

$$P_5 = 12 - 4 \\ = 8$$

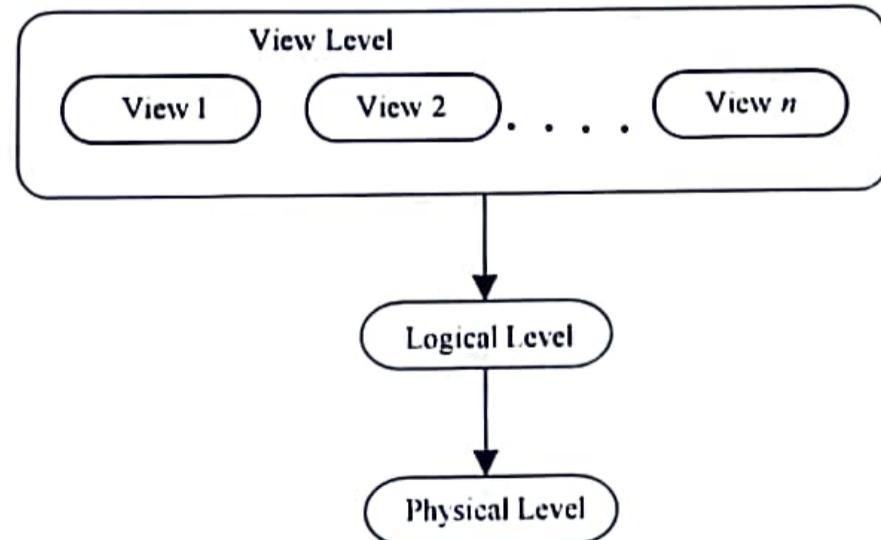


# RDBMS

- ◆ PL/SQL is a oracle procedural language extension to SQL.
- ◆ PL/SQL is not a case sensitive, so lower case letters are equivalent to corresponding upper case letters except within string and character literals.
- ◆ PL/SQL built in function.
  - Error reporting functions
  - Number functions
  - Character functions
  - Conversion functions
  - Data functions, Miscellinius functions
- ◆ (SQL CODE) function returns NUMBER
- ◆ (SQL ERROR) function returns CHAR
- ◆ (UID) function returns NUMBER
- ◆ (USER) returns VARCHAR2
- ◆ ENTRY ID return an auditing entry identifier
- ◆ Language returns language, territory and database character set in use.
- ◆ Session ID returns the auditing session identifier.
- ◆ TERMINAL returns the operators system identifier for the session terminals.
- ◆ PL/SQL provides two composite data types: TABLES AND RECORD
- ◆ You can use the % ROWTYPE attribute to declare a record that represents a row in a table or a row fetched by a cursor.
- ◆ **Conditional Control:** If statements (IF-THEN-ELSEIF)
- ◆ Iterative Control: LOOP and EXIT statements
- ◆ The WHILE LOOP statements associates a condition with a sequence of statements enclosed by the keywords LOOP and ENDLOOP  
SYNTAX: WHILE condition     LOOP  
              sequence of statements;  
              END LOOP;
- ◆ Sequential Contol: GOTO and NULL statements
- ◆ PL/SQL a warning or error condition is called an exception
- ◆ Exceptions can be internally defined or user defined
- ◆ Examples of internally defined Exceptions include division by zero and out of memory.
- ◆ Some common internally defined exceptions include have predefined names, such as ZERO-DIVIDE and STORAGE-ERROR
- ◆ You can define exceptions of your own in like declarative part of any PL/SQL Block, Sub program or Package
- ◆ User defined exceptions must be given names.
- ◆ When an error occurs exception is raised i.e., normal execution stops and control transfers to the exception handling part of your PL/SQL bolck or sub program.
- ◆ Internal exceptions are raised implicitly by the Runtime System.

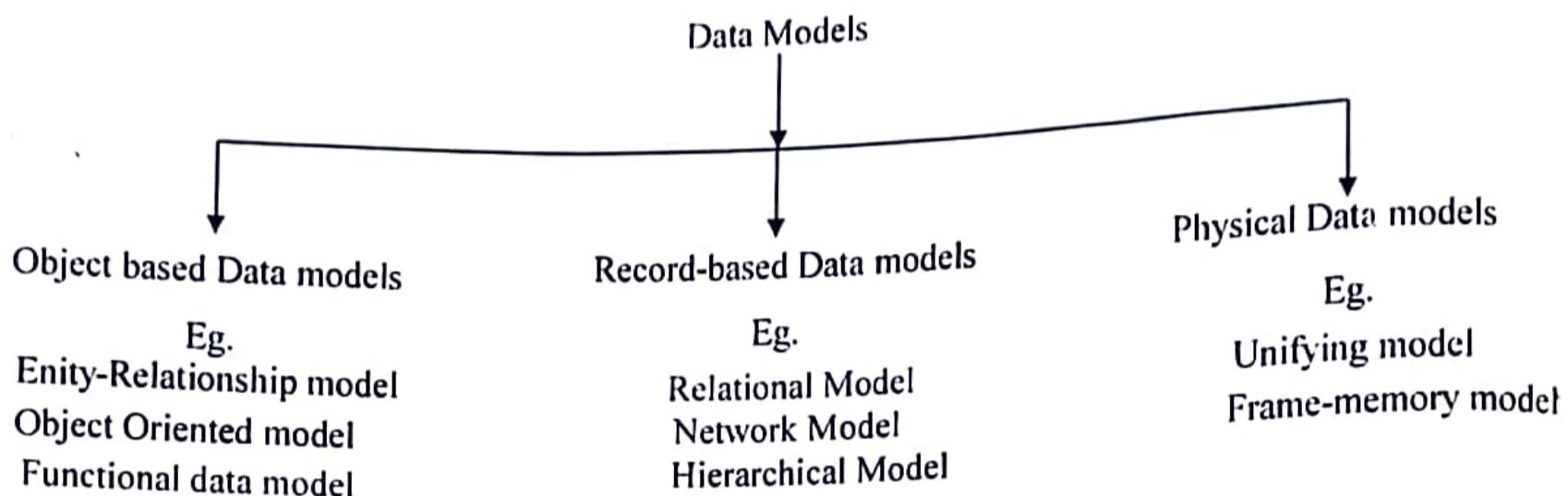


- ◆ “5” procedures to output data to a file PUT, PUT-LINE, NEW-LINE PUTE, FFTUSIT, PUT, FFWSH.PUT-LINE, FFWSH.NEW-LINE.
- ◆ We can not use a comment statement in database trigger.
- ◆ The max buffer size that can be specified using the DBMS - OUTPUT.ENABLE function, 1,000,00.
- ◆ The maximum no of triggers, can apply to a single table is “12” triggers
- ◆ Transaction is defined as all changes made to the database between successive commits.
- ◆ SQL\*LOADER is a product for moving data from external files into tables in an RDBMS.
- ◆ Files into tables in an RDBMS.
- ◆ “Oracle error no starts with ORA00001”
- ◆ Data is nothing but raw values. They can be numeric, character or boolean. Processed data is called information.
- ◆ A database is a repository for stored data. A computer based record keeping system is called database.
- ◆ A database management system (DBMS) consists of a collection of interrelated data and a set of programs to access those data.
- ◆ The primary goal of a DBMS is to provide the environment that is both convenient and efficient to use in retrieving and storing database information.
- ◆ Database systems are designed to manage large bodies of information
- ◆ The disadvantages of file management system are
  - | Data Redundancy and inconsistency
  - | Atomicity problems
  - | Difficulty in accessing data
  - | Data Isolation
  - | Security Problems
  - | Integrity Problems
- ◆ Data duplication at several places is called data redundancy.
- ◆ If the same data item has different values at different places it is called data inconsistency.
- ◆ Concurrent sharing is the ability of several users to be actually accessing the database at the same time.
- ◆ Data abstraction is hiding of complexities from different types of users.
- ◆ There are various levels of data abstraction.
- ◆ **Physical Level :** The lowest level of abstraction describes how the data are actually stored on the devices.
- ◆ **Logical Level :** The next higher level of abstraction describes what data are stored in the database. The logical level of abstraction is used by database administrators.
- ◆ **View Level :** The highest level of abstraction describes only part of the entire database. The system may provide many views for the same database.



- ◆ **Schema :** The overall design of the database is called the database schema.
- ◆ **Instance :** The collection of information stored in the database at a particular moment is called as an instance.

- ◆ **Data Independent** : The ability to modify a schema definition in one level without affecting a schema definition in the next higher level is called data independence.
- ◆ **Physical Data Independence** : It is the ability to modify the physical schema without causing application programs to be rewritten.
- ◆ **Logical Data Independence** : It is the ability to modify the logical schema without causing application programs to be rewritten.
- ◆ Logical data independence is more difficult to achieve than in physical data independence
- ⇒ **DATA MODELS** :
- ◆ A collection of conceptual tools for describing data, data relationships and consistency constraints is called a data model.



- ◆ Object based Data models are used in describing at the logical and view levels
- ◆ Record based Data models are also used in describing data in logical and view levels.
- ◆ The three most widely accepted record-based models are the relational, network and Hierarchical models.
- ◆ Relational model uses a collection of tables to represent both data and relationships among those data.
- ◆ Data in network model are represented by collections of records and relationships among data are represented by links. They are similar to arbitrary graphs.
- ◆ The hierarchical model is similar to the network model and also uses links. They are similar to trees.
- ◆ Physical data models are used to describe data in the lowest level.
- ◆ Database system provides two different types of languages.
  - 1) Data Definition Language
  - 2) Data Manipulation Language
- ◆ Data Definition Language : A database schema is specified by a set of definitions expressed by a special language called a data-definition language.
- ◆ The result of compilation of DDL statements is a set of tables that is stored in a special file called data dictionary.
- ◆ Data Dictionary is a file that contains meta data-data about data.
- ◆ **Data Manipulation Language** : It is a language that enables users to access or manipulate data. There are basically two types of data manipulation languages.
- ◆ **Procedural DMLs** : They require the user to specify what data are needed and how to get those data.

- ◆ **Non-procedural DML's** : They require the user to specify what data are needed without specifying how to get those data.
- ◆ A query is a statement requesting the retrieval of information
- ◆ A transaction is a collection of operations that performs a single logical function in a database application.
- ◆ **DBA : (DATA BASE ADMINISTRATOR)**
- ◆ A person who has Central Control over the entire system is called DBA.
- ◆ The functions of a DBA are
  - Schema Definition
  - Storage structure and access-method definition
  - Schema and physical organization modification
  - Granting of authorization for data access
  - Integrity constraint specification
- ◆ **Database Users :**
- ◆ There are four types of database system users.
  - Application programmers
  - Sophisticated Users
  - Specialized Users
  - Naive Users
- ◆ Application programmers are computer professionals who write application programs.
- ◆ Sophisticated users interact with the system without writing programs, applications that do not fit into the traditional data-processing framework.
- ◆ Naive users are unsophisticated users who interact with the system by invoking one of the permanent application programs that have been written previously.
- ◆ A distributed database is spread across a network of computers that are geographically dispersed and connected via communication links.
- ◆ The functional components of a database system include
  - File Manager** : It manages the allocation of space on disk storage and the data structures used to represent information stored in disk.
  - Database Manager** : It provides the interface between the low-level data stored in the database and the application programs and queries submitted to the system.
  - Query Processor** : It translates statements in a query language into low-level instructions that the database manager understands.
  - DML Precompiler** : It converts DML statements embedded in an application program to normal procedure calls into host language.
  - DDL Compiler** : It converts DDL statements to a set of tables containing metadata.
- ◆ **Entity-Relationship Model**
- ◆ An entity is a thing or object in the real world that is distinguishable from all other objects
- ◆ An entity set is a set of entities of the same type that share the same attributes.
- ◆ An entity is represented by a set of attributes.
- ◆ An attribute which is simple and which cannot be divided into subparts is called simple attribute.
- ◆ An attribute which can be divided into subparts is called composite attribute.
- ◆ The attribute which can have a single value is called single-valued attribute.
- ◆ The attribute which can have multiple values is called multi-valued attribute.
- ◆ A null value is used when an entity does not have a value for an attribute.
- ◆ The attribute which can be derived from the values of other related attributes is called derived attribute.
- ◆ A relationship is an association among several entities.

- ◆ A relationship set is a set of relationship same type
- ◆ A relationship may have descriptive attributes.
- ◆ The number of entity sets that participate in a relationship set is called the degree of the relationship set
- ◆ The mapping cardinalities can be one of the following
  - One to one
  - One to many
  - Many to one
  - Many to many
- ◆ **Keys :**
- ◆ A superkey is a set of one or more attributes that, taken collectively, allows us to identify uniquely an entity in the entity set.
- ◆ Minimal set of superkeys are called candidate keys.
- ◆ Candidate key chosen by the database designer is primary key.
- ◆ The major components of an E-R diagram are
  - Rectangles : which represent entity sets
  - Ellipses : Which represent attributes
  - Diamonds : Which represent relationship sets
  - Lines : Which link attributes to entity sets and entity sets to relationship sets
  - Double Ellipses : Which represent multivalued attributes
  - Dashed Ellipses : Which denote derived attributes
  - Double lines : Which indicate total participation of an entity in a relationship set
- ◆ An entity set which does not have sufficient attributes to form a primary key is called Weak
- ◆ An entity set that has a primary key is termed a strong entity set.
- ◆ The weak entity set depends on the strong entity set for primary key.
- ◆ Specialization, Generalization and Aggregation are extended E-R features.
- ◆ Specialization is a go-down approach, It is based on differences.
- ◆ Generalization is a simple inversion of specialization.
- ◆ Aggregation is an abstraction through which relationships are treated as higher level entities.
- ◆ The E-R model is converted into corresponding tables.
- ◆ An RDBMS consists of a collection of tables.
- ◆ An RDBMS has to satisfy atleast six of the 12 Codd rules.
- ◆ Normalization is the process of refining the data model built by the Entity-Relationship model
- ◆ Advantages of normalization are
  1. improves database design
  - 2 ensures minimum redundancy of data
  3. reduces need to recognize data
- ◆ **First Normal Form :** A relation R is in first normal form if and only if all the underlying domains contain atomic values only.
- ◆ **Second Normal Form :** A relation is in second normal form if and only if it is in 1 NF and every nonkey attribute is fully dependent on the primary key.
- ◆ **Third Normal Form :** A relation is in third normal form if and only if it is in 2NF and every nonkey attribute is nontransitively dependent on the primary key.

## ⇒ ORACLE SERVER CONCEPTS

- ◆ A database server focusses on efficiency managing resources.
- ◆ The primary job of a server is to manage its resources
- ◆ **Functions of db servers :**
  1. Management of single database among concurrent users
  2. Control of database across and other security requirements
  3. Protection of database information with back-up and recovery features.
  4. Central server manages the database among a number of clients.

- ◆ Activities in space management are

### Table Space Creation and Growth :

- When a new application is installed in a system, we create one or more new ‘ tablespaces ’ in the oracle database, so that the application’s data is physically separated from other application data.
- If the tablespace is not enough for required storage, its storage capacity can be increased and data files are configured to make the tablespace grow dynamically.

### Tuning Space Usage :

- DBA needs to understand correctly about the database objects while creating them to see that the database will make use of space and deliver optional performance regarding due I/O operators.
- The DBA is responsible for the effective database design, considering the space implicators of the tables.

## ⇒ MONITORING OF SPACE USAGE :

- Once the database is created, there is a need to consistently monitor storage structures.
- If a table needs more space, oracle will automatically, extend it according to the requirements.
- ◆ **Open Database :** The database which is under use and subjected to continuous operational activities is called “open-database” or “online database”
- ◆ **Closed Database :** The database which is under shut down state is called “closed database” is “offline database”
- ◆ **Logical Database Structures :**
- ◆ The logical database structure is determined by 2 components.

1 Tablespaces	1 Scheme objects
---------------	------------------
- ◆ **Tablespaces :** A database in oracle is divided into logical storage units called tablespaces
- ◆ Every oracle database has atleast one tablespace called “System table Space”
- ◆ Oracle uses System table Space to hold the data dictionary.
- ◆ **Scheme Objects :** The scheme objects are the logical structures that directly refer to the data inside the database
- ◆ The various scheme objects are
  - Tables
  - Indexes
  - Stored procedures
  - Synonyms
  - Views
  - Clusters
  - Database links
  - Sequences
- ◆ A table is a relation whichy consists of a set of records. It is also called base table.
- ◆ A view is a logical representation of 1 or more tables. The view derives data values from the base table.
- ◆ An index is a table of pointers used for faster accessing of row in database table.
- ◆ A cluster is a collection of catalogs. The data clusters for a database are used to physically store, related rows together, to improve the performance of certain operations on the database.

A stored procedure is a compiled collection of SQL statements, flow control statements and variable declarations.

A database link is used to connect one database with a remote database.

A synonym is an alias name for other schema objects.

A sequence generates a sequence of unique numbers.

Data Blocks, Extents and Segments

**Data Blocks :** A data block is a partition or logical area of storage in database that directly corresponds to one or more physical data files.

**Extents :** An extent is a specific number of continuous data blocks obtained in a single allocation used to store a specific type of information. This is the next level of logical database space.

**Segments :** A set of extents allocated for a certain logical structures.

The different types of segments are

**Data Segments :** Each table stores all its data in the extents of data segment.

**Index Segments :** Each index stores its data in index segment

**Rollback Segments :** They contain information required for "read consistency" and 'redo changes' which transactions are rolled back.

**Temporary Segments :** Created temporarily by oracle server.

Bootstrap Segment : contain information regarding loading of oracle server.

### ⇒ **PHYSICAL DATABASE STRUCTURES :**

The physical database structures are

\* Data Files

\* Redo Log Files

\* Control Files

**Data Files :** The data files contain a set of dictionary and user tables

The data files contain all database data.

The oracle data files are the only physical database objects.

Each data file is allocated to a tablespace.

**Redo Log Files :** Redo files contain recovery data.

It is a set of OS files, external to the database that record all changes made to the database.

During recovery, all the changes made in the redo log are applied to the database.

**Control Files :** These are small mandatory files which are automatically created and maintained by oracle.

They identify and verify database configuration by identifying and locating the data and redo-log files.

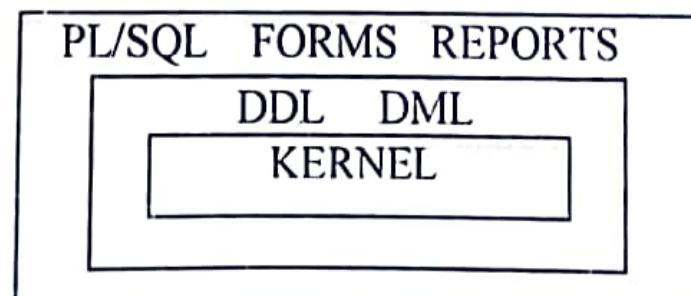
Oracle server also uses some other types of files

**Parameter file :** used to design the characteristics of an oracle instance.

**Password file :** used to authenticate privileged database users.

**Archived Redo Log files :** These are offline copies of the redo-log files that may be necessary to recover from media failures.

### ⇒ **ORACLE SYSTEM ARCHITECTURE**



- ◆ Oracle tools are integrated with kernel as “abdons”.
- ◆ The oracle tools allows the user to create database, objects, forms, reports.
- ◆ Oracle server is an Object-relational Database Management System that provides open, comprehensive, integrated approach to information management.
- ◆ Oracle Server consists of Oracle Instance and Oracle database.
- ◆ Oracle Instance consists of a memory structure called SGA (System Global Area) and background processors used by an oracle server to manage a database
- ◆ An oracle instance is a means to access an oracle database and always opens one and only one database.

⇒ **SGA**

- ◆ SGA contains data and control information for the oracle server.
- ◆ SGA is allocated in virtual memory of the computer where the oracle-server resides.
- ◆ SGA comprises of the following memory structures
  - \* Shared Pool
  - \* Buffer Cache
- ◆ **Shared Pool :** Shared pool is used to store information such as the most recently used SQL statements + PL/SQL procedure and the most recently used data from data dictionary.
- ◆ **Buffer Cache :** It reduces the disk I/O by storing data that the transactions have recently requested.
- ◆ This is in-memory work area for transaction processing.
- ◆ ‘DB buffer Cache’ is used to store the most recently used data.
- ◆ ‘Redo log buffer’ is used to register changes made to the database using the instance.

⇒ **DB BUFFER CACHE**

- ◆ ‘DB buffer Cache’ stores the most recently used blocks.
- ◆ When a query is processed the server process looks for the blocks needed in data-base buffer caches. If the block is not found in the database buffer cache, the server process reads the block from the data file and places a copy in the buffer cache. Subsequent requests for the same block are likely to find the block in memory, and may not require physical reads.
- ◆ Oracle server uses Least Recently Used (LRU) algorithm to age out buffers, that have not been accessed recently to make way for new blocks to be accommodated in the buffer cache.

⇒ **REDO LOG BUFFER**

- ◆ Its size in bytes is defined by the ‘log-buffer’ parameter.
- ◆ It stores redo-records, which record changes (i.e., the block that is changed, the location of the change and the new value)
- ◆ The redo log buffer is used sequentially and changes made by one transaction may be interleaved with changes made by other transactions.

⇒ **PGA (PROCESS OR PROGRAM GLOBAL AREA)**

- ◆ The PGA is not shared and not writable.
- ◆ PGA is a memory region, that contains data and control information, for a single server process or a single background process

It contains :

- |             |                       |                |               |
|-------------|-----------------------|----------------|---------------|
| I Sort Area | I Session information | I Cursor State | I Stack Space |
|-------------|-----------------------|----------------|---------------|
- ◆ Sort Area is used for any sort that may be necessary, before rows are processed or returned to the user.
  - ◆ Session Information is information such as user privileges for the session.
  - ◆ Cursor State indicates the state of various cursors that are currently used by the sessions.
  - ◆ Stack Space contains are session variables.
  - ◆ The PGA is allocated when a process is created and deallocated when the process is terminated.

## → ORACLE PROCESSES

- ◆ A process is a task that a computer's OS schedules and executes.
- ◆ A client/server system splits processing as client process / server process
- ◆ Other sets of processes are
  - Foreground server processes
  - Background processes

## → USER PROCESS (CLIENT)

- ◆ A user starts a tool such as SQL Plus. The user process is started when the tool is started and is terminated when the user exists.
- ◆ In client server model the application runs on the client machine.
- ◆ The user process includes CPI (User Program Interface)
- ◆ UPI generates calls to the oracle server, whenever the user makes a request.

## → SERVER PROCESS

- ◆ Each server process uses an area of memory called PGA.
- ◆ The server process uses the OPI (Oracle Program Interface) which is used to communicate with Oracle Server, at the request of the user process.
- ◆ The server process returns status information and results to the user process.

## → PROCESSING OF A DML STATEMENT :

- ◆ A DML statement requires 2 phases of processing: parsing and executing.

## → STEPS IN EXECUTING THE UPDATA STATEMENT :

- ◆ The server process reads the data and rollback blocks from the data files, they are not already in the buffer cache.
- ◆ Copies to the block that are read are placed in the buffer cache.
- ◆ The server process places locks on the data.
- ◆ The server process records the changes to be made to the rollback (before image) and to the data (new value) in the redo-log buffer.
- ◆ The changed blocks in the buffer cache are marked as dirty buffers.

## → ROLLBACK SEGMENT :

- ◆ Before making a change, the server process saves the old value into a rollback segment.
- ◆ Rollback segments tables and indexes exist in data files and parts of them are brought into the 'db buffer cache' when required.

## → OTHER PROCESSES :

- ◆ The Foreground Server Process directly handles requests from client processes.
- ◆ During transaction processing, Oracle automatically adjusts the number of foreground server processes to match the processing on the system.
- ◆ Background processes handle specific jobs of the database server.
- ◆ Each Oracle instance may use several background server processes depending on the configuration.
- ◆ Some important background processes are
  - DBMS:** (Data Base Writer) It is responsible for writing changed data to the database.
  - LGWR:** (LOG Writer) It records changes registered in the redo-log buffer to the database in the disk.
  - ARCH:** (ARCHive) The archive process
  - CKPT:** (Check Point Process) It is responsible for updating the database status information whenever changes in the buffer cache are permanently recorded in the database. It is responsible for signalling DBWR at check points and updating all data files and control files.

- ◆ **PMON:** (Process MONitor) It performs process recovery when the user process fails. It clears the cache and release the resources that the process was using
- ◆ **SMON :** (System Monitor) It performs instance recovery and claims up temporary segments that are no longer in use. It checks for consistency and initiate the recovery of the database, when the database is opened.
- ◆ **RECO :** It resolves distributed transactions that are pending due to a network failure in the distributed database.

⇒ **SQL (STRUCTURED QUERY LANGUAGE)**

- ◆ SQL is the standard language used to access data held in relational database.
- ◆ SQL statements are divided into 6 categories
- ◆ Data Manipulation Language statements: These statements are used to change the data in tables or query data in a database table, but not change the structure of the table  
Eg: Select, Insert, Update, Delete
- ◆ **Transaction Control Statements:** These statements guarantee the consistency of the data by organising SQL statements into logical transactions, which either succeed or fail as a unit.  
Eg: Commit, Rollback, Savepoint
- ◆ Session Control Statement: These statements change the settings for a single database connection.Eg : Alter Session
- ◆ System Control Statements: These statements change the settings for the entire database.  
Eg: Alter System
- ◆ Embedded SQL Statements: These statements are used in Oracle precompiler and Oracle Call Interface Programs  
Eg : Connect, declare cursor

◆ **Creation of a table:**

- ◆ The basic elements of create table command are the word create, the name of the table, an opening parenthesis, column definitions, closing parenthesis and SQL terminator.
- ◆ Individual column definitions are separated by commas.

◆ **SYNTAX :**

```
create table tablename(
    Variablename datatype,
    Variablename datatype,
    );
```

◆ **Data Constraints :**

- ◆ Data constraints are the data value restrictions applied on the columns

**Column level constraints:** If the constraints are defined along with the column definition, it is called as column level constraint.

**Table level constraints:** If the constraints are defined for the table then they are called table constraints.

**Null value constraints:**

- Setting a null value is appropriate when the actual value is unknown.
- A null value is not equivalent to 0.
- A null value will evaluate to null in an expression.
- When a column is set to not null, one cannot enter null value into that column.
- NULL keyword is used.

⇒ **Primary key concepts:**

- ◆ A primary key is one or more columns in a table used to uniquely identify each row in the table. Primary

key values must not be null and must be unique across the column. A multicolumn primary key is called primary key is called composite primary key.

A primary key is given by PRIMARY KEY keyword.

#### UNIQUE KEY CONCEPTS:

A unique key is similar to primary key, except that the purpose of an unique key is to ensure that information in the column for each record is unique.

A table can have many unique keys. An unique key is given by UNIQUE.

#### DEFAULT VALUE CONCEPTS:

At the time of cell creation a default value can be assigned to it.

When the user is loading a record with values and leaves this cell empty, the system will automatically load this cell with default value specified.

The DEFAULT clause is used.

#### FOREIGN KEY CONCEPTS:

A foreign key is a column which is the primary key from other table.

Foreign keys are used to represent the relationship between the tables.

Foreign key is also called referential integrity constraint.

It rejects an insert or update of a value if a corresponding value does not exist in the primary key table.

The data type of the foreign key should match in both the tables.

#### CHECK INTEGRITY CONSTRAINTS:

It is used to enforce rules based on logical expressions.

The check constraint consists of keyword CHECK followed by a parenthesised predicate containing the fields to be checked.

#### ALTERING TABLES:

The rules for adding a column to a table are

\* We can add a new column at any time if NOT NULL is not specified.

\* We can increase the width of a column at any time.

We cannot delete a column we use

Alter table tablename add(newcolumnname datatype(size));

To modify a column we use

Alter table tablename modify(columnname datatype(newsize));

We cannot decrease the size of a column.

#### DROPPING TABLES :

A table can be removed or deleted or dropped by using Drop table tablename;

Truncate command will remove all rows in the table but retains the table definition.

#### INSERTION OF DATA INTO TABLES:

A single row can be inserted by

Insert into tablename values (v1,v2.....);

Inserting data into a table from another table Insert into tablename1 select columnname 1, columnname 2 from tablename 2;

#### UPDATING CONTENTS OF A TABLE :

The contents of a table are updated by update statement which is used as follows

Eg: Update emp set sal = sal + 2000 where ename='john';

Updations which do not satisfy the constraints are not allowed.

## ⇒ DELETING ROWS OF A TABLE :

- ◆ The rows of a table can be deleted as follows  
Delete from tablename :  
This deletes all the rows,
- ◆ Delete from tablename where condition  
This deletes the rows which satisfy the given condition from the table.
- ◆ Retrieving information from a table :
- ◆ The basic structure of an SQL expression consists of three clauses ; select, from and Where.
- ◆ A typical SQL query has the form  
Select <columnlist>  
from <tablelist>  
where condition  
[group by <columnname>]  
[having <condition>]  
[order by <expression>];
- ◆ The keyword distinct is used after select to avoid duplicate tuples.  
Eg : Select distinct job from emp;
- ◆ The keyword all is used after select to have duplicate values.  
Eg : Select distinct job from emp;
- ◆ The \*“asterisk” is used to denote all attributes.  
Eg : Select \* from emp ;
- ◆ Shows all the rows with all columns of the table emp

### **Logical Operators**

And logical and  
or logical or  
Not logical not

### **Relational Operators**

= Equal to  
> Greater than  
< Less than  
≥ = Greater than or equal to  
≤ = Less than or equal to

### **Special Operators**

!= ◊ Not equal to

is null checks for null values

in check a value in a set of values

Between checking a value within a range.

Like matching for a pattern in a column.

- ◆ SQL uses logical connectives and,or,not
- ◆ SQL includes a between comparision operator used to specify range of values.  
Eg : Select loannumber from loan where amount between 9000 and 20000;
- ◆ SQL provides a mechanism for renaming both relations (tables) and attributes (columns) by using as clause. Select empno as employee number from emp;
- ◆ Pattern matching of strings is done by like operator. Two symbols are used Percent (%) the character % matches any substring.
- ◆ Eg : Select customername from customer where cust-street like "%main%"; It displays all customers whose street address includes the substring main.
- ◆ The order by clause allows the rows in the result of the query to appear in sorted order.
- ◆ To specify the sort order, we specify desc for descending operate on two or more select statements and they will find the union intersection and difference of the rows selected by the two select statements.  
Datatype of the corresponding columns must be same.

Eg : Select cname from depositor union select cname from borrower.

### AGGREGATE FUNCTIONS :

Aggregate functions are functions that take a collection of values as input and return a single value.

SQL has five built-in aggregate functions

Average

avg

Minimum min

Maximum

max

Total

sum

Count

count

Eg. Select avg (balance) from account ;

The set of rows can be grouped by the group by clause.

Eg. Select branch-name-, avg (balance) from account group by branch-name;

The HAVING Clause is used only with expression and columns that are specified with Group by clause.

Select count(\*) from customer.

It is used to count the number of rows in the table customer.

The special operator IS is used with keyword NULL to locate null values.

### NESTED QUERIES :

The result of one query is dynamically substituted in the condition of another.

SQL first evaluates the inner query within the where clause.

There is no particular limitation to the level of nesting queries.

The special operators for nested queries are exists, any some and all.

Exists operator produces boolean result.

Exists operator takes a subquery as an argument and evaluates it to true, if it produces any output otherwise it evaluates to false.

Correlated Subqueries :

In a correlated subquery the table used in outer query refers to the table used in the inner subquery.

### JOINS :

SQL has the ability to define relationships between multiple tables and draw information from them in terms of these relationships in a single command.

### SELF JOIN

Joining a table to itself means that each row of the table is combined with itself and with every other row of the table.

The selfjoin can be viewed as a join of two copies of the same table.

To distinguish the column names from one another, aliases for the actual table name are used, since both the tables have the same name.

Equijoin

When two tables are joined together using equality of values in one or more columns then they form equijoin.

Equi-joins are also called inner join or natural join.

In natural join the rows with the same values of the primary key of both the tables are joined.

We may lose information in natural join.

If we don't want to lose any information of left table then left outer join is performed.

If we don't want to lose any information of left table then left outer join is performed

If we don't want to lose any information of right table then right outer join is performed.

## ⇒ VIEWS :

- ◆ A view is a database object that contains no data of its own.
- ◆ It is virtual table whose contents are taken from other tables through the execution of a query.
- ◆ The changes performed in the base tables are automatically reflected in the views.
- ◆ A view is queried similar to a table and an user cannot distinguish between a view and a table.
- ◆ A view is created with the command **Create view**  
Eg: Create view dept20 as select \* from emp where deptno=20;
- ◆ View does not store any data, so there is no problem of redundancy.
- ◆ Complicated queries can be simplified by views.
- ◆ The insert, update and delete commands can be used with views.
- ◆ Syntax for dropping a view  
Drop view viewname;
- ◆ Indexing and clustering are the methods for enhancing performance in retrieving information from a table.

## ⇒ INDEXES:

- ◆ An index is a database object which provides fast access path to columns that are indexed.
- ◆ Indexes are also used to ensure that no duplicate values are entered into a column.
- ◆ Indexes are referred whenever the indexed columns are referred in the **where** clause.
- ◆ Indexes are stored separately from actual data.
- ◆ Indexes need not be activated or deactivated. With every data manipulation the appropriate index is automatically updated.
- ◆ There is no limit on the number of indexes on a table in oracle.
- ◆ Syntax for creating an index  
**Create [unique] index indexname on tablename**
- ◆ Syntax for dropping an index  
Drop index indexname;
- ◆ **Clusters:** Clustering is a method of storing tables that are related and often accessed together.
- ◆ A cluster is a group of rows from separate tables stored in the same block.
- ◆ Clustered tables must have a common column called the cluster column.
- ◆ To cluster tables the user must own the table.
- ◆ Syntax for dropping a cluster.  
Drop cluster clustername;
- ◆ **Sequences :** A sequence is a database object used to generate unique integers generally for the use of primary keys.
- ◆ Syntax for creation of sequence  
**Create sequence seqname [INCREMENT BY n] [START WITH n];**
- ◆ The default incrementation is by 1. START WITH is the number with which the sequence begins.
- ◆ CURRVAL returns the current value of sequence.
- ◆ NEXTVAL returns the next value of the sequence.
- ◆ Syntax for dropping a sequence  
Drop sequence sequencename;
- ◆ **Synonyms:**  
Oracle allows to create a synonym for a complicated reference.
- ◆ The synonym essentially renames the table reference, similar to an alias.

Syntax for creation of synonyms

**Create synonym synonymname for reference;**

Creating a synonym does not grant any privileges on the referenced object.

Syntax for dropping of synonym

**Drop synonym synonymname;**

### **Grant, Revoke and Privileges**

There are two kinds of privileges namely **object privileges** and **system privileges**.

GRANT statement is allowed to give a privilege and REVOKE statement is used to remove access allowed.

Syntax of using grant statement

GRANT privilege ON object TO grantee [WITH GRANT OPTION];

Privilege - desired privilege

Object - to which access is granted

Grantee - user who will receive privilege

Syntax of using revoke statement

REVOKE privilege ON object FROM grantee;

In a large oracle system with many different user accounts administrating privileges can be a challenge. A role is essentially a collection of privileges both object and system.

The role PUBLIC is predefined by oracle and every user has been automatically granted the role.

### **Transaction Control:**

A transaction is a series of SQL statements that either succeed or fail as a unit. This prevents inconsistent data.

#### **Commit**

When a **commit** statement is issued the database transaction is ended.

All work done by the transaction is made permanent.

Other sessions can see changes made by the transaction.

#### **Rollback:**

When **rollback** statement is issued to database then all the work done by the transaction is undone.

#### **Save Points:**

The rollback undoes entire transaction by using savepoint only part of a transaction can be undone.

**Syntax: savepoint name;**

Once a savepoint is defined the program can rollback to the savepoint.

When rollback to savepoint is issued then any work done since savepoint is undone.

### **PL/SQL**

PL/SQL is a sophisticated programming language to access oracle database from various environments.

PL/SQL stands for Procedural Language Structured Query Language.

In PL/SQL several SQL statements can be bundled together into one PL/SQL block and sent to server as a single unit.

#### **Block Structure of a PL/SQL program**

##### **Declare**

Declarative section

##### **Begin**

Executable section

##### **Exception**

Exception handling section

End;

• All PL/SQL statements are either procedural or SQL statements.

• PL/SQL is not case-sensitive

• PL/SQL character set is single-byte character set.

• Identifiers are used to name variables cursors and subprograms. Maximum length of an identifier is 30 characters.

• Reserved words have special meaning to PL/SQL.

• Every variable is associated with a specific type.

• A literal is a character numeric or boolean value that is not an identifier.

• Character literals are known as string literals delimited by single quotes.

• Numeric literals represent either an integer or real value

• Boolean literals are only 3 boolean values true, false and null.

• Single line comments are represented by two dashes \_.

• Multiline comments start with /\* and end with \*/.

• Variables are memory locations which can store data values.

• All PL/SQL types are either scalar, composite or reference.

#### ⇒ SCALAR TYPES :

• Numeric family : They store integer or real values. Basic types in this family are

Number and binary\_integer.

• Number can hold integer or real quantity. Syntax : number (p,s) p-precision and s-scale.

• A subtype is an alternate name for a type. The number of subtypes equivalent to Number are

Dec                decimal doubleprecision integer                int

Numeric            real                smallint

• Binary\_integer can hold only integers.

• The subtypes of binary\_integer are

    natural            positive

#### ⇒ CHARACTER FAMILY :

• The basic types are varchar2, char and long.

• Varchar2 can hold variable length character strings with a maximum length.

• Char variables are fixed length character strings.

• Character is the subtype of char.

• Long is a variable length string.

#### ⇒ RAW FAMILY :

• The types in the raw family are used to store binary data.

• Raw is similar to char variables except that they are not converted between character sets.

• Long raw is similar to long except that it is not converted between character sets.

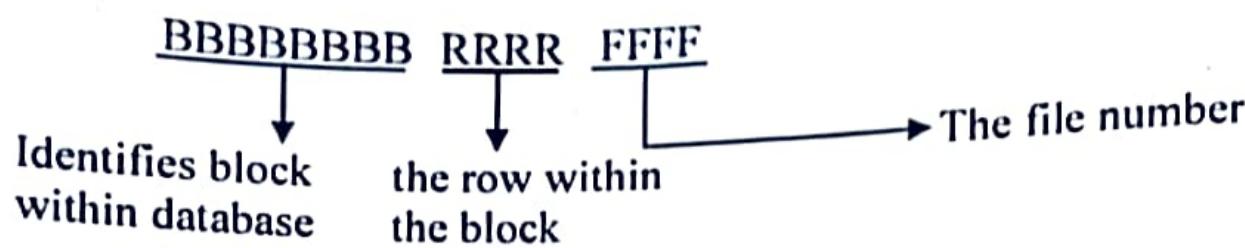
#### ⇒ DATE FAMILY :

• Date type is used to store both date and time information including century, year month day, hour minute and second.

• Values are assigned to date variables via to\_date built in function

#### ⇒ ROWID FAMILY :

• Rowid can hold a rowid which can be thought of as a unique key for every row in the database.



- ⇒ **BOOLEAN FAMILY** : Boolean can hold true, false or null only.
- ⇒ **TRUSTED FAMILY** : M1slabel to store variable length binary labels.
- ⇒ **COMPOSITE TYPES** : The composite types are records and tables.
- ⇒ **RECORDS** : PL/SQL records are similar to C structures. It provides a way to deal with sepa rated bu related variables as unit.
- ★ **Syntax :**

```
TYPE record-type IS RECORD {
    Field type [NOT NULL] [ := exp ],
    .....;
```
- ★ In order to refer a field within a record dot notation is used.
- ★ Syntax : recordname.fieldname.
- ★ In order for one record to assigned to another both records must be of the same type.
- ★ To declare a record with the same type as a database row we use %rowtype. Tables:
- ★ PL/SQL tables are similar to arrays in C.
- ⇒ **SYNTAX :**

```
TYPE table_type IS TABLE OF type INDEX BY BINARY_INTEGER ;
```
- ★ A PL/SQL table is similar to database table with two columns KEY and VALUE Reference Type
- ★ A reference type in PL/SQL is same as pointers in C.
- ★ A variable that is declared of reference type can point to different storage locations over the life of the program.
- ★ The reference type in PL/SQL is cursor.
- ⇒ **CURSORS :**
  - ★ In order to process an SQL statement it needs to allocate memory. This memory is called context area. A cursor is a handle or pointer to the context area.
  - ★ Processing explicit cursors
 

I Declare the cursor	I Open cursor for a query
I Fetch results into PL/SQL variables.	I Close the cursor
- ⇒ **DECLARING A CURSOR :**
  - ★ It defines name of cursor and associates with a SELECT statement.
  - Syntax : CURSOR cursorname IS select statement:
  - Opening a cursor
  - Syntax : OPEN cursorname ;
  - The values of bind variables are examined.
  - Active set pointer is pointed to first row.
- ⇒ **FETCHING FROM A CURSOR :**
  - Syntax : FETCH cursorname INTO listofvariables.
  - The variables in the INTO clause must be compatible with select statement of the cursor.
  - After each FETCH the active set pointer is increased to the next row.

## CLOSING A CURSOR :

- ◆ When all the active set has been retrieved, the cursor should be closed.
- ◆ All the resources are freed and it is illegal to FETCH from it after it is closed.

## CURSOR ATTRIBUTES :

- ◆ They are appended to a cursor name in PL/SQL block and then used in expressions.
- ◆ %found is a boolean attribute. It returns true if previous fetch statement returns a row and false if it does not. It is illegal to check when cursor is not open.
- ◆ % not found is opposite of %found.
- ◆ %is open is used to determine whether or not the associated cursor is open. If it is open it returns true else returns false.
- ◆ %rowcount is a numeric attribute and returns the number of rows fetched by the cursor so far.
- ◆ The implicit cursor is the sql cursor.

## PL/SQL Control Structures :

### **If-then-else statement :**

Syntax : if boolexp 1 then

```
    Seq 1  
    [elsif boolexp2 then  
        seq2]  
    end if;
```

### **Simple loop :**

### **Syntax :**

```
loop  
    Seq of statements ;  
    exit when condition  
    end loop;
```

### **While loop :**

While cond loop

Seq of statements ;

End loop;

### **For loop :**

For loopcounter in [reverse] low bound....highbound loop

End loop;

◆ If REVERSE is used values ranging from high bound to low bound are used.

## PROCEDURES :

- ◆ Procedures are also known as subprograms.

- ◆ When a procedure is created, it is compiled and stored in the database.

- ◆ Syntax for creating a procedure :

```
CREATE [OR REPLACE] PROCEDURE proc_name  
[(argument [{IN|OUT|IN OUT}{} type,...,...]) {IS|AS}  
procedure_body ;
```

- ◆ If the parameter is sent in IN mode then it is read-only.
- ◆ If the parameter is sent in OUT mode then it is write-only.
- ◆ If the parameter is sent in IN OUT mode then it is both read and write.
- ◆ The arguments can be passed to procedures by using positional notation, named notation and mixed notation.

- ◆ If the actual arguments are associated with formal arguments by position it is called positional notation.
  - ◆ In named notation the formal parameter and actual parameter are both included for each argument separated by =>
  - ◆ Mixed notation uses both positional notation and named notation.
  - ◆ Syntax for dropping a procedure  
Drop procedure procedurename ;
- ⇒ **FUNCTIONS :**
- ◆ A function is very similar to a procedure except that it has a return value.
  - ◆ Syntax for creating a function :  

```
CREATE [OR REPLACE] FUNCTION func_name
  {(argument [{IN|OUT|IN OUT}] type, ....)} RETURN ret_type {IS | AS}
  func_body;
```
  - ◆ The RETURN statement is used to return the control to the calling environment with a value.
  - ◆ Functions can accept some default values.
  - ◆ Generally if we have more than one return value then we make use of a procedure and if we have only one return value then we use a function.
  - ◆ Syntax for dropping a function;  
Drop function functionname ;
  - ◆ Procedures and functions are present in the data dictionary once it is compiled. So procedure and functions are called stored subprograms.
- Packages
- ◆ Packages allow related objects to be stored together.
  - ◆ A package has two separate parts - specification and body.
  - ◆ Syntax for package specification  

```
CREATE [OR REPLACE] PACKAGE pac_name {IS | AS}
  Procedurespecification, functionspecification
END ;
```
  - ◆ Package body contains the code for the forward subprogram declaration.
- ⇒ **DATABASE TRIGGERS :**
- ◆ Triggers are similar to procedures with declarative, executable and exception-handling sections
  - ◆ A trigger is executed implicitly whenever the triggering event happens.
  - ◆ The act of executing a trigger is called firing a trigger.
  - ◆ Triggers are used for maintaining complex integrity constraints.
- Syntax of creating a trigger
- ```
CREATE [OR REPLACE] TRIGGER trigg_name
  {BEFORE|AFTER} trigg_event ON tab_ref
  [FOR EACH ROW]
```

| Type of triggers | values                 | comments                                                                                                                           |
|------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Statement        | Insert, update, delete | defines which kind of DML statement causes the trigger to fire                                                                     |
| Timing           | before or after        | defines whether the statement is executed before or after                                                                          |
| Level            | row or statement       | if the trigger is row-level it fires once each Row is affected. A statement-level trigger fires once before or after the statement |

A trigger may not issue any transaction control statements like commit, rollback and savepoint.

Syntax for dropping a trigger

```
Drop trigger triggername ;
```

A trigger can be disabled without dropping it.

When a trigger is disabled it still exists in data dictionary but is never fired.

#### ORDER OF TRIGGER FIRING :

1. Execute the before-statement-level trigger

2. For each row effected by statement

    execute the before-row-level trigger

    execute the statement itself

    execute after row-level trigger if present

3. Execute after-row level trigger if present.

A row-level trigger fires once per row processed by the triggering statement.

Inside the trigger we can access the row that is currently being processed. We can access the old value before updation by :old pseudo record and the new value by :new pseudo record.

#### EXCEPTION HANDLING :

PL/SQL implements error handling via exceptions and exception handlers.

Exceptions are designed for run-time error handling.

There are two types of exceptions namely-predefined exceptions and user-defined exceptions.

Exceptions are explicitly raised by RAISE statement.



There is no substitute to  
**HARDWORK**

## PRACTICE SET - I

- Show your answer*
- 01.** When several users access the database at the same time, it is said to be  
 1) connecting trap  
 2) concurrent sharing  
 3) integrated dated  
 4) database
- 02.** To which component of DBMS do disks, drums, tapes belong to  
 ✓ hardware                          2) software  
 3) data                              4) users
- 03.** An area holding a group of records which are addressed jointly is called as a  
 1) block                            2) bucket  
 3) extent                         4) data set
- 04.** The concept of locking is not used for solving with following problem  
 1) lost update  
 2) uncommitted dependency  
 3) inconsistent data  
 4) deadlock
- 05.** The entity-relationship model comes under  
 ✓ object based logical models  
 2) record based logical model  
 3) physical data model  
 4) none
- 06.** If every nonkey attribute is functionally dependent on the primary key, then the Relation will be in  
 1) INF                              ✓ 2NF  
 ✓ 3NF                              4) 4NF
- 07.** The column of a table is referred to as the  
 1) tuple                            ✓ 2) attribute  
 3) entity                         4) degree
- 08.** Which of the following is record based logical model  
 ✓ network model  
 2) object-oriented model  
 3) E-R model  
 4) memory frame model
- 09.** In an E-R model ellipses represent  
 1) entity sets                    2) relationship sets  
 ✓ 3) attributes                   4) weak entity set
- 10.** The set of permitted values for each attribute is called its  
 1) attribute set                 2) attribute range  
 3) domain                        4) group
- 11.** Choose the incorrect statements  
 1) procedural DML requires user to specify what data is needed and how to get it  
 ✓ 2) procedural DML requires user to specify what data is needed without specifying how to get it  
 3) Non-procedural DML requires the user to specify what data is needed without specifying how to get it.  
 4) None of the above
- 12.** Relations from E-R model will always be in  
 ✓ 1NF                              2) 2NF  
 ✓ 3NF                              4) 4NF
- 13.** Choose the incorrect statement  
 1) In network model, data is represented by a collection of records and relationship by links  
 2) in hierarchical model, data and relationships among data are represented by records and links respectively  
 3) in hierarchical model, the records are organized as a collection of arbitrary graphs  
 4) none
- 14.** Choose the correct remark  
 ✓ 1) an alternate key is a candidate key, that is not a primary key  
 2) an alternate key is a primary key, that is not a candidate key  
 ✓ 3) an alternate key is a candidate key, that is also primary key  
 4) none
- 15.** E-R modelling technique is a  
 ✓ 1) top-down approach  
 2) bottom-up approach  
 ✓ 3) left-right approach  
 4) none
- 16.** Who of the following is more concerned about the conceptual level of RDBMS  
 1) DBA                            2) end user  
 3) systems programmer        4) client
- 17.** An attribute of one table matching the primary key of another table is called  
 1) foreign key                   2) secondary key  
 3) candidate key                4) composite key
- 18.** A weak entity set is meaningful if it is a part of  
 1) one-to-one relationship  
 2) one-to-many relationship  
 3) many-to-many relationship  
 4) none

19. The retrieve operation is a part of  
 1) DML                    2) DDL  
 3) PL/I                    4) host language
20. Which of the following is not the responsibility of DBA  
 1) deciding information content of the database  
 2) providing logins and securities for various users  
 3) Deciding storage structure and access strategy  
 4) Marketing the software
21. In hierarchical approach, how many dependents can a root have  
 1) one                    2) two  
 3) three                    4) any number
22. How many Dr. E.F Codd rules are defined  
 1) 10                    2) 11  
 3) 12                    4) 17
23. The result of compilation of DDL statements is a set of tables which are stored in a special file called  
 1) audit trail            2) compilation table  
 3) data dictionary        4) definition table
24. The overall design of the database is called  
 1) instance              2) view  
 3) table                  4) schema
25. Grant and revoke are examples of  
 1) DDL                    2) DML  
 3) DCL                    4) none
26. Create-alter and drop are  
 1) DDL                    2) DML  
 3) DCL                    4) DQL
27. In order to use a record management system  
 1) you need to understand the low level details  
 2) you need to understand the model of the system  
 3) both 1 and 2            4) none
28. Which language has recently become the standard for interfacing application Programs with relational database system  
 1) foxpro                2) SQL  
 3) dbase                  4) 4GL
29. If a piece of data is stored in two places in the database then  
 1) storage space wasted  
 2) may lead to inconsistency  
 3) highly useful  
 4) both 1 and 2
30. The lowest level of abstraction which describes how the data are actually stored is  
 1) conceptual            2) view  
 3) physical                4) none
31. To represent entity sets, attributes and relationships which of the following are used Respectively  
 1) diamond, lines, ellipses  
 2) rectangles, ellipses, diamond  
 3) triangles, diamonds, ellipses  
 4) ellipses, rectangles, diamonds
32. Which language is used to manipulate or across data in an organised way  
 1) DDL                    2) DML  
 3) DCL                    4) SQL
33. Which is a containment relationship that exists between a higher level entity set and One or more lower level entity sets  
 1) aggregation            2) generalization  
 3) specialization         4) differentiation
34. Which of the following uses bottom-up approach  
 1) aggregation            2) generalization  
 3) specialization         4) differentiation
35. Which of the following makes use of differences as the basic criteria  
 1) aggregation            2) generalization  
 3) specialization         4) differentiation
36. Which of the following is a process that acts in refining and segregating data into Tables to avoid redundancy  
 1) segregation            2) refinement  
 3) aggregation            4) normalization
37. The DBMS acts as an interface between what two components of an enterprise-class database system?  
 1) Database application and the database  
 2) Data and the database  
 3) The user and the database application  
 4) Database application and SQL
38. Which of the following products was an early implementation of the relational model developed by E.F. Codd of IBM?  
 1) IDMS                    2) DB2  
 3) dBase-II                4) R:base
39. The following are components of a database except \_\_\_\_\_.  
 1) user data                2) metadata  
 3) reports                  4) indexes

40. An application where only one user accesses the database at a given time is an example of a(n) \_\_\_\_\_.
- 1) single-user database application
  - 2) multiuser database application
  - 3) e-commerce database application
  - 4) data mining database application
41. An on-line commercial site such as Amazon.com is an example of a(n) \_\_\_\_\_.
- 1) single-user database application
  - 2) multiuser database application
  - 3) e-commerce database application
  - 4) data mining database application
42. Which of the following products was the first to implement true relational algebra in a PC DBMS?
- 1) IDMS
  - 2) Oracle
  - 3) dBase-II
  - 4) R:base
43. SQL stands for \_\_\_\_\_.
- 1) Structured Query Language
  - 2) Sequential Query Language
  - 3) Structured Question Language
  - 4) Sequential Question Language
44. Because it contains a description of its own structure, a database is considered to be \_\_\_\_\_.
- 1) described
  - 2) metadata compatible
  - 3) self-describing
  - 4) an application program
45. The following are functions of a DBMS except \_\_\_\_\_.
- 1) creating and processing forms
  - 2) creating databases
  - 3) processing data
  - 4) administrating databases
46. Helping people keep track of things is the purpose of a(n) \_\_\_\_\_.
- 1) database
  - 2) table
  - 3) instance
  - 4) relationship
47. Which of the following products implemented the CODASYL DBTG model?
- 1) IDMS
  - 2) DB2
  - 3) dBase-II
  - 4) R:base
48. An Enterprise Resource Planning application is an example of a(n) \_\_\_\_\_.
- 1) single-user database application
  - 2) multiuser database application
  - 3) e-commerce database application
  - 4) data mining database application
49. A DBMS that combines a DBMS and an application generator is \_\_\_\_\_.
- 1) Microsoft's SQL Server
  - 2) Microsoft's Access
  - 3) IBM's DB2
  - 4) Oracle Corporation's Oracle
50. You have run an SQL statement that asked the DBMS to display data in a table named USER\_TABLES. The results include columns of data labeled "TableName," "NumberOfColumns" and "PrimaryKey." You are looking at \_\_\_\_\_.
- 1) user data.
  - 2) metadata
  - 3) A report
  - 4) indexes
51. The relational database environment has all of the following components except
- 1) users
  - 2) separate files
  - 3) database
  - 4) query languages
52. Database management systems are intended to
- 1) eliminate data redundancy
  - 2) establish relationship among records in different files
  - 3) manage file access
  - 4) all of the above
53. One approach to standardization storing of data?
- 1) MIS
  - 2) structured programming
  - 3) CODASYL specification
  - 4) none of the above
54. The language used application programs to request data from the DBMS is referred to as the
- 1) DML
  - 2) DDL
  - 3) query language
  - 4) any of the above
55. The highest level in the hierarchy of data organization is called
- 1) data bank
  - 2) data base
  - 3) data file
  - 4) data record
56. Choose the RDBMS which supports full fledged client server application development
- 1) dBase V
  - 2) Oracle 7.1
  - 3) FoxPro 2.1
  - 4) Ingress
57. Report generators are used to
- 1) store data input by a user
  - 2) retrieve information from files

58. A form defined  
1) where data is placed on the screen  
2) the width of each field  
3) both 1 and 2  
4) none of the above

59. A top-to-bottom relationship among the items in a database is established by a  
1) hierarchical schema  
2) network schema  
3) relational schema  
4) all of the above

60. The management information system (MIS) structure with one main computer system is called a  
1) hierarchical MIS structure  
2) distributed MIS structure  
3) centralized MIS structure  
4) decentralized MIS structure

61. The relational database environment has all of the following components except  
1) users  
2) separate files  
3) database  
4) query languages

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1) eliminate data redundancy  
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1) data bank  
2) data base  
3) data file  
4) data record

66. Choose the RDBMS which supports full fledged client server application development  
1) dBase V  
2) Oracle 7.1  
3) FoxPro 2.1  
4) Ingress

67. Report generators are used to  
1) store data input by a user  
2) retrieve information from files  
3) answer queries  
4) both 2 and 3

68. A form defined  
1) where data is placed on the screen  
2) the width of each field  
3) both 1 and 2  
4) none of the above

69. A top-to-bottom relationship among the items in a database is established by a  
1) hierarchical schema  
2) network schema  
3) relational schema  
4) all of the above

70. The management information system (MIS) structure with one main computer system is called a  
1) hierarchical MIS structure  
2) distributed MIS structure  
3) centralized MIS structure  
4) decentralized MIS structure

71. Which of the following hardware component is the most important to the operation of database management system?  
1) high resolution video display  
2) printer  
3) high speed, large capacity disk  
4) plotter

72. Batch processing is appropriate if  
1) large computer system is available  
2) only a small computer system is available  
3) only a few transactions are involved  
4) none of the above

73. Large collection of files are called  
1) fields  
2) records  
3) database  
4) sectors

74. Which of the following is not a relational database?  
1) dBase IV  
2) 4th Dimension  
3) FoxPro  
4) Reflex

75. In order to use a record management system  
1) you need to understand the low level details of how information is stored  
2) you need to understand the model the record management system uses  
3) both 1 and 2  
4) none of the above

76. Sort/Report generators  
 1) are faster than index/report generators  
 2) require more disk space than indexed/report generators  
 3) do not need to sort before generating report  
 4) both 1 and 2
77. If a piece of data is stored in two places in the database, then  
 1) storage space is wasted  
 2) changing the data in one spot will cause data inconsistency  
 3) it can be more easily accessed  
 4) both 1 and 2
78. An audit trail  
 1) is used to make backup copies  
 2) is the recorded history of operations performed on a file  
 3) can be used to restore lost information  
 4) none of the above
79. Which of the following fields in a student file can be used as a primary key?  
 1) class  
 2) Social Security Number  
 3) GPA  
 4) Major
80. Which of the following is not an advantage of the database approach  
 1) Elimination of data redundancy  
 2) Ability to associate deleted data  
 3) increased security  
 4) all of the above
81. Which of the following contains a complete record of all activity that affected the contents of a database during a certain period of time?  
 1) report writer  
 2) query language  
 3) data manipulation language  
 4) transaction log
82. In the DBMS approach, application programs perform the  
 1) storage function  
 2) processing functions  
 3) access control  
 4) all of the above
83. A set of programs that handle a firm's database responsibilities is called  
 1) database management system (DBMS)  
 2) database processing system (DBPS)  
 3) data management system (DMS)  
 4) all of above
84. Which is the make given to the database management system which is able to handle full text data, image data, audio and video?  
 1) full media                            2) graphics media  
 3) multimedia                            4) hypertext
85. A record management system  
 1) can handle many files of information at a time  
 2) can be used to extract information stored in a computer file  
 3) always uses a list as its model  
 4) both 1 and 2
86. A command that lets you change one or more fields in a record is  
 1) insert                                2) modify  
 3) lookup                              4) none of above
87. A transparent DBMS  
 1) can not hide sensitive information from users  
 2) keeps its logical structure hidden from users  
 3) keeps its physical structure hidden from users  
 4) both 1 and 3
88. A file produced by a spreadsheet  
 1) is generally stored on disk in an ASCII text format  
 2) can be used as is by the DBMS  
 3) both 1 and 2  
 4) none of the above
89. The ascending order of a data hierarchy is:  
 1) bit-byte-record-field-file-database  
 2) byte-bit-field-record-file-database  
 3) bit-byte-field-record-file-database  
 4) bit-byte-file-record-field-database
90. Which of the following is true of a network structure?  
 1) It is a physical representation of the data  
 2) It allows a many-to-many relationship  
 3) It is conceptually simple  
 4) It will be dominant data base of the future
91. Which of the following is a problem of file management system?  
 1) difficult to update  
 2) lack of data independence  
 3) data redundancy  
 4) all of above
92. One data dictionary software package is called  
 1) DB/DC dictionary                    2) TOTAL  
 3) ACCESS  
 4) Datapac

93. The function of a database is ...  
 1) to check all input data 2) to check all spelling  
 3) to collect and organize input data  
 4) to output data
94. What is the language used by most of the DBMSs for helping their users to access data?  
 1) High level language 2) SQL  
 3) Query Language  
 4) 4GL
95. The model for a record management system might be  
 1) handwritten list      2) a Rolodex card  
 file                      3) a business form  
 4) all of above
96. Primitive operations common to all record management system include  
 1) print      2) sort  
 3) look-up    4) all of above
97. In a large DBMS  
 1) each user can "see" only a small part of the entire database  
 2) each subschema contains every field in the logical schema  
 3) each user can access every subschema  
 4) all of above
98. Information can be transferred between the DBMS and a  
 1) spreadsheet program  
 2) word processor program  
 3) graphics program  
 4) all of the above
99. What is Cartesian product  
 1) group function  
 2) the result of join select statement with no where clause  
 3) a special feature of oracle server  
 4) none of the above
100. Who proposed Twelve commandments of DDBMS  
 1) C.J. Date      2) Richard Elison  
 3) Sudersan        4) All of them

## PRACTICE SET - I KEY

- |       |       |       |       |        |
|-------|-------|-------|-------|--------|
| 01) 2 | 02) 1 | 03) 2 | 04) 4 | 05) 1  |
| 06) 2 | 07) 2 | 08) 1 | 09) 3 | 10) 3  |
| 11) 2 | 12) 3 | 13) 3 | 14) 1 | 15) 1  |
| 16) 1 | 17) 1 | 18) 2 | 19) 1 | 20) 4  |
| 21) 4 | 22) 3 | 23) 3 | 24) 4 | 25) 3  |
| 26) 1 | 27) 2 | 28) 2 | 29) 4 | 30) 3  |
| 31) 2 | 32) 2 | 33) 3 | 34) 2 | 35) 3  |
| 36) 4 | 37) 1 | 38) 2 | 39) 3 | 40) 1  |
| 41) 3 | 42) 4 | 43) 1 | 44) 3 | 45) 1  |
| 46) 1 | 47) 1 | 48) 2 | 49) 2 | 50) 2  |
| 51) 2 | 52) 4 | 53) 3 | 54) 1 | 55) 2  |
| 56) 2 | 57) 4 | 58) 1 | 59) 1 | 60) 3  |
| 61) 2 | 62) 4 | 63) 3 | 64) 1 | 65) 2  |
| 66) 1 | 67) 4 | 68) 1 | 69) 1 | 70) 3  |
| 71) 3 | 72) 4 | 73) 3 | 74) 4 | 75) 2  |
| 76) 2 | 77) 4 | 78) 2 | 79) 2 | 80) 4  |
| 81) 4 | 82) 2 | 83) 4 | 84) 3 | 85) 2  |
| 86) 2 | 87) 3 | 88) 1 | 89) 3 | 90) 2  |
| 91) 4 | 92) 1 | 93) 3 | 94) 3 | 95) 4  |
| 96) 3 | 97) 1 | 98) 4 | 99) 2 | 100) 1 |

## PRACTICESET- II

01. Which of the following is not considered to be a basic element of an enterprise-class database system?  
 1) Users  
 2) Database applications  
 3) DBMS  
 4) COBOL programs
02. The DBMS that is most difficult to use is \_\_\_\_\_.  
 1) Microsoft's SQL Server  
 2) Microsoft's Access  
 3) IBM's DB2  
 4) Oracle Corporation's Oracle
03. Every time attribute A appears, it is matched with the same value of attribute B, but not the same value of attribute C. Therefore, it is true that:  
 1) A '!' B.                      2) A '!' C.  
 3) A '!' (B,C).                4) (B,C) '!' A.

A → R

- 04.** The different classes of relations created by the technique for preventing modification anomalies are called:  
 1) normal forms.  
 2) referential integrity constraints.  
 3) functional dependencies.  
 4) None of the above is correct.
- 05.** A relation is in this form if it is in BCNF and has no multivalued dependencies:  
 1) second normal form.  
 2) third normal form.  
 3) fourth normal form.  
 4) domain/key normal form.
- 06.** Row is synonymous with the term:  
 1) record.                    2) relation.  
 3) column.                  4) field.
- 07.** The primary key is selected from the:  
 1) composite keys.        2) determinants.  
 3) candidate keys.        4) foreign keys.
- 08.** Which of the following is a group of one or more attributes that uniquely identifies a row?  
 1) Key                      2) Determinant  
 3) Tuple                    4) Relation
- 09.** When the values in one or more attributes being used as a foreign key must exist in another set of one or more attributes in another table, we have created a(n):  
 1) transitive dependency. 2) insertion anomaly.  
 3) referential integrity constraint.  
 4) normal form.
- 10.** A relation is considered a:  
 1) Column.  
 2) one-dimensional table.  
 3) two-dimensional table. 4) three-dimensional table.
- 11.** In the relational model, relationships between relations or tables are created by using:  
 1) composite keys.        2) determinants.  
 3) candidate keys.        4) foreign keys.
- 12.** A functional dependency is a relationship between, or among:  
 1) tables.                   2) rows.  
 3) relations.                4) attributes.
- 13.** Table is synonymous with the term:  
 1) record.                   2) relation.  
 3) column.                  4) field.
- 14.** Which of the following is not a restriction for a table to be a relation?  
 1) The cells of the table must contain a single value.  
 2) All of the entries in any column must be of the same kind.  
 3) The columns must be ordered.  
 4) No two rows in a table may be identical.
- 15.** For some relations, changing the data can have undesirable consequences called:  
 1) referential integrity constraints.  
 2) modification anomalies.  
 3) normal forms.  
 4) transitive dependencies.
- 16.** A key:  
 1) must always be composed of two or more columns.  
 2) can only be one column.  
 3) identifies a row.  
 4) identifies a column.
- 17.** An attribute is a(n):  
 1) column of a table.  
 2) two dimensional table  
 3) row of a table.  
 4) key of a table.
- 18.** A relation in this form is free of all modification anomalies.  
 1) First normal form  
 2) Second normal form  
 3) Third normal form  
 4) Domain/key normal form
- 19.** If attributes A and B determine attribute C, then it is also true that:  
 1) A  $\nsubseteq$  C.  
 2) B  $\nsubseteq$  C.  
 3) (A,B) is a composite determinant.  
 4) C is a determinant.
- 20.** A tuple is a(n):  
 1) column of a table.  
 2) two dimensional table.  
 3) row of a table.  
 4) key of a table.
- 21.** If attribute A determines both attributes B and C, then it is also true that:  
 1) A  $\nsubseteq$  B.                    2) B  $\nsubseteq$  A.  
 3) C  $\nsubseteq$  A.                    4) (B,C)  $\nsubseteq$  A.

22. One solution to the multivalued dependency constraint problem is to:  
 1) split the relation into two relations, each with a single theme.  
 2) change the theme.      3) create a new theme.  
 4) add a composite key.
23. Which of the following indicates the maximum number of entities that can be involved in a relationship?  
 1) Minimum cardinality  
 2) Maximum cardinality  
 3) ERD  
 4) Greater Entity Count (GEC)
24. Which type of entity cannot exist in the database unless another type of entity also exists in the database, but does not require that the identifier of that other entity be included as part of its own identifier?  
 1) Weak entity  
 2) Strong entity  
 3) ID-dependent entity  
 4) ID-independent entity
25. In a one-to-many relationship, the entity that is on the one side of the relationship is called a(n) entity.  
 1) parent                  2) child  
 3) instance                4) subtype
26. Which type of entity represents an actual occurrence of an associated generalized entity?  
 1) Supertype entity  
 2) Subtype entity  
 3) Archetype entity  
 4) Instance entity
27. A recursive relationship is a relationship between an entity and \_\_\_\_\_.  
 1) itself                  2) a subtype entity  
 3) an archetype entity    4) an instance entity
28. Which of the following indicates the minimum number of entities that must be involved in a relationship?  
 1) Minimum cardinality  
 2) Maximum cardinality  
 3) ERD  
 4) Greater Entity Count (GEC)
29. Which of the following refers to something that can be identified in the users' work environment, something that the users want to track?  
 1) Entity                  2) Attribute  
 3) Identifier              4) Relationship

30. In which of the following is a single-entity instance of one type related to many entity instances of another type?  
 1) One-to-One Relationship  
 2) One-to-Many Relationship  
 3) Many-to-Many Relationship  
 4) Composite Relationship
31. Which of the following refers to an entity in which the identifier of one entity includes the identifier of another entity?  
 1) Weak entity  
 2) Strong entity  
 3) ID-dependent entity  
 4) ID-independent entity
32. Which type of entity is related to two or more associated entities that each contain specialized attributes that apply to some but not all of the instances of the entity?  
 1) Supertype entity      2) Subtype entity  
 3) Archetype entity      4) Instance entity
33. An attribute that names or identifies entity instances is a(n):  
 1) entity.                  2) attribute.  
 3) identifier.              4) relationship.
34. Properties that describe the characteristics of entities are called:  
 1) entities.                2) attributes.  
 3) identifiers.             4) relationships.
35. In which of the following can many entity instances of one type be related to many entity instances of another type?  
 1) One-to-One Relationship  
 2) One-to-Many Relationship  
 3) Many-to-Many Relationship  
 4) Composite Relationship
36. Entities of a given type are grouped into a(n):  
 1) database.              2) entity class.  
 3) attribute.              4) ERD.
37. Which of the following is NOT a basic element of all versions of the E-R model?  
 1) Entities                2) Attributes  
 3) Relationships          4) Primary keys
38. In which of the following is a single-entity instance of one type related to a single-entity instance of another type?  
 1) One-to-One Relationship  
 2) One-to-Many Relationship  
 3) Many-to-Many Relationship  
 4) Composite Relationship

39. Entities can be associated with one another in which of the following?  
 1) Entities                    2) Attributes  
 3) Identifiers                4) Relationships
40. Which type of entity has its relationship to another entity determined by an attribute in that other entity called a discriminator?  
 1) Supertype entity         2) Subtype entity  
 3) Archetype entity         4) Instance entity
41. Which type of entity represents a logical generalization whose actual occurrence is represented by a second, associated entity?  
 1) Supertype entity         2) Subtype entity  
 3) Archetype entity         4) Instance entity
42. In a one-to-many relationship, the entity that is on the many side of the relationship is called a(n) \_\_\_\_\_ entity.  
 1) parent                    2) child  
 3) instance                 4) subtype
43. The SQL command to create a table is:  
 1) MAKE TABLE.              2) ALTER TABLE.  
 3) DEFINE TABLE.            4) CREATE TABLE.
44. A \_\_\_\_\_ is a stored program that is attached to a table or a view.  
 1) pseudofile  
 2) embedded SELECT statement  
 3) trigger  
 4) None of the above is correct.
45. The DROP TABLE statement:  
 1) deletes the table structure only.  
 2) deletes the table structure along with the table data.  
 3) works whether or not referential integrity constraints would be violated.  
 4) is not an SQL statement.
46. SQL views can be used to hide:  
 1) columns and rows only.  
 2) complicated SQL syntax only.  
 3) both of the above can be hidden by an SQL view.  
 4) None of the above is correct.
47. The SQL statement to create a view is:  
 1) CREATE VIEW.             2) MAKE VIEW.  
 3) SELECT VIEW.            4) INSERT VIEW.
48. To update an SQL view, the DBMS must be able to associate the column(s) to be updated with:  
 1) a particular column in a particular underlying table.  
 2) a particular column in a particular row.  
 3) a particular row in a particular underlying table.  
 4) None of the above is correct.
49. Which of the following is NOT a type of SQL constraint?  
 1) PRIMARY KEY  
 2) FOREIGN KEY  
 3) ALTERNATE KEY  
 4) UNIQUE
50. A \_\_\_\_\_ is a program that performs some common action on database data and that is stored in the database.  
 1) trigger  
 2) stored procedure  
 3) pseudofile  
 4) None of the above is correct.
51. Which constraint requires that the binary relationship indicate all combinations that must appear in the ternary relationship?  
 1) MUST COVER  
 2) MUST NOT  
 3) Both of the above.  
 4) None of the above is correct.
52. Each entity is represented as a(n):  
 1) tuple.                    2) table.  
 3) attribute.                4) file
53. For every relationship, how many possible sets of minimum cardinalities are there?  
 1) Two                      2) Three  
 3) Four                     4) Six
54. If a relationship has a cascade updates constraint, then if \_\_\_\_\_ in the parent table is changed, then the same change will automatically be made to any corresponding foreign key value.  
 1) the primary key         2) any alternate key  
 3) a surrogate key         4) a foreign key



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55. Which of the following column properties would be used to specify that cells in a column must contain a monetary value that is less than another monetary value in the same row?  
 1) Null status                    2) Data type  
 3) Default value                4) Data constraints
56. What type of failure occurs when Oracle fails due to an operating system or computer hardware failure?  
 1) Application failure            2) Instance Failure  
 3) Media Failure                4) Rollback failure
57. Which statement about sequences is not true?  
 1) A sequence is an object that generates a sequential series of unique numbers.  
 2) Sequences are most often used to provide values for surrogate keys.  
 3) *NextVal* and *CurrVal* are both sequence methods.  
 4) Sequences guarantee valid surrogate key values.
58. Which prefixes are available to Oracle triggers?  
 1) :new only                    2) :old only  
 3) Both :new and :old        4) Neither :new nor :old
59. In creating a procedure, you may get a message if you have compile errors. Which of the following is true?  
 ✓ 1) The line numbers reported match the line numbers you see in your text editor.  
 2) SQL\*Plus will automatically show the errors to you.  
 3) To see the errors, enter SHOW ERRORS in SQL\*Plus.  
 4) If there are no syntax errors, you will receive the message "NO ERRORS."
60. Which of the following is **not** true about indexes?  
 1) Indexes are created to enforce uniqueness on columns.  
 2) Indexes are created to enable fast retrieval by column values.  
 3) Columns that are frequently used with equal conditions in WHERE clauses are good candidates for indexes.  
 4) Indexes are created with the ALTER TABLE command.
61. Which of the following is **not** true of SQL views?  
 1) Oracle views cannot use the ORDER BY clause in view definitions.  
 2) Oracle views are created using the standard SQL-92 CREATE VIEW command.  
 3) Oracle views can be queried.  
 4) The SQL-92 standard does not allow the use of the ORDER BY clause in view definitions.  
 SQL\*Plus will finish the statement and execute it when the user types in this:  
 1) A left slash (\) followed by [Enter].  
 2) A colon (:) followed by [Enter].  
 3) A semicolon (;) followed by [Enter].  
 4) A period (.) followed by [Enter].
62. Which of the following is NOT an Oracle-supported trigger?  
 1) BEFORE                      2) DURING  
 3) AFTER                        4) INSTEAD OF
- After a table has been created, its structure can be modified using the SQL command:  
 1) UPDATE TABLE [TableName].  
 2) MODIFY TABLE [TableName].  
 3) ALTER TABLE [TableName].  
 4) CHANGE TABLE [TableName].
63. Which of the following is **not** true about modifying table columns?  
 1) You can drop a column at any time.  
 2) You can add a column at any time as long as it is a NULL column.  
 3) You can increase the number of characters in character columns or the number of digits in numeric columns  
 4) You cannot increase or decrease the number of decimal places.
64. If a denormalization situation exists with a one-to-one binary relationship, which of the following is true?  
 1) All fields are stored in one relation.  
 2) All fields are stored in two relations.  
 3) All fields are stored in three relations.  
 4) All fields are stored in four relations.
65. Selecting a data type involves which of the following?  
 1) Maximize storage space  
 2) Represent most values  
 3) Improve data integrity  
 4) All of the above.
66. 67.

68. What is the best data type definition for Oracle when a field is alphanumeric and has a length that can vary?  
 1) VARCHAR2      2) CHAR  
 3) LONG      4) NUMBER
69. If a denormalization situation exists with a many-to-many or associative binary relationship, which of the following is true?  
 1) All fields are stored in one relation.  
 2) All fields are stored in two relations.  
 3) All fields are stored in three relations.  
 4) All fields are stored in four relations.
70. Which of the following is an advantage of partitioning?  
 1) Complexity  
 2) Inconsistent access speed  
 3) Extra space  
 4) Security

### PRACTICE SET - II KEY

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 01) 4 | 02) 4 | 03) 1 | 04) 1 | 05) 3 |
| 06) 1 | 07) 3 | 08) 1 | 09) 3 | 10) 3 |
| 11) 4 | 12) 4 | 13) 2 | 14) 3 | 15) 2 |
| 16) 3 | 17) 1 | 18) 4 | 19) 3 | 20) 3 |
| 21) 1 | 22) 1 | 23) 2 | 24) 1 | 25) 1 |
| 26) 4 | 27) 1 | 28) 1 | 29) 1 | 30) 2 |
| 31) 3 | 32) 1 | 33) 3 | 34) 2 | 35) 3 |
| 36) 2 | 37) 4 | 38) 1 | 39) 4 | 40) 2 |
| 41) 3 | 42) 2 | 43) 4 | 44) 3 | 45) 2 |
| 46) 3 | 47) 1 | 48) 3 | 49) 3 | 50) 2 |
| 51) 1 | 52) 2 | 53) 3 | 54) 1 | 55) 4 |
| 56) 2 | 57) 4 | 58) 3 | 59) 3 | 60) 4 |
| 61) 1 | 62) 3 | 63) 2 | 64) 3 | 65) 4 |
| 66) 1 | 67) 3 | 68) 1 | 69) 2 | 70) 4 |

### PRACTICE SET – III

01. For what purposes are views used?  
 1) To hide columns only  
 2) To hide rows only  
 3) To hide complicated SQL statements only  
 4) All of the above are uses for SQL views.

02. What is an SQL virtual table that is constructed from other tables?  
 1) Just another table      2) A view  
 3) A relation      4) Query results
03. When using the SQL INSERT statement:  
 1) rows can be modified according to criteria only.  
 2) rows cannot be copied in mass from one table to another only.  
 3) rows can be inserted into a table only one at a time only.  
 4) rows can either be inserted into a table one at a time or in groups.
04. What is not an advantage of stored procedures?  
 1) Greater security  
 2) SQL can be optimized  
 3) Code sharing  
 4) Increased network traffic
05. A reason for using an SQL view to hide columns is:  
 1) to simplify a result only.  
 2) to prevent the display of sensitive data only.  
 3) to accomplish both of the above.  
 4) None of the above are reasons for using an SQL view.
06. Which of the following is an SQL trigger supported by Oracle?  
 1) BEFORE      2) INSTEAD OF  
 3) AFTER      4) All of the above.
07. The SQLALTER statement can be used to:  
 1) change the table structure.  
 2) change the table data.  
 3) add rows to the table.  
 4) delete rows from the table.
08. What SQL structure is used to limit column values of a table?  
 1) The LIMIT constraint  
 2) The CHECK constraint  
 3) The VALUE constraint  
 4) None of the above is correct.
09. Which is NOT one of the most common types of SQL CHECK constraints?  
 1) System date      2) Range checks  
 3) Lists of values  
 4) Comparing one column value to another within the same table

10. What is an advantage of placing computations in SQL views?  
 1) To save users from having to write an expression.  
 2) To ensure that the results are consistent.  
 3) To accomplish both of the above.  
 4) None of the above is correct - computations cannot be placed in a view.
11. Views constructed from SQL SELECT statements that conform to the SQL-92 standard may not contain:  
 1) GROUP BY.                    2) WHERE.  
 3) ORDER BY.                    4) FROM.
12. You can add a row using SQL in a database with which of the following?  
 1) ADD                            2) CREATE  
 3) INSERT                        4) MAKE
13. The command to remove rows from a table 'CUSTOMER' is:  
 1) REMOVE FROM CUSTOMER ...  
 2) DROP FROM CUSTOMER ...  
 3) DELETE FROM CUSTOMER WHERE ...  
 4) UPDATE FROM CUSTOMER ...
14. The SQL WHERE clause:  
 1) limits the column data that are returned.  
 2) limits the row data are returned.  
 3) Both 1 and 2 are correct.  
 4) Neither 1 nor 2 are correct.
15. Which of the following is the original purpose of SQL?  
 1) To specify the syntax and semantics of SQL data definition language  
 2) To specify the syntax and semantics of SQL manipulation language  
 3) To define the data structures  
 4) All of the above.
16. The wildcard in a WHERE clause is useful when?  
 1) An exact match is necessary in a SELECT statement.  
 2) An exact match is not possible in a SELECT statement.  
 3) An exact match is necessary in a CREATE statement.  
 4) An exact match is not possible in a CREATE statement.
17. A view is which of the following?  
 1) A virtual table that can be accessed via SQL commands  
 2) A virtual table that cannot be accessed via SQL commands  
 3) A base table that can be accessed via SQL commands  
 4) A base table that cannot be accessed via SQL commands
18. The command to eliminate a table from a database is:  
 1) REMOVE TABLE CUSTOMER;  
 2) DROPTABLE CUSTOMER;  
 3) DELETE TABLE CUSTOMER;  
 4) UPDATE TABLE CUSTOMER;
19. ON UPDATE CASCADE ensures which of the following?  
 1) Normalization                2) Data Integrity  
 3) Materialized Views        4) All of the above.
20. SQL data definition commands make up a(n)  
 1) DDL                        2) DML  
 3) HTML                        4) XML
21. Which of the following is valid SQL for an Index?  
 1) CREATE INDEX ID;  
 2) CHANGE INDEX ID;  
 3) ADD INDEX ID;  
 4) REMOVE INDEX ID;
22. The SQL keyword(s) \_\_\_\_\_ is used with wildcards.  
 1) LIKE only                    2) IN only  
 3) NOT IN only                4) IN and NOT IN
23. Which of the following is the correct order of keywords for SQL SELECT statements?  
 1) SELECT, FROM, WHERE  
 2) FROM, WHERE, SELECT  
 3) WHERE, FROM, SELECT  
 4) SELECT, WHERE, FROM
24. A subquery in an SQL SELECT statement is enclosed in:  
 1) braces — {...}.  
 2) CAPITAL LETTERS.  
 3) parenthesis — (...).  
 4) brackets — [...].
25. The result of a SQL SELECT statement is a(n)  
 1) report                      2) form  
 3) file                        4) table

26. Which of the following are the five built-in functions provided by SQL?  
 1) COUNT, SUM, AVG, MAX, MIN  
 2) SUM, AVG, MIN, MAX, MULT  
 3) SUM, AVG, MULT, DIV, MIN  
 4) SUM, AVG, MIN, MAX, NAME
27. In an SQL SELECT statement querying a single table, according to the SQL-92 standard the asterisk (\*) means that:  
 1) all columns of the table are to be returned.  
 2) all records meeting the full criteria are to be returned.  
 3) all records with even partial criteria met are to be returned.  
 4) None of the above is correct.
28. The HAVING clause does which of the following?  
 1) Acts like a WHERE clause but is used for groups rather than rows.  
 2) Acts like a WHERE clause but is used for rows rather than columns.  
 3) Acts like a WHERE clause but is used for columns rather than groups.  
 4) Acts EXACTLY like a WHERE clause.
29. The SQL -92 wildcards are \_\_\_\_\_ and \_\_\_\_\_.  
 1) asterisk (\*); percent sign (%)  
 2) percent sign (%); underscore (\_)  
 3) underscore(\_); question mark (?)  
 4) question mark (?); asterisk (\*)
30. To remove duplicate rows from the results of an SQL SELECT statement, the \_\_\_\_\_ qualifier specified must be included.  
 1) ONLY                    2) UNIQUE  
 3) DISTINCT              4) SINGLE
31. The benefits of a standard relational language include which of the following?  
 1) Reduced training costs      2) Increased dependence on a single vendor  
 3) Applications are not needed.  
 4) All of the above.
32. Which of the following do you need to consider when you make a table in SQL?  
 1) Data types                2) Primary keys  
 3) Default values           4) All of the above.
33. SQL query and modification commands make up a(n) \_\_\_\_\_.  
 1) DDL                      2) DML  
 3) HTML                     4) XML
34. When three or more AND and OR conditions are combined, it is easier to use the SQL keyword(s):  
 1) LIKE only.  
 2) IN only.  
 3) NOT IN only.  
 4) Both IN and NOT IN.
35. The Microsoft Access wildcards are \_\_\_\_\_ and \_\_\_\_\_.  
 1) asterisk (\*); percent sign (%)  
 2) percent sign (%); underscore (\_)  
 3) underscore(\_); question mark (?)  
 4) question mark (?); asterisk (\*)
36. Find the SQL statement below that is equal to the following: SELECT NAME FROM CUSTOMER WHERE STATE = 'VA';  
 1) SELECT NAME IN CUSTOMER WHERE STATE IN ('VA');  
 2) SELECT NAME IN CUSTOMER WHERE STATE = 'VA';  
 3) SELECT NAME IN CUSTOMER WHERE STATE = 'V';  
 4) SELECT NAME FROM CUSTOMER WHERE STATE IN ('VA');
37. Which one of the following sorts rows in SQL?  
 1) SORT BY                2) ALIGN BY  
 3) ORDER BY              4) GROUP BY
38. To sort the results of a query use:  
 1) SORT BY.  
 2) GROUP BY.  
 3) ORDER BY.  
 4) None of the above is correct.
39. To define what columns should be displayed in an SQL SELECT statement:  
 1) use FROM to name the source table(s) and list the columns to be shown after SELECT.  
 2) use USING to name the source table(s) and list the columns to be shown after SELECT.  
 3) use SELECT to name the source table(s) and list the columns to be shown after USING.  
 4) use USING to name the source table(s) and list the columns to be shown after WHERE.
40. SQL can be used to:  
 1) create database structures only.  
 2) query database data only.  
 3) modify database data only.  
 4) All of the above can be done by SQL.

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41. The SQL statement that queries or reads data from a table is \_\_\_\_\_.  
 1) SELECT  
 2) READ  
 3) QUERY  
 4) None of the above is correct.
42. The SQL keyword BETWEEN is used:  
 1) for ranges.  
 2) to limit the columns displayed.  
 3) as a wildcard.  
 4) None of the above is correct.
43. A subquery in an SQL SELECT statement:  
 1) can only be used with two tables.  
 2) can always be duplicated by a join.  
 3) has a distinct form that cannot be duplicated by a join.  
 4) cannot have its results sorted using ORDER BY.
44. \_\_\_\_\_ was adopted as a national standard by ANSI in 1992.  
 1) Oracle                  2) SQL  
 3) Microsoft Access      4) Dbase
45. SQL is:  
 1) a programming language.  
 2) an operating system.  
 3) a data sublanguage.  
 4) a DBMS.
46. Needing to use more complicated SQL in database applications is a(n) \_\_\_\_\_ of normalization.  
 1) advantage  
 2) disadvantage  
 3) either an advantage or disadvantage  
 4) neither an advantage nor disadvantage
47. Eliminating modification anomalies is a(n) \_\_\_\_\_ of normalization.  
 1) advantage              2) disadvantage  
 3) either an advantage or disadvantage  
 4) neither an advantage nor disadvantage
48. Multivalued dependencies should \_\_\_\_\_ be eliminated.  
 1) always                2) commonly  
 3) seldom                4) never
49. When assessing the table structure of an acquired set of tables with data, accessing the validity of possible referential integrity constraints on foreign keys is (part of) the:  
 1) first step.            2) second step.  
 3) third step.           4) fourth step.

50. Using the SQL GROUP BY phrase with a SELECT statement can help detect which of the following problems?  
 1) The multivalue, multicolumn problem  
 2) The inconsistent values problem  
 3) The missing values problem  
 4) The general-purpose remarks column problem

### PRACTICE SET - III KEY

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 01) 4 | 02) 2 | 03) 4 | 04) 4 | 05) 3 |
| 06) 4 | 07) 1 | 08) 2 | 09) 1 | 10) 3 |
| 11) 3 | 12) 3 | 13) 3 | 14) 2 | 15) 4 |
| 16) 2 | 17) 1 | 18) 2 | 19) 2 | 20) 1 |
| 21) 1 | 22) 1 | 23) 2 | 24) 3 | 25) 4 |
| 26) 2 | 27) 1 | 28) 1 | 29) 2 | 30) 3 |
| 31) 1 | 32) 4 | 33) 2 | 34) 4 | 35) 4 |
| 36) 4 | 37) 3 | 38) 3 | 39) 1 | 40) 4 |
| 41) 1 | 42) 1 | 43) 3 | 44) 2 | 45) 3 |
| 46) 2 | 47) 1 | 48) 1 | 49) 3 | 50) 2 |

### SELF TEST

01. When assessing the table structure of an acquired set of tables with data, determining foreign keys is (part of) the:  
 1) first step.            2) second step.  
 3) third step.           4) fourth step.
02. Creating a read-only database is a task that is \_\_\_\_\_ assigned to beginning database professionals.  
 1) always                2) commonly  
 3) seldom                4) never
03. Each answer below shows example data from a table. Which answer is an example of the general-purpose remarks column problem?  
 1) Three columns have the values 534-2435, 534-7867, and 546-2356 in the same row.  
 2) Three rows have the values Brown Small Chair, Small Chair Brown, and Small Brown Chair in the same column.  
 3) Three rows have the values Brown, NULL, and Blue in the same column.  
 4) One row has the value "He is interested in a Silver Porsche from the years 1978-1988" in a column..

04. For a number of reasons, normalizations is not often an advantage for a(n) \_\_\_\_\_ database.  
 1) read-only                    2) updateable  
 3) either a read-only or an updateable  
 4) None of the above is correct.
05. Most of the time, modification anomalies are serious enough that tables should be normalized into:  
 1) 1NF.                        2) 2NF.  
 3) 3NF.                        4) BCNF.
06. Each answer below shows example data from a table. Which answer is an example of the missing values problem?  
 1) Three columns have the values 534-2435, 534-7867, and 546-2356 in the same row.  
 2) Three rows have the values Brown Small Chair, Small Chair Brown, and Small Brown Chair in the same column.  
 3) Three rows have the values Brown, NULL, and Blue in the same column.  
 4) One row has the value "He is interested in a Silver Porsche from the years 1978-1988" in a column.
07. When assessing the table structure of an acquired set of tables with data, determining functional dependencies is (part of) the:  
 1) first step.                 2) second step.  
 3) third step.                 4) fourth step.
08. Each answer below shows example data from a table. Which answer is an example of the multivalue, multicolumn problem?  
 1) Three columns have the values 534-2435, 534-7867, and 546-2356 in the same row.  
 2) Three rows have the values Brown Small Chair, Small Chair Brown, and Small Brown Chair in the same column.  
 3) Three rows have the values Brown, NULL, and Blue in the same column.  
 4) One row has the value "He is interested in a Silver Porsche from the years 1978-1988" in a column.
09. When assessing the table structure of an acquired set of tables with data, counting the number of table rows is (part of) the:  
 1) first step.                 2) second step.  
 3) third step.                 4) fourth step.
10. If a table has been normalized so that all determinants are candidate keys, then that table is in:  
 1) 1NF.                        2) 2NF.  
 3) 3NF.                        4) BCNF.
11. Read-only databases are \_\_\_\_\_ updated.  
 1) always                      2) commonly  
 3) seldom                      4) never
12. Needing to assess the validity of assumed referential integrity constraints on foreign keys is a(n) \_\_\_\_\_ of normalization.  
 1) advantage                  2) disadvantage  
 3) either an advantage or disadvantage  
 4) neither an advantage nor disadvantage
13. When assessing the table structure of an acquired set of tables with data, determining primary keys is (part of) the:  
 1) first step.                 2) second step.  
 3) third step.                 4) fourth step.
14. Normalization \_\_\_\_\_ data duplication.  
 1) eliminates                 2) reduces  
 3) increases                  4) maximizes
15. Each answer below shows example data from a table. Which answer is an example of the inconsistent values problem?  
 1) Three columns have the values 534-2435, 534-7867, and 546-2356 in the same row.  
 2) Three rows have the values Brown Small Chair, Small Chair Brown, and Small Brown Chair in the same column.  
 3) Three rows have the values Brown, NULL, and Blue in the same column.  
 4) One row has the value "He is interested in a Silver Porsche from the years 1978-1988" in a column.
16. Which of the following data constraints would be used to specify that the value of cells in a column must be one of a specific set of possible values?  
 1) A domain constraint  
 2) A range constraint  
 3) An intrarelationship constraint  
 4) An interrelationship constraint
17. In a 1:N relationship, the foreign key is placed in:  
 1) either table without specifying parent and child tables.  
 2) the parent table.  
 3) the child table.  
 4) either the parent table or the child table.

18. Which of the following column properties specifies whether or not cells in a column must contain a data value?

- 1) Null status
- 2) Data type
- 3) Default value
- 4) Data constraints

A primary key should be defined as:

- 1) NULL.
- 2) NOT NULL.
- 3) Either of the above can be used.
- 4) None of the above are correct.

20. Which of the following column properties would be used to specify that cells in a column must contain a monetary value?

- 1) Null status
- 2) Data type
- 3) Default value
- 4) Data constraints

21. Which of the following situations requires the use of ID-dependent entities?

- 1) Association relationships only
- 2) Multivalued attributes only
- 3) Archetype-instance relationships only
- 4) All of the above use ID dependent entities

22. A foreign key is:

- 1) a column containing the primary key of another table.
- 2) used to define data types.
- 3) used to define null status.
- 4) all of the above are above correct.

23. Which of the following columns is(are) required in a table?

- 1) A foreign key
- 2) An alternate key
- 3) A primary key
- 4) A surrogate key.

24. In a 1:1 relationship, the foreign key is placed in:

- 1) either table without specifying parent and child tables.
- 2) the parent table.
- 3) the child table.
- 4) either the parent table or the child table.

25. Which of the following column properties would be used to specify that cells in a column must be immediately filled with a monetary value of \$10,000?

- 1) Null status
- 2) Data type
- 3) Default value
- 4) Data constraints

26. The identifier of an entity will become the \_\_\_\_\_ of the new table.

- 1) foreign key
- 2) main attribute
- 3) primary key
- 4) identity key

27. Which of the following data constraints would be used to specify that the value of a cell in one column must be less than the value of a cell in another column in the same row of the same table?

- 1) A domain constraint
- 2) A range constraint
- 3) An intrarelationship constraint
- 4) An interrelationship constraint

28. A unique, DBMS-supplied identifier used as the primary key of a relation is called a(n):

- 1) primary key.
- 2) foreign key.
- 3) composite key.
- 4) surrogate key.

29. Which is not true about surrogate keys?

- 1) They are short.
- 2) They are fixed.
- 3) They have meaning to the user.
- 4) They are numeric.

30. For every relationship, how many possible types of actions are there when enforcing minimum cardinalities?

- 1) Two
- 2) Three
- 3) Four
- 4) Six

### SELF TEST KEY

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 01) 2 | 02) 2 | 03) 4 | 04) 1 | 05) 4 |
| 06) 3 | 07) 2 | 08) 1 | 09) 1 | 10) 4 |
| 11) 4 | 12) 4 | 13) 2 | 14) 1 | 15) 2 |
| 16) 1 | 17) 3 | 18) 1 | 19) 2 | 20) 2 |
| 21) 4 | 22) 1 | 23) 3 | 24) 1 | 25) 3 |
| 26) 3 | 27) 3 | 28) 4 | 29) 3 | 30) 4 |

### PREVIOUS ECET BITS

#### ECET -2009

01. The primary key of database is  
1) A set of attributes uniquely identify rows in the table  
2) A set of attribute(s) only  
3) A set of attribute(s) with duplicate values  
4) A set of attribute(s) with a match to other key values

02. Which of the following is not a logical database structure?

- 1) Chain
- 2) Network
- 3) Tree
- 4) Relational

- 03.** If an entity appears in more than 5 relationships then it is a  
 1) 1 : 1 relationship      2) 1 : 5 relationship  
 3) 5 : 1 relationship      4) 5 : 5 relationship
- 04.** A relation is said to be in 3 NF if  
 1) it is in 2 NF      2) Non key attributes are independent of one other  
 3) Key attribute is not dependent on part of a composite key  
 4) has a multivalued dependency
- 05.** A DBMS is  
 1) Another name of database system  
 2) Independent of a database  
 3) Dependent on application programs  
 4) A set of procedures which manage a database
- 06.** Which SQL statement is used to extract data from a database ?  
 1) ~~SELECT~~      2) GET  
 3) OPEN      4) EXTRACT
- 07.** Which SQL, how do you select a column named "First Name" from a table named "Persons"?  
 1) SELECT Persons. First Name  
 2) EXTRACT First Name from Persons  
 3) SELECT First Name From Persons  
 4) GET First Name From Persons
- 08.** How can you change "Hansen" into "Nilsen" in the "Last Name" column in the "Persons" table?  
 1) UPDATE Persons SET Last Name = 'Nilsen'  
 WHERE Last Name = 'Hansen'  
 2) MODIFY Persons SET Last Name = 'Nilsen' INTO Last Name = 'Nilsen'  
 3) UPDATE Persons SET Last Name = 'Nilsen' INTO Last Name = 'Nilsen'  
 4) MODIFY Persons SET Last Name = 'Nilsen'  
 WHERE Last Name = 'Hansen'
- 09.** What is meant by view ?  
 1) View is a virtual table in the database defined by a query  
 2) View is a virtual database defined by CREATE VIEW  
 3) View is a virtual database defined by CREATE DATABASE  
 4) View is a virtual database defined by CREATE DATA
- 10.** What best describes the relationship between indexes and SQL performance ?  
 1) Indexes are only used in special cases  
 2) Indexes are used to make table storage more efficient
- 11.** 3) Indexes rarely make a difference in SQL performance  
 4) Indexes exists solely to improve query speed  
 CREATE PROCEDURE my Proc ()  
 BEGIN  
 SELECT COUNT (marks) FROM students  
 WHERE marks >= 70;  
 END ;  
 Which of the following executes the above function?  
 1) Execute my Proc () ;  
 2) Call my Proc () ;  
 3) Run my Proc () ;  
 4) f(my Proc ()) ;
- 12.** Trigger procedures are always defined  
 1) After defining a trigger 2) Along with the trigger  
 3) Before defining a trigger  
 4) In the middle of defining a trigger
- ECET -2010**
- 13.** Description of the data in the database saved in which of the following system database  
 1) Schema      2) Table  
 3) Data dictionary      4) View
- 14.** Which is the oldest database model ?  
 1) Network      2) Hierarchical  
 3) Relational      4) Object - oriented
- 15.** What is a subclass having more than one superclass called ?  
 1) Classification      2) Category  
 3) Combination      4) Generalization
- 16.** What lines are used to represent participation in ER modeling between the superclass and the specialization generalization circle ?  
 1) Double      2) Dotted  
 3) Double dotted      4) Single
- 17.** \_\_\_\_\_ normal form is said to be satisfied if all columns in a table describe and depend upon primary key.  
 1) First      2) Second  
 3) Third      4) Fourth
- 18.** For which case will RDBMS specify a default value for the column if there are no values for  
 1) ~~NOT NULL~~ DEFAULT  
 2) NOT NULL UNIQUE  
 3) NOT NULL DISTINCT  
 4) NOT NULL

19. Which of the following clause is usually used together with aggregate functions ?  
 1) ORDER By  
 2) GROUP By < column name >  
 3) < column name > GROUP By  
 4) GROUP < column name > By

20. Which of the following is not an executable statement ?  
 1) OPEN                            2) CLOSE  
 3) DECLARE                        4) FETCH

21. Which command will delete all data from a table and will not write to the rollback segment ?  
 1) DROP                            2) DELETE  
 3) CASCADE                        4) TRUNCATE

22. Which of the following SQL functions can operate on any data type ?  
 1) CEIL                            2) LOWER  
 3) LPAD                            4) MAX

23. What is the output of the following ?  
 SELECT SUBSTR ('ECET, Examination Hall', -8, -2) FROM dual;  
 1) at                              2) 11  
 3) ti                              4) NULL

24. Which character is used to continue a statement in SQL\* plus ?  
 1) \*                                2) /  
 3) -                                4) @

**ECET -2011**

25. Which of the following is not an advantage of the database approach  
 1) Reduction of data redundancy  
 2) Ability of associate deleted data  
 3) increased security  
 4) program/ data independence

26. \_\_\_\_\_ operator is used to compare a value to a list literal values that have been specified  
 1) LIKE                            2) COMPARE  
 3) BETWEEN                        4) IN

In a relational model, degree is termed as  
 1) no.of tables                    2) no. of attributes  
 3) no. of rows                    4) no. of candidate keys

28. The metadata is created by  
 1) DML compiler                  2) DML preprocessor  
 3) DDL interpreter                4) Query interpreter

29. Which of the following constitutes a basic set of operations for manipulating relational data ?  
 1) Relational algebra              2) TRC  
 3) DRC                            4) SQL

30. The operation which is not basic in relational algebra is  
 1) JOIN                            2) select  
 3) union                            4) Cartesian product

31. In SQL, testing a sub query for emptiness is done by  
 1) DISTINCT                      2) UNIQUE  
 3) NULL                            4) EXISTS

32. In an ER-diagram, Y is the dominant entity and X is the subordinate entity, when which of the following is incorrect ?  
 1) Operationally, if Y is deleted so is X  
 2) X's existence is dependent on Y  
 3) If X is deleted so is Y  
 4) If X is deleted, Y remains the same

33. Which of the following is not a characteristic of a relational database model  
 1) TABLE                            2) TREE structure  
 3) Records                        4) Complex logical relationship

34. The statement that is executed automatically by the system as a side effect of the modification of the database is  
 1) backup                        2) recovery  
 3) assertion                      4) trigger

35. Generally speaking, for a weak entity set to be meaningful it must be part of a  
 1) one-to-one relationship  
 2) one-to-many relationship  
 3) many-to-many relationship  
 4) many-to-one relationship

36. Assume transaction A holds a shared lock R. If transaction B also requests for a shared lock on R, it will  
 1) Result in a deadlock station  
 2) immediately be granted  
 3) immediately be rejected  
 4) Be granted as soon as it is released by A

**ECET -2012**

37. Relational database is a group of  
 1) Fields                            2) Records  
 3) Tables                            4) Packages

The best way to classify the data models is by the degree of  
 1) difficulty                      2) abstraction  
 3) knowledge                      4) unification

39. Hierarchical database is not efficient when handling
- security
  - large amounts of data
  - large number of transactions
  - 1 : M relationships
40. Which of the following is a Date function in SQL ?
- SYSDATE
  - ~~SYS\_DATE~~
  - SYSTEM\_DATE
  - CURRENT\_DATE
41. What needs to be created if Kishan is working with an employee table and wants to find out how many employees are working in India ?
- Create a new table
  - ~~Create a new query~~
  - Create a new form
  - Utilize the database wizard
42. A normal form which is sufficient for the consideration of a relational database design is
- BCNF
  - 5NF
  - 4NF
  - 3NF
43. Which of the following type of JOIN is not used in SQL ?
- Inner join
  - Outer join
  - Equi-join
  - ~~Non Equi-join~~
44. Abbreviate SQL : \_\_\_\_\_
- Symmetric Query Language
  - ~~Structured Query Language~~
  - Structural Query Language
  - Simple Query Language
45. What is the command used in SQL to remove row(s) from a given table ?
- DELETE
  - DROP
  - ERASE
  - REMOVE
46. Where is the 'HAVING' clause of SQL used for querying ?
- Used for rows rather than columns
  - Used for columns rather than rows
  - Used for groups rather than rows
  - Used for rows rather than groups
47. If duplicate rows are to be avoided in the queried output using a SELECT statement, what qualifier should be used
- DEFINITE
  - DISTINCT
  - DISJOINT
  - UNIQUE
48. Select one equivalent SQL statement for the given query ?
- SELECT EMP\_NAME FROM EMPLOYEE WHERE PLACE = 'HYD';
- ~~SELECT EMP\_NAME FROM EMPLOYEE WHERE PLACE IN ('HYD');~~
  - SELECT EMP\_NAME IN EMPLOYEE WHERE PLACE IN ('HYD');
  - SELECT EMP\_NAME IN EMPLOYEE WHERE PLACE = 'H'
  - SELECT EMP\_NAME IN EMPLOYEE WHERE PLACE = 'HYD';
49. In SQL what command is used to get sorted output of a given query ?
- GROUPBY
  - ~~ORDERBY~~
  - SORTBY
  - ARRANGEBY
50. Multi-valued dependencies should \_\_\_\_\_ be eliminated.
- Never
  - Rarely
  - ~~Always~~
  - Frequently
51. DROP statement in SQL belongs to which category statement
- DML statement
  - ~~DDL statement~~
  - DCL statement
  - TCL statement
- ECET-2013**
52. A table emp contains the values 10, 20, 30, null, null for a column col 1. What is the result for following query : SELECT count (col 1) FROM emp ;
- 3
  - 5
  - 4
  - 2
53. Which of the following is aggregate function in SQL ?
- LTRIM()
  - TO\_NUMBER()
  - SUM()
  - LENGTH()
54. In E-R diagrams relationship is represented with \_\_\_\_\_ symbol.
- Diamond
  - Rectangle
  - Double lines
  - Circle
55. The operation which combines results from two or more relations is \_\_\_\_\_
- Join
  - Combine
  - Concentration
  - Add
56. Which of the following is not a property of transactions
- Atomicity
  - ~~Concurrency~~
  - Isolation
  - Durability

57. Find the ODD data type out.  
 1) VARCHAR2      2) RECORD  
 3) BOOLEAN      4) RAW
58. DROP is a \_\_\_\_\_ statement in SQL.  
 1) Query      2) Embedded SQL  
 3) DDL      4) DCL
59. SQL query to return the number of records in the "Persons" table is \_\_\_\_\_  
 1) Select COUNT (\*) From Persons  
 2) Select \* From Persons  
 3) Select SUM (\*) From Persons  
 4) Select AVG (\*) From Persons
60. The rule that a value of a foreign key must appear as a value of some specific table is called a constraint  
 1) Referential      2) Integrity  
 3) Combine      4) Primary
61. A relation is in \_\_\_\_\_ normal form if an attribute of a composite key is dependent on an attribute of other composite key.  
 1) 3NF      2) 2NF  
 3) BCNF      4) 1NF
- ECET - 2014**
62. Which of the following Command is used to give Permission of operation to other users in Database.  
 1) Permission      2) Allow  
 3) Grant      4) Revoke
63. All of the following are types of databases, except :  
 1) Relational  
 2) Relational oriented  
 3) Object oriented  
 4) Multidimensional
64. Which of the following is not a DML statement  
 1) UPDATE      2) COMMIT  
 3) INSERT      4) DELETE
65. In the architecture of a database system, external level is the  
 1) Physical level      2) Logical level  
 3) Conceptual level      4) View level
66. The column of a table is referred to as the  
 1) Tuple      2) Attribute  
 3) Entity      4) Degree
67. A primary key for an entity is  
 1) A candidate key  
 2) Any attribute  
 3) A unique attribute  
 4) A super key
68. Operator is used to compare a value to a list of literals value that have been specified  
 1) BETWEEN      2) ANY  
 3) IN      4) ALL
69. In E-R Diagram relationship type is represented by  
 1) Ellipse      2) Dashed ellipse  
 3) Rectangle      4) Diamond
70. A relation in which the intersection of each row and column contains one and only one value is said to be in  
 1) First normal form  
 2) Second normal form  
 3) Third normal form  
 4) Fourth normal form
71. Two phase protocol in a database management is  
 1) A concurrency mechanism that is not deadlock free  
 2) A recovery protocol used for resorting a database after a crash  
 3) Any update to the system log done in two phases  
 4) Not effective in database
- AP - ECET - 2015**
72. The following is not a DBMS  
 1) DB2      2) websphere  
 3) MySQL      4) oracle
73. In a relational table, the primary key  
 1) can not be a composite key  
 2) can not be the super key  
 3) is one of the candidate keys  
 4) can have null value
74. A relation where there is no partial dependency of any column on the primary key is in  
 1) 4<sup>th</sup> and higher normal forms only      2) only in 3<sup>rd</sup> normal form  
 3) 1<sup>st</sup> normal form and 2<sup>nd</sup> normal form only  
 4) 2<sup>nd</sup> and higher normal forms
75. When an E-R model is converted to a relational database.  
 1) entities become tables and relationships become fields  
 2) entities become fields and relationships become tables  
 3) both entities relationships become tables  
 4) entities become table and relationships become keys

76. In a database table containing non-atomic fields is  
 1) not even in 1<sup>st</sup> normal form  
 2) in 1<sup>st</sup> normal form, but not in higher normal forms  
 3) in 2<sup>nd</sup> normal form  
 4) in 3<sup>rd</sup> normal form but not in 2<sup>nd</sup> normal form
77. In DBNS, a 'view' can be considered as  
 1) a virtual table  
 2) a virtual database  
 3) a table without records 4) a fully normalized table
78. In DBMS, to create a new column in a table, we have to use  
 1) DML 2) DCL  
 3) DDL 4) TCL
79. A database table named 'person' has the fields {name, sex, age, weight}, where name is any string, sex is (male, female), age between 1-100, weight between 1-100. What is the output generated by the SQL statement  
`SELECT COUNT (*) FROM person WHERE age < 10 group by sex`  
 1) one positive number  
 2) a table containing the details of all persons less than 10 years age  
 3) a table containing two values  
 4) a table containing ages and sex of all persons less than 10 years age
80. There are two database tables. The first one is 'subject' containing the fields ( subject\_ID, subject\_name, marks, student\_ID). the second one is 'student' containing the fields (ID, name). Find the SQL statement which gives the marks of radhika in the subject DBMS.  
 1) SELECT marks FROM subject marks WHERE student.name = "Radhika" and subject name = "DBMS"  
 2) SELECT subject.marks FROM subject WHERE subject.ID = studen.ID and student.name = "Radhika" and subject\_ID = "BDMS"  
 3) SELECT marks FROM subject WHERE student.student\_ID = student.ID and student. name = "Radhika" and subject \_ name = "DBMS"  
 4) SELECT subject.marks FROM subject and student WHERE ID = student.ID and name= "Radhika" and subject\_name "DBMS"

81. The following operator is not supported in PL/SQL:  
 1) \*\* 2) % 3) ◊ 4) ||  
 The following statement is true in OOP:  
 1) a program contains zero or more objects  
 2) in a well-written program, every object must define friend functions  
 3) a class is instantiated from its object  
 4) the objects interact by passing messages
- TS - ECET - 2015**
83. Which of the following class of languages is used to work with RDBMS  
 1) static languages 2) query languages  
 3) embedded programs 4) system programs
84. Which of the following normal forms is adequate for designing relational database  
 1) 2 NF 2) 3NF 3) 4NF 4) BCNF
85. In relational model the data is stored and organized in two dimensional tables called  
 1) schema 2) fields  
 3) records 4) relations
86. The SQL operations REVOKE, ALTER USER and GRANT are included in  
 1) DCL ( data control language)  
 2) DDL (data definition language)  
 3) DML (data manipulation language)  
 4) DAS (data acquisition language)
87. EMP is a table with three columns EMP\_NUM, EMP\_NAME and EMP\_ADDR. Which of the following is correct syntax to create an index on column EMP\_NUM  
 1) create index EMP (EMP\_NUM);  
 2) create index emp\_ind on EMP(EMP\_NUM);  
 3) create index EMP(EMP\_NUM) emp\_ind;  
 4) create index emp\_ind on EMP;
88. Which type of PL/SQL statement is used to increase the price values by 15 percent for items with more than 10,000 in stock and by 30 percent for items with fewer than 1000 in stock  
 1) a simple INSERT loop  
 2) a simple UPDATE statement  
 3) WHILE loop  
 4) an IF...THEN...ELSE statement
89. Which of the following sections of a PL/SQL routine contains functions for error trapping  
 1) definition 2) declaration  
 3) exception 4) execution

90. Which of the following statements is used to get the quantity and description of each item that was ordered before July 1, 2009, and whose price is less than 5.00 or greater than 10.00 from the table stock
- 1) SELECT quantity, description FROM stock WHERE (price < 5.00 OR price > 10.00) AND order\_date < '01-jul-2009';
  - 2) SELECT quantity, description FROM stock WHERE price BETWEEN 5.00 and 10.00 OR order\_date < '01-jul-2009';
  - 3) SELECT quantity, description FROM stock WHERE price < 5.00 OR price > 10.00 AND order\_date > '01-jul-2009';
  - 4) SELECT quantity, description FROM stock WHERE price IN (5.00, 10.00) OR order\_date < '01-jul-2009';
- AP - ECET - 2016
91. An attribute of one table matching the primary key of another table is called as
- 1) foreign key      2) secondary key
  - 3) candidate key    4) composite key
92. The maximum marks in a subject should not be greater than 100. This is
- 1) referential constraint    2) feasible constraint
  - 3) integrity constraint
  - 4) over-defined constraint
93. The SQL statement  

$$\text{SELECT SUBSTR('123456789', INSTR('abcabcabc', 'b'), 4) FROM DUAL;}$$
prints
- 1) 6789    2) 2345    3) 1234    4) 456789
94. In SQL, 10/NULL will evaluate to
- 1) FALSE    2) -1    3) NULL    4) 10
95. Which normal form is considered adequate for relational database design
- 1) 4NF    2) BCNF    3) 2NF    4) 3NF
96. The column of a table is referred to as the
- 1) tuple    2) attribute    3) entity    4) degree
97. The data flow model of an application mainly shows
- 1) communication network structure
  - 2) the underlying data and the relationship among them
  - 3) processing requirements and the flow of data
  - 4) decision and control information
98. Student and courses enrolled, is an example of
- 1) many - to - one relationship
  - 2) one - to - one relationship
  - 3) one - to - many relationship
  - 4) many - to - many relationship
99. E-R modeling technique is a
- 1) right - left approach    2) left - right approach
  - 3) bottom - up approach
  - 4) top - down approach
100. A trigger is
- 1) a statement that enables to start any DBMS
  - 2) a statement that is executed automatically by the user as a side effect of a modification to the database
  - 3) a statement that is executed automatically by the system as a side effect of a modification to the database
  - 4) a condition the system tests for the validity of the database user
- TS - ECET - 2016
101. The metadata is created by the
- 1) DML compiler    2) DML pre-processor
  - 3) DDL interpreter    4) query interpreter
102. When an E-R diagram is mapped to tables, the representation is redundant for
- 1) weak entity sets    2) weak relationship sets
  - 3) strong entity sets    4) strong relationship sets
103. The keyword to eliminate duplicate rows from the query result in SQL is
- 1) DISTINCT    2) NO DUPLICATE
  - 3) UNIQUE
  - 4) NONREDUNDANT
104. Relational algebra is
- 1) data definition language
  - 2) meta language
  - 3) procedural query language
  - 4) declarative language
105. A functional dependency of the form  $x \rightarrow y$  is trivial if
- 1)  $y \subseteq x$
  - 2)  $y \subset x$
  - 3)  $x \subseteq y$
  - 4)  $x \subset y$
106. Relations produced from an E-R model will always be in which form
- 1) first normal form    2) second normal form
  - 3) third normal form    4) fourth normal form
- Relationships among relationships can be represented in an E-R model using \_\_\_\_\_
- 1) aggregation    2) association
  - 3) weak entity sets
  - 4) weak relationship sets

**AP - ECET - 2017**

108. Which of the following can be chosen as primary key of the relation in database design  
 1) name of the person 2) age  
 3) aadhar card number 4) address
109. \_\_\_\_\_ supports efficient retrieval of records based on the value of a search key  
 1) trigger 2) cursor 3) index  
 4) package
110. Which of the following operation(s) can be done with ALTER command  
 I. insert new rows into the table  
 II. delete records from table  
 III. insert new column into the table  
 IV. modify or drop the columns from table  
 1) I, II & III 2) II & III 3) III & IV  
 4) I, II, III & IV
111. A relation R = (A, B, C, D, E, F) holds the following functional dependencies  
 $A \rightarrow BC$ ,  $A \rightarrow E$ ,  
 $B \rightarrow CD$ ,  $C \rightarrow F$   
 Which attribute can be chosen as primary key for the relation  
 1) EF 2) C  
 3) A 4) BC
112. The SQL statement select ROUND(67.987,-2) from dual;  
 1) It is Illegal 2) prints 68  
 3) prints 0 4) prints 60
113. In ordered indices if the file containing the records is sequentially ordered, then \_\_\_\_\_ is an index, whose search key also defines the sequential order of the file  
 1) clustered index 2) structured index  
 3) unstructured index 4) non-clustered index
114. What operator tests column for the absence of data  
 1) EXISTS operator 2) NOT operator  
 3) IS NULL operator 4) none of these
115. A \_\_\_\_\_ is a database object that groups logically related  
 1) module 2) package  
 3) object 4) class
116. \_\_\_\_\_ provide a way for your program to select multiple rows of data from the database and then process each row individually  
 1) PL/SQL cursors 2) PL/SQL trigger  
 3) PL/SQL select 4) PL/SQL process

117. A relation is said to be in 3 NF if and only if  
 I. it is already in 2NF  
 II. transitive dependency should be removed  
 III. only partial functional dependency has to be removed  
 IV. multi-value dependency has to be removed  
 V. it should already in BCNF  
 1) I & III only 2) II, III & V  
 3) I, IV & V 4) I & II only

**TS - ECET - 2017**

118. Which of the following clause is needed to sort the value of a particular column  
 1) having 2) order by  
 3) group by 4) sort by
119. The column of a table in relational model is referred to as \_\_\_\_\_  
 1) tuple 2) attribute  
 3) entity 4) degree
120. CREATE TABLE is an example for \_\_\_\_\_  
 1) DDL 2) DCL  
 3) DML 4) DTL
121. To modify the structure of a table the following command is used  
 1) MODIFY 2) ALTER TABLE  
 3) UPDATE 4) CORRECT
122. In which normal form every non-key attribute is non-transitively depending on key attribute  
 1) first 2) second  
 3) third 4) fourth
123. An index which contains at least one data entry for search key value that appears in a record in the indexed file is \_\_\_\_\_  
 1) primary index 2) secondary index  
 3) dense index 4) clustered index
124. All locks obtained by a transaction are unlocked after the transaction  
 1) commit 2) grant  
 3) revoke 4) complete
- AP - ECET - 2018**
125. A relational database consists of a collection of  
 1) tables 2) fields  
 3) records 4) keys
126. For each attribute of a relation, there is a set of permitted values, called the \_\_\_\_\_ of that attribute  
 1) relation 2) schema  
 3) domain 4) set
127. Which of the following contains a complete record of all activity that affected the contents of a database during a certain period of time  
 1) query language 2) report writer

- 3) transaction log  
4) data manipulation language
128. The statement in SQL which allows to change the definition of a table is  
1) ALTER                    2) UPDATE  
3) CREATE                  4) SELECT
129. The wildcard in a WHERE clause is useful when?  
1) an exact match is necessary in a SELECT statement  
2) an exact match is not possible in a SELECT statement  
3) an exact match is necessary in a CREATE statement  
4) an exact match is not possible in a CREATE statement
130. When three or more AND and OR conditions are combined, it is easier to use the SQL keyword(s)  
1) LIKE only                2) IN only  
3) NOT IN only             4) both IN and NOT IN
131. Given the basic ER and relational models, which of the following is INCORRECT?  
1) an attribute of an entity can have more than one value  
2) an attribute of an entity can be composite  
3) in a row of a relational table, an attribute can have more than one value  
4) in a row of a relational table, an attribute can have exactly one value or a NULL value
132. Which of the following is TRUE?  
1) every relation in 3NF is also in BCNF  
2) every relation in BCNF is also in 3NF  
3) a relation R is in 3NF if every non-prime attribute of R is fully functionally dependent on every key of R  
4) no relation can be in both BCNF and 3NF
133. A selection of the form giving all the records not satisfying simple individual conditions is \_\_\_\_\_  
1) conjunctive selection  
2) disjunctive selection  
3) negation  
4) conjunctive selection by intersection of identifiers
134. The lowest level operator to access data in query processing is \_\_\_\_\_  
1) file scan                2) file manipulation  
3) file handing            4) file organization
- TS-ECET - 2018
135. Which of the following notations is used for multi-level attributes in an E-R diagram?  
1) ellipse                    2) dashed ellipse  
3) double ellipse           4) double rectangle

136. \_\_\_\_\_ data independence is the capacity to change the conceptual schema without having to change external schemas or application programs  
1) physical                2) logical  
3) external                4) abstract
137. A weak entity type normally has a \_\_\_\_\_ which is the set of attributes that can uniquely identify weak entities that are related to the same owner entity  
1) super key              2) candidate key  
3) determinant            4) primary key
138. An attribute of relation schema R is called a \_\_\_\_\_ attribute of R if it is a member of some candidate key of R  
1) non-prime              2) prime  
3) composite              4) simple
139. The state of the data accessed by an aborted transaction must be restored to what it was just before the transaction started executing. This process is known as \_\_\_\_\_  
1) roll back                2) save point  
3) commit                  4) terminating
140. 3NF is based on the concept of \_\_\_\_\_ dependency  
1) local                    2) transitive  
3) global                   4) virtual
141. A relation schema R is in \_\_\_\_\_, if every non-prime attribute A in R is fully functionally dependent on the primary key of R  
1) 1NF                      2) 3NF  
3) 2NF                      4) 4NF
142. Which command is used to remove a table and its contents from the database  
1) delete table            2) remove table  
3) drop table              4) alter table

**Arise ! Awake ! And  
stop not till the goal  
is reached**

## PREVIOUS ECET BITS KEY

|        |        |        |        |        |
|--------|--------|--------|--------|--------|
| 01) 1  | 02) 1  | 03) 2  | 04) 1  | 05) 4  |
| 06) 1  | 07) 3  | 08) 1  | 09) 1  | 10) 4  |
| 11) 1  | 12) 1  | 13) 3  | 14) 2  | 15) 4  |
| 16) 2  | 17) 2  | 18) 1  | 19) 3  | 20) 3  |
| 21) 2  | 22) 3  | 23) 3  | 24) 3  | 25) 2  |
| 26) 4  | 27) 1  | 28) 3  | 29) 4  | 30) 4  |
| 31) 4  | 32) 3  | 33) 2  | 34) 4  | 35) 2  |
| 36) 2  | 37) 3  | 38) 2  | 39) 2  | 40) 4  |
| 41) 2  | 42) 4  | 43) 4  | 44) 2  | 45) 1  |
| 46) 2  | 47) 2  | 48) 1  | 49) 2  | 50) 3  |
| 51) 2  | 52) 2  | 53) 3  | 54) 1  | 55) 1  |
| 56) 2  | 57) 2  | 58) 3  | 59) 1  | 60) 1  |
| 61) 1  | 62) 3  | 63) 2  | 64) 2  | 65) 4  |
| 66) 2  | 67) 3  | 68) 3  | 69) 4  | 70) 1  |
| 71) 1  | 72) 2  | 73) 3  | 74) 4  | 75) 3  |
| 76) 1  | 77) 1  | 78) 3  | 79) 3  | 80) 3  |
| 81) 2  | 82) 4  | 83) 2  | 84) 2  | 85) 4  |
| 86) 1  | 87) 2  | 88) 4  | 89) 3  | 90) 1  |
| 91) 1  | 92) 3  | 93) 2  | 94) 3  | 95) 4  |
| 96) 2  | 97) 3  | 98) 4  | 99) 4  | 100) 2 |
| 101) 3 | 102) 2 | 103) 1 | 104) 3 | 105) 1 |
| 106) 1 | 107) 1 | 108) 3 | 109) 3 | 110) 3 |
| 111) 3 | 112) 3 | 113) 1 | 114) 3 | 115) 2 |
| 116) 1 | 117) 4 | 118) 2 | 119) 2 | 120) 1 |
| 121) 2 | 122) 3 | 123) 3 | 124) 1 | 125) 2 |
| 126) 4 | 127) 3 | 128) 3 | 129) 2 | 130) 2 |
| 131) 2 | 132) 2 | 133) 2 | 134) 1 | 135) 1 |
| 136) 2 | 137) 3 | 138) 2 | 139) 3 | 140) 1 |
| 141) 2 | 142) 2 |        |        |        |

## SPACE FOR IMPORTANT NOTES

Simple

Composite

Derive & Comtribute

Single valued "

Multi valued "

(@)

DML

DDL

Select  
Insert  
Update  
Delete

1, Create  
2, DROP  
3, ALTER  
4, RENAME  
5, TRUNCATE

DCB

GRANT  
REVOKE

Grant privilege list or  
creation name or view name  
TO user / role list

Ex  
Grant all on employee to ABC

Types of function dependency

④ Union =  $y \rightarrow y$  &  $y \rightarrow z$  then  $y \rightarrow yz$

⑤ Decomposition  $y \rightarrow xz = y \rightarrow y$   $y \rightarrow z$

$y \rightarrow y$

$x \wedge y = \emptyset$

- ④ Definitivity  $y \rightarrow y$ ,  $y \subseteq x$
- ⑤ Transitivity if  $(y \rightarrow y)$   $(y \rightarrow z)$   
 $y \rightarrow z$
- ⑥ Argumentation  $y \rightarrow y$  then  $yA \rightarrow yA$

PUT YOUR FULL EFFORTS  
DON'T WORRY ABOUT RESULTS  
THEY ARE BOUND TO COME TO  
YOU

- ⑦ Union =  $y \rightarrow y$  &  $y \rightarrow z$  then  $y \rightarrow yz$
- ⑧ Decomposition  $y \rightarrow xz = y \rightarrow y$   $y \rightarrow z$
- ⑨ Pseudo transitivity  $y \rightarrow y$  &  $y \rightarrow z$



# OOPS & C++

D A \* P

Programming in C++ uses the concept of object oriented programming. The style of object oriented programming is something new compared to other programming style.

All programming methodologies are classified into 3 styles as

## Low Level Programming

- machine level language
- assembly level language

## High Level Programming

- Procedural/Structured programming  
eg. C, Pascal, FORTRAN, COBOL
- Functional Programming

Eg. LISP

- Logic Programming  
Eg. PROLOG

- Object-oriented Programming  
Eg. Java, smalltalk, C++

## Very High Level Programming

- Command Language

Eg. Shell programming in Unix

- Query Language

Eg. SQL in RDBMS

## Advantages of procedural programming

- Easy to learn and teach
- Mainly used for general purpose
- Easy to design for solution, easy to verify the functionality
- Testing and maintenance is possible

AJL

General

## Disadvantages of procedural programming

- Maintenance and modification is possible but very difficult for large applications.
- Data cannot be hidden

## Features of Object-oriented Programming

- Improvement over the structured programming paradigm
- Emphasis on data rather than algorithm
- Data abstraction is introduced in addition to procedural abstraction
- Data and associated operations are unified into a single unit, thus the objects are grouped with common attributes, operations and semantics.
- Programs are designed around the data being operated, rather than operations themselves.
- Eg. C++, Smalltalk, Eiffel, Java etc.

## Basic concepts of OOP

- Objects
- Classes
- Data abstraction

- Data Encapsulation
  - Inheritance
  - Polymorphism
  - Dynamic Binding
  - Message Passing
  - Extensibility
  - Persistence
  - Delegation
  - Genericity
- ◆ **Objects :** Objects are basic runtime entities in object oriented system. An object is an instance of a class. They represent person, place, bank account etc.
- ◆ **Classes :** A class is a template or model by which any number of objects can be created. A class is a collection of objects of similar type. It defines the characteristics and operations.
- ◆ **Data Abstraction :** The technique of creating new data types that are well suited to an application to be programmed is known as data abstraction. It is a process of hiding unnecessary details and taking upon only wanted details.
- ◆ **Data Encapsulation :** It is a mechanism that associates the code and the data it manipulates into a single unit and keeps them safe from external interference and misuse. In C++, this is supported by a construct called class.
- ◆ **Inheritance :** It allows the extension and reuse of existing code without having to rewrite the code from scratch. Inheritance involves the creation of new classes (derived classes) from the existing ones (base classes) thus enabling the creation of a hierarchy of classes that simulate the class and subclass concept of the real world.
- ◆ **Polymorphism :** It allows a single name/operator to be associated with different operations depending on the type of data passed to it. In C++, it is achieved by operator overloading and function overloading.
- ◆ **Dynamic Binding :** The process of binding the code at runtime to the function calls is called dynamic binding.
- ◆ **Message Passing :** It is the process of invoking an operation on an object. In response to a message, the corresponding method is executed in the object.
- ◆ **Extensibility :** It is the feature which allows the extension of the functionality of the existing software components.
- ◆ **Persistence :** The phenomenon where the object outlives the program execution time and exists even after the execution of the program is known as persistence.
- ◆ **Delegation :** It is alternative to inheritance. Delegation is a way of making object composition as powerful as inheritance.
- ◆ **Genericity :** It is the property used for defining functions and classes of the same functionality and which differ only in the data type.
- ◆ Depending on the object features supported, the languages are classified into two categories
- I. Object based programming languages
  - II. Object Oriented programming languages
- ◆ Object based programming languages support encapsulation and object identity without supporting important features of OOP languages such as polymorphism, inheritance, message passing. Ada is a typical example of object based programming language.
- ◆ Object oriented programming languages incorporate all the features of object-based programming languages along with inheritance and polymorphism.

C++ is an object oriented programming language developed by Bjarne Stroustrup at AT & T Bell laboratories.

Stroustrup combined the features of C and simul 67.

C++ is a superset of C and is also called "C with classes".

C++ supports a rich set of functions for performing input and output operations.

C++ handles I/O operations by using streams.

Streams in C++ are classified into

- Output Streams

- Input Streams

Output Streams : The output streams allow to perform write operations on output devices such as screen, disk etc.

Output on the standard stream is performed using the cout object.

The word cout is followed by the symbol << which is called insertion or put-to operator.

More than one item can be displayed using a single cout output stream object. Such operations in C++ are called cascaded output operations.

The cout object will display all the items from left to right.

Input Streams : The input streams allow to perform read operation with input devices such as keyboard, disk etc.

Input from the standard stream is performed using the cin object.

Cin is followed by the symbol >> which is called the extraction operator.

Input of more than one item which can be of any type can be performed by using a single cin object. Such operations in C++ are cascaded input operations.

Streams do not require explicit data type specification and explicit address operator.

<< and >> are also used as left shift and right shift operators.

C++ supports single line comments // along with the ordinary comments in C(\* \*).

C++ supports a mechanism to access a global variable from a function in which a local variable is defined with the same name as a global variable. It is achieved by using scope resolution operator (::).

Unlike in C, variables can be defined in any part of the program in C++.

Variable Aliases or Reference variables

Reference variables enjoy the simplicity of value variables and the power of pointer variables. They are also called aliases.

They are created by using the symbol & before the reference variable name.

Syntax : datatype & referencevariable = variablename;

The reference variable must be initialized to some variable only at the point of its declaration.

Constants cannot be pointed by reference variables.

C++ is a strict type checking language. Function prototyping is compulsory.

#### Inline Functions :

These are also called as open sub-routines similar to macros.

Inline functions are used when the function is very small.

The keyword inline is used before the function to define it as inline.

Any function defined within a class is by default inline.

The function call is replaced by the function code by the compiler.

So inline functions generally increase the compilation time and decrease the execution time.

The function defined as inline need not be definitely substituted , it is compiler dependent(the compiler takes the decision).

Akhilesh Jaddan

In general, inline functions should not be used . Only the functions which contain one simple statement should be defined as inline.

### Default Arguments :

- ◆ In a function call, when one or more arguments are omitted, the function may be defined to take default values for omitted arguments by providing the default values in the function prototype.
- ◆ The default arguments can be given from right to left.
- ◆ Default arguments reduces the burden of passing arguments explicitly at the point of function call.
- ◆ The feature of default arguments can be utilized to enhance the functionality of the program, without the need for modifying the old code referencing to functions.
- ◆ All the arguments in a multiple argument function need not have default values.

### Type Conversion :

- ◆ The feature of the compiler that performs data conversion without the user intervention, is known as implicit type conversion.
- ◆ Type casting in C++ can be done explicitly by using any of the given syntax  
(data type ) variable or data type (variable)
- ◆ Runtime Memory management:
- ◆ If the amount of memory required is unknown at the compile time then the memory allocation can be performed during execution. Such allocation is called dynamic memory allocation.
- ◆ C++ provides two special operators to perform memory management dynamically.

### They are new and delete operators.

- ◆ new operator : It is used for allocating memory dynamically similar to malloc() function.
- ◆ It throws an exception if memory allocation fails.
- ◆ Syntax : datatype \* new datatype[size]
- ◆ new operator can be overloaded.
- ◆ The memory allocated by new operator cannot be deallocated by free() function.
- ◆ delete operator : It is used for deallocating the memory allocated by new operator.
- ◆ Syntax : delete pointervariable;
- ◆ The pointervariable will not be deleted but the memory pointed by that variable will be released.
- ◆ The delete operator cannot be used for deallocating memory allocated by malloc() function.
- ◆ delete operator can also be overloaded.
- ◆ To delete an array of integers or float or double the syntax is  
delete [] arrayname;

### Classes and Objects :

- ◆ Object oriented programming constructs are modeled out of the data types called classes.
- ◆ Defining variables of a class datatype is known as a class instantiation and such variables are called objects.
- ◆ A class encloses both the data and functions that operate on the data, into a single unit.
- ◆ The variables and functions enclosed in a class are called *data members* and *member functions*.
- ◆ Classes are similar to structures. The difference between structures and classes of C++ is that in a structure by default the members are public whereas the members within the class are private by default.
- ◆ Class that do not contain data members and member functions are called empty classes. Empty classes are also called stubs.
- ◆ Members within the class can be *private or public or protected*. These are called access specifiers.
- ◆ The private members have strict access control and only the member functions of the same class can be accessed.
- ◆ The private members of a class are not accessible outside the class except through friend functions. So friend functions hinder the concept of data hiding.
- ◆ The access control of protected members is similar to that of private members and has more significance in inheritance.

The members defined as protected can be accessed by its members and members of its subclasses.

The members of the class declared as public can be accessed without restriction even from outside the class.

The public, private and protected sections are defined within the class by using the keywords **public**, **private** and **protected**.

The public , private and protected sections within a class can be in any order.

Data is hidden inside a class and it is achieved by declaring the data as *private*.

The syntax for defining a class is

```
class class name { };
```

The data members must be declared within the body of the class, whereas the member functions can be defined either inside the class or outside the class.

If it is to be defined outside the class , the class name and scope resolution operator(::) are used along with it to mention that it belongs to a particular class.

Functions defined inside the class are by default inline whereas the functions defined outside the class are outline.

A class can have multiple member functions with the same name but they should differ in the number or type of arguments. It is called function overloading.

Two classes within a same program cannot have same names.

The resources are not allocated when a class is defined but they are allocated when the class is instantiated i.e. when the object is created.

Classes can have pointers.

Even it can have pointer which points to object of same classes. Such classes are called self-referential classes.

Self-referential classes are used for implementing complicated data structures like trees, graphs and linked lists.

The data members and member functions of an object can be accessed by using (.)dot operator. objectname. Membername

Objects can also be passed as arguments to functions and as well they can be returned by a function.

### Friend Functions:

If a function which is not a member of a class and wants to access the private members of a class then they should be friend functions.

A function can be friend for multiple classes.

The scope of a friend function is not limited to the class in which it has been declared as a friend.

A friend function cannot be called using the object of that class; it is not the scope of the class. It can be invoked like a normal function without the use of any object.

Unlike class member functions , it cannot access the class members directly.

It can be declared in the private part or public part.

Friendship is not mutual by default. If B is declared as a friend of A, this does not mean A is a friend of B.

Friend functions are used as bridge for two or more classes.

Friend functions are also used to increase the versatility of overloaded operators.

Friendship is not transitive.

*L4*

### Friend classes :

All the member functions of one class can be friend of another class.

A specific member function of one class can be friend function to another class.

### Static data members and functions:

The static data members must be initialized during their definition outside all the member functions in the same way as global variables are initialized.

- Irrespective of whether the data member is private, public or protected , it must be defined using the scope resolution operator.
  - Static variables act like a bridge between objects of the same class.
  - Static functions can access only static members defined in the same class, non-static data are unavailable to these functions.
  - Only one copy of static data member exists for all the instances of the class.
  - Static data members can be accessed even before any object is created by using the class name.
  - Storage space for data members which are declared as static is allocated only once during the class declaration.
- Constructors:**
- A constructor enables an object to initialize itself during creation. This operation is called object initialization.
  - A constructor is a special member function whose main operation is to allocate required resources such as memory and initialize the objects of its class.
  - A constructor has the same name as that of the class to which it belongs.
  - A constructor is executed automatically whenever the class is instantiated.
  - A constructor does not have any return type.
  - It is normally used to initialize the data members of a class.
  - Constructors can be invoked with any number of functions .
  - Constructors can be overloaded as ordinary functions.
  - Constructor without any arguments is called a default constructor.
  - Constructors can be virtual
  - Constructors can also be constructed by using default arguments.
- Destructor:**
- The destructor destroys the object when it is no longer required, by releasing all the resources allocated to it. This operation is called clean up.
  - It has the same name of the class and has a ~ symbol before it.
  - A destructor is automatically invoked whenever the object is to be destroyed.
  - A destructor does not return any value.
  - A destructor cannot take arguments. So destructor overloading is not possible.
  - Destructors can be virtual.
  - There should be only one destructor for a single class.
  - The scope of dynamically created data members is not within the class so the destructor should be explicitly called to destroy dynamically created memory.
  - This reduces memory leaking.
  - C++ supports the creation of unnamed objects or nameless objects.
  - Nameless objects can be used within a single statement.
  - A nameless object is created and destroyed at the same point.
  - The objects which are defined as constant are called read-only objects.
  - A class declared inside the declaration of another class is called nested class.
  - Nesting of classes enables in building very powerful data structures.
  - An object which is definitely initialized during the process of its construction is called a live object.
  - A class whose live object is to be created must have at least one constructor.
  - An array of objects can be created.
- Copy Constructor:**
- A constructor having a reference to an instance of its own class as an argument is known as copy constructor.
  - All the members of the source object are copied into destination object by the copy constructor.
  - A copy constructor can have only one argument.

A copy constructor can take an argument by pass by reference.  
The argument for copy constructor cannot be passed by value.  
If an argument is passed by value the constructor is called again and again until it is out of memory.

**this pointer:**

- The keyword **this** is a pointer variable , which always contains the address of the object in question.
- Each member function of a class is born with a pointer called **this** , which points to the object itself.
- The **this** pointer is used to access even the data members inside.
- The **this** pointer cannot be used within a function which is not the member of any class.
- this** pointer is used in member functions returning pointers to their respective objects.
- It is also used to remove ambiguities between class data members and arguments of the function if they have the same name.

### **Operator Overloading:**

Operator overloading is used for

- i. Extending the capability of operators to operate on user defined data.
- ii. Data conversion.

Operator overloading is a feature which supports polymorphism.

Many operators can be overloaded in C++.

At least one operand of the operator which is overloaded should be an object of a class.

The precedence relation of over loadable operators and their expression syntax remains the same.

Only existing operators can be given new functionality but new operators cannot be defined.

An operator is overloaded in a class by defining **operator** function by using **operator** keyword.

An unary operator overloading function requires no arguments.

A binary operator overloading function requires one argument.

Ternary operator cannot be overloaded.

The operator function can be defined within the class or outside the class like any other member function.

In the overloading of binary operators, the left hand operand is used to invoke the operator function and the right hand operand is passed as an argument to the operator function.

The operators **new** and **delete** can be overloaded.

### **Data Conversion:**

The compiler can convert one of the basic type to another basic type automatically. This is known as *implicit type conversion*.

Conversion can be explicitly specified by type casting. It is known *explicit type conversion*.

Conversion from user defined data type to basic type is done with the help of a conversion function.

Conversion from basic data type to user-defined type is done with the help of one-argument constructor.

Conversion from one user defined type to another user defined type can be done by using an one argument constructor or conversion function.

A class can have any number of conversion functions.

Operators can be overloaded as friend operator functions.

The operators which cannot be overloaded as friend operator functions but can be overloaded as operator member functions are =, (),[],->.

The operators which cannot be overloaded at all are

|               |                             |
|---------------|-----------------------------|
| .             | (dot operator)              |
| ::            | (scope resolution operator) |
| ?:            | ( conditional operator)     |
| <b>sizeof</b> | (size of operator)          |
| ->*           | (pointer to member)         |

### **Inheritance:**

- ◆ New classes can be built from existing classes. The technique of building new classes from the existing classes is called inheritance.
- ◆ The new classes are called derived classes or children or subclasses or descendent whereas the existing classes are called base classes or parent or super classes or ancestors.
- ◆ The derivation of *derived class* from the *base class* is indicated by :(colon)
- ◆ Visibility mode specifies whether the features of the base class are publicly or privately inherited.
- ◆ In public derivation, the public members of the super class will become public in derived class and the protected members of the super class will become protected.
- ◆ In private derivation, the public members of the super class will become private in derived class and the protected members of the super class will become private.
- ◆ A derived class inherits data members and member functions, but not the constructor or destructor from its base class.
- ◆ The different forms of inheritance are
  - i. single inheritance
  - ii. multiple inheritance
  - iii. hierarchical inheritance
  - iv. multilevel inheritance
  - v. hybrid inheritance
  - vi. multipath inheritance
- ◆ **Single inheritance :** Derivation of a class from only one base class is called single inheritance.
- ◆ **Multiple inheritance:** Derivation of a class from several base classes is called multiple inheritance. It causes ambiguities and problems.
- ◆ **Hierarchical inheritance :** Derivation of several classes from a single base class is called hierarchical inheritance.
- ◆ **Multi-level inheritance :** Derivation of a class from another derived class is called multi-level inheritance.
- ◆ **Hybrid inheritance :** Derivation of a class involving more than one form of inheritance is called hybrid inheritance.
- ◆ **Multipath inheritance :** Derivation of a class from another derived classes , which are derived from the same base class is called multipath inheritance.
- ◆ If the base class has constructors with arguments then it is mandatory for the derived class to have a constructor.
- ◆ When an object of a derived class is created , the constructor of the base class is executed first and later the constructor of the derived class.
- ◆ In the derived class, first the constructors of virtual base classes are invoked and then non-virtual base classes.
- ◆ If the same member function or data exists in both the base class and the derived class the member of the derived class is executed.
- ◆ The default visibility mode of inheritance is private.
- ◆ Inheritance allows the construction of reusable software components.
- ◆ **Virtual Base classes :** The concept of virtual base classes is used to remove the duplication due to multipath inheritance.
- ◆ **Virtual Functions :** The concept of virtual functions is used to implement run-time polymorphism.
- ◆ Resolving a function call at compile time is called compile-time or static or early binding.
- ◆ Resolving a function call at runtime is called run-time or dynamic or late binding.
- ◆ Virtual functions postpone the decision of selecting the suitable member functions until runtime.
- ◆ A pointer to a base class can also point to any one of its derived classes.
- ◆ Virtual functions should be defined in the public part to realize its full potential.

- Virtual functions should be accessed through pointers of the base class.
- Virtual functions with null body or no definition are called pure virtual functions.
- These functions do nothing and are also called dummy functions.
- Pure virtual function is declared as a virtual function with its declaration followed by =0.

A class with at least one pure virtual function is called an abstract class. It is not a complete class as the definition is not complete. So it cannot have instances of its own(i.e. objects cannot be created)

A class without any pure virtual function is called concrete class.

Destructors of a base class should be declared as virtual.

Virtual functions cannot be static members.

A virtual function can be a friend to another class.

A class with a pure virtual function cannot be instantiated.

#### **Templates:**

Templates support generic programming.

It allows to develop reusable software components such as functions, classes supporting different data types.

#### **Function templates:**

A function template or generic function is a function which used as a general function for various functions which have the same functionality but differ only in data types.

Templates are defined by using the keyword **template**.

A call to a template function is similar to that of a normal function and the parameters can be of any data-type.

When the compiler encounters a call to such functions, it identifies the data type of the parameters and creates a function internally and makes a call to it.

Function templates can be overloaded.

A template function should definitely have an argument which is of generic type.

#### **Class templates:**

Classes which are declared to operate on different data types are called class templates.

Any call to the template functions and classes, needs to be associated with a data type or a class.

The compiler then instantiates a copy of the template function or template class for the data type specified.

Class templates can be inherited.

A derived class of a template based base class is not necessarily template derived class.

Delegation can be implemented by template functions.

#### **Stream computation with Console:**

C++ uses the concept of streams and stream classes to perform I/O operations with console and disk files.

Streams are classified into input streams and output streams.

A stream is a series of bytes, which act either as a source from which input data can be extracted or as a destination to which the output can be sent.

The C++ language offers a mechanism which permits the creation of an extensible and consistent input-output system in the form of streams library.

The predefined streams in C++ are

Cin standard input usually keyboard

Cout standard output usually screen

Cerr standard error output

Clog fully buffered version of cerr

IX

The main advantage of using iostream.h functions over the stdio.h functions is data independence.

Mixed usage of stdio and stream class functions are not advisable.

Cin and cout are objects of certain classes defined in iostream.h.

- ◆ The C++ input-output system supports a hierarchy of classes that are used to manipulate both the console and disk files, called stream classes.
- ◆ **ios class** provides operations common to both input and output.
- ◆ The classes derived from ios class are
  - istream**
  - ostream**
  - iostream**
- ◆ **istream** is a derived class of ios and inherits the properties of ios. It defines input functions such as `get()`, `getline()` and `read()`. The stream extraction operator `>>` is overloaded in it.
- ◆ **ostream** is derived class of ios and inherits the properties of ios. It defines output functions such as `put()` and `write()`. The stream insertion operator `<<` is overloaded in it.
- ◆ **iostream** is derived from multiple base classes, **istream** and **ostream**, which in turn are inherited from the class ios. It provides facility for handling input and output streams.
- ◆ The function `get()` is a member function of the input stream class **istream** and is used to read a single character from the input device.
- ◆ The function `put()` is a member function of the output stream class **ostream** and is used to write a single character to the output device.
- ◆ The function `getline()` reads a whole line of text that ends with new line or until the maximum limit is reached.
- ◆ Formatted console operations can be performed by using
  - i. ios stream class member functions and flags
  2. standard manipulators
  3. user defined manipulators
- ◆ **ios stream class member functions and flags:**
- ◆ The following the important ios class functions

| Function                     | Task Performed                                                                                                |
|------------------------------|---------------------------------------------------------------------------------------------------------------|
| i. <code>width()</code>      | specifies the required number of fields to be used while displaying the output value.                         |
| ii. <code>precision()</code> | specifies the number of digits to be displayed after the decimal point.                                       |
| iii. <code>fill()</code>     | specifies a character to be used to fill the unused area of a field. By default, fills blank space character. |
| iv. <code>setf()</code>      | sets format flag that control the form of output display                                                      |
| v. <code>unsetf()</code>     | clears the specified flag.                                                                                    |

- ◆ The following the flags of ios stream class

| Flags value                | Bit field                     | Effect produced                     |
|----------------------------|-------------------------------|-------------------------------------|
| <code>ios:: left</code>    | <code>ios::adjustfield</code> | left justified output               |
| <code>ios::right</code>    | <code>ios::adjustfield</code> | right justified output              |
| <code>ios::internal</code> | <code>ios::adjustfield</code> | padding occurs between sign and no. |
| <code>ios::dec</code>      | <code>ios::basefield</code>   | decimal conversion                  |
| <code>ios::oct</code>      | <code>ios::basefield</code>   | octal conversion                    |
| <code>ios::hex</code>      | <code>ios::basefield</code>   | hexadecimal conversion              |

ios::scientific      ios::floatfield      using exponential floating notation  
ios::fixed            ios::floatfield      using ordinary floating notation  
C++ has manipulators which produce output and consume input to extend stream I/O formatting. Such manipulators can be especially useful for simple parsing of stream inputs.

Manipulators are categorized into the following two types

- i. non-parameterized manipulators
- ii. parameterized manipulators

The manipulators are defined in iomanip.h.

The following are some of the manipulators

| <b>Manipulator</b>  | <b>Action performed</b>                           |
|---------------------|---------------------------------------------------|
| dec                 | sets the conversion base to 10                    |
| hex                 | sets the conversion base to 16                    |
| oct                 | sets the conversion base to 8                     |
| ws                  | extracts white space characters from input stream |
| endl                | outputs a newline and flushes stream              |
| flush               | flushes the stream                                |
| setw(width)         | sets the field width                              |
| setprecision(prec)  | sets floating point precision                     |
| setfill(fchar)      | sets the fill character                           |
| setbase(base)       | sets the conversion base                          |
| setiosflags(long)   | sets the format flag                              |
| resetiosflags(long) | resets the format flag                            |

The user can also define his own manipulators.

The user defined manipulator will be declared with an argument.

In C++, streams are used for file computations.

The three stream classes used for file handling are

ifstream for handling input files

ofstream for handling output files

fstream for handling files on which input and output can be performed

**ifstream** class supports input operations. It opens the file in input mode by default. It inherits get(), getline(), read() functions from istream.

**ofstream** class supports output operations. It opens the file in output mode by default. It inherits put(), seekp(), tellp() and write() functions from ostream.

**fstream** supports simultaneous input and output operations. It opens the file for both input and output.

In C++, a file can be opened using the following

Constructor function of the class

The member function open() of the class

A file can be opened in the following modes

| <b>Mode</b> | <b>Effect of the mode</b>                 |
|-------------|-------------------------------------------|
| ios::in     | open for reading                          |
| ios::out    | open for writing                          |
| ios::ate    | go to the end of the file at opening time |
| ios::app    | open in append mode                       |
| ios::trunc  | erminate the file if it already exists    |

- ios::nocreate      open fails if file does not exist
- ios::noreplace      open fails if file already exists
- ios::binary          open as a binary file
- ◆ A sequential file has to be accessed sequentially, to access the particular data in the file all the preceding data items have to be read and discarded.
- ◆ A random file allows access to the specific data without the need for accessing its preceding data items.
- ◆ The error-handling mechanisms of C++ is generally referred as exception handling.
- ◆ Exceptions are classified into synchronous and asynchronous exceptions.
- ◆ The exceptions which occur during program execution, due to some fault in the input-data are known as synchronous exceptions.
- ◆ The exceptions caused by events external to the program are called asynchronous exceptions.
- ◆ The keywords which are used for exception handling are try, catch, throw.

16 84 L1  
14 30 84 u2

**PUT YOUR FULL EFFORTS  
DONOT WORRY ABOUT THE RESULT  
THEY ARE BOUND TO COME TO YOU**

m' s  
n' s  
A. Sf = v xk.  
r' s

## PRACTICE SET - I

01. In C++, a function contained within a class is called  
 1) member function 2) class function  
 3) an operator 4) none
02. When a language has the capability to produce new data types, it is said to be  
 1) reprehensible 2) encapsulated  
 3) abstracted 4) extensible
03. A normal C++ operator that acts in special ways on newly defined data types is said to be  
 1) glorified 2) encapsulated  
 3) classified 4) overloaded
04. The && and || operators  
 1) compare numeric values  
 2) combine boolean values  
 3) compare boolean values  
 4) combine numeric values
05. When an argument is passed by reference  
 1) variable is created in the function to hold the argument's value  
 2) the function cannot access the argument's value  
 3) temporary variable is created in the calling program to hold the arguments value  
 4) none
06. In a class specifier, data or functions designated private are accessible  
 1) to any function in the program  
 2) only if u know the password  
 3) to member functions of the class  
 4) only public members of the class
07. Operator overloading is  
 1) making C++ operators work with objects  
 2) creating new C++ operators  
 3) both 1 and 2 4) none
08. To convert from a user-defined class to a basic data type, you would most likely use  
 1) a built-in conversion function  
 2) one-argument constructor  
 3) an overloaded= operator  
 4) a conversion function that's member of the class
09. The scope resolution operator  
 1) limits the visibility of variables to a certain function  
 2) resolves ambiguities  
 3) has 3 : symbols 4) none
10. The new operator  
 1) returns a pointer to a variable  
 2) creates a variable called new  
 3) tells the total memory available  
 4) sells the old things
11. A pure virtual function is a virtual function that  
 1) has no body  
 2) returns nothing 3) takes no arguments  
 4) all
12. The keyword `typedef` is used to  
 1) declare a member function that is defined in a subclass  
 2) designate the absence of a type  
 3) declare objects that can be modified outside of program control  
 4) declare a synonym of an existing type
13. The keyword `asm` is used to  
 1) specify a class declaration  
 2) specify a constant definition  
 3) allow information to be passed to assembler directly  
 4) none
14. Which is the declaration for a pointer to a function that returns an integer  
 1) `int f()` 2) `int f()`  
 3) `int (*f)()` 4) ~~`int * (*f)()`~~
15. Which is the logical expression for n is even but not 8  
 1)  $(n \% 2 == 0) \parallel (n != 8)$  2)  $(n \% 2 == 0) \&\& (n != 8)$   
 3)  $(n > 8) \&\& (n \% 2)$  4) none
16. Before the execution of the statement `m*=n++;` if the values of m and n are 5 and 2. The values after execution of the statement are  
 1) 3 15 2) 2 10 3) 3 10 4) 2 15
17. The symbol `<<` is called  
 1) insertion operator  
 2) extraction operator  
 3) both 4) none
18. A class that contains atleast one pure virtual function is called as  
 1) pure class 2) abstract class  
 3) base class 4) derived class
19. What is the output of the following  
`cout.setf(ios::oct,ios::basefield);`  
`cout<<30;`  
 1) 30 2) 36 3) 24 4) error

20. In C++, what is the output  
`void f(int a=1) { cout<<"hai";}  
 void g(void) { cout<<"rai"; }  
 void main() { f(); }`  
 1) hai    2) rai    3) error    4) none
21. Templates enables us to create a range of related  
 1) operators    2) lists  
 3) functions    4) none
22. In C++, the structures are by default  
 1) public    2) private  
 3) protected    4) none
23. How many arguments can a copy constructor have  
 1) two    2) one    3) three    4) no limit
24. fstream class in C++ is  
 1) a predefined class to open a file in input mode only  
 2) a predefined class to open a file in output mode only  
 3) a predefined class to open a file in both input and output modes    4) none
25. In C++, suppose fp is a file stream for some file and is closed as  
 1) close(fp)    2) fp.close()  
 3) close    4) all
26. What is the output of the following C++ code  
`void main()  
{  
 cout.fill('*');  
 cout.width(7);  
 cout<<5250;  
}`  
 1) error    2) 5250  
 3) \*\*\*5250    4) 5250\*\*\*
27. class A : public B , public C , public D { } is  
 1) an example of multilevel inheritance  
 2) an example of hybrid inheritance  
 3) an example of hierarchical inheritance  
 4) an example of multiple inheritance
28. The statements  
`int a=20;  
cout<<"upper">>a>>2<<"lower";` outputs  
 1) upper5lower    2) upper20lower  
 3) upper202lower    4) error
29. Which of the following is true  
 1) destructors can be overloaded but constructors cannot be overloaded  
 2) constructors can be overloaded but destructors cannot be overloaded
30. 3) destructors can take arguments but constructors cannot  
 4) none  
 What is the output of the following program  
`int I=50;  
void main()  
{    int I=100;  
{     int I=150;  
printf("%d %d", ::I,I);  
}  
}  
 1) 50 100    2) 50 150  
 3) 50 100    4) 100 50`
31. In which of the following cases inline expansion may not work  
 1) functions which contain static variables  
 2) functions which are recursive  
 3) both 1 and 2  
 4) inline expansion always occurs
32. Which of the following is correct  
 1) ?: can be overloaded  
 2) :: can be overloaded  
 3) .\* can be overloaded  
 4) new can be overloaded
33. A static function  
 1) should be called when an object is destroyed  
 2) is closely connected with an individual object of a class  
 3) can be called using the class name and function name  
 4) is used when a dummy object must be created
34. cout in C++ is  
 1) an object    2) a class  
 3) both 1 and 2    4) none
35. cin in C++ can  
 1) read only one value at a time  
 2) read any number of values of same type only  
 3) read any number of values of same or different types    4) none
36. All the functions in abstract base class must be declared pure virtual  
 1) true    2) false  
 3) can't say    4) none

37. Which of the following properties about the static member variables is true  
 1) it has access to all members of its class  
 2) it has access to only static members of its class  
 3) it should be called only by using the object name  
 4) it can access only non-static members of its class
38. Which of the following is true about a static variable  
 1) it is initialized to 0 when the first object of its class is created  
 2) a separate copy of the variables is created for each object  
 3) its value will be vanished after the termination of function  
 4) it is visible to all the classes in the program
39. Which of the following prototype is illegal  
 1) void prod(int a, int b, int c);  
 2) void prod(int a, int b, int c=10);  
 3) void prod (int a=10, int b=3, int c);  
 4) void prod(int a=1, int b=4, int c=3);
40. In private derivation, which of the following is true  
 1) private members become private  
 2) public members become public  
 3) public members become private  
 4) protected members become public
41. An exception is caused by  
 1) hardware problem  
 2) a problem in operating system  
 3) syntax error ~~✓~~ 4) run-time error
42. Which of the following OOP feature is not supported by C++  
 1) polymorphism      2) delegation  
 ✓ 3) persistance      4) genericity
43. The following is true about a pure OOP language  
 1) all the OOP features are implemented in it  
 2) every thing in it is in the form of classes and objects  
 3) C++ is a example of it  
 4) There will not be any impure classes and all the classes are filtered
44. Templates in C++ are used to support which OOP feature  
 1) encapsulation      2) delegation  
 ✓ 3) genericity      4) inheritance

45. What is the output of the following program in C++

```
void main()
{
    int y=10;
    int &x=y;
    x=(++y * 3);
    printf("%d",y);
}
```

1) 333    2) 363    3) 1089    4) none

46. Which of the following is false about inline functions

- ~~Simple~~ 1) all the functions defined within the class are inline by default  
 2) inline functions are also called as open subroutines  
 3) they improve compilation speed  
 4) they may use the keyword inline

47. Which of the following is true

- 1) overloading and overriding are the same  
 2) overloaded functions may differ only in the return type  
 3) overloaded functions should have same function name  
 4) template functions cannot be overloaded

48. Which functions hinder the concept of data hiding

- 1) virtual functions      2) template functions  
 ✓ 3) friend functions      4) overloaded functions

49. Which of the following is true about virtual functions

- 1) they are imaginary functions and not real functions  
 2) they are called as normal functions  
 ✓ 3) they are called by using pointers of base class  
 4) they should always be pure without definition

50. Which of the following is true

- 1) classes can be overloaded  
 2) we can create any number of objects of a particular class  
 3) there cannot be more than 20 objects of a particular class  
 4) we can never access members by the class name

## PRACTICE SET - I KEY

|      |      |      |      |      |
|------|------|------|------|------|
| 01-1 | 02-4 | 03-4 | 04-2 | 05-1 |
| 06-3 | 07-1 | 08-4 | 09-2 | 10-1 |
| 11-1 | 12-4 | 13-3 | 14-3 | 15-2 |
| 16-3 | 17-1 | 18-2 | 19-2 | 20-3 |
| 21-3 | 22-1 | 23-2 | 24-3 | 25-2 |
| 26-3 | 27-4 | 28-1 | 29-2 | 30-3 |
| 31-4 | 32-4 | 33-3 | 34-1 | 35-3 |
| 36-2 | 37-2 | 38-1 | 39-3 | 40-3 |
| 41-4 | 42-3 | 43-2 | 44-3 | 45-2 |
| 46-3 | 47-3 | 48-3 | 49-3 | 50-2 |

## PRACTICE SET - II

01. Which of the following is false  
 1) a class can be left empty  
 2) a class can be defined without a name  
 3) a class with pure virtual function can have objects  
 4) a class with pure virtual function can be used as base class
02. Which of the following is true about friendship in C++  
 1) it is transitive      2) it is mutual  
 3) should be used only in necessary  
 4) two data members can be close friends
03. Which of the following is true in C++  
 1) exception handling is not supported  
 2) there are some functions which are invoked automatically  
 3) static data members can be left uninitialized  
 4) there can be more than one destructor in a class
04. Which of the following is true about constructors and destructors  
 1) both of them can be virtual  
 2) both of them can be overloaded  
 3) both of them can be in any number  
 4) both of them cannot return value
05. Which of the following is false  
 1) classes can be nested  
 2) public part can be before private part  
 3) classes can be self-referential  
 4) classes can be overloaded
06. Which of the following is false  
 1) a class from which a live object is created should definitely have a constructor  
 2) any member function of every object can access this pointer  
 3) virtual functions use static binding  
 4) data structures like trees, graphs and lists are implemented by self referential classes
07. The number of arguments in operator function for overloading a binary operator is  
 1) one    2) two    3) three    4) none
08. Which type of inheritance has ambiguities and problems  
 1) single inheritance  
 2) multiple inheritance  
 3) hierarchical inheritance  
 4) multilevel inheritance
09. Which of the following is false  
 1) constructors can not be inherited from base class to derived class  
 2) to create derived object both the constructors of base and derived are invoked  
 3) first the constructor of the base class is invoked and then that of derived  
 4) first the destructor of the base class is invoked and then that of derived
10. What is the order of invocation of the constructors when object of class D is created, given class D : public A1, virtual A2  
 1) D,A1,A2      2) D,A2,A1  
 3) A1,A2,D      4) A2,A1,D
11. To handle ambiguity caused due to multipath inheritance which is used  
 1) virtual functions    2) templates  
 3) virtual base classes  
 4) friend functions
12. Which of the following is false about virtual functions  
 1) they cannot be static members  
 2) they can be friend to other class  
 3) a destructor can be virtual  
 4) they are accessed normally
13. Generic classes are nothing but  
 1) container classes    2) template classes  
 3) Empty classes  
 4) self-referential classes
14. Formatted I/O operations can be performed by  
 1) ios stream class member functions and flags  
 2) standard manipulators

- 3) user-defined manipulators  
4) all the above
- Which of the following mode is used to open the file for writing  
1) ios::in                  2) ios::out  
3) ios::binary            4) ios::nocreate
- Which of the following is not a key word related to exception handling  
1) try                  2) throw            3) hit            4) catch
- Memory leaks in C++ are less when compared to C  
1) yes                  2) no                3) can't say    4) none
- Which of the following is an example for a manipulator  
1) cin                  2) auto            3) endl            4) cout
- Can the memory allocated by new operator deallocated by using free() function  
1) yes                  2) no                3) can't say    4) none
- What is the syntax for deleting an array A dynamically  
1) delete A 2) delete A{}  
3) delete [] A            4) delete [A]
- The definition const int \* xyz; then xyz  
1) is a constant pointer 2) is a pointer constant  
3) both                  4) none
- Which of the following is an example of a pure object oriented language  
1) C                  2) C++            3) java            4) smalltalk
- Which of the following operator has the highest precedence level  
~~xyz::~~ 2) ++            3) \*            4) new
- Which pointers cannot be dereferenced without explicit type casting  
1) constant pointers    2) null pointers  
3) void pointers        4) Wild pointers
- Can functions be defined in C++ structures  
1) yes                  2) No  
3) Can't say            4) None
- The exceptions caused by some faults external to the program are called  
1) synchronous        2) Asynchronous  
3) Either              4) Pure exceptions
- C++ streams are treated as \_\_\_\_\_ because they have even the capability to change the data representation.  
1) Erasers              2) Filters  
3) Browsers            4) Loaders
28. Can you use printf() statements and cout stream objects for producing the output in the same program  
1) yes                  2) No                3) Can't say    4) None
- In which of the following stream classes the operator << is overloaded  
1) istream            2) ostream  
3) iostream            4) los
30. Which of the following is an example for a parameterized manipulator in C++  
1) hex                  2) endl            3) flush            4) Setw
- What will be the output of the following code  
#include <iostream.h>  
void main()  
{     cout.precision(2);  
    cout<<7.002;  
}  
1) 7.00                  2) 7                3) 7.001        4) error
32. What is the output of the following code  
#include <iostream.h>  
void main()  
{     int x=100;  
    cout<<hex<<x<<oct<<(x>>2);  
}  
1) 100 50            2) 64 25        3) 64 31        4) Error
33. Which of the following is not a ios flag  
1) los :: left        2) los:: right  
3) los:: external    4) los::internal
34. What is the output of the following code  
#include <iostream.h>  
void main()  
{     cout.put('B');  
}  
1) B                  2) 66                3) 98            4) Error
35. The minimum number of parameters required for defining an non-parameterized user-defined manipulator is  
1) 0                  2) 1                3) 2            4) 3
36. Which of the following is false about function templates  
1) they are also called generic functions  
2) they can be overloaded  
3) a function template can have multiple generic arguments  
4) a template function may not have any arguments

- 37.** Which of the following is true about a template class  
 1) all the member functions of a template class are treated as template functions  
 2) a derived class of a template base class is also a template class  
 3) the objects of template classes are not used in the same way as normal classes  
 4) template classes cannot be inherited
- 38.** Which of the following is not used for implementing polymorphism  
 1) operator overloading  
 2) Function overloading  
 3) inline functions      4) Virtual functions
- 39.** If class B is derived from A and class C is derived from B then the pointer to the class A can  
 1) point to only objects of class A  
 2) Point to only objects of A and B  
 3) point to objects of A,B,C  
 4) Point to only objects of B and C
- 40.** To get the maximum use of virtual functions they should be defined in  
 1) Private part      2) Public part  
 3) Protected part      4) Any part
- 41.** A derived class of an abstract class  
 1) should be abstract    2) Should be concrete  
 3) either abstract or concrete  
 4) Neither abstract nor concrete
- 42.** Which of the following is true about virtual functions  
 1) they improve execution speed  
 2) They degrade the execution speed  
 3)sometimes improves and sometimes degrades  
 4) none
- 43.** If x is a private data member of integer type of the class A. If abc is the object of the class A which invokes constructor which initialise x to 10. What is the output of the code  

```
#include <iostream.h>
void main()
{
    cout << abc.x;
```

 1) abc.x    2) 10    3) 0    4) error
- 44.** The default visibility mode of inheritance is  
 1) private    2) Public    3) protected    4) none
- 45.** The type of inheritance in which a class is derived from another derived class is called  
 1) multiple inheritance  
 2) Multi-level inheritance
- 46.** 3) hierarchical inheritance  
 4) Multi-path inheritance  
 Which of the following is false  
 1) a public member can access a private member of the same class  
 2) a private member can access a public member of the same class  
 3) a friend function can access private data of a particular class  
 4) protected members of a class cannot be accessed by private members
- 47.** What is the order of invocation of the constructors when an object of class D is created given class D : public A, public C  
 1) DAC    2) ACD    3) CAD    4. ADC
- 48.** The number of arguments for overloading an unary operator in operator function is  
 1) 0    2) 1    3) 2    4) 3
- 49.** The conversion between objects of two user defined classes is done by using  
 1) one-argument constructor  
 2) Conversion function    3) either 1 or 2  
 4) done automatically by compiler
- 50.** Operators can be overloaded by using even with these functions  
 1) inline functions    2) Friend functions  
 3) Overloaded functions 4. Virtual functions
- 51.** Which of the following operators can be overloaded  
 1) ::    2) Sizeof ~~5~~ +=    4) ?:
- 52.** Which of the following function is called when an object goes out of scope  
 1) default constructor 2) Operator function  
 3) Destructor    4) Nothing
- 53.** If an object is created by using the keyword const then such object is  
 1) live object    2) Name less object  
 3) Read only object    4) Pure object
- 54.** Which of the following is false  
 1) data members can be initialized at the point of their definition  
 2) constructors can have default arguments  
 3) constant objects can be initialized by constructor  
 4) constructors defined in private part are useless
- 55.** Following is not true about passing of objects as arguments  
 1) they can be passed by value  
 2) They can be passed by reference

- 3) they can be passed by auto\_ptr  
 4) Objects can be passed
56. Assume class C with objects a,b,c. For the statement c=a-b to work correctly the overloaded operator - must  
 1) take two arguments  
 2) create named temporary object  
 3) Return value  
 4) Use the object of which it is a member as an operand
- When you overload an arithmetic assignment operator, the result  
 1) goes in the object to the right of the operator  
 2) goes in the object to the left of the operator  
 3) must be returned  
 4) goes in the object of which the operator is a member
- If you want to sort many objects , it would be more efficient to  
 1) place them in an array and sort the array  
 2) place pointers to them in an array and sort the array  
 3) place them in a linked list and sort the linked list  
 4) both 1 and 2 are of equal efficiency
57. A static function  
 1) should be called when an object is destroyed  
 2) is closely connected with an individual object of a class  
 3) can be called using the class name and function name.  
 4) is used when a dummy object must be created
58. The operation of assignment operator and that of the copy constructor are  
 1) similar, except that the copy constructor creates a new object  
 2) similar , except that the assignment operator copies member data  
 3) different , except that they both create a new object  
 4) none
59. A C++ stream is  
 1) the flow of control through a function  
 2) A flow of data from one place to another  
 3) associated with a particular class  
 4) A file
60. We can output text to an object of class ofstream using the insertion operator << because  
 1) the ofstream class is a stream  
 2) The insertion operator works with all classes
- 3) we are actually outputting to cout  
 4) The insertion operator is overloaded in ostream
63. The major goal of inheritance in C++ is  
 1) to help modular programming  
 2) To facilitate the conversion of data types  
 3) to facilitate reusability of code  
 4) To hide the details of base classes
64. In which of the following code fragments the variable x is evaluated to 8  
 1) int x=30 x=x>>2    2) int x=33 x=x>>2  
 3) int x=37 x=x>>2    4) Int x=18 x=x>>2
65. In C++, a function can return multiple values  
 1) true                        2) False  
 3) Some times false    4) None
66. Which of the following is a legal way to access a class data member using this pointer  
 1) this->x    2) this.x    3) this.x    4)\*(this.x)
67. The function show() is a member of the class A and obj is a object of A and ptr is a pointer to A . Which of the following are valid access statements  
 1) \*obj.show()              2) Obj->show()  
 3) Ptr->show                4) Ptr.show()
68. What is the output of the following program
- ```
#include <iostream.h>
#include <conio.h>
void main()
{
    int number=-2;
    if(number>=0)
        if(number<0)
            cout<<"positive";
        else
            cout<<"negative";
}
```
- 1) positive                    2) Negative  
 3) Error                        4) Nothing is printed
69. What is the output of the following code
- ```
#include <iostream.h>
void main()
{
    int x=10,y=15;
    x=((x<y)?(y++:x):(y-x));
    cout<<x<<" "<<y;
}
```
- 1) 25 16    2) 26 15    3) 10 16    4) error

70. What is the result of the expression  $(1 \& 2) + (3 \& 4)$  in base 10.  
 1) 1    2) 2    3) 8    4) 7
71. A class hierarchy  
 1) shows the same relationships as an organization chart  
 2) describes "has-a" relationship  
 3) describes "kind of" relationship  
 4) none
72. What is the output of the following code
- ```
#include <iostream.h>
void main()
{
    char k=65;
    cout<<++k<<endl;
}
```
- 1) 65    2) 66    3) A    4) B
03. 3) Used for both console input and output  
 4) Used for console input, console error and console output
04. OOP treats as a critical element in the program development.  
 1) data 2) function 3) object 4) classes
05. Output of the following program is void main()  
 $\text{int } s = 0;$   
 $\text{while } (s++ < 10)$   
 $\{$   
 $\text{if } (s < 4 \& \& s < 9)$   
 $\text{continue};$   
 $\text{cout} \ll s \ll " ";$   
 $\}$
- 1) 1 2 3 4 5 6 7 8 9    2) 1 2 3 1 0  
 3) 4 5 6 7 8 9 10    4) 4 5 6 7 8 9

### PRACTICE SET - II KEY

01-3	02-3	03-2	04-4	05-4
06-4	07-1	08-2	09-4	10-4
11-3	12-4	13-2	14-4	15-2
16-3	17-1	18-3	19-2	20-3
21-2	22-3	23-1	24-3	25-1
26-2	27-2	28-2	29-2	30-4
31-2	32-3	33-3	34-1	35-2
36-4	37-1	38-3	39-3	40-2
41-3	42-2	43-4	44-1	45-2
46-4	47-2	48-1	49-3	50-2
51-3	52-3	53-3	54-1	55-1
56-4	57-2	58-2	59-3	60-1
61-2	62-4	63-3	64-2	65-2
66-1	67-3	68-4	69-1	70-4
71-3	72-4			

### PREVIOUS ECET BITS

#### ECET -2009

01. Which one of the following is used for standard C++ comment?  
 1) /    2) /\*\* \*\*/    3) //    4) <!>
02. What is the use of preprocessor directive (#include)?  
 1) Used for console output  
 2) Used for console input
03. 3) Used for both console input and output  
 4) Used for console input, console error and console output
04. OOP treats as a critical element in the program development.  
 1) data 2) function 3) object 4) classes
05. Output of the following program is void main()  
 $\text{int } s = 0;$   
 $\text{while } (s++ < 10)$   
 $\{$   
 $\text{if } (s < 4 \& \& s < 9)$   
 $\text{continue};$   
 $\text{cout} \ll s \ll " ";$   
 $\}$
- 1) 1 2 3 4 5 6 7 8 9    2) 1 2 3 1 0  
 3) 4 5 6 7 8 9 10    4) 4 5 6 7 8 9
05. Choose the error in the for loop if any
- ```
# include <iostream.h>
main()
{
    int i=1;
    for(; ;)
        cout << i++;
    if(i>10)
        break;
}
```
- 1) The condition in the for loop is a must  
 2) Two semicolon should be dropped  
 3) The for loop should be replaced by a while loop  
 4) no error
06. A class hierarchy (in C++)  
 1) describes "has a" relationships  
 2) describes "is a kind of" relationships  
 3) shows the same relationships as a family tree  
 4) Shows the same relationship as an organization chart.

07. Virtual functions in C++ allows you to
- 1) Use the same function call to execute member function of objects from different class
  - 2) Create functions that have no body
  - 3) Group objects of different so they can all be accessed by the same function code
  - 4) Create an array of type pointer-to-base-class that can hold pointer to derived class
08. In C++, operator << is called as
- 1) an insertion operator or put to operator
  - 2) an extraction operator or get from operator
  - 3) an insertion operator or get from operator
  - 4) an extraction operator or put from operator

### ECET -2010

09. \_\_\_\_\_ defines how closely the members are related to each other or how strongly the members depend on each other in a class ?
- 1) Encapsulation
  - 2) Inheritance
  - 3) Cohesion
  - 4) Coupling
10. Which of the following member is not automatically provided by the compiler if the programmer does not provide it explicitly ?
- 1) Equality operator
  - 2) Assignment operator
  - 3) Constructor
  - 4) Destructor
11. Which of the following member function is resolved dynamically ?
- 1) Static member function
  - 2) Const member function
  - 3) Virtual member function
  - 4) Non virtual member function
12. Which of the following is the default mode of operating a file in C++ ?
- 1) Text mode
  - 2) Binary mode
  - 3) Executable mode
  - 4) Batch mode
13. Which of the following operators used to obtain the dynamic type of an object / class ?
- 1) Type of
  - 2) typeid
  - 3) Size of
  - 4) Dynamic-cast

14. Which of the following members of the subclass inherits from the base class ? ~~ok~~
- 1) Public & Private
  - 2) Private & protected
  - 3) Protected & public
  - 4) Private
15. What does multi level inheritance mean ?
- 1) Deriving a class from single base class
  - 2) Single base class deriving two classes
  - 3) Procedure of deriving a class from derived class
  - 4) Deriving a class from two base classes.
16. Which of the following describes a virtual function better ?
- 1) A member function that can be changed at runtime
  - 2) A function whose name is virtual
  - 3) A function which is not physically present
  - 4) A function has no name

### ECET -2012

17. \_\_\_\_\_ storage class is not supported by C ++ compiler.
- 1) Dynamic
  - 2) Register
  - 3) Auto
  - 4) Mutable
18. \_\_\_\_\_ feature is not at all supported by the C ++ compiler
- 1) Operator overloading
  - 2) Exception handling
  - 3) Reflection
  - 4) Namespaces
19. \_\_\_\_\_ keyword supports dynamic method resolution in C ++.
- 1) Abstract
  - 2) Virtual
  - 3) Dynamic
  - 4) typeid
20. Which of the following should be used to access an array element in C ++ ?
- 1) Dot operator
  - 2) Member name
  - 3) An index number
  - 4) Function name
21. What is meant by operator overloading in C + + ?
- 1) It is creating new operations
  - 2) It is creating new functions
  - 3) It is giving new meanings to existing C + + operators
  - 4) It is loading multiple operators into a given function

22. What is meant by C++ pure virtual function ?  
 1) A function which has no body  
 2) A function which returns no value  
 3) A function which is never used in a base class  
 4) A function which is difficult to explain
23. In C++ what does redirection perform  
 ✓ 1) It redirects a file from a device to a stream  
 2) It redirects a stream from a file to a console  
 3) It redirects a device from the screen to a file  
 4) It redirects the screen from a device to a stream
24. To which class of stream does 'cout' object in C++ belong to ?  
 1) stringstream      2) istream  
 3) ostream      4) ifstream
25. Which of the following is used by an object to refer to itself?  
 1) this    2) itself    3) self    4) own
26. In C++ when no access specifier is explicitly mentioned for the base class, \_\_\_\_\_ is the default inheritance type.  
 1) Public      2) Private  
 3) Internal      4) Protected
27. In C++, name mangling is used to support the feature called \_\_\_\_\_  
 1) Overloading      2) Overriding  
 3) Data Hiding      4) Abstraction
28. Which of the following operators in C++ cannot be overloaded ?  
 1) Assignment - =    2) Equality - ==  
 3) Scope resolution - :: 4) Arrow - ->
29. \_\_\_\_\_ cannot be declared as a template in C++  
 1) Classes      2) Member functions  
 3) Global functions      4) Macros

### ECET -2013

30. The default access specifier is  
 1) Public      2) Private  
 3) Protected      4) Friend
31. When a base class is privately inherited by a derived class, public members of the base class become \_\_\_\_\_ members of the derived class  
 1) Private    2) Public    3) Protected    4) Friend

32. C++ uses a unique keyword called \_\_\_\_\_ to represent an object that invokes a member function  
 1) This    2) New    3) Delete    4) Malloc
33. The wrapping up of data and functions into a single unit is known as  
 1) Polymorphism      2) Abstraction  
 3) Encapsulation      4) Inheritance
34. If class A is friend of class B then class B is  
 1) Automatically friend of A  
 2) Automatically friend of derived class A  
 3) Not automatically friend of A  
 4) Automatically friend of derived class of B
35. The operator that can not be overloaded  
 1) + +    2) ::    3) ()    4) - -
36. Which of the following is not construct ?  
 1) Friend constructor    2) Copy constructor  
 3) Parameterized constructor    4) Default constructor
37. The declaration of pure virtual function is \_\_\_\_\_  
 1) Virtual void display () {0} :  
 2) Virtual void display = 0;  
 3) Void display () = 0;  
 4) Virtual void display () = 0;
38. Which inheritance is not supported by C++  
 1) Multilevel      2) Single  
 3) Multiple      4) None
39. The legal access to a class data members using this pointer \_\_\_\_\_  
 1) this->x      2) this.x  
 3) \*this.x      4) \*this (x)

### ECET -2014

40. Which of the following is not a type of constructor?  
 1) Copy constructor  
 2) Friend constructor  
 3) Default constructor  
 4) Parameterized constructor
41. Which of the following concepts says, method invoking at runtime ?  
 ✓ 1) Data hiding      2) Dynamic Typing  
 ✓ 3) Dynamic binding  
 4) Dynamic loading

42. Which one of the following are standard stream objects

- 1) PIPE
- 2) SYS
- 3) ERROR
- 4) BUFF

43. How many objects can be created from an abstract class?

- 1) Zero
- 2) One
- 3) Two
- 4) As many as we want

44. Which of the following will be called when an object goes out of scope?

- 1) Constructor
- 2) Destructor
- 3) Main
- 4) Virtual function

45. Which of the following function / type of function cannot be overloaded?

- 1) Member function
- 2) Static function
- 3) Virtual function
- 4) Operator function

46. Which of the following statement is correct?

- 1) Two functions having same number of argument, order and type of argument can be overloaded if both functions do not have any default argument.
- 2) Overloaded function must have default arguments.
- 3) Overloaded function must have default arguments starting from the left of argument list
- 4) A function can be overloaded more than once

47. The operator that cannot be overloaded is:

- 1) ++
- 2) ( )
- 3) ::
- 4) ~

48. If you create a file by 'fstream', then the default mode of the file is:

- 1) ios :: app
- 2) ios :: out
- 3) ios :: app & ios :: out
- 4) ios :: in & ios :: out

49. When you derive a class privately, a protected base class member becomes

- 1) Private
- 2) Public
- 3) Not inherited
- 4) Protected

50. Which will legally declare, construct, and initialize an array?

- 1) int [] myList = { "1", "2", "3" };
- 2) int [] myList = (5, 8, 2)
- 3) int myList [] [] = {4, 9, 7, 0};
- 4) int myList [] = {4, 3, 7}

### AP - ECET - 2015

51. Which of the following statements is false

- 1) a destructor cannot pass parameters
- 2) a constructor must always be used along with a destructor
- 3) a constructor is a member function
- 4) a destructor can be either public or private

52. In C++, cin is

- 1) a method
- 2) an object
- 3) an operator
- 4) a predefined function

53. The output of the following C++ code

- ```
1) for (int a = 0; a < 10; a++)  
    cout << a;  
}  
1) 0 1 2 3 4 5 6 7 8 9 2) 1 3 5 7 9  
3) 0 2 4 6 8 10  
4) 1 2 3 4 5 6 7 8 9 10 11
```

54. In C++, the following operator is used to call object destructor:

- 1) delete
- 2) deallocate
- 3) destroy
- 4) destruct

55. In C++, overloaded functions must differ in

- 1) return type
- 2) number of parameters passed
- 3) types of parameters passed
- 4) either number or types of parameters

56. An abstract call must contain

- 1) only pure virtual functions
- 2) any virtual function
- 3) at least one pure virtual function
- 4) at least one virtual function

57. Correct the following C++ code

- ```
1) int*a,c=10; cin>>a;c = c-a; cout << c;  
2) int * a,c = 10; cin >> &a;c = c - &a; cout << c;  
3) int *a,c = 10 ; cin >> *a;c = c-*a; cout << c;  
4) int *a,c = 10; cin >> a; *c=*&c-&a; cout << *c;
```

58. If some private data in class A is to be accessed by class B, then

- 1) A must be made a sub class of B
- 2) A must declare B as a friend
- 3) B must be made a sub class of A.
- 4) B must declare A as a friend

59. In C++, if the variable 'a' is declared as 'protected' in class X, then apart from the methods of class X
- all friend classes of X can access it
  - any class where protected data is declared can access it
  - all subclasses of X can access it
  - only immediate sub class of X can access it

TS - ECET - 2015

60. Operator overloading feature in C++ comes under
- polymorphism
  - inheritance
  - encapsulation
  - abstraction
61. Which of the following is the C++ features where more than one user-defined functions can have the same name but perform different operations
- inheritance
  - operator overloading
  - function overloading
  - friend function
62. In C++, private data of class can be accessed only through
- member functions
  - member data
  - friend function
  - inheritance
63. Which of the following operators cannot be overloaded in C++
- addition
  - multiplication
  - division
  - scope resolution operator
64. Pure virtual function is an example of
- runtime polymorphism
  - inheritance
  - friend function
  - overloading
65. The following statement: int num[2][3] = {{1,2}, {3,4}, {5,6}};
- assigns a value 3 to num [1][2]
  - assigns a value 2 to num [1][2]
  - assigns a value 4 to num [2][2]
  - gives an error message
66. The output of following program is: int main  
{cout<<"Hello world!"; return 0;}
- Hello world
  - Hello world!
  - syntax error
  - 0

67. The output of the following C++ code is:

```
int a = 50;
void main()
{
    int a = 100;
    cout<<a<<; a;
}
```

- 100 50
- 100 100
- 50 100
- syntax error

68. Which of the following is the correct way to access a class data member using the pointer this

- \*this->x
- this.x
- this->x
- \*this.x

69. Which of the following is the correct syntax for declaring a function as constant

- int fun ( void ) const /\*statements\*/;
- const int fun ( void ) /\* statements \*/;
- int const fun ( void ) /\* statements \*/;
- both 2 and 3

70. What will be the output of following code?

```
import java.util.*;
class arraylist
{
    public static void main ( String args [] )
    {
        array list arrlist = new array list();
        system.out.println("Initial size of
arrlist=" + arrlist.size());
    }
}
```

- initial size of arrlist = 3
- initial size of arrlist = 0
- initial size of arrlist = 1
- initial size of arrlist = 2

AP - ECET - 2016

71. Reusability is a desirable feature of a language as it
- decreases the testing time
  - increases the testing time
  - reduces the compilation time
  - reduces the execution time
72. A constructor is called whenever
- an object is used
  - an object is declared
  - a class is declared
  - a class is used

- Which of the following remarks about the differences between constructors and destructors are correct  
 ✓ constructors can take arguments but destructors cannot  
 2) constructors and destructors can be used to copy the information  
 3) destructors can take arguments but constructors cannot  
 4) destructors can be overloaded but constructors cannot be overloaded

Choose the best answer:

74. A function that does the same operation on different data types is to be implemented by using  
 1) macros                    2) overloading  
 3) function template        4) default arguments

75. In C++, dynamic memory allocation is accomplished with the operator  
 1) new                      2) this  
 3) malloc()                4) calloc()

76. The process of building new classes from existing one is called  
 1) polymorphism            2) structure  
 3) inheritance             4) cascading

77. In C++ runtime polymorphism is achieved by  
 1) friend function         2) virtual function  
 3) inline function         4) function overloading

78. The operator that cannot be overloaded is  
 1) ++                      2) ~                    3) ()                    4) ::

79. Which of the following may be part of a class definition  
 1) instance variables    2) instance methods  
 3) constructors            4) all the above

#### TS - ECET - 2016

80. The class which is inherited by parent class is termed as  
 1) base class              2) derived class  
 3) member of class        4) public member of class

81. A pointer to the base class can hold address of  
 1) only base class object  
 2) only derived class object  
 3) base class object as well as derived class object  
 4) only base class

82. Which of the following operator can be overloaded through friend function  
 1) -->                    2) =                    3) ()                    4) \*

83. What would be the output of the following program  

```
int main()
{ int x,y = 10, z = 10;
  x = (y == z); cout << x;
  return 0; }
```

 1) 0                      2) 1  
 3) syntax error         4) 10

84. In C++, dynamic memory allocation is accomplished with the operator  
 1) new                    2) this                3) sizeof()            4) delete

85. Which of the following is not a standard file stream  
 1) stdin                  2) stdfile            3) stderr              4) stdout

86. Which of the following operator cannot be overloaded  
 1) ?:                    2) ++                3) []                4) ==

87. Which function can operate on two different classes, and also acts as a bridge between two different classes  
 1) virtual function     2) member function  
 3) friend function     4) inline function

88. Which type of constructor initialize the values from an existing object of a class to new instantiated object of the same class  
 1) default constructor  
 2) parameterized constructor  
 3) copy constructor  
 4) duplicate constructor

89. The objects in C++ can be de-initialized by using a function termed as  
 1) destructor            2) constructor  
 3) calloc()              4) malloc()

#### AP - ECET - 2017

90. In which parameter passing technique of C++ passes only the contents of the variable of the receiving function  
 1) by reference         2) by value  
 3) globally             4) locally

91. A constructor without any parameters is called  
 \_\_\_\_\_ constructor  
 1) custom              2) dynamic  
 3) static                4) default

92. What is the output of this program

```
#include <iostream>
using namespace std;
int main()
{
    int i;
    char * arr[] = {"C", "C++", "java", "VBA"};
    char * (*ptr)[4] = & arr;
    cout << ++(*ptr)[2];
}
```

- 1) ava                    2) java  
 3) c++                    4) compile time error  
 93. In C++, 'friend' keyword can be placed before \_\_\_\_\_  
 1) function declaration    2) function definition  
 3) main function            4) pakage

#### TS- ECET - 2017

94. Which of the following is true about the static member variable in C++  
 i. It is initialized to zero when the first object of its class is created. Other initialization is also permitted  
 ii. It is visible only within the class, but its lifetime is the entire program  
 1) i-True, ii-True            2) i-False, ii-True  
 3) i-True, ii-False            4) i-False, ii-False  
 95. Which of the following statements is incorrect  
 1) friend keyword can be used in the class to allow access to another class  
 2) friend keyword can be used for a function in the public section of a class  
 3) friend keyword can be used for a function in the private section of a class  
 4) friend keyword can be used on main()

96. What is the output of this program

```
#include<iostream>
using namespace std;
int main()
{
    char arr[20];
    int i;
    for (i=0, i<10'i++)
        *(arr+i)=65+i;
    *(arr+i)=10;
    cout<<arr;
    return(0);
}
```

- 1) ABCDEFGHIJ            2) AAAAAAA  
 3) JJJJJJJJJJ            4) BBBBBBBBBB

97. Where does a cin stop its extraction of data  
 1) by seeing ()  
 2) when a blank space is encountered  
 3) when user stops typing  
 4) when keyboard buffer is full

98. ios :: trunc is used for  
 1) if the file is opened for output and it already existed, its previous content is deleted and replaced by new one  
 2) if the file is opened for output and it already existed, no action is taken  
 3) if the file is opened for input and it already existed, the file is truncated  
 4) if the file is opened for input, it position file at the end of file

99. Which of the following advantages we lose by using multiple inheritance  
 1) static binding            2) polymorphism  
 3) dynamic binding            4) virtualization

100. What is output of this program

```
#include<iostream>
#include<fstream>
using namespace std;
int main()
{
    ofstream outfile ("test.txt");
    for (int n = 0; n < 100; n++)
    {
        cout << "Done";
        outfile.close();
    }
    return 0;
}
```

- 1) done                    2) error  
 3) runtime error  
 4) file not found exception

101. What must be specified when we construct an object of class ostream  
 1) stream                    2) streambuf  
 3) memory                    4) fstream

#### AP - ECET - 2018

102. The process of making a function to exhibit different behaviours in different instances is called \_\_\_\_\_  
 1) function overloading  
 2) operator overloading  
 3) inheritance                    4) polymorphism  
 103. The \_\_\_\_\_ principle helps the programmer to build secure programs  
 1) operator overloading  
 2) encapsulation  
 3) data hiding  
 4) polymorphism  
 104. In a class, encapsulating an object of another class is called  
 1) composition                    2) inheritance  
 3) encapsulation                    4) polymorphism

105. If you want to write multiple functions in a class with same name, then what C++ feature will you use

- 1) function overriding
- 2) function overloading
- 3) encapsulation
- 4) inheritance

106. In C++, class object created statically and dynamically are stored in the following memories respectively.

- 1) stack, heap
- 2) heap, heap
- 3) heap, stack
- 4) stack, stack

107. Which of the following statements is correct in C++

- 1) C++ allows any operator to be overloaded
- 2) some of the existing operators cannot be overloaded
- 3) operator precedence cannot be changed
- 4) reduces the compilation time

108. Which of the following operators cannot be overloaded

- 1) >>
- 2) ?:
- 3) .
- 4) ?

109. The fields in a structure of a C program are by default

- 1) protected
- 2) public
- 3) private
- 4) void

110. Blanks, tabs, newlines, form feeds and comments are collectively called \_\_\_\_\_

- 1) blank fields
- 2) white space
- 3) null values
- 4) literals

111. Use of existing assets in some form within software product development process is termed as

- 1) reusability
- 2) usability
- 3) robust
- 4) reboot

#### TS-ECET - 2018

112. Polymorphism refers to the ability to associate multiple meanings to one function name by means of a special mechanism known as \_\_\_\_\_ binding

- 1) late
- 2) virtual
- 3) abstract
- 4) early

113. What will happen in this code

```
int a = 100, b=200;
int *p=&a, *q=&b;
p=q;
```

- 1) b is assigned to a
- 2) p now points to b
- 3) a is assigned to b
- 4) q now points to a

114. What is the output of this program

```
#include <iostream>
using namespace std;
int main()
{
    char *ptr;
    char str[]="abcdefg";
    ptr=str;
    ptr+=5;
    cout<<ptr;
    return 0;
}
```

- 1) fg
- 2) cdef
- 3) defg
- 4) abcd

115. What is the output of this program?

```
#include <iostream>
#include <ostring>
using namespace std;
int main()
{
    char str1[10] = "Hello";
    char str2[10] = "World";
    char str3[10];
    int len;
    strcpy(str3, str1);
    strcat(str1, str2);
    len=strlen(str1);
    cout<len<<endl;
    return 0;
}
```

- 1) 5
- 2) 55
- 3) 11
- 4) 10

116. Which of the following is not the member of class

- 1) static function
- 2) friend function
- 3) const function
- 4) virtual function

117. What is the output of the following (when embedded in a complete program)?

```
int n=5;
while (--n>0)
{
    if (n==2)
        break;
    cout<<n<<" ";
}
cout<<"End of Loop";
```

- 1) 4 3 End of Loop
- 2) 4 3
- 3) 5 4 3 End of Loop
- 4) 3 4 End of Loop

118. A default catch block catches

- 1) all thrown objects
- 2) no thrown objects
- 3) any thrown object that has not been caught by an earlier catch block
- 4) all thrown objects that have been caught by an earlier catch block

## SPACE FOR IMPORTANT NOTES

119. A/An \_\_\_\_\_ is a member function of a class that is called automatically when an object of the class goes out of scope  
1) destructor      2) constructor  
3) class            4) object
120. Member functions that allow you to find out the values of the private variables of a class are called \_\_\_\_\_ functions  
1) imitator        2) constant  
3) accessor       4) derived
121. A/an \_\_\_\_\_ function of a class is not a member function of the class but has access to the private members of the class just as a member function does  
1) member          2) constructor  
3) over loaded     4) friend

### PREVIOUS ECET BITS KEY

|       |        |       |       |       |
|-------|--------|-------|-------|-------|
| 01-3  | 02-4   | 03-3  | 04-2  | 05-4  |
| 06-2  | 07-1   | 08-1  | 09-4  | 10-1  |
| 11-3  | 12-1   | 13-1  | 14-3  | 15-3  |
| 16-1  | 17-4   | 18-3  | 19-2  | 20-3  |
| 21-3  | 22-1   | 23-1  | 24-3  | 25-1  |
| 26-2  | 27-1   | 28-3  | 29-3  | 30-2  |
| 31-1  | 32-1   | 33-3  | 34-3  | 35-2  |
| 36-1  | 37-4   | 38-4  | 39-1  | 40-2  |
| 41-3  | 42-1   | 43-1  | 44-2  | 45-3  |
| 46-4  | 47-3   | 48-4  | 49-1  | 50-4  |
| 51-4  | 52-2   | 53-2  | 54-1  | 55-4  |
| 56-3  | 57-3   | 58-2  | 59-3  | 60-1  |
| 61-3  | 62-1&3 | 63-4  | 64-1  | 65-4  |
| 66-2  | 67-1   | 68-3  | 69-1  | 70-2  |
| 71-3  | 72-2   | 73-1  | 74-3  | 75-1  |
| 76-3  | 77-2   | 78-4  | 79-3  | 80-2  |
| 81-2  | 82-2   | 83-2  | 84-1  | 85-2  |
| 86-1  | 87-3   | 88-3  | 89-1  | 90-2  |
| 91-4  | 92-1   | 93-1  | 94-2  | 95-4  |
| 96-1  | 97-2   | 98-1  | 99-3  | 100-1 |
| 101-2 | 102-3  | 103-1 | 104-3 | 105-4 |
| 106-1 | 107-1  | 108-3 | 109-1 | 110-1 |
| 111-4 | 112-2  | 113-2 | 114-2 | 115-1 |
| 116-1 | 117-2  | 118-2 | 119-1 | 120-1 |
| 121-1 |        |       |       |       |

PUT YOUR FULL EFFORTS

DON'T WORRY ABOUT RESULTS

THEY ARE BOUND TO COME TO

YOU

SPACE FOR IMPORTANT NOTES

$s = \phi \times 2$   
 while ( $s <= 10$ )  
 $\downarrow$   
 $\phi \leftarrow \phi \times 10$   $N = 10^{\phi} \approx \infty$   
 Answe  
 r

①

$\text{int num} = 2$   
 $\text{int } a = 0, a < 10, a++$   
 $\text{cout} \ll a$   
 $\text{num} = 2^a$

$s = 0$   
 $s++ \ll$   
 $\downarrow$   
 $x \leftarrow 1, 2, 3, 4$   
 $\downarrow$   
 $12310$

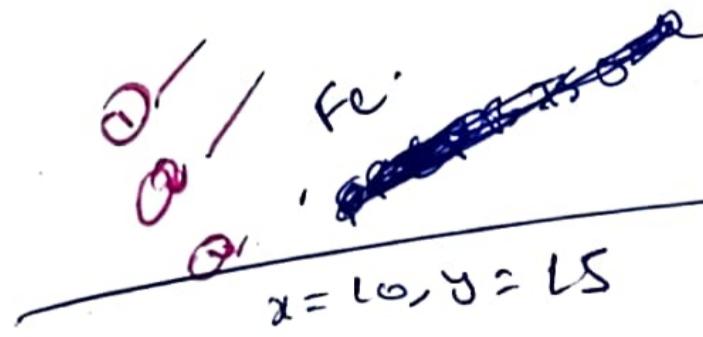
$1 \ 2 \ 3$   
 $3 \ 2 \ 16 \ 8 \ 4 \ 2 \ 1$   
 $1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1$   
 $6 \ 5 \ 4 \ 3 \ 2 \ 1 \ 0$   
 $3 \ 2 \ 16 \ 8 \ 4 \ 2 \ 1$   
 $y \ 1 \ 0 \ 0 \ 0 \ 1 \ 1$

13

Athirathri

Amma's

11. ⑯



$x = 10, y = 15$

$$x = (10 + 15) \text{ or } (10 + 15, 15)$$

$(15 - 10)$

16  
20

Amma's



# JAVA

## → IMPORTANT POINTS

Java is a high level programming language (initially called OAK) developed by James Gosling

- Byte Code is designed to be executed at runtime by Java Virtual Machine (JVM)

- Java is pure (100%) OOPS programming language

- To run a Java application it requires JRE (Java Runtime Environment)

- Java is extension for Java program

- Java doesn't consist of pointers, go to statement and multiple inheritance.

- Java support four "4" access specifiers 1) Private

- 2) Public

- 3) Protect

- 4) default

- Mark & Sweep is an algorithm used by garbage collector to delete unused variables and object from memory.

- In Java object cannot exist without class but a class can exist without any object.

- Java does not contain header files.

- There are 4a reserved key words in Java language

- J.L (Java Language) supports 3 types of comments.

- 1. /\* comment \*/ - multi line

- 2. // comment single line

- 3. /\*\* comment 1 Java documentation

- comment 2

- comment 3

Comment h \* /. This is known as documentation comment usually used in html files.

## Separators.

| Symbol | Purpose |
|--------|---------|
|--------|---------|

|     |                               |
|-----|-------------------------------|
| ( ) | Expression control statements |
|-----|-------------------------------|

|     |                                                 |
|-----|-------------------------------------------------|
| { } | Block of code classes, methods and local scopes |
|-----|-------------------------------------------------|

|     |                            |
|-----|----------------------------|
| [ ] | dereferencing array values |
|-----|----------------------------|

|   |                       |
|---|-----------------------|
| ; | terminating statement |
|---|-----------------------|

|   |                                                                                |
|---|--------------------------------------------------------------------------------|
| . | separate packes from subpackages and classes, method from a reference variable |
|---|--------------------------------------------------------------------------------|

|   |             |
|---|-------------|
| , | identifiers |
|---|-------------|

Hash Code : It is a unique identification number allocate to objects by the JVM

Java is case sensitive language

Unique code system : It is a system to indicate all the alphabates from all human languages (including characters)

Java virtual machine (JVM) is system dependent.

With the help of SUPER keyword we can derive variables and method from base class.

Object code is machine code is equivalent of source code.

Coercion : It is automatic conversions between different data types done by the compiler.

In java all variables are in " Heap" memory.

Method over riding : Writing two or more methods in super and sub classes such that same name and same signature.

The processes of assigning smaller type into larger is known as widening or promotion.

The process of assigning larger type into smaller is known as narrowing

Type casting : Converting one type of data type another data type and it is also known as casting.  
"escape sequences " in Java

\r Enter key

\b back space

\f from field

\\ displays slash

Float can represent upto seven digits quarterly after decimal point where as double an represent upto 15 digits.

dot operator (.) is also known as member operator

Priority of operator :

1) ( ), //

2) + + , --

3) \* , / , %

4) + , -

5) Relational operators

6) Boolean and Bitwise

7) Logical

8) ternary

9) Assignment

String is a class it's not a data type

Jagged array is an array that contains a group of array with in it.

Runtime errors : The errors that occur

Boxing : Converting a primitive datatype in to objecting

Character wrapper class which contains only one constructor.

JAR : Java Archive file

Generalization is phenomenon where a sub class is promoted to a super class

Specialization is phenomenon where super class is narrow down to sub class

Static polymorphism is polymorphism executed at compile time.

Positive numbers are represented using one's complement used negative numbers are represented by using two's complement internally.

System : exit (0) terminates the program normally

System. exit (1) terminates the program because of sum error encountered in the program

Return statement is used to come out of it

Default priority of thread is 5

Maximum priority of thread is 10

Minimum priority of thread is 1

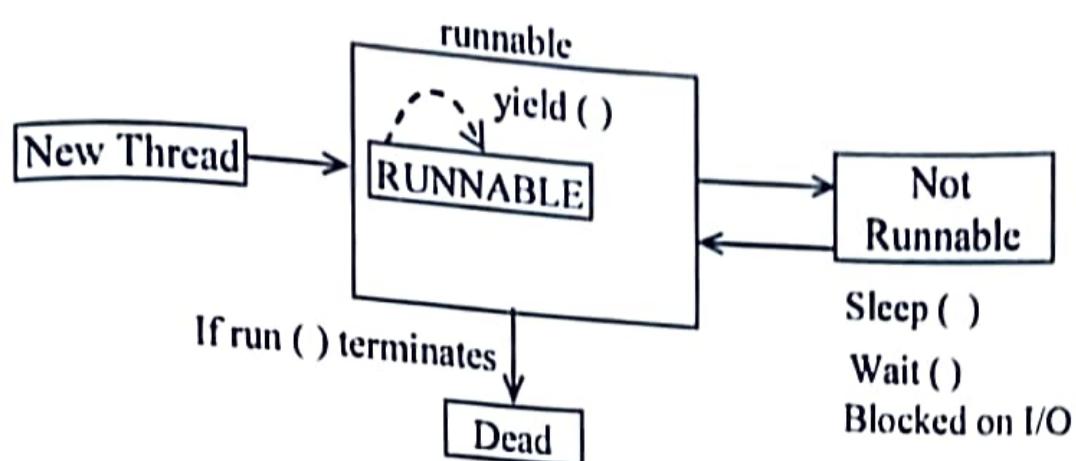
By default "Main thread" always runs in a java program.

Threads are called "light-weight" because they utilize minimum resources of the system, that mens they take less memory and less processor time.

Band width  
CO Axial cable  
10 to 100 mHz  
Optical fibers 10 GmHz

- Executing only one job at a time is called single tasking
- Executing several jobs at a time is called multi tasking
- Threads are mainly used in server-side programs
- We can create the threads by two ways
  - i) extends threads class
  - ii) implements Runnable interface
- **Ex :** Class myclass extends Thread  
Class myclass implements Runnable
- **To stop the thread :**  
First of all, we should create a boolean type variable which stores "False" when the user wants to stop the thread, we should store "true" in to the variable. The status of the variable checked in the run ( ) method and if it is true, the thread executes 'return' statement and then stops.
- 'extends thread' and implements Runnable'
  - \* Both are functionally same
  - \* When we write the extend thread, there is not scope to extend another class, as multiple inheritance is not supported in java.
- Eg : Class Myclass extends Thread, another class //invalid  
If we write implements Runnable, then still there is a scope to extend another class.
- **Ex :** Class Myclass extends another class implements Runnable valid.
- Public void run ( ) method is executed by the thread by default,
- When a thread is already acting on an object, preventing any other thread from acting on the same object called as "thread synchronization" or "thread safe"
- The object on which the threads are synchronized is called "synchronized object"
- Thread synchronized is recommended when multiple threads are used on the same object (in multi threading)
- Synchronized block is useful to synchronize a block of statements.
- Synchronized keyword is useful to synchronize an entire method.
- To test the thread is still alive (t. is Alive ( ) return T/F)
- To weight a thread dies [t. join ( ) ;]
- When a thread has locked an object and waiting for another object to be released by another thread, and the other thread is also waiting for the first thread to release the first object, both the threads will continue for ever. "This is called" thread deadlock"
- Obj. notify ( ) : - This method releases an object and sends a notification to a waiting thread that the object is available.
- **Obj. notify All ( ) :** To send the notification to all waiting threads at once that the object is available.
- **Obj. wait ( ) :** - This method makes a thread wait for the object till it receives a notification from a notify () (or) notify all () methods.
- Sleep ( ) & Wait ( ) :  
Both are used to suspend a thread execution for a specified time.  
Generally sleep ( ) is used for making a thread to wait for same time.  
But wait ( ) is used in connection with notify ( ) or notify all ( ) methods in thread communication

## Thread Life Cycle



## Visibility of Fields in a class :

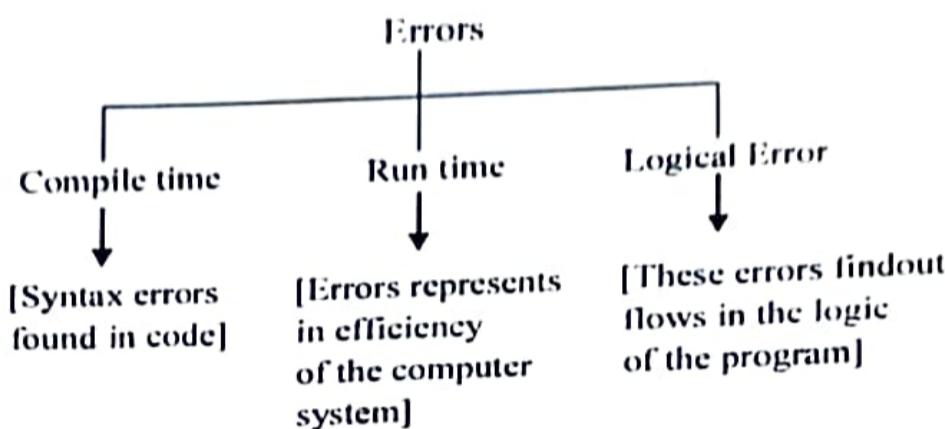
| Access location \ Access modifier | Public | Protected | Default | Private<br>Protected | Private |
|-----------------------------------|--------|-----------|---------|----------------------|---------|
| Some Class                        | Yes    | Yes       | Yes     | Yes                  | Yes     |
| Sub class in same package         | Yes    | Yes       | Yes     | Yes                  | No      |
| Other classes in same package     | Yes    | Yes       | Yes     | No                   | No      |
| Sub class in other package        | Yes    | Yes       | No      | Yes                  | No      |
| Non-sub class in other package    | Yes    | No        | No      | No                   | No      |

## Primitive data type Corresponding wrapper class

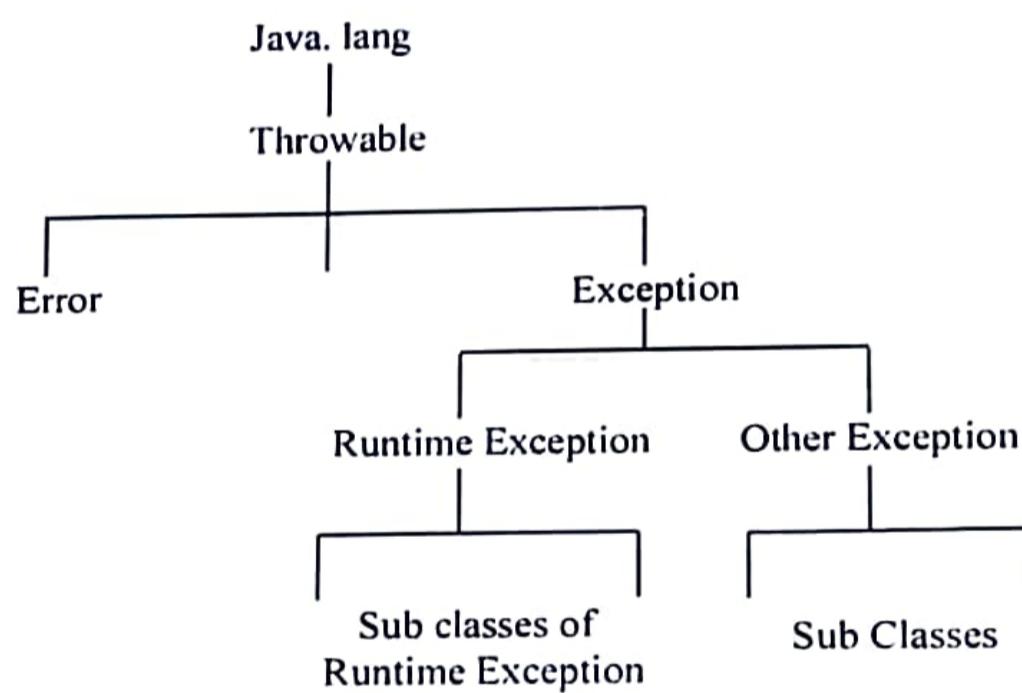
|         |           |
|---------|-----------|
| Char    | Character |
| byte    | Byte      |
| Short   | Short     |
| int     | Integer   |
| long    | Long      |
| float   | Float     |
| double  | Double    |
| boolean | Boolean   |

- Character has only one constructor which accept the primitive data type.
- The character wrapper class doesnot contain a construction with string as parameter.
- Byte wrapper class has two constructors :
  - 1) Number parameter    2) String type parameter
- Short class contains two constructors
  - 1) number    2) string
- Integer class contains two constructors
  - 1) number    2) string
- Long class contains two constructors
  - 1) long number    2) strings

- Float class contains three constructors  
1) float number    2) double number    3) string type
- Double class has two constructors  
1) double number    2) string type
- Boolean class has two constructors  
1) boolean number    2) string
- Converting primitive datatype into an object is called "Boxing"
- Converting an object into its corresponding primitive datatype is called unboxing
- Errors can't be handled by programmer.



- Exception is an run time error
- If exception occurs the programmer can do some thing to handle it.
- The exception that are checked at compile-time by the java compiler called as "**checked exceptions**"
- The exceptions that are checked by the JVM are called "**Unchecked Exceptions**"



- Throwable is a class that represent all errors and exceptions which many occur in java.
- Exception : Is the super class for all the exceptions in Java
- Throwable is the super class for exception
- An exception can be handled using try, catch and finally blocks
- It is possible to handle multiple exceptions using multiple catch blocks.
- Eventhough there is a possibility for several exceptions in try block, at a time only one exception will be raised.
- A single try block can be followed by several catch blocks.

|                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|
| We cannot write a catch without a try block, but we can write a try without any catch block.                              |
| It is not possible to inset some statements between try and catch.                                                        |
| It is possible to write a try block within another try, they are called nested try blocks.                                |
| Throws clause is used when the programmer does not want to handle the exception and throw it out of a method.             |
| Throw clause is used when the programmer wants to throw an exception explicitly and wants to handle it using catch block. |
| Hence throws and throw are contradictory                                                                                  |
| Types in exceptions                                                                                                       |
| i) Built - in exceptions                                                                                                  |
| ii) User - defined exceptions                                                                                             |
| <b>Exception Class</b>                                                                                                    |
| Arithmetic                                                                                                                |
| Array Index out of Bounds                                                                                                 |
| Exception                                                                                                                 |
| Class not found exception                                                                                                 |
| File not found exception                                                                                                  |
| IO Exception                                                                                                              |
| InterruptedException                                                                                                      |
| No Such field exception                                                                                                   |
| No such method exception                                                                                                  |
| Null pointer exception                                                                                                    |
| Number format exception                                                                                                   |
| Runtime Exception                                                                                                         |
| String Index out of Bound exception                                                                                       |
| Bound exception                                                                                                           |
| <b>Meaning</b>                                                                                                            |
| Thrown when an exceptional condition has occurred in an arithmetic operation                                              |
| thrown to indicate that an array has been accessed within illegal index.                                                  |
| The index is either negative or greater than or equal to the size of the array                                            |
| This exception is raised when we try to access a class whose definition is not found                                      |
| Raised when a file is not accessible or does not open                                                                     |
| Thrown when an input -output operation failed or interrupted                                                              |
| Thrown when a thread is waiting , sleeping or doing some processing, and it is interrupted                                |
| Thrown when a class does not contain the field (or variable) specified                                                    |
| Thrown when accessing a method which is not found                                                                         |
| Raised when referring to the member of a null object, null represents nothing                                             |
| Raised when a method could not convert a string in to a numeric format                                                    |
| This represents any exception which occurs during run time                                                                |
| Thrown by string class methods to indicate that an index is either negative or greater than the size of the string        |

### User - defined Exceptions :

- Created by the programmers.
- Class my exception extends **exception** || checked exception (compiling time)
- Class My Exception extends **Null Pointer Exception** || Unchecked Exception (Run Time)
- We can re throw an exception from catch block to another class where it can be handled
- An interface contains only abstract methods. Which are all incomplete methods.
- It is not possible to create instance to interface
- We can create a reference variable to interface
- The reference variable of interface can hold information about which class implements the interface
- We can declare the methods in the interface those methods will become public abstract by default
- We can declare the variable those variable becomes "Public static final" by default
- The implementation of the interfaces will be done by the third party vendor (will implements in another classes)

Eg : Interface MyInter

```
{  
    int a;  
    int b;  
    connect();  
    add();  
}
```

**After Compilation**

Interface MyInter

```
{  
    Public static final int a;  
    Public static final int b;  
    Public abstract connect();  
    Public abstract add();  
}
```

- An interface can extend another interface

Eg : Interface my inter extends MyInter 1 P

- An interface can not implement another interface

Eg : Interface MyInter implement myinter 1O

- It is possible to write a class with in an interface.

- Interfaces forces the implementation classes to implement all of its methods compulsory. Java compiler checks whether all the methods are implemented in the implementation classes or not

- A class can implement (not extend) multiple interfaces

Eg : class myclass implements interface 1, interface 2.....

Class myclass extends class 1 implements inter 1, inter 2

- An Abstract class is a class that contains '0' or more abstract methods

- An abstract method is a method without method body

- An abstract method is written when the same method has to perform different tasks depending on the object calling it.

- Package represents a directory that contains a related group of classes and interfaces.

Applet = javabyte code + HTML page.

- An applet represents java byte code embeded in a webpage

- applet life cycle

init(), start(), stop(), destroy().

- An applet born with init() method and starts functions with start(). to stop the applet, the stop() method is called and to terminate the applet completely from memory, the destroy(). called

- One applets are executed by a progress is called as **applet engine** which is similar to a virtual machine that exists inside the web browser at clientside.

- Hot Java is the first applet - enabled browser developed in java to support running of applets

<APPLET> tag is used to insert applet into HTML page

- An applet can not run any executable program in the client machine.

## PRACTICE SET - I

01. Consider the following class definition class A extends B

```

    {
        public A (int x) { }
        public A (int x, int y)
    }

    {
        super (x,y) ;
    }
}

```

Which of the following are legal statements to construct A type objects ?

- 1) B obj = new B () ;    2) A obj = new A (5);
- 3) A obj = new B () ;    4) both 2 and 3

02. Which of the following are overloading the method int sum ( int x, int y)

```

    {
        int sum (int x, int y, int z { }
        float sum (int x, int y) { }
        int sum (int a, int b) { }
    }

```

- 4) both 1 and 2

03. Which key word can protect a class in a package from accessible by the classes outside the package

- 1) private                      2) protected
- 3) final

- 4) don't use any keyword at all (make it default)

04. We would like to make a member of class visible in all subclasses regardless of what package they are in. Which one of the following keywords would achieve this

- 1) private                      2) protected
- 3) public                        4) private protected

05. A package is a collection of

- 1) classes                     2) interfaces
- 3) editing tools
- 4) classes and interfaces

06. What will be the output of the following program

```

class Main1
{
    public static void main ( String args [ ] )
    {
        boolean b = true ;
        System.out.println ("XXX");
        return
        System.out.println ("YYY");
    }
}

```

}                                  2) YYY

- 1) XXX
- 3) XXX followed by YYY

4) Error, Won't complete  
Which exception is thrown by the read ( ) method of input Stream class ?

- 1) Exception
- 2) File not Found Exception
- 3) Read Exception    4) IO exception

A (n) .....is a software unit that combines a structured set of data with a set of operations for inspecting and manipulating that data

- 1) Class                        2) Object
- 3) Method                      4) Signature

09. A(n).....is a blueprint for objects, which defines a type of object according to the data the object can hold and the operations the object can perform

- 1) class                        2) object
- 3) method                      4) signature

10. A class declaration is class designed with implementation gaps for sub-classes to fill in

- 1) abstract                    2) Pascal
- 3) Fortarn                    4) PL/SQL

11. Which of the following events will cause a thread to die

- 1) the method sleep ( ) is called
- 2) the method wait ( ) is called
- 3) Execution of the start ( ) method ends
- 4) Execution of the run ( ) method ends

12. Given three classes A,B and C, where B is a subclass of A and C are subclasses of B. Which one of these boolean expressions correctly identifies when an object O has actually been instantained from class B as opposed to from A or C

- 1) (0 instance of B) & & (! instance A))
- 2) (0 instance of B) && (!(0 instance of C))
- 3) (0 instances of A) || (0 instance of B))
- 4) (0 instance of B).

13. There are \_\_\_\_ types of Comments in Java

- 1) One    2) Two    3) Three    4) Four

14. \_\_\_\_\_ is the mechanism that binds together code and the data it manipulates, and keeps both safe from outside interference and misuse

- 1) Encapsulation              2) Class
- 3) Inheritance                4) Polymorphism

15. Java is Architectural  
 1) Dependent      2) Neutral  
 3) Independent    4) None of the above
16. An \_\_\_ is a special kind of Java program that is designed to be transmitted over the Internet  
 1) Viewlet        2) Applet  
 3) Servlet        4) Object
17. Which of the following methods are methods of the Math class ?  
 1) absolute ()    2) log ()  
 3) cosine ()      4) sine ()
18. Which operator is used to create and concentrate a string  
 1) ++    2) &&    3) &    4) +
19. Which of the following types of class members can be part of the internal part of a class ?  
 1) Private method  
 2) Public instance variables  
 3) Private constructors 4) Public methods
20. Which of the following is illegal ?  
 1) float f = 45.0 ;    2) Float f = 45.0  
 3) double d = 45.0 ;    4) int i = 32 ;
21. What is the result of executing the following fragment of code ?  

```
boolean
flag = false ;
if(flag == true)
{
    system.out.print ln ("true") ;
}
else
{
    system.out.print ln ("false") ;
}
```

 1) Nothing happens  
 2) An exception is raised  
 3) true is printed to standard out  
 4) false is printed to standard out
22. Which of the following wrapper classes cannot take a "string" in constructor  
 1) Long            2) Boolean  
 3) Character      4) Integer
23. Consider the following Java program  

```
Public class Example App {
    Public static void main (string [] args) {
        int var ;
        system.out.print ln ("The value of var is. "+var);
```

- Choose the correct statement**
- 1) This program will not compile successfully because the local variable var is used without being assigned a value.  
 2) The value of var that is printed is an unpredictable garbage value  
 3) The value of var that is printed is 0  
 4) The value of var that is printed is compiler dependent
24. The finally block is executed  
 1) only when a checked exception is thrown  
 2) only when an unchecked exception is thrown  
 3) only when an exception is thrown  
 4) irrespective of whether an exception is thrown or not.
25. What is the output of the following program?  

```
Public class Example App {
    Public Static Void Magic (int x ) {
        System.out.print (x % 10) ;
        If ((x / 10 != 0)
            Magic (x / 10) ;
        System.out.println (x % 10) ;
    }
    Public static void main (string [] args) {
        Example App.Magic (2357) ;
    }
}
```

 1) 2357            2) 75322357  
 3) 7532            4) Runtime error
26. The statements  

```
byte var = -9 ;
system.out.println (var) ;
```

 1) prints - 9      2) prints - 10  
 3) prints - 119    4) prints 118
27. How many #'s do the following statement print?  
 $m: 1 \times 2$   

```
For (int m = 0, n = 10, n - m > 5 ; ++m, --n)
    system.out.print ("#");
```

 1) 2    2) 4    3) 1    4) 3
28. The statement  

```
System. OUT. print ((double 7/4) ;
```

 1) 1.75    2) 1.0    3) 1    4) 2.0
29. When writing comments you can  
 1) use code /\* comment on the same line  
 2) use code // comments on the same line  
 3) use code and // \* comments on the same line  
 4) use code and < ! - comments on the same line  
 $m: 1 \times 9 \quad n = 2 \times 8 \times 7$   
 1) 1    2) 3    3) 4    4) 5

30. In java the Exceptions that are expected to possibly occur are called  
 1) unchecked exceptions  
 2) checked exceptions  
 3) erroneous exceptions  
 4) runtime exceptions
31. In Java the default value for float is  
 1) 10                    2) 0.0  
 3) garbage value      4) None
32. Which of the following is a valid variable declaration in java  
 1) int 9 elements     2) int 4932  
 3) int elements;      4) None
33. Package members are accessible outside the package if they are  
 1) private    2) Public    3) protected    4) None
34. In which package the class is stored if package name is not mentioned.  
 1) global package    2) by default package  
 3) default package   4) None
35. The result of a Relational operation is always  
 1) either True or False  
 2) is less than or is more than  
 3) is equal or less or more  
 4) All the above
36. The keyword used to declare constants in Java  
 1) constant    2) const    3) final      4) None
37. Which of the following is not a Boolean operator  
 1) &&    2) !    3) !=    4) None
38. JVM stands for  
 1) Java Vertical Mechanism  
 2) Java Virtual Machine  
 3) Java Virtual Mechanism  
 4) None of the above
39. In Java garbage collection runs as  
 1) a max - priority thread  
 2) a medium - priority thread  
 3) a low - priority thread      4) None
40. JVM plays a key role in making Java  
 1) Robust                2) High performance  
 3) Portable              4) None
41. Which of the following doesn't have a super class  
 1) Lang                  2) system  
 3) Object                4) Exception
42. What exception is created by the following code?  
`int a,b,c ; a = 7, b = 0 ; c = a/b ;`  
 1) Arithmetic Exception  
 2) Null Pointer Exception
- Amrit Jit Singh
- (43) 3) 10 Exception  
 4) Out of Memory Exception  
 Static variables of a class are also known as  
 1) instance variables    2) class variables  
 3) simple variables      4) None
44. Which of the following method is called exactly once in an Applet life cycle ?  
 1) init()                2) destroy()  
 3) both 1 and 2          4) None
- An Applet is  
 1) run and delivered as a java byte code  
 2) run and executed in a container where it is deployed  
 3) both 1 and 2          4) none of the above
45. Servelets are executed in JVM by a service called  
 1) Servlet container    2) Servlet engine  
 3) Servlet tracker      4) None of the above
46. The following program segment prints \_\_\_\_\_  
`byte var = ~ 34 ;  
 system.out.print ln (var) ;`  
 1) -94    2) -33    3) -35    4) 93
47. What does the statement  
`import java.util.* ; import ;`  
 1) All the methods in the class java.util  
 2) All the classes in the package java.util  
 3) All the packages starting with java.util  
 4) None
48. Which of the following methods is invoked by garbage collector  
 1) finally                2) constructor  
 3) finalize              4) destructor
49. Which of the following can be used to generate HTML documentation from Java source code?  
 1) java HTML doc      2) Javadoc  
 3) jar                    4) java C
50. The Java compiler generates code in  
 1) byte code              2) OP - code  
 3) Machine-language    4) assembly language
51. If the member variable of a class is to be shared by all the objects that class, it should be declared  
 1) volatile    2) public    3) final    4) static
52. The statement  
`system.out.println (-34>>2) ;`  
 1) prints - 36            2) prints -136  
 3) prints 136            4) prints - 9
- 18/10/2018

54. Which of the following statements is valid?  
 statement 1 : float m1 = 2.1 ;  
 statement 2 : double m2 = 2.1 ;  
 statement 3 : long m3 = 2.1 ;  
 1) statement 1 & 2      2) statement 2  
 3) statement 7      4) none
55. Which of the following operator work with variables but not literals?  
 A)  $++$  ( pre - increment)  
 B)  $++$  (post- inc)  
 C)  $>>$       D) no such operator exists  
 1) A and B      2) A only  
 3) C only      4) D
56. The statements int m = 9, n= 5, P=3 ;  
 system.out.print((m-m/n \* n%p)>(m%n%p));  
 1) prints true      2) prints O  
 3) prints false      4) prints non-zero
57. Which of the following is not a keyword in Java?  
 1) Super    2) Volatile    3) this ~~4) pointer~~
58. Which of the following can be declared final  
 (A) A class      (B) A method  
 (C) A member variable  
 1) A and B      2) A and C  
 3) All the above      4) None
59. Which of the following cannot be used as identifier?  
 1) Letter 2) Digits 3) underscores 4) spaces
60. The concept of multiple inheritance is implemented in Java by  
 1) extending two or more classes  
 2) extending one class and implementing one or more interfaces  
 3) implementing two or more interfaces  
 4) Both 2 and 3
61. We would like to make a member of a class visible in all subclasses regardless of what package they are in. Which one of the following keywords would achieve this?  
 1) private      2) protected  
 3) private OR protected 4) public
62. Which of the following are valid statements  
 1) public class MyCalc extends Math  
 2) Math.max(s);  
 3) Math.round(9.99,1); 4) None of the above.
63. Which of the following are true?  
 1) The Void class extends the Class class.  
 2) The Float class extends the Double class.  
 3) The System class extends the Runtime class.  
 4) The Integer class extends the Number class.
64. Which of the following classes is used to perform basic console I/O?  
 1) System      2) SecurityManager  
 3) Math      4) Runtime
65. Which of the following methods cause the String object referenced by s to be changed?  
 1) s.concat()      2) s.toUpperCase()  
 3) s.replace()      4) both 1 and 2
66. Which of the following is true?  
 1) wait(),notify(),notifyall() are defined as final & can be called only from within a synchronized method  
 2) Among wait(),notify(),notifyall() the wait() method only throws IOException  
 3) wait(),notify(),notifyall() & sleep() are methods of object class  
 4) All the above
67. What is the mechanism defined by java for the Resources to be used by only one Thread at a time?  
 1) Synchronisation      2) Catch  
 3) Wait      4) None
68. If you do not implement all the methods of an interface while implementing , what specifier should you use for the class ?  
 1) abstract      2) instance class  
 3) interface      4) none
69. Which are keywords in Java?  
 1) NULL      2) extends  
 3) synchronized      4) both 2 and 3
70. Identify the true statements about finalization.  
 1) A class may have only one finalize method  
 2) Finalizers are mostly used with simple classes  
 3) Finalizer overloading is not allowed  
 4) both 2 and 3
71. Which of the following operators are used in conjunction with the this and super references?  
 1) The new operator  
 2) The instanceof operator  
 3) The dot operator      4) none of the above
72. When must the main class and the file name coincide?  
 1) When class is declared public.  
 2) When class is declared private  
 3) When class is declared protected  
 4) All of the above

73. When may a constructor be called without specifying arguments?  
 1) When the default constructor is not called  
 2) When the name of the constructor differs from that of the class  
 3) When there are no constructors for the class  
 4) When a parameterized constructor is called
74. What are the functions of the dot(.) operator?  
 1) It enables you to access instance variables of any objects within a class  
 2) It enables you to store values in instance variables of an object  
 3) It is used to call object methods  
 4) All the above
75. Which of the following statements can be used to describe a public method?  
 1) It is accessible to all other classes in the hierarchy  
 2) It is accessible only to subclasses of its parent class  
 3) It represents the public interface of its class  
 4) Both 1 and 3
76. What is the result of expression  $5.45 + "3.2"$ ?  
 1) The double value 8.6 2) The string "8.6"  
 3) The long value 8.  
 4) The String "5.453.2"
77. What is the value of  $a[3]$  as the result of the following array declaration?  
`int a[] = new int[5] {2,3,9,4,8};`  
 1) 2      2) 3      3) 1      4) 4
78. You would use the \_\_\_\_\_ operator to create a single instance of a named class.  
 1) new      2) dot  
 3) equal to      4) none of the above
79. You can explicitly drop an object reference by setting the value of a variable whose data type is a reference type to \_\_\_\_\_.  
 1) null      2) object      3) class      4) method
80. What are all the methods available in the Thread class?  
 1) isAlive()      2) join()  
 3) resume()      4) suspend()
81. Which of the following statements correctly describes an interface?  
 1) It's a concrete class 2) It's a superclass  
 3) It's a type of abstract class  
 4) none of the above
82. All the classes in a package can be simultaneously imported using \_\_\_\_\_.  
 1) =      2) \*      3) dot      4) new

83. When might your program wish to run the garbage collector?  
 1) before it enters a compute-intense section of code  
 2) before it enters a memory-intense section of code  
 3) when it knows there will be some idle time  
 4) All the above
84. Which of the following types of class members can be part of the internal part of a class?  
 1) Public instance variables  
 2) Private instance variables  
 3) Private methods      4) both 1 and 3
85. What is the range of the char type?  
 1) 0 to 216      2) 0 to 255  
 3) 0 to 216-1      4) 0 to 215-1
86. Because finalize () belongs to the java.lang.Object class, it is present in all \_\_\_\_\_.  
 1) objects      2) classes  
 3) methods      4) All the above
87. Which of the following methods are methods of the Math class?  
 1) absolute()      2) log()  
 3) cosine()      4) sine()
88. What will happen if you attempt to compile and run the following code?  
`Integer ten=new Integer(10);  
Long nine=new Long (9);  
System.out.println(ten + nine);  
int i=1;  
System.out.println(i + ten);`  
 1) 19 followed by 20  
 2) 19 followed by 11  
 3) Error: Can't convert java.lang.Integer  
 4) 10 followed by 1
89. The use of protected keyword to a member in a class will restrict its visibility as follows:  
 1) Visible in all classes in the same package and subclasses in other packages.  
 2) Visible only in the class and its subclass in the same package.  
 3) Visible only inside the package.  
 4) Visible only in the class where it is declared.
90. Which of the following are keywords?  
 1) switch & default      2) integer & byte  
 3) both 1 and 3      4) object & Class

91. Consider the following code: interface Area

```
{  
protected void compute();  
}
```

- 1) Method compute() in class Room should be declared public
- 2) Interface definition is incomplete
- 3) Method compute() in interface Area should be declared public
- 4) All of these

92. Which of the following will output -4.0

- 1) System.out.println(Math.floor(-4.7));
- 2) System.out.println(Math.round(-4.7));
- 3) System.out.println(Math.ceil(-4.7));
- 4) System.out.println(Math.Min(-4.7));

93. Which of the following methods are methods of the String class?

- 1) delete()                  2) append()
- 3) reverse()                4) replace()

94. What is the method available for setting the priority?

- 1) getPriority()            2) setPriority( )
- Both 1 and 2                4) none

95. What is an example of polymorphism?

- 1) Inner class              2) Anonymous classes
- 3) Method overloading
- 4) Method overriding

96. Which of the following can be referenced by this variable?

- 1) The instance variables of a class only
- 2) The methods of a class only
- 3) The instance variables and methods of a class
- 4) none of the above

97. Which method is used to garbage collect an object?

- 1) finalize( )              2) get( )
- 3) throw( )                4) sleep( )

## PRACTICE SET - I KEY

|     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|
| 01) | 4 | 02) | 4 | 03) | 4 | 04) | 4 | 05) | 4 |
| 06) | 3 | 07) | 4 | 08) | 2 | 09) | 1 | 10) | 1 |
| 11) | 4 | 12) | 2 | 13) | 3 | 14) | 1 | 15) | 2 |
| 16) | 2 | 17) | 1 | 18) | 4 | 19) | 1 | 20) | 2 |
| 21) | 4 | 22) | 3 | 23) | 1 | 24) | 4 | 25) | 2 |
| 26) | 3 | 27) | 4 | 28) | 1 | 29) | 2 | 30) | 2 |
| 31) | 2 | 32) | 3 | 33) | 2 | 34) | 3 | 35) | 1 |
| 36) | 3 | 37) | 3 | 38) | 2 | 39) | 3 | 40) | 3 |
| 41) | 3 | 42) | 1 | 43) | 2 | 44) | 3 | 45) | 1 |
| 46) | 2 | 47) | 3 | 48) | 1 | 49) | 3 | 50) | 2 |
| 51) | 1 | 52) | 4 | 53) | 4 | 54) | 2 | 55) | 1 |
| 56) | 1 | 57) | 4 | 58) | 3 | 59) | 4 | 60) | 4 |
| 61) | 2 | 62) | 4 | 63) | 4 | 64) | 1 | 65) | 4 |
| 66) | 4 | 67) | 1 | 68) | 1 | 69) | 4 | 70) | 4 |
| 71) | 3 | 72) | 4 | 73) | 3 | 74) | 4 | 75) | 4 |
| 76) | 4 | 77) | 4 | 78) | 1 | 79) | 1 | 80) | 1 |
| 81) | 3 | 82) | 2 | 83) | 3 | 84) | 4 | 85) | 2 |
| 86) | 2 | 87) | 1 | 88) | 2 | 89) | 1 | 90) | 3 |
| 91) | 3 | 92) | 2 | 93) | 4 | 94) | 2 | 95) | 4 |
| 96) | 3 | 97) | 1 |     |   |     |   |     |   |

## PRACTISE SET - II

01. Which of the following defines a legal abstract class
- 1) abstract vehicle {
  - 2) abstract class Vehicle {
  - abstract void display ( ) ; }
  - abstract void supply ( ) ; }
  - 3) class abstract vehicle {
  - abstract void supply ( ) ; }
  - 4) none
02. The concept of multiple inheritance is implemented in Java by
- 1) extending two or more classes
  - 2) extending one class and implementing one or more interfaces
  - 3) implementing two or more interfaces
  - 4) both 2 and 3
03. Which of the following statements are valid array declaration
- 1) int number( ) ;            2) float average [ ] ;
  - 3) double [ ] marks ;        4) both 2 and 3
04. Consider the following code
- ```
int number [ ] = new int [ 5 ] ;
```
- After execution of this statement, which of the following are true ?

- 1) number [5] is undefined  
2) number [2] is 0  
3) number length () is 5  
4) all the above
- What will be the content of array available table after executing the following code  
`for (int i = 0; i < 3; i++)  
for (int j = 0, j < 3; j++)  
if (j == i) table [i] [j] = 1;  
else table [i] [j] = 0;`
- 1)  $I_{3,3}$  matrix      2)  $I_{2,2}$  matrix  
3)  $I_{4,4}$  matrix      4) none
- .....Class is a class designed with implementation gaps for sub-classes to fill in  
 1) An instance      2) An abstract  
3) A class      4) None of the above
- The keyword gives a class explicit access to the constructors, methods, and variables of its second arguments  
 1) final      2) super  
3) instance of      4) implicit
- .....is a class defined in the java lang package, whereas it is primitive data type defined in the Java language  
 1) int      2) float      3) char      4) integer
- Which of the following is not a reserved keyword in Java  
 1) abstract      2) boolean  
3) break      4) count
- In a method invocation, does java pass  
 1) arguments by reference  
2) arguments by value  
3) arguments by pointer  
4) arguments by variable
- Which one of the following methods must a subclass of Applet implement  
 1) destroy ()      2) init ()  
3) start ()      4) none of the above
- Which of the following methods are never run by the applet context  
 1) destroy ()      2) init ()  
3) main ()      4) stop ()
- Java Virtual Machine is an interpreter for byte code  
 1) True      2) False
14. When Java source code is completed, each individual class is put into its own output file named after the class and using the \_\_\_\_\_ extension  
 1).h      2).java      3)>.java      4).class
15. Java in Case \_\_\_\_\_  
 1) Sensitive 2) Insensitive
16. The Java interpreter is used for the \_\_\_\_\_ of the source code  
 1) debugging      2) Execution  
3) Compiling      4) Creation
17. Which one does not extend java.lang.Number  
 1) Integer      2) Boolean      3) Short      4) Long
18. What will happen if you try to compile and run the following code  
`Public class  
{ Public static void main (string argv [ ])  
{ int anar [ ] = new int [5] ;  
system.out.println (anar [0] ; })  
1) Error      2) null      3) 5      4) 0`
19. How can class be imported to a program  
 1) import "class name";  
2) import "class name" \* ;  
3) import "class name" ;  
4) import "class name. \* " ;
20. Applets are executed generally in a  
 1) Console      2) Browser  
3) Server      4) Network
21. What is the O/P of the following program ?  
`Public class Example App {  
Public static void main (string [ ] args) {  
int a = 1, b = 13 ;  
If (( b < (a = a + a)) || (b < (a = a + a ))||  
(b < (a = a + a)) ||  
(b < (a = a + a))|| (b < (a = a + a))  
system.out.println (b - a ) ;  
else  
system.out.println (b + a ) ;  
1) compilation error      2) 14  
3) 16      4) -3`
22. Which of the following comments about the program counter (PC) are true ?  
 (A) It is a register  
 (C) During execution of the current instruction, its content changes  
 1) A and B      2) A and C  
3) only A      4) None

- Java Interview Questions*
- 23.** The difference between int a; and 'a' is  
 1) The first one refers to a variable whose identifier is 'a' and the second one refers to the character constant  
 2) The first one is a character constant and second one is the string literal  
 3) Both are same      4) None of the above
- 24.** What is the environment variable that contains a list of directories where Java looks for classes referenced in a program?  
 1) PATHCLASS      2) SEARCHCLASS  
 3) PATHDIR      4) CLASSPATH
- 25.** Regarding the use of new line character (/n) and endl manipulator with cout statement  
 1) Both ways are exactly same  
 2) endl can't be used with out  
 3) Both are similar but endl additionally performs flushing of buffer  
 4) /n can't be used with cout.
- 26.** Which of the following are Java variables type  
 A) instance variable      B) local variables  
 C) class variable      D) None of the above  
 1) A and C      2) A,B and C  
 3) A and B      4) D
- 27.** Constructor is called  
 1) When the class is declared  
 2) when the object of class is created  
 3) when the class is defined  
 4) none of the above
- 28.** Which of the following is not a type of exception  
 1) runtime      2) checked  
 3) unchecked      4) routine
- 29.** The main thread of Java program is controlled by  
 1) a thread class  
 2) an object of thread class  
 3) an object of main thread itself      4) None
- 30.** In Java the Exception class is a subclass of  
 1) Error class      2) Throwable class  
 3) System class      4) None of the above
- 31.** A class variable is a variable that is declared inside a class as  
 1) Static      2) abstract  
 3) final      4) extends
- 32.** In threads  
 1) a lower priority thread can pre-empt a higher priority thread  
 2) a higher priority thread can pre-empt a low priority thread  
 3) no thread can be pre-empted  
 4) none
- 33.** \_\_\_\_\_ class is used for creating string objects which are to be changed  
 1) string      2) string buffer  
 3) both 1 and 2      4) None
- 34.** To promote encapsulation, Java provides an access modifier  
 1) protected      2) private  
 3) public      4) none
- 35.** Which of the following packages is imported by default?  
 1) java.lang      2) java.io  
 3) java.text      4) java.math
- 36.** What does the statement  
`System.out.println( ++ 5); print ?`  
 1) 6      2) 5  
 3) Results in a compilation error  
 4) Results in Runtime error
- 37.** How many concrete classes can you have inside an interface?  
 1) 4      2) 3      3) 1      4) None
- 38.** Which of the following statements accurately describe the use of access modifiers within a class definition?  
 1) They can be applied to both data & methods  
 2) They must precede a class's data variables or methods  
 3) They can appear in any order  
 4) All of the above
- 39.** Which of the following are primitive types?  
 1) byte      2) String      3) integer      4) Float
- 40.** What are all the methods used for Inter Thread communication and what is the class in which these methods are defined?  
 1) wait()      2) notify()  
 3) notifyall()      4) All the above
- 41.** If you run the code below, what gets printed out?  
`String s=new String("Bicycle");  
int iBegin=1;  
char iEnd=3;  
System.out.println(s.substring(iBegin,iEnd));`  
 1) Bic      2) ic      3) icy      4) error: no method matching substring(int,char)
- 42.** Which of the following statements about abstract methods/classes in Java are true?  
 1) An abstract class cannot be instantiated.  
 2) Constructors cannot be abstract.  
 3) A subclass of an abstract class must define the abstract methods.  
 4) Both 1 and 2

43. What is meant by "Passing by value" and "Passing by reference"?
- objects - pass by reference ; Methods - pass by value
  - Method - pass by reference ; Objects - pass by value
  - class - pass by value ; Objects - Pass by reference
  - None of the above
44. Which of the following statements correctly describes the relation between an object and the instance variable it stores?
- Each new object has its own distinctive set of instance variables
  - Each object has a copy of the instance variables of its class
  - the instance variable of each object are separate from the variables of other objects
  - All the above
45. The this reference is used in conjunction with \_\_\_\_\_ methods.
- static
  - non-static
  - final
  - none of the above
46. What are the values of x and y ?  
 $x = 5; y = ++x;$
- $x = 5 ; y = 5$
  - $x=6 ; y = 5$
  - $x=5 ; y=6$
  - $x = 6 ; y = 6$
47. Which keyword is used to create an instance of a class?
- object
  - new
  - final
  - friend
48. What is the output of the following program?  

```
public class Question {
    public static void main(String args[]) {
        String s1 = "abc";
        String s2 = "def";
        String s3 = s1.concat(s2.toUpperCase());
        System.out.println(s1+s2+s3);
    }
}
1) abcdefabcdef      2) abcabcDEFDEF
3) abcdefabcDEF     4) None of the above
```
49. Which Java operator is right associativity?
- \*
  - /
  - +
  - =
50. Which of the following are true?
- The Class class is the superclass of the Object class.
  - The Class class can be used to load other classes.
51. 3) The ClassLoader class can be used to load other classes.  
 4) both 2 and 3
52. Which of the following not declare an array of string objects?
- String[ ] s;
  - String [ ]s:
  - String[ s]:
  - String s[ ]:
53. What are the values of x and z?  
 $x = 5; z = x++;$
- $x = 6 ; z = 6$
  - $x = 5 ; z = 6$
  - $x = 6 ; z = 5$
  - $x = 5 ; z = 5$
54. Which priority Thread can prompt the lower primary Thread?
- Lower Priority
  - Higher Priority
  - Normal Priority
  - none
55. Which of the following keywords are used to control access to a class member?
- public
  - abstract
  - protected
  - All of the above
56. A package is a collection of
- classes
  - classes and interfaces
  - interfaces
  - editing tools
57. The concept of multiple inheritance is implemented in Java by
- extending two or more classes
  - extending one class and implementing one or more interfaces
  - implementing two or more interfaces
  - Both 2 & 3
58. What are the constants defined by both Float and Double classes?  
 $\cancel{x}$
- MAX\_RADIX
  - MIN\_RADIX
  - MAX\_VALUE
  - MIN\_VALUE and TYPE.
59. Given the following declarations  
 $String s1=new String("Hello")$   
 $String s2=new String("there");$   
 $String s3=new String();$
- Which of the following are legal operations?
- $s3=s1 + s2$
  - $s3=s1 - s2$
  - $s3=s1 \& s2$
  - $s3=s1 \&& s2$
60. Which of the following is not a wrapper class?
- String
  - Integer
  - Boolean
  - Character
61. Garbage collector thread belongs to which priority?
- High priority
  - low-priority
  - normal priority
  - none of these

61. What are the possible access modifiers when implementing interface methods?  
 1) Protected            2) Private  
 3) public.            4) none
62. Which of the following methods is used to get the error message for the exception that was thrown?  
 1) print message      2) extract message  
 3) thrown message    4) get message
63. Java is a  
 1) course  
 2) object oriented programming language  
 3) Subject            4) None
64. Java runs on  
 1) windows            2) Unix/linux  
 3) Mac                4) All of the above

### PRACTICE SET - II KEY

01)	2	02)	4	03)	4	04)	4	05)	1
06)	2	07)	3	08)	4	09)	4	10)	2
11)	4	12)	3	13)	1	14)	2	15)	1
16)	2	17)	2	18)	4	19)	4	20)	2
21)	4	22)	2	23)	1	24)	4	25)	3
26)	2	27)	2	28)	4	29)	2	30)	2
31)	1	32)	2	33)	2	34)	2	35)	1
36)	3	37)	4	38)	4	39)	1	40)	4
41)	3	42)	4	43)	1	44)	4	45)	2
46)	4	47)	2	48)	3	49)	4	50)	4
51)	3	52)	3	53)	2	54)	4	55)	2
56)	4	57)	1	58)	1	59)	1	60)	2
61)	3	62)	4	63)	2	64)	4		

### PRACTISE SET - III

01. Which of the following classes are available in the java.lang package  
 1) math                2) string  
 3) string buffer     4) all the above
02. Which of the following are the wrapper classes  
 1) byte              2) integer  
 3) short             4) all the above
03. Which of the following methods belong to the string class  
 1) length()          2) compare to ()  
 3) Equals             4) all the above

04. Given the code  
 String s1 = "yes"  
 String s2 = "yes"  
 String s3 = new String (s1);  
 Which of the following would equate to true ?  
 1) s1 = s2            2) s3 equals (s1)  
 3) s3 equals (s1)    4) all the above
05. Given the following code  
 class Base {int x = 10 ;}  
 class Derived extends Base  
 { int x = 20 ;}  
 Base b = new base ();  
 Derived d = new derived ();  
 Base bd = new derived ();  
 The statement  
 system.out.println(b.x + " " + d.x + " " + bd.x);  
 will produce the output  
 1) 10 20 20            2) 10 20 10  
 3) 20 10 20            4) 20 20 10
06. Consider the following code snippet  
 ....  
 ....  
 try {  
 int x=0;  
 int y=50/x;  
 system.out.println("Division by zero");  
 System.out.println("Catch block");  
 }  
 ....  
 ....  
 What will be the output  
 1) Error. Won't compile  
 2) Division by zero    3) Catch block  
 4) Division by zero Catch block
07. An.....is a Java compatible program that you can embed in a web page  
 1) javap    2) applet    3) servlet    4) tag
08. A class derived from another class is  
 1) Subclass            2) Derived class  
 3) Child class        4) all the above
09. A class from which other classes are derived  
 1) Base class          2) Parent class  
 3) Super class        4) all the above
10. Which of the following array declaration and instantiation are not legal  
 1) int [ ] a [ ] = new int [4] [4];  
 2) int a [ ] [ ] = new int [4] [4];  
 3) int a [ ] [ ] = new int [ ] [4];  
 4) int [ ] a [ ] = new int [4] [ ];

11. Given a variable x of type int (which may contain a negative value), which of the following are correct ways of doubling type value of x  
 1)  $x < 1$ ;      2)  $x = x * 2$ ;  
 3)  $x * = 2$ ;      4) both 2 and 3
12. Which of the following methods is executed first when an applet is run  
 1) destroy()      2) init()  
 3) main()      4) stop()
13. What does J2SE mean?  
 1) Java 2 Platform Standard Edition  
 2) Java 2 Internet Standard Edition  
 3) Java 2 Platform Independent Standard Edition  
 4) Java 2 Systems Edition
14. An interface contains \_\_\_ methods  
 1) Non-abstract      2) Implemented  
 3) unimplemented
15. Given the following declarations  
`String s1 = new String ("Hello")  
 String s2 = new String ("there");  
 String s3 = new String ();`  
 Which of the following are legal operations?  
 1)  $s3 = s1 + s2$  ;      2)  $s3 = s1 - s2$  ;  
 3)  $s3 = s1 \& s2$       4)  $s3 = s1 \& \& s2$
16. Which one is a key word in Java?  
 1) Friend      2) Size of      3) extends      4) Null
17. What will be printed out if this code is run with the following command line?  
`Java my-prog good morning`  
`Public class my - prog`  
`{Public static void main (string argv [ ])`  
`{system.out.println (argv [2])}`  
 1) my - prog  
 2) Exception raised : "java. long. Array index out of Bounds exception : 2"  
 3) Morning      4) good
18. Which character encoding scheme is followed for the "char" datatype in Java?  
 1) ASCII      2) EBCDIC  
 3) BCD      4) Unicode
19. \_\_\_ operator is not a bit-wise operator  
 1)  $>>>$       2)  $>$       3)  $>>$       4)  $<<$
20. Which of the following feature in Java is not a keyword?  
 1) Package      2) volatile  
 3) import      4) Null
21. Which of the following operations in Java has the highest precedence than the other operator?  
 1) &      2) %      3)  $++$       4)  $::$
22. Which of the following ways of declaring and initialization a 1-dimensional integer array of size there is / are statically correct ?  
 (A) `int [ ] var = {1, 5, 6} ;`  
 (B) `int var [ ] = { 1, 5, 6}`  
 (C) `int [3] var = new int [ ] { 1, 5, 6} (D) int [ ] var = new int [ ] { 1, 5, 6} ;`  
 1) A and B      2) A,B and D  
 3) A and C      4) None of the above
23. Consider the statement  
`System.out.print (Math.round (Math.random ()))`  
 The statement can print  
 1) only 0      2) only 1  
 3) only 0 or 1      4) any non-negative integer
- Is null an object  
 1) Yes      2) no  
 3) sometimes yes      4) none of the above
25. Which of the following statements will result in compilation error?  
 (A) `signed int abc ;`      (B) `unsigned int abc ;`  
 (C) `signed byte abc ;`      (D) `sined long abc :`  
 1) A,B and C      2) A,B and D  
 3) all the above      4) None
26. The statements  
`double what is this = -1.010.0 ;`  
`system.out.print (what is this) ;`  
 1) results in compilation error  
 2) results in overflow error  
 3) prints - Infinity      4) prints a garbage value
27. The operators ||, &&, \*, !, if arranged in the ascending order of precedence, read  
 1) &&, ||, \*, !      2) ||, &&, \*, !  
 3) ||, &&, ! \*      4) !, ||, &&, \*
28. Which of the following is a well-defined state of a thread  
 1) Ready state      2) Running state  
 3) Waiting state      4) All the above
29. A new thread can be created  
 1) by extending thread class  
 2) by implementing the runnable interface  
 3) both 1 and 2  
 4) none of the above
30. Which of the following statement is correct  
 1) An interface does not have instance variable  
 2) Every method of an interface is abstract  
 3) All the methods of an interface are automatically public  
 4) All the above

31. The keyword used to include a particular package  
 1) package 2) include 3) import 4) None
32. In Java Error class  
 1) defines those exceptions which are not expected by the programmer to handle  
 2) is used to handle exceptional conditions  
 3) both 1 and 2 4) None
33. Which of the following can be used to copy data from one array to another  
 1) system.array.copy 2) system.clone  
 3) java.lang.clone 4) java.lang.clone
34. Which of the following keyword is not related to exception in Java  
 1) Catch 2) Throws  
 3) thrown 4) Finally
35. The Java util package contains two classes that are designed to work with hashtables. They are \_\_\_\_\_ and \_\_\_\_\_  
 1) Hashtable, Hashmap class  
 2) Hashtable, list 3) Vector, List  
 4) Vector, Hashtable
36. Data members of the Hashtable class stored in the \_\_\_\_\_  
 1) private access specifier  
 2) Public access specifier  
 3) common access specifier  
 4) None
37. The number of byte needed to store a number of data type double is  
 1) JVM dependent  
 2) Operating system dependent  
 3) Compiler dependent 4) 8
38. The following program segment prints \_\_\_\_\_  
 int m = 1;  
 For ( ; m < 20 ; m ++ )  
 system.out.print(m \* = 1 + m);  
 1) 21230 2) 21220  
 3) 212182 4) 2642
39. The statement  
 System.out.println(2 == 2.0);  
 1) prints false 2) prints true  
 3) will not complete successfully  
 4) will compile successfully but raises an exception
40. The fact that any program can use System.out.println implies that  
 1) out is declared public  
 2) out is declared static 3) both 1 and 2  
 4) none
41. Which of the following features are not common to both Java & C++?  
 1) The class declaration  
 2) The access modifiers  
 3) The encapsulation of data & methods with in objects  
 4) The use of pointers  
 What is the value of  $111\% 13$ ?  
 1) 3 2) 5 3) 7 4) 9
42. A \_\_\_\_\_ is used to separate the hierarchy of the class while declaring an Import statement.  
 1) Object 2) Method  
 3) Package 4) Static
43. How many threads at a time can access a monitor?  
 1) Two 2) Four 3) one 4) none
44. Which of the following statements are true?  
 1) The String class is implemented as a char array, elements are addressed using the stringname[] convention  
 2) Strings are a primitive type in Java that overloads the + operator for concatenation  
 3) Strings are a primitive type in Java and the StringBuffer is used as the matching wrapper type  
 4) The size of a string can be retrieved using the length property.
45. Which keyword can protect a class in a package from accessibility by the classes outside the package?  
 1) private 2) protected  
 3) final  
 4) don't use any keyword at all (make it default)
46. Which of the following statements are true?  
 1) An abstract class may not have any final methods.  
 2) A final class may not have any abstract methods.  
 3) An inner class may be declared with any accessibility keyword.  
 4) Both 2 and 3
47. Which of the following are true about the Error and Exception classes?  
 1) Both classes extend Throwable.  
 2) The Error class is final and the Exception class is not.  
 3) The Exception class is final and the Error is not.  
 4) Both classes implement Throwable.
48. Which of the following are true about the Error and Exception classes?  
 1) Both classes extend Throwable.  
 2) The Error class is final and the Exception class is not.  
 3) The Exception class is final and the Error is not.  
 4) Both classes implement Throwable.

49. What is the data type for the parameter of the sleep() method?  
 1) byte                  2) long  
 3) float                4) Boolean
50. When a program does not want to handle exception, the \_\_\_\_\_ clause is used.  
 1) throws              2) catch  
 3) notify              4) wait

### PRACTICE SET - III KEY

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 01) 4 | 02) 4 | 03) 4 | 04) 4 | 05) 2 |
| 06) 1 | 07) 2 | 08) 4 | 09) 4 | 10) 3 |
| 11) 4 | 12) 2 | 13) 1 | 14) 3 | 15) 1 |
| 16) 3 | 17) 2 | 18) 4 | 19) 2 | 20) 1 |
| 21) 1 | 22) 2 | 23) 3 | 24) 2 | 25) 3 |
| 26) 3 | 27) 2 | 28) 4 | 29) 3 | 30) 4 |
| 31) 3 | 32) 1 | 33) 1 | 34) 3 | 35) 1 |
| 36) 1 | 37) 4 | 38) 3 | 39) 2 | 40) 3 |
| 41) 4 | 42) 3 | 43) 3 | 44) 3 | 45) 2 |
| 46) 4 | 47) 4 | 48) 1 | 49) 2 | 50) 1 |

### SELF TEST

01. Suppose that following s1 and s2 are two strings. Which of the statements or expressions are correct  
 1) String s3 = s1 + s2    2) s1 compare to (s2);  
 3) int m = s1.length(); 4) all the above
- The methods wait() and notify() are defined in  
 1) java.lang.String    2) java.lang.Runnable  
 3) java.lang.Object    4) java.lang.Thread
03. When we implement the Runnable interface, we must define the method  
 1) start()              2) int()  
 3) run()                4) runnable()
04. DataInputStream is  
 1) an abstract class defined in java.io.  
 2) a class we can use to read primitive data types  
 3) an interface that defines methods to open  
 4) an interface that defines methods to read primitive data types
05. Which are the valid ways to create data input Stream streams?  
 1) new DataInputStream();  
 2) new DataInputStream("in.dat", r)  
 3) new DataInputStream(new File("in.dat"));  
 4) New DataInputStream(new FileInputStream("in.dat"));

06. The Java Virtual Machine performs  
 1) loading              2) Linking  
 3) initialization      4) none of the above
07. Java....is a language of machine instructions understood by the Java Virtual Machine and usually generated (Compiled) from Java language source code  
 1) Javap                2) Applet  
 3) Beans               4) bytecodes
08. The Java compiler program is  
 1) compjava            2) javac  
 3) javacomp           4) jc
09. The Java interpreter program is  
 1) java                2) intjava  
 3) javaint            4) none of the above
10. Which of the following command is used to compile the java program HelloJavaApp.java  
 1) comp HelloJavaApp.java  
 2) javac helloJavaApp.java  
 3) java comp HelloJavaApp.java  
 4) None of the above
11. HelloJavaApp.java is the file you created in the text editor, and ...is the class file that java compiler created  
 1) hellojavaapp.class    2) helloJavaApp.cc  
 3) HelloJavaApp.exe    4) HelloJavaApp.com

12. Which of the following cannot be used with the throw statement ?  
 1) Error                2) Event  
 3) Throwable           4) Exception
13. Consider the following Java code int x, y, z;  
 y = 1; z = 5; x = 0 - (++y) + z++;  
 After execution of this code, what will be the values of x,y and z ?  
 1) x = 3, y = 2, z = 6    2) x = 4, y = 2, z = 6  
 3) x = 4, y = 1, z = 5    4) x = -7, y = 1, z = 5
14. In Java, what is the advantage of inheritance ?  
 1) security            2) Portability  
 3) Reusability          4) Abstraction
15. The following methods are used for Inter Thread communication ?  
 1) Stop() and start()  
 2) Start() and destroy()  
 3) Sleep and suspend()  
 4) wait() and notify()

16. What is the sequence for calling the method by AWT for Applets ?  
 1) init( ), start( ), paint( )  
 2) init( ), stop( ), destroy( )  
 3) start( ), destroy( )  
 4) init( ), start( ), repaint( )
17. Which of the following is a correct comment?  
 1) /\* comments \*/    2) \* \* comment \*\*  
 3) /\* comment \*/    4) { comment }
18. Which of the following is not a primitive data type in java ?  
 1) byte                2) boolean  
 3) string              4) double
19. What is the output of the following java program ?  

```
Public class Example App {
  Public Static Void Main (String [ ] args) {
    System . out . print in
    (( 1 == 1 ) ? ( 7 == 8 ) ? 5 : 6 : 4 );
    1) 4                2) 6                3) 5                4) 1
```
20. Which of the following methods is used to get the error message for the exception that was thrown?  
 1) print message    2) extract message  
 3) thrown message    4) get message
21. Which of the following is the boolean operator for logical - AND ?  
 1) &                2) &&            3) 1                4) 1&
22. A block comment can be written by  
 1) Starting every line with double slashes (//)  
 2) starting with /\* and ending with \*/  
 3) starting with /\* and ending with \*//  
 4) starting with <! - and ending with -!>
23. Which of the following identifiers is invalid ?  
 1) Papername        2) wrtername  
 3) 5type name      4) printname
24. Which of the following cannot be used as valid identifier ?  
 1) bitand            2) bittand      3) biand          4) band
25. Which of the following is not a valid escape code?  
 1) \t                2) \v                3) \f                4) \w
26. Let m be a variable of data type byte. The value of m << 4 is same as  
 1) m\*=16;    2) m\*=4    3) m\*=2    4) none
27. Which of the following operator tape (s) only integer operands  
 1) %                2) + + (Post - increment)  
 3) + + (Pre-increment)    4) None
28. Which of the following is the correct operator to compare two variables ?  
 1) :=                2) =                3) equal          4) ==
29. A variable are / is  
 1) string that varies during program execution  
 2) A portion of memory to store a determined value.  
 3) Those numbers that are frequently required in programs  
 4) None of the above
30. A 'thread' is  
 1) a program in path of execution  
 2) a program in execution  
 3) a set of programs    4) None

### SELF TEST KEY

01)	4	02)	3	03)	3	04)	4	05)	4
06)	1	07)	4	08)	2	09)	1	10)	2
11)	1	12)	3	13)	1	14)	3	15)	4
16)	4	17)	3	18)	3	19)	2	20)	4
21)	2	22)	2	23)	3	24)	1	25)	4
26)	1	27)	4	28)	4	29)	2	30)	1

### PREVIOUS ECET BITS

#### ECET-2009

01. Consider the following Java code int x,y,z :  
 $y = 1 ; z = 5 ; x = 0 - (++y) + z ++ ;$   
 After execution of this code, what will be the values of x,y and z ?  
 1) x = 3, y = 2, z = 6    2) x = 4, b = 2, z = 6  
 3) x = 4, y = 1, z = 5    4) x = -7, y = 1, z = 5
02. In Java, what is the advantage of inheritance?  
 1) Security                2) Portability  
 3) Reusability              4) Abstraction
03. The following methods are used for inter Thread communication  
 1) Stop( ) and start( )  
 2) Start( ) and destroy( )  
 3) Sleep and suspend( )  
 4) Wait( ) and notify
04. What is the sequence for calling the methods by AWT for applets ?  
 1) init( ), start( ), paint( )  
 2) init( ), stop( ), destroy( )  
 3) start( ), destroy( )  
 4) init( ), start( ), repaint( )

05. What exception is created by the following code ?

int a, b, c ; a = 7 , b = 0, c = a/b ;

- 1) Arithmetic Exception
- 2) Null Pointer Exception
- 3) IO Exception
- 4) Out of Memory Exception

#### ECET-2010

06. Which of the following is a scalar data type?

- 1) Array
- 2) Char
- 3) Struct
- 4) Union

07. Static variables in a function have

- 1) Global scope and global extent
- 2) Global scope and local extent
- 3) Local scope and global extent
- 4) Local scope and local extent

08. Which character encoding scheme is followed for the 'clear' datatype in Java?

- 1) ASCII
- 2) EBCDIC
- 3) BCD
- 4) Unicode

09. \_\_\_\_\_ Operator is not a bit-wise operator :  
1) >  
2) >>  
3) >>>  
4) <<

10. Which of the following features in Java is not a keyword?

- 1) Package
- 2) Volatile
- 3) Import
- 4) Null

11. Which of the following is the default access specifiers for class members?

- 1) Public access
- 2) Private access
- 3) Protected access
- 4) Package access

12. Which of the following operators in Java has the highest precedence than the other operators?

- 1) &
- 2) %
- 3) + +
- 4) : ?

13. Which of the following cannot be used with the throw statement?

- 1) Error
- 2) Event
- 3) Throwable
- 4) Exception

#### ECET -2011

14. Which of the following types of class members can be part of the internal part of a class?

- 1) Private methods
- 2) Public instance variables
- 3) Private constructors
- 4) Public methods

15. What is an example of polymorphism?

- 1) Method overloading
- 2) Anonymous classes
- 3) Inner class
- 4) Method overriding

16. What is the result of executing the following fragment of code :

```
boolean  
flag = false ;  
if(flag == true)  
{System.out.println("false");}  
else  
{System.out.println("true");}
```

- 1) nothing happens
- 2) an exception is raised
- 3) true is printed to standard out
- 4) false is printed to standard out

17. Which of the following is illegal?

- 1) float f = 45.0;
- 2) float f = 45.0 ;
- 3) double d = 45.0;
- 4) int i = 32 ;

18. Constructor is a method that determine how an object is

- 1) initialized when destroyed
- 2) initialized
- 3) initialized when created
- 4) initialized when called

19. Which of the following wrapper classes cannot take a "String" in constructor

- 1) Long
- 2) Boolean
- 3) Character
- 4) Integer

20. Final variable should be declared in the

- 1) inside constructors
- 2) outside the methods
- 3) inside methods
- 4) inside classes

21. The Java Interpreter is used for the \_\_\_\_\_ of the source code.

- 1) debugging
- 2) execution
- 3) compiling
- 4) creation

22. Which one does not extend java.lang.Number

- 1) Integer
- 2) Boolean
- 3) Short
- 4) Long

23. What will happen if you try to compile and run the following code? public class Q

```
{public static void main (string arg v [])}  
{int anar [] = new int [5];
```

```
{system.out.print ln (anar [0]); }
```

- 1) Error
- 2) null
- 3) 5
- 4) 0

- 24.** How can class be imported to a program?
- import "class name"
  - import "class name ++ ;"
  - import "class name";
  - import "class name".\* ;
- 25.** Which statement is true about a nonstatic inner class?
- it can access private instance variables in the enclosing object
  - it is accessible from any other class
  - it can only be instantiated in the enclosing class
  - it must implement an interface
- 26.** Applets are executed generally in a
- console
  - browser
  - server
  - network
- 27.** Which one is a key word in a Java?
- friend
  - size of
  - extends
  - NULL
- 28.** What will be printed out if this code is run with the following command line?
- ```
java my_prog good morning
```
- public class my\_prog  
{ public static void main (string argv[])  
{ system.out.print ln (argv [2]) } }
- my\_prog
  - exception raised : "java.lang.ArrayIndexOutOfBoundsException:2"
  - moming
  - good

### ECET -2012

- 29.** Which of the following Inheritance mechanisms is not supported in Java
- Single level
  - Multiple level
  - Multi level
  - All the above
- 30.** What is the output of the following given Java code:
- ```
public class Ecet {  

public static void main (string [] args) {  

new Ecet (). go ("hello", 1);  

new Ecet (). go ("hello", "word", 2);  

}  

public void go (string y, int x) {  

System.out.print (y[y.length-1] + " ");  

}
```

- } 2) hello world  
1) h. he ✓ compilation fails  
3) world world
- 31.** Which one of the following statements is TRUE?
- At once, more than two threads may possibly end up in deadlock.
  - The JVM implementation guarantees that multiple threads cannot enter into a deadlock state.
  - Deadlock threads release once their sleep ( ) method's sleep duration has expired
  - Deadlocking can occur only when the wait (), notify (), and notify All () methods are used incorrectly.
- 32.** Fill up the blank with one of the following statements for the given Java code which allows Ecet class to compile:
- ```
class Navigation {  

public enum Direction {North, South, East,  

West}  

}  

public class Ecet {  

_____
```
- Direction d = North;
  - Navigation. Direction d = Navigation. Direction. North;
  - Direction d = Direction. North;
  - Navigation. Direction d = North;
- 33.** What is the output of the given Java code below
- ```
interface Test A ( String to String () ; )  

public class Test {  

public static void main (String [] args) {  

System.out.println(new TestA () {  

public String to String () {return "test";}  

});  

}  

}  

1) test      2) null  

3) An exception is thrown at runtime  

4) Compilation fails because of an error in line 1
```

34. Given the following Java code, \_\_\_\_\_ can directly access and change the value of the variable name ?

```
package exam;
class Ecet {
    public String name = "hello";
}
```

1) any class  
2) only the Ecet class  
3) any class in the exam package  
4) any class that extends Ecet

35. What is the output of the following Java code?

```
public class EcetString1 {
    public static void main (String [] args) {
        String str = "420";
        System.out.print(str);
    }
}
```

1) 42      2) 420      3) 42042      4) 462

36. Given the following Java code below, what is the output ?

```
int a = 0;
int b = 10;
do {
    b--;
    ++a;
}while (a<5);
System.out.print (+a "," +b);

```

1) 5,6      2) 5,5      3) 6,5      4) 6, 6

#### ECET -2013

37. Which of the following is not the method of thread class ?

- 1) Start      2) Stop  
3) Run      4) Sleep

38. Which of the following event is generated when a scroll bar is manipulated

- 1) Action Event      2) Adjustment Event  
3) Container Event      4) Item Event

39. Which of the following is not an AWT class ?

- 1) Image      2) Event  
3) Cursor      4) Applet

40. If a class includes an interface but does not fully implement the methods defined by that interface, then that class must be declared as \_\_\_\_\_

- 1) Abstract      2) Static  
3) Final      4) Public

41. A sub-class can call a constructor defined by its super-class by using \_\_\_\_\_ keyword

- 1) Extend      2) Final  
3) Super      4) This

42. Objects are passed by use of \_\_\_\_\_ in JAVA.

- 1) Call-by-name      2) Call-by-reference  
3) Call-by-value      4) Call-by-object

43. Which is the default layout manager ?

- 1) Border Layout      2) Grid Layout  
3) Flow Layout      4) Card Layout

44. The \_\_\_\_\_ method is used just before an object is destroyed and can be called prior to garbage collection.

- 1) Final      2) Finally  
3) Finalize      4) Finalization

45. The \_\_\_\_\_ is the mechanism by which a call to an overridden method is resolved at runtime rather than compile time

- 1) Dynamic method dispatch      2) Static method dispatch  
3) Automatic method dispatch      4) Through method dispatch

46. Which package contains Event Object class ?

- 1) Java.lang      2) Java.util  
3) Java.io      4) Java.net

#### ECET -2014

47. Which two are valid constructors for thread in JAVA ?

- 1) Thread (Runnable r, string name)  
2) Thread ()  
3) Thread (int priority)  
4) Thread (Runnable r, Thread Group g)  
1) 1 and 3      2) 2 and 4  
3) 1 and 2      4) 3 and 4

48. Which is TRUE about a method - local inner class

- 1) it must be marked final  
2) it can be marked abstract  
3) it can be marked public  
4) it can be marked static

49. What will be the output of the program ?

```
try
{
    int x = 0;
    int y = 5/x;
}
catch (Exception e)
{
    System.out.println ("Exception");
}
catch (Arithmetic Exception ae)
{
```

- System.out.println("Arithmetic Exception");  
 }  
 System.out.println("finished");  
 1) Finished                  2) Exception  
 3) Compilation fails        4) Arithmetic Exception
50. Given a class name as 'Student', which of the following is a valid constructor declaration for the class?  
 1) Student (student s) {}  
 2) Student student () {}  
 3) Private final student () {}  
 4) Void student () {}
51. Which of the keyword is used to define package in Java?  
 1) pkg                      2) Pkg  
 3) package                  4) Package
52. Which of the access specifier can be used as an interface?  
 1) Public                   2) Protected  
 3) Private                  4) Derfault
53. What is multithreaded programming?  
 1) It's a process in which two different processes run simultaneously.  
 2) It's a processes in which two ore more parts of same process run simultaneously  
 3) It's process in which many different processes are able to access same information  
 4) It's process in which a single process can access information from many sources
54. Which of these keywords is not part of exception handling?  
 1) try                      2) finally  
 3) thrown                  4) catch
- AP - ECET - 2015**
55. Byte code is executed by  
 1) JVM                      2) Javac  
 3) JSP                      4) poerating system
56. The base calass of all objects in java is called  
 1) object    2) class    3) system    4) jdk
57. An applet runs in  
 1) web browser            2) web server  
 3) microsoft windows    4) java server pages
58. Which of the follwoing statmenets is true  
 1) JDK contains JRE; and JRE contains JVM  
 2) JRE contains JDK and JVM  
 3) JVM contains JDK; and JDK contains JRE  
 4) JDK, JRE and JVM are totally independent

59. Given below some defective java code that doesn't compile: public class myproblem {  
 public class myproblem {  
 public int compute(int x)  
 {  
 int a = x \* x;  
 return a;  
 }  
 public static void main (string []args)  
 {  
 compute myfunction = new computer();  
 system.out.println(myfunction.compute(3));  
 }  
 }
- Do the following to correct the above code  
 1) make 'compute' private  
 2) insert line 'friend compute()' in the beginning of main  
 3) replace 'new compute' by ' new myfunction'  
 4) replace all occurrences of 'compute' by 'myproblem' in the 1<sup>st</sup> line of main
60. A java interface is  
 1) an abstract class      2) not a class  
 3) a package              4) a collection of implemenataion code
61. In java, a 'try' block  
 1) is followed by a single ' catch' block only  
 2) is always followed by a ' finally' block  
 3) is followed by one or more ' catch' blocks  
 4) in never followed by a 'finally' block
62. The following is not a predefined calass in java:  
 1) string    2) hashtable 3) object    4) std
63. The following is not true in case of java references  
 1) java refernces are used to access objects  
 2) arithmetic cannot be performed on java references  
 3) a reference cannot be cast to a different type  
 4) a java reference variable can be used refer another reference variable

Overloading operators in java

64. 1) is performed by using a special function  
2) is not possible  
3) is allowed only for the operators '\*' , '>>' and '`<<`'.  
4) is easier than in C++.

TS-ECET - 2015

65. Object is defined as a/an

- 1) real world entity      2) runtime entity  
3) instance of a class      4) class

66. What happens if string arg [ ] is not written in the main () method

- 1) code will compile but JVM cannot run the code  
2) results in syntax error      3) code will not compile  
4) code will compile and run successfully

67. In which class is standard output variable 'out' defined

- 1) void      2) process  
3) system      4) runtime

68. The method used to read a string from the keyboard using scanner class is

- 1) nextInt ( )      2) next ( )  
3) nextFloat ( )      4) nextDouble()

69. An exception cannot be handled using

- 1) finally      2) catch      3) try      4) out

70. Consider the following program:

```
import my.library.*;  
  
public class show MyClass  
{  
    // code for the class...  
}
```

What is the name of the java file containing this program

- 1) my Library.java      2) showMyClass.java  
3) showMyClass      4) showMy Class.class

71. Which of the following statements is TRUE

- 1) int is the name of a class available in the package java.lang  
2) in java, an instance field declared public generates a compilation error  
3) instance variable names may only contain letters and digits  
4) a class has always a constructor (possibly automatically supplied by the java compiler).

72. What does the following code segment implement

```
static int test ( int n )  
{  
    return ( n < 1 ? 1 : n * test(n-1));  
}
```

- 1) a recursive function for fibonacci sequence  
2) a recursive function for calculation of prime numbers  
3) a recursive function for calculation of natural numbers  
4) a recursive function for finding factorial

73. Which of the following creates platform independent code from a source file

- 1) java compiler      2) GUI  
3) byte code      4) JVM

74. Which of the following is NOT an ASP component

- 1) adRotator      2) counter  
3) link counter      4) file access

75. What is the name of the standard component in ASP that displays different advertisements each time a user enters or refreshes a page

- 1) advertisement      2) adrotator  
3) advertise      4) rotateads

76. What is the correct way to create a filesystem object

- 1) create ("filesystemobject")  
2) createobject("scripting.filesystemobject")  
3) server.createobject("scripting.filesystemobject")  
4) server.createobject("filesystemobject")

AP-ECET - 2016

77. Consider the following code  
string state = new string ("andhra");  
system.out.println(state.length());

What is printed

- 1) 6      2) 7      3) 8      4) andhra

78. What is the difference between java applet and java application

- 1) an application can in general be trusted whereas an applet can't  
2) an applet must be executed in a browser environment  
3) an applet is not able to access the files of the computer it runs on  
4) all the above

79. What is byte code in the context of java  
 1) the type of code generated by a java compiler  
 2) the type of code generated by a java virtual machine  
 3) it is another name for a java source file  
 4) it is the code written within the instance methods of a class
80. You read the following statement in a java program that compiles and executes  
`submarine.dive(depth);`  
 1) depth must be an int  
 2) dive must be a method  
 3) dive must be the name of an instance field  
 4) submarine must be the name of a class
81. Which of the following is not a primitive data type  
 1) boolean                  2) string  
 3) byte                      4) double
82. The statement `System.out.println(double d/4);` prints  
 1) 1.75    2) 1            3) 1.0            4) 2.0
83. Exceptions that are expected to possibly occur are called:  
 1) checked exceptions    2) unchecked exceptions  
 3) runtime exceptions    4) errors
84. Garbage collector frees the programmer from worrying about  
 1) memory leaks            2) dangling references  
 3) creating new objects    4) recursion
85. Which of the following is platform free language  
 1) JAVA                    2) COBOL  
 3) C                        4) FORTRAN

#### TS-ECET - 2016

86. Which class does not override the equals() and hashCode() methods, inheriting them directly from class object  
 1) `java.lang.StringBuffer` 2) `java.lang.String`  
 3) `java.lang.Double`        4) `java.lang.Character`
87. Java language has support for which of the following types of comment  
 1) block, line and javadoc  
 2) javadoc, literal and string  
 3) javadoc, char and string  
 4) single, multiple and quote
88. Which of the following statement is correct  
 1) for positive numbers, result of operators `>>` and `>>>` are same  
 2) java provides two operators to do left shift `<<<` and `<<`  
 3) `>>` is the zero fill right shift operator  
 4) `>>>` is the signed right shift operator

89. What is the output of the given java code snippet  
`class c1 { public static void main (String a []) {  
 c1 ob1 = new c1 ();  
 Object ob2 = ob1;  
 System.out.println(ob2 instanceof Object);  
 System.out.println(ob2 instanceof c1 );}}`  
 1) true, false              2) false, true  
 3) true, true                4) compile time error
90. What is the output of the given java code snippet  
`class Bike {}  
class arr extends Bike {  
 public static void main (String [] args) {  
 arr [] a1 = new arr [2];  
 Bike [] a2;  
 a2=a1;  
 arr [] a3;  
 a3=a1;  
 System.out.println(a3);}}`  
 1) compile time error at line 3  
 2) compile time error at line 5  
 3) runtime exception  
 4) garbage value
91. What is the output of the given java code snippet  
`class C {  
 public static void main (String [] args) {  
 byte b1=33;                //1  
 b1++;                      //2  
 byte b2=55;                //3  
 b2=b1 + 1;                //4  
 System.out.println(b1+" "+b2);  
 }}`  
 1) compile time error at line 2  
 2) compile time error at line 4  
 3) 34, 56    4) runtime exception
92. When the JVM runs out of memory, which exception will be thrown  
 1) memory bound exception  
 2) out of memory error  
 3) out of range exception  
 4) null reference exception

- AP - ECET - 2017**
93. Which exception is thrown by read() method  
 1) exception  
 2) file not found exception  
 3) read exception      4) IO exception
94. Which of the following sequence of method calls take place when an applet begins  
 1) init(), start(), create()  
 2) start(), init(), paint()  
 3) init(), start(), paint()  
 4) start(), paint(), destroy()
95. On invoking repaint() method for a component, which method is invoked by AWT  
 1) draw()                  2) show()  
 3) update()                4) paint()
96. If a class contains pure virtual function, then it is termed as \_\_\_\_\_  
 1) virtual class            2) sealed class  
 3) pure local class        4) abstract class
97. Which of the statements are true  
 I. function overloading is done at compile time  
 II. protected members are accessible to the member of derived class  
 III. A derived class inherits constructors and destructors  
 IV. a friend function can be called like a normal function  
 V. nested class is a derived class  
 1) I, II, III                2) II, III, V  
 3) III, IV, V              4) I, II, IV
98. Which one of the following are essential features of an object-oriented programming language  
 I. abstraction and encapsulation  
 II. strictly-typedness  
 III. type-safe property coupled with sub-type rule  
 IV. polymorphism in the presence of inheritance  
 1) I and II only            2) I and IV only  
 3) I, II and IV only      4) I, III and IV only
99. Evaluate the following expression  
 $(\text{true} \&\& \text{false}) \parallel \text{true} \parallel \text{false}$   
 1) 0            2) 1            3) false        4) 01
100. Which of the following automatic type conversion is supported in java  
 1) short to int            2) byte to int  
 3) int to long             4) long to int
101. What will be the return type of a method that will not return any value in a java  
 1) void            2) int        3) double      4) string
102. Which of the following is valid statement for declaration, and initializing an array  
 1) int [ ] my data;  
 2) int [ ] myData=(15, 8, 22);  
 3) int myData [ ][ ] = {34,19,27,20};  
 4) int myData [ ] = {34, 63, 77};
103. The java compiler  
 1) creates executable file  
 2) creates new classes  
 3) converts java source code to byte code  
 4) produces java interpreter
104. Which of the following is true  
 1. a class can extend more than one class  
 2. a class can extend only one class but many interfaces  
 3. an interface can extend many interfaces  
 4. a class can extend one class and implement many interfaces  
 1) 1 and 2    2) 2 and 4    3) 3 and 5    4) 3 and 4
105. The concept of multiple inheritance is implemented in Java by  
 I. extending two or more classes  
 II. extending one class and implementing one or more interfaces  
 III. implementing two or more interfaces  
 1) only (II)                2) (I) and (II)  
 3) (II) and (III)          4) only (I)
106. Which of the following package contains exception classes  
 1) java.util                2) java.io  
 3) java.io                 4) java.lang
107. What does AWT stands for  
 1) all window tools        2) all writing tools  
 3) abstract window toolkit  
 4) abstract writing toolkit
108. Which of the following blocks execute automatically whether exception is caught or not  
 1) finally    2) catch      3) throws    4) throw
109. \_\_\_\_\_ method cannot be overridden  
 1) super        2) static     3) final      4) private
- TS - ECET - 2017**
110. Which exception is thrown by dynamic\_cast  
 1) bad\_cast                2) bad\_typeid  
 3) bad\_exception          4) bad\_alloc
111. Which one among the following is a legal declaration and initialization of an array in Java language  
 1) int a[] = {"1", "2", "3", "4"};  
 2) int a[] = {1, 2, 3, 4};  
 3) int a[] = (1, 2, 3, 4);  
 4) int a [ ] = {1, 2, 3, 4};

- (70) (85) (80)
- 112.** Applet method `getParameter (String paramName)`, in java language is used for \_\_\_\_\_  
 1) getting the parameter value as a string  
 2) getting the environment variable  
 3) getting the program argument  
 4) getting the parameter value as a number
- 113.** Synchronized method of a class, in Java language, makes \_\_\_\_\_  
 1) the system is synchronized with other systems  
 2) the method synchronized with other methods  
 3) the method work as an entry method of a monitor  
 4) the class is synchronized with the program
- 114.** Member method `isAlive()` of Thread class Java language, is used for \_\_\_\_\_  
 1) testing whether the process is alive  
 2) testing whether the thread is currently running  
 3) testing for whether the process is currently running  
 4) testing whether the thread is active
- 115.** The keyword 'throws' is used for \_\_\_\_\_  
 1) throwing an exception  
 2) throwing an object  
 3) indicates that the specified exceptions may be raised in the corresponding method  
 4) raising a list of exceptions explicitly
- 116.** `ArrayIndexOutOfBoundsException` exception in Java language is raised when  
 1) an index outside the limits of array is used  
 2) a non-integer is used as an index  
 3) a non-array is accessed using array indexing  
 4) an array is accessed using zero index value
- 117.** Which one of the following statements, in the context of Java language is wrong  
 1) a member with no access modifier can be accessed in a non-subclass in the same package  
 2) a member with protected modifier cannot be accessed in a subclass of a different package  
 3) a member with protected modifier can be accessed in a non-subclass of the same package  
 4) a member with private modifier can be accessed only in its own class
- 118.** A final method in Java language indicates that  
 1) it is a last method being executed  
 2) it is a last handler for an exception  
 3) it is a constant method  
 4) it cannot be overloaded
- 119.** The '>>>>' operator in Java language is used for  
 1) rotating right signed  
 2) shifting right signed  
 3) rotating right unsigned  
 4) shifting right unsigned
- 120.** Which one of the following statements is true in Java language  
 1) simple variables can be passed either by value or by reference  
 2) objects can be passed either by value or by reference  
 3) objects can be passed only by reference  
 4) simple variables can be passed only by reference
- AP - ECET - 2018**
- 121.** Size of float and double in Java is  
 1) 32 and 64      2) 64 and 64  
 3) 32 and 32      4) 64 and 32
- 122.** The prototype of the default constructor is  
 1) `set()`      2) `set(void)`  
 3) `public set()`      4) `public set(void)`
- 123.** What is the output of the following program?  

```
class Output
{
    public static void main(String
args[])
    {
        boolean a= true;
        boolean b = false;
        boolean c = a ^ b;
        System.out.println(c);
    }
}
```

 1) 0      2) true      3) false      4) 1
- 124.** Given the following code fragment, What is the value of `A[3]`?  

```
int A[];
int i=0;
A = new int A[4];
while (i<4)
{
    A[i]=10;
    i = i+1;
}
```

 1) 0      2) 3      3) 10      4) 11
- 125.** Which class cannot be subclassed (or extended) in java  
 1) abstract class      2) parent class  
 3) final class      4) sub class
- 126.** Thread class is available in  
 1) `java.io` package      2) `java.lang` package  
 3) `java.awt` pacakge      4) `java.util` package

127. Which of the operator is used to generate an instance of an exception than can be thrown by using throw?  
 1) new    2) malloc    3) alloc    4) thrown
128. String is the predefined  
 1) method    2) class  
 3) variable    4) object
129. Which of these methods can be used to output a string in an applet?  
 1) display()    2) print()  
 3) drawstring()    4) transient()
130. Which of these keywords is used by a class to use an interface defined previously?  
 1) import    2) export  
 3) implements    4) variables passing
- TS-ECET - 2018**
131. What is the output\_initialization  
 class dynamic\_initialization
- ```

public static void main(string args[])
{
    double a, b;
    a = 3.0;
    b = 4.0;
    double c = math.sqrt(a*a+b*b);
    system.out.println(c);
}
  
```
- 1) 5.0    2) 25.0    3) 7.0  
 4) compilation error
132. Which of the following is a necessary condition for automatic type conversion in java  
 1) the destination type is smaller than source type  
 2) the destination type is larger than source type and compatible  
 3) the destination type can be larger or smaller than source type  
 4) the destination type can be any type but larger than source type
133. What is the error in this code fragment  
`byte b= 50;  
b = b * 50;`  
 1) b cannot contain value 100, limited by its range  
 opertor has converted b\* 50 into int, which cannot be converted to byte  
 2) without casting  
 3) b cannot contain value 50  
 4) no error in this code
134. When is method overloading determined  
 1) at run time  
 2) at compile time  
 3) at coding time    4) at execution time
135. Which of the following is not OOP concept inJava  
 1) inheritance    2) encapsulation  
 3) polymorphism    4) compilation
136. Which concept of java is achieved by combining methods and attributes into a class  
 1) encapsulation    2) inheritance  
 3) polymorphism    4) abstraction
137. Which of these keywords cannot be used for exception handling ikn JAVA  
 1) try    2) finally  
 3) thrown    4) catch
138. Which of these methods waits for the thread to terminate  
 1) sleep0    2) isAlive0  
 3) join0    4) stop0
139. What is synchronization in reference to a thread  
 1) it's a process of handling situations when two or more threads need access to a heared resource  
 2) it's a process by which many threads are able to access same shared resource simultaneously  
 3) it's a process by which a method is able to access many different threads simultaneously  
 4) it's a method that allows many threads to access any information required
140. Which of these functions is called to display the output of an applet  
 1) display0    2) paint0  
 3) display Applet0    4) printApplet0


  
**Araise ! Awake !  
 And stop not till  
 the goal is reached**

## PREVIOUS ECET BITS KEY

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 01-1  | 02-3  | 03-4  | 04-4  | 05-1  |
| 06-2  | 07-3  | 08-4  | 09-2  | 10-1  |
| 11-2  | 12-1  | 13-3  | 14-1  | 15-4  |
| 16-4  | 17-2  | 18-3  | 19-2  | 20-4  |
| 21-2  | 22-2  | 23-4  | 24-1  | 25-4  |
| 26-2  | 27-3  | 28-2  | 29-2  | 30-4  |
| 31-4  | 32-4  | 33-4  | 34-3  | 35-2  |
| 36-2  | 37-2  | 38-2  | 39-4  | 40-1  |
| 41-3  | 42-2  | 43-4  | 44-3  | 45-1  |
| 46-2  | 47-3  | 48-2  | 49-2  | 50-1  |
| 51-3  | 52-1  | 53-2  | 54-3  | 55-1  |
| 56-1  | 57-1  | 58-1  | 59-4  | 60-2  |
| 61-3  | 62-4  | 63-4  | 64-2  | 65-3  |
| 66-1  | 67-3  | 68-2  | 69-4  | 70-2  |
| 71-4  | 72-4  | 73-1  | 74-3  | 75-2  |
| 76-3  | 77-1  | 78-4  | 79-1  | 80-2  |
| 81-2  | 82-1  | 83-1  | 84-1  | 85-1  |
| 86-1  | 87-1  | 88-1  | 89-4  | 90-4  |
| 91-2  | 92-2  | 93-4  | 94-3  | 95-4  |
| 96-4  | 97-4  | 98-2  | 99-2  | 100-3 |
| 101-1 | 102-4 | 103-3 | 104-3 | 105-3 |
| 106-4 | 107-3 | 108-1 | 109-3 | 110-1 |
| 111-2 | 112-1 | 113-3 | 114-4 | 115-3 |
| 116-1 | 117-2 | 118-4 | 119-3 | 120-3 |
| 121-4 | 122-3 | 123-2 | 124-4 | 125-3 |
| 126-1 | 127-1 | 128-4 | 129-1 | 130-2 |
| 131-3 | 132-4 | 133-4 | 134-4 | 135-1 |
| 136-4 | 137-4 | 138-3 | 139-1 | 140-2 |



*Swami  
Vivekananda*

ALL POWER IS WITHIN  
YOU  
YOU CAN DO  
ANYTHING  
AND  
EVERYTHING

## SPACE FOR IMPORTANT NOTES

Physical layer (Data information bits)

→ Transmission mode

(④) Bit synchronization

(⑤) Bit rate control

(⑥) Identifying topologies

### DATALINK LAYER

- ① Data is represented as frames
- ② It is responsible to transmit error-free data
- ③ Responsible for reliable and efficient communication

### Functions

→ Framing

Header bits (Trailer)

← same →

→ Physical addressing

\* Destination hardware address will be included as header

→ Error control

\* Error control mechanism will be implemented calculated bit (CRC) will be added in trailer

\* If any error(s) data corrupted the receiver sends acknowledgement to retransmit the corrupted data

→ Flow control :-

maintaining constant bit-rate

→ Access control :-

If more than one device sharing same communication channel

the LLC protocols are responsible



# INTERNET PROGRAMMING

## HYPertext Markup Language :-

HTML stands for Hyper Text Markup Language An HTML file is a text file containing small

### Markup tags

The markup tags tell the Web browser how to display the page

An HTML file can be created using a simple text editor

HTML tags are surrounded by the two characters

<and>

The surrounding characters are called angle brackets

HTML tags normally come in pairs like <b> and </b>

The first tag in a pair is the start tag, the second tag is the end tag

The text between the start and end tags is the element content

HTML tags are not case sensitive, <b> means the same as <B>

This HTML element starts with the start.tag <body>, and ends with the end tag</body>.

The purpose of the <body> tag is to define the HTML element that contains the body of the HTML document.

### Headings.

Headings are defined with the <h1>to<h6>tags.<h1> defines the largest heading .. <h6> defines the smallest heading.

### Closing Tag

You might have noticed that paragraphs can be written without end tags</p>

### Line Breaks

The <br>tag is used when you want to break a line.

But don't want to start a new paragraph. The <br> tag forces a line break wherever you place it.

### Comments in HTML

The comment tag is used to insert a comment in the HTML source code. A comment will be ignored by the browser. You can use comments to explain your code. Which can help you when you edit the source code at a later date.

Each HTML element has an element name (body, h1, p, br)

The start tag is the name surrounded by angle brackets:

<h1>

The end tag is a slash and the name surrounded by angle brackets </h1>

The element content occurs between the start tag and the end tag

Some HTML elements have no content

Some HTML elements have no end tag

### Tag

<html>

Defines an HTML documents

<body>

Defines header 1 to header 6

<p>

Defines a paragraph

<br>

Inserts a single line break

<hr>

Defines a comment

<!-->

Define horizontal rule

### Tag

<b>

Defines bold text

<big>

Defines big text

<em>

Define emphasized text

<i>

Defines italic text

<small>

Defines small text

<strong>

Defines strong text

<sub>

Defines subscripted text

<sup>

Defines superscripted text

<ins>

Defines inserted text

<del>

Defines deleted text

<s>

Deprecated. Use <del> instead.

<strike>

Deprecated. Use <del> instead.

<u>

Deprecated. Use styles instead

<ins>

element is displayed in inserted text

<del>

element is displayed in deleted text

<big>

element is displayed one font size larger than the rest of the text surrounding

<small>

element is displayed one font size smaller than the rest of the text surrounding

### Tag

<code>

Defines computer code text

<kbd>

Defines keyboard text

<samp>

Defines sample computer code

<tt>

Defines teletype text

<var>

Defines a variable

<pre>

Defines preformatted text

<listing>

Deprecated. Use <pre> instead

<plaintext>

Deprecated Use <pre> instead

<xmp>

Deprecated Use <pre> instead

### **HTML TAGS:**

HTML is a markup language and makes use of various tags to format the content. The tags are enclosed within angle brace <tag name>. Except few tags, most of the tags have their corresponding closing tag.

**Tag**

**Description**

<!DOCTYPE..> The tag defines document type and html version.

<html>

This tag encloses the complete Html document and mainly comprises of document header which is represented by

<head>..</head> and document header which is represented by <head>..</head> and document body is represented by <body>...</body> tags.

<head> The represents the documents header to keep another Html tags like <title>, <link> etc.

<title> The tag used inside <head> tag to mention document title. <body> This tag represents the documents body which keeps other Html tags like <h1>, <div>, <p> etc.

<h1> This tag represents heading

<p> This tag represents a paragraph.

### **HTML DOCUMENT STRUCTURE:-**

A typical HTML document will have the following structure.

Document Declaration Tag:

<html>

<head>

Document header related tags.

</head>

<body>

Document body related tags

</body>

</html>

### **HTML BASIC TAGS:**

Any document starts with heading. You can use different sizes of your heading. HTML has six levels of heading

<h1>, <h2>, <h3>, <h4>, <h5>, <h6>. While displaying

any heading, browser adds one line before and one line after the heading.

Example:-

<!DOCTYPE>

<html>

<head>

<title>Heading Example</title>

</head>

<title>Heading Example</title>

</head>

<body>

<h1>This is heading1 </h1>

<h2>This is heading2 </h2>

<h3>This is heading1 </h3>

<h4>This is heading1 </h4>

<h5>This is heading1 </h5>

<h6>This is heading1 </h6>

</body>

</html>

### **Paragraph Tag:-**

The <p> tag offers a way to structure your text in different paragraphs. Each paragraph should be between opening and closing tag.

<!DOCTYPE>

<html>

<head>

<title>Paragraph Example</title>

</head>

<body>

<p>Here is first paragraph</p>

<p>Here is second paragraph</p>

</body>

</html>

Output:-

Here is first paragraph

Here is second paragraph

### **Centering Content:-**

<center> tag is used to put any content in the centre of the page or any table cell.

Example:-

<!DOCTYPE>

<html>

<body>

<p>This text is not in center</p>

<center>

<p>This text is in center</p>

</center>

</body>

</html>

Output:-

This text is not in center

This text is in center

### **Horizontal Lines:-**

Horizontal lines are used to visually breakup section of a document. The <hr> tag creates a line from the current position in the document to the right margin and breaks the line accordingly

```

<!DOCTYPE>
<html>
<body>
<hr>
<p>This paragraph one should be on top</p>
<hr>
<p>This paragraph two should be at bottom</p>
</body>
</html>

```

**Output:-**

This paragraph one should be on top

This paragraph two should be at bottom

**Generic Attributes:-**

There are some attributes that are readily usable with many of the HTML tags.

**Options**

align right, left, center

**Function**

Horizontally aligns tags

valign top, middle, bottom

Vertically aligns tag within an

HTML element

bgcolor

Places a backgroundcolor

RGB values

Names an element for use

with CSS

Places background image

behind an element class

Names an element for use with

CSS width Numeric value

Specifies width of tables,

images or table cells.

Specifies height of tables,

images or table cellstitle

User defined elements

height Numeric value

**HTML FORMATTING:-**

**Bold text:** Anything that appears within **<b>...</b>** elements is displayed in bold

**Italic text:** Anything that appears within **<i>...</i>** elements is displayed in italicized

**Underlined text:** Anything that appears within **<u>...</u>** element is displayed with underline.

**Strike text:** Anything that appears within **<del>...</del>** element is displayed with strike through it.

**Example:-**

```

<!DOCTYPE>
<html>
<head>
<title>HTML Formatting </title>
</head>
<body>
<p>The following word uses a <b>bold</b> format</p>
<p>The following word uses a <i>italicized</i> format</p>
<p>The following word uses a <u>underlined</u> format</p>
<p>The following word uses a <del>strike through</del> format</p>
</body>
</html>

```

**Output:-**

The following word uses a **bold** format

The following word uses a *italicized* format

The following word uses a underlined format

The following word uses a --strike through--format

**SuperScript and SubScript Text:-**

The content of <sup>.....</sup> element is written in superscript the font size used is same size as the characters surrounding it but is displayed half a character's height above other character.

where as the content of <sub>.....</sub> is displayed half a character height beneath the other characters.

**Example:-**

```

<!DOCTYPE html>
<html>
<head>
<title>Subscript and super script example </title>
</head>
<body>
<p>The following word uses a <sup>superscript</sup> type</p>
<p>The following word uses a <sub>subscript</sub> type</p>
</body>
</html>

```

**Output:-**

superscript

The following word uses a type

The following word uses a type

subscript

### HTML Lists:-

Html offers 3 ways for specifying lists of information.  
 All lists must contain one or more list elements  
 .<ul>- An unordered list. This will list item using plain bullets.  
 <ol>-An ordered list. This will use different schemes of numbers to list your items  
 <dl>-A definition list. This arranges your items in the same way as they are arranged in a dictionary

### HTML: Unordered Lists:-

An ubnordered list is a collection of related items that have special order or sequence. The list is created by using HTML <ul> tag. Each item in the list is marked with a bullet.

Example:-

```
<!DOCTYPE html>
<HTML>
<head>
<title>HTML Unordered List</title>
</head>
<body>
<ul>
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ul>
</body>
</html>
output
•.Beetroot
•.Ginger
•.Potato
•.Radish
```

### The type attribute

You can use type attribute for <ul> tag to specify the bullet you like. By default it is a disc.

Following are the possible options

```
<ul type = "square">
<ul type = "disc">
<ul type = "circle">
```

### HTML Orderd Lists

If you are required to put your items in a numbered list instead of bullet, then HTML ordered list will be used. This is created by <ol> tag. The numbering starts with one for each successive ordered list element tagged with <li>

Ex: <!DOCTYPE html>

```
<html>
<head>
<title> ordered list </title>
</head>
<body>
<ol>
<li>Beetroot</li>
<li>Ginger</li>
<li>Potato</li>
<li>Radish</li>
</ol>
</body>
</html>
```

output  
 1. Beetroot  
 2. Ginger  
 3. Potato  
 4. Radish

### VB SCRIPT

VBScript is a scripting language A scripting language is a lightweight programming language VBScript is a light version of Microsoft's programming language visual basic

How to Put VBScript Code in an HTML Document <script type="text/vbscript"> in Head or body tag.

#### **Scripts in both the body and the head section :**

You can an unlimited number of scripts in your document, so you can have scripts in both the body and the head section.

To insert a script in an HTML document, use the <Script> tag. Use the type attribute to define the scripting language.

The Output Statement in VBSCRIPT is document.write("pattern").

If given in old browsers we specify the script type as

```
<script type="pattern">
```

#### ► Head section

Scripts can be placed in the head section. Usually we put all the "functions" in the head section. The reason for this is to be sure that the script is loaded before the function is called.

#### ► Body Section

Execute a script that is placed in the body section Scripts in the body section are executed when the page is loading.

### Create a variable

Variables are used to store information. This example demonstrates how you can create a variable, and assign a value to it.

### Create an array:

Arrays are used to store a series of related data items. This example demonstrates how you can make an array that stores names. (We are using a "for loop" to demonstrate how you write the names)

Ex:

```
Dim name  
Name=some value
```

### Life time of the variables:-

When you declare a variable within a procedure the variable can only be accessed within that procedure. When the procedure exits, the variable is destroyed. These variables are called local variables. You can have local variables with the same name in different procedures because each is recognized only by the procedure in which it is declared.

If you declare a variable outside a procedure, all the procedures on your page can access it. The lifetime of these variables starts when they are declared, and ends when the page is closed.

#### Rules for Variable Names:

Must begin with a letter

Cannot contain a period (.)

Cannot exceed 255 characters

#### Array Variables:

Then you can create a variable that can contain a series of values. This is called an array variable. The declaration of an array variable uses parentheses () following the variable name.

### VB Script Procedures:

We have two kinds of procedures

#### A Sub procedure:

- ◆ Is a series of statements enclosed by the Sub End Sub statements
- ◆ Can perform actions but does not return a value
- ◆ Can take arguments that are passed to it by a calling procedure
- ◆ Without arguments must include an empty set of parentheses ()

### A Function procedure:

- ◆ Is a series of statements, enclosed by the Function and End Function statements
- ◆ Can perform actions and can return a value
- ◆ Can take arguments that are passed to it by a calling procedure
- ◆ Without arguments, must include an empty set of parentheses ()
- ◆ Returns a value by assigning a value to its name

### In VBScript we have four conditional statements:

- ◆ If statement – use this statement if you want to execute a set of code when a condition is true
- ◆ If .....then.....else statement – use this statement if you want to select one of two sets of lines to execute
- ◆ If.....then.....elseif statement – use this statement if you want to select one of many sets of lines to execute
- ◆ Select case statement – use this statement if you want to select one of many sets of lines to execute

### Looping Statements:

Very often when you write code you want to allow the same block of code to run a number of times. You can use looping statement in your code to do this.

In VBScript we have four looping statements:

- ◆ For... Next statement – runs statements a specified number of times.
- ◆ For Each...Next statement – runs statements for each item in a collection or each element of an array
- ◆ Do....Loop statement - Loops while or until a condition is true
- ◆ While... Wend statement – Do not use it – use the Do... Loop statement instead

### ASP PROGRAMMING

- ◆ ASP stands for Active Server Pages
- ◆ ASP is a program that runs inside IIS
- ◆ IIS stands for Internet Information Services
- ◆ IIS comes as a free component with Windows 2000
- ◆ IIS is also a part of the Windows NT 4.0 Option Pack

- ◆ The option Pack can be downloaded from Microsoft
- ◆ PWS is a smaller—but fully functional—version of IIS
- ◆ PWS can be found on your Windows 95/ 98 CD

#### ► Compatibility

ASP is a Microsoft Technology

To run IIS you must have windows NT 4.0 or later

To run PWS you must have Windows 95 or later Chili

ASP is a technology that runs ASP without Windows OS

**Instant ASP is another technology that runs ASP without Windows**

#### ASP File:-

An ASP file is just the same as an HTML file

An ASP file can contain text, HTML... XML. And scripts

Scripts in an ASP file are executed on the server

An ASP file has the file extension “asp”

#### ASP Vs HTML?

When a browser requests an HTML file. The server returns the file when a browser requests an ASP file, IIS passes the request to the ASP engine. The ASP engine reads the ASP file. Line by line, and executes the scripts in the file. Finally the ASP file is returned to the browser as plain HTML

#### Functions of ASP:-

- ◆ Dynamically edit. Change or add any content of a web page
- ◆ Respond to user queries or data submitted from HTML forms
- ◆ Access any data or database and return the results to a browser
- ◆ Customize a Web page to make it more useful for individual users
- ◆ The advantages of using ASO instead of CGI and Perl, are those of simplicity and speed
- ◆ Provide security since your ASP code can not be viewed from the browser
- ◆ Clever ASP programming can minimize the network traffic

You cannot view the ASP source code by selecting “View source” in a browser, you will only see the output from the ASP file, which is plain HTML. This

is because the scripts are executed on the server before the result is sent back to the browser

#### ► Syntax:

An ASP file normally contains HTML tags, just like an HTML file. However, an ASP file can also contain **server scripts**. Surrounded by the delimiters <% and %>. Server scripts are **executed on the server**, and can contain any expressions, statements, procedures or operators valid for the scripting language you prefer to use Write Output to a Browser

The response. Write command is used to write output to a browser. The following example sends the text “Hello World” to the browser:

```
<html>
<body>
<% response . write ("Hello World!")>
</body>
</html>
```

VBScript is default scripting language for ASP hence on need to mention. Whereas the java script need to be mentioned separately.

To set Java Script as the default scripting language for a particular page you must insert a language specification at the top of the page:

```
<%@ language = "Javascrip"%>
```

#### ► Other Scripting Languages:

ASP is shipped with VBScript and JScript (Microsoft's implementation of Java Script). If you want to script in another language. Like PERL..REXX. or Python, you will have to install script engines for them.

**Important:** Because the Scripts are executed on the server, the browser that displays the ASP file does not need to support scripting at all!

#### Lifetime of Variables:

- ◆ A variable declared outside a procedure can be accessed and changed by any script in the ASP file.
- A variable declared inside a procedure is created and destroyed every time the procedure is executed. No scripts outside the procedure can access or change the variable.
- To declare variables accessible to more than one ASP file. Declare them as session variables or application variables.

### ► Session Variables:

Session variables are used to store information about ONE single user. And are available to all pages in one application. Typically information stored in session variables are name, Id, and preference.

### ► Application Variables:

Application variables are also available to all pages in one application. Application variables are used to store information about ALL users in a specific application.

### ► Differences Between VBScript and JavaScript in ASP:

When calling a VBScript or a JavaScript procedure from an ASP file written in VBScript you can use the "call" Keyword followed by the procedure name. If a procedure required parameters, the parameter list must be enclosed in parentheses when using the "call" keyword. If you omit the "call" keyword. The parameter list must not be enclosed in parentheses if the procedure has no parameters the parentheses are optional.

When calling a JavaScript or a VBScript procedure from an ASP file written in JavaScript, always use parentheses after the procedure name.

### ► User Input:

The Request object may be used to retrieve user information from forms. User input can be retrieved in two ways: With Request.QueryString or Request.From.

### ► Request Form

The Request.From command is used to collect values in a form with method = "Post" information sent from a form with the POST method is invisible to others and has no limits on the amount of information to send.

### ► Form Validation:

User input should be validated on the browser whenever possible (by client scripts). Browser validation is faster and you reduce the server load. You should consider using server validation if the user input will be inserted into a database. A good way to validate a form on the server is to post the form to itself instead of jumping to a different page. The user will then get the error messages on the same page as the form. This makes it easier to discover the error.

### ► Cookie:-

A cookie is often used to identify a user. A cookie is a small file that the server embeds on the user's computer. Each time the same computer requests a page with a

browser, it will send the cookie too. With ASP, you can both create and retrieve cookie values.

The "Response.Cookies" command is used to create cookies.

Note: The Response.Cookies command must appear BEFORE the <html> tag.

```
<%  
Response.Cookies("firstname")="saimedha"  
%>
```

Setting a date when the cookie should expire:

```
<%  
Response.Cookies("firstname")="Alex"  
Response.Cookies("firstname").Expires=#May  
10.2002#  
%>
```

### To Retrieve an Cookie Value?

The "Request.Cookies" command is used to retrieve a cookie value.

In the example below, we retrieve the value of the cookie named "firstname" and display it on a page:

```
<%  
Fname=Request.Cookies("firstname")  
Response.Write("Firstname="fname)  
%>
```

### ► Session Object :-

The Session object is used to store information about, or change setting for a user asession. Variables stored in the Session object user, and are available to all pages in one application .

### ► A session starts when :-

A new user requests an ASP file, and the Global.asax file includes a Session OnStart procedure

A value is stored in a Session variable

A user requests an ASP file, and the instantiate an object with session scope

### ► A Session Ends when

- ◆ A session ends if a user has not requested or refreshed a page in the application for a specified period. By default, this is 20 minutes

- ◆ If you want to set a timeout interval that is shorter or longer than the default, you can set the **Timeout** property

\* To end a session immediately you may use the

### ► Abandon method :-

#### Remove Session Variable :-

The Contents collection contains all session variables.

It is possible to remove a session variable with the Remove method.

### ► Loop Through the Contents Collection :-

The Contents collection contains all session variables. You can loop through the Contents collection.

### ► Application :-

A group of ASP files that work together to perform some purpose is called an application. The Application object in ASP is used to tie these files together.

### ► Application Object

An application the web may be a group of ASP files. The ASP files work together to perform some purpose. The Application object in ASP is used to tie files together.

The Application object is used to store and access variables from any page just like the Session object. The difference is that ALL users share one Application object for EACH user.

The Application object should hold information that will be used by many pages in the application (like database connection information). This means that you can access the information from any page. It also means that you can change the information in one place and the change will automatically be reflected on all pages.

## PRACTICE SET

01. Choose the correct HTML tag for the largest heading  
1) <heading>      2) <h1>  
3) <h6>      4) <head>

02. What is the correct HTML tag for inserting a line break?  
1) <lb>      2) <break>  
3) <br>      4) none

03. What is the correct HTML for adding a background color?  
1) <body color="yellow">  
2) <body bgcolor="yellow">  
3) <background>yellow</background>  
4) none

04. Choose the correct HTML tag to make a text bold  
1) <bb>      2) <bold>  
3) <bld>      4) <b>

05. Choose the correct HTML tag to make a text italic  
1) <italics>      2) <ii>  
3) <i>      4) none

06. What is the correct HTML for making a hyperlink?  
a) <a href="http://www.HELLOWORLD">HELLOWORLD<a>

2) <a url="http://www.HELLOWORLD">HELLOWORLD<a>

3) <a name="http://www.HELLOWORLD">HELLOWORLD<a>

4) <a> http://www. HELLOWORLD<a>

07. How can you make an e-mail link?

1) <mail>xxx@yyy</mail>

2) <a href="xxx@yyy">

3) <mail serf="xxx@yyy">

4) <a href=>>mail to xxx@yyy">

08. How can you open a link in a new browser window?

1) <a href="url"new>

2) <a href="url target>

3) <a href="url"new> 4) none

09. Which of these tags are all table tags?

1) <table><head><<tfoot>

2) <table><tr><u>

3) <table><body><tr>

4) <table><tr><td>

10. Choose the correct HTML to left-align the content inside a table  
1) <td leftalign>      2) <tdalign=left>

3) <td valign="left">      4) <tdleft>

11. How can you make list that lists the items with numbers?  
1) <dl>      2) <ol> *number*

3) <ul>      4) <list>

12. How can you make list that list the items with bullets?  
1) <ul> *bullet*      2) <list>

3) <ol>      4) <dl>

13. What is the correct HTML for making a checkbox  
1) <input type="check">  
2) <input type="check">

3) <checkbox>      4) <check>

14. What is the correct HTML for making a text input field?  
1) <textfield>  
2) <textinput type="text">  
3) <inputtype="text">  
4) <inputtype="textfiled">

- What - How - Admin*
15. What is the correct HTML for making a dropdown list?  
 1) <input type="list">      2) <select>  
 3) <input type="dropdown">    4) <list>
16. What is the correct HTML for making a text area?  
 1) <input type="textarea">  
 2) <input type="textbox">  
 3) <textarea>      4) none
17. What is the correct HTML for inserting an image?  
 1) <img>image.gif</img>  
 2) <image src="image.gif">  
 3) <img href="image.gif">  
 4) 
18. What is the correct HTML for inserting a background image?  
 1) <body background="background.gif">  
 2)   
 3) <background img="background.gif">  
 4) none
19. WWW stands for  
 1) World web wall      2) world wide web  
 3) web world wide      4) none
20. Software that acts a security filter that can restrict types of network communication called  
 1) Anti virus      2) anti Phishing  
 3) firewall      4) anti spamming
21. What does ASP stand for?  
 1) A Server Page      2) Active Standard Pages  
 3) Active Pages      4) All Standard Pages
22. Asp server scripts are surrounded by which delimiters?  
 1) <%>...<%>      2) <&>...</&>  
 3) <Script>...</Script>    4) <%...%>
23. How do you write "Hello World" in ASP  
 1) Document. Write("Hello World")  
 2) "Hello World"  
 3) Response. Write ("Hello World")  
 4) none
24. <%= is the same as:  
 1) <%Document. Write    2) <%Write  
 3) <%Response      4) <%Equal
25. What is the default scripting language in ASP?  
 1) PERL      2) JavaScript  
 3) EcmaScript      4) VBScript
26. How can you script your ASP code in JavaScript  
 1) End the document with:<%language="JavaScript"%>  
 2) Start the document with:<% language = "JavaScript"%>
27. 3) JavaScript is the default scripting language  
 4) Start the document with: <%@ language="JavaScript"%>
28. How do you get information from a form that is submitted using the "get" method  
 1) Request. QueryString  
 2) Request. From
29. How do you get information from a form that is submitted using the "post" method?  
 1) Request .QueryString  
 2) request .Form
30. Page I has this link:  
<a href="page2.asp?color=green">GO</a> How can page2.asp get the "Color" parameter?  
 1) Response .Query String ("Color")  
 2) Response. Parameter ("Color")  
 3) Request. Query String("Color")  
 4) Get ("Color")
31. Which ASP property is used to identify user?  
 1) The Application object  
 2) The Server object  
 3) An ASP Cookie      4) None
32. All users of the same application share ONE Session object.  
 1) True      2) False
33. All users of the same application share ONE Application object.  
 1) False      2) True
34. If a user has Cookies enabled, a session variable is shared across all pages in one application  
 1) True      2) False
35. Include files must have the file extension ".inc"  
 1) False      2) True
36. Which is the correct way to include the file "time.inc"?  
 1) <include file="time.inc">  
 2) <!-- #include file="time.inc"-->  
 3) <%#include file="time.inc"%>  
 4) <% include file="time.inc"%>
37. Which one of these events is a standard Global.asa event?  
 1) Session \_Start      2) Session \_id
38. Global.asa is required for all web sites  
 1) True b. False c. Only for ASP web sites
39. Which of these objects is NOT an ASP component?  
 1) File Access      2) Link Counter  
 3) AdRotator      4) Counter

39. ASP comes with a standard component that displays a different advertisement each time a user enters or refreshes a page, what is the name of this component?  
1) Advertise      2) Advertisement  
3) RoataateAds    d. AdRotator

40. How do you create a File System Object?  
1) Server.CreateObject ("FileSystemObject")  
2) server.CreateObject ("Scripting.FileSystemObject")  
3) CreateObject ("Scripting.FileSystemObject")  
4) Create ("File SystemObject")

04. The ASP object used to send / output to the user the server is  
1) Request                  2) Response  
3) Session                  4) Connection

05. The ASP statement used to create an open connection to a data source  
1) set objConnection = Server.CreateObject ("ADODB.connection")  
2) set objConnection = Server.CreateObject ("ADO.connection")  
3) set objConnection = Server.CreateObject ("ADO.connection")  
4) set objConnection = Server.CreateObject ("ADO.connection")

## PRACTICE SET KEY

<b>01 - 2</b>	<b>02 - 3</b>	<b>03 - 2</b>	<b>04 - 4</b>	<b>05 - 3</b>
<b>06 - 1</b>	<b>07 - 3</b>	<b>08 - 2</b>	<b>09 - 4</b>	<b>10 - 2</b>
<b>11 - 2</b>	<b>12 - 1</b>	<b>13 - 2</b>	<b>14 - 2</b>	<b>15 - 2</b>
<b>16 - 2</b>	<b>17 - 4</b>	<b>18 - 1</b>	<b>19 - 2</b>	<b>20 - 2</b>
<b>21 - 3</b>	<b>22 - 4</b>	<b>23 - 3</b>	<b>24 - 3</b>	<b>25 - 4</b>
<b>26 - 4</b>	<b>27 - 1</b>	<b>28 - 2</b>	<b>29 - 3</b>	<b>30 - 3</b>
<b>31 - 2</b>	<b>32 - 2</b>	<b>33 - 2</b>	<b>34 - 2</b>	<b>35 - 3</b>
<b>36 - 2</b>	<b>37 - 3</b>	<b>38 - 4</b>	<b>39 - 4</b>	<b>40 - 2</b>

## **PREVIOUS ECET BITS**

ECET -2009

- PRACTICE SET KEY**

01 - 2	02 - 3	03 - 2	04 - 4	05 - 3
06 - 1	07 - 3	08 - 2	09 - 4	10 - 2
11 - 2	12 - 1	13 - 2	14 - 2	15 - 2
16 - 2	17 - 4	18 - 1	19 - 2	20 - 2
21 - 3	22 - 4	23 - 3	24 - 3	25 - 4
26 - 4	27 - 1	28 - 2	29 - 3	30 - 3
31 - 2	32 - 2	33 - 2	34 - 2	35 - 3
36 - 2	37 - 3	38 - 4	39 - 4	40 - 2

**PREVIOUS ECET BITS**

**ECET -2009**

  - In HTML which command is used to link a page with an HTML page ?
    - <a link = \ "Page.htm "\></a>
    - <a href = \ " Page.htm "\></a>
    - <a connect = \ "Page.htm "\></a>
    - <a attach = \ "Page.htm "\></a>
  - Write syntax to get "VB welcomes you !" Using VB Script.
    - documentwrite ("VB welcomes you !")
    - point ("VB welcomes you !")
    - print. write ("VB welcomes you !")
    - script. write ("VB welcomes you !")
  - What is the use of ReDim statement in VB Script ?
    - To change the size of an array in VB Script
    - Define the variable
    - To declare the variable
    - To assign a value to a variable

**ECET -2012**

  - The ASP object used to send / output to the user the server is
    - Request
    - Response
    - Session
    - Connection
  - The ASP statement used to create an open connection to a data source
    - set objConnection = Server.CreateObject ("ADODB.connection")
    - set objConnection = Server.CreateObject ("ADO.connection")
    - set objConnection = Server.CreateObject ("ADO.connection")
    - set objConnection = Server.CreateObject ("ADODB.connection")
  - What is a Web Browser ?
    - A compiler which compiles high level language programs
    - A compiler which compiles low level language programs
    - An interpreter which helps to view and navigate through web pages
    - a loader program which connects to the operating system
  - Which of the following is not a Web Browser?
    - Mozilla Firefox
    - Apple Safari
    - Google Chrome
    - YouTube
  - Which protocol is used to connect to Internet?
    - HTTP
    - FTP
    - ICMP
    - IP
  - Which HTML tag is used for indicating long quotations ?
    - title
    - blockquote
    - label
    - style
  - Which of the following statements is correct about VBScript ?
    - It is an application - specific programming language like LISP
    - It is client - side scripting language
    - It is not a Web Browser friendly language
    - It is not an active scripting language
  - Which VBscript built - in function gives the position of the occurrence of one string within another file on the end of the string ?
    - InStr
    - String
    - InStrRev
    - StrComp
  - Which of the following is an ASP object ?
    - AdRotator
    - Server

- ECET-2013**

  13. Which of the following is an ASP component
    - 1) Response
    - 2) Request
    - 3) Application
    - 4) Content Rotator
  14. Which priority determines whether a control is displayed to the user ?
    - 1) Hide
    - 2) Show
    - 3) Visible
    - 4) Enable
  15. The Cancel Button property belongs to which object ?
    - 1) Button
    - 2) Form
    - 3) Label
    - 4) Text Box
  16. Which of the following object is not an ASP component.
    - 1) File axis
    - 2) Ad Rotator
    - 3) Counter
    - 4) Link counter
  17. Which user action will not generate a server-side event ?
    - 1) Mouse Move
    - 2) Text Change
    - 3) Button Click
    - 4) Mouse click
  18. Which of the following control structure is not available in VB script ?
    - 1) If statement
    - 2) Nest if statement
    - 3) Switch case shunt
    - 4) If-then-else if - statement
  19. Which of the following is used to increase the row height ?
    - 1) Cell spacing
    - 2) Cell padding
    - 3) Row span
    - 4) Col span
  20. Which is the largest Heading Tag ?
    - 1) H1
    - 2) H3
    - 3) H4
    - 4) H6
  21. Choose odd one tag of HTML ?
    - 1) Table
    - 2) Tr
    - 3) Td
    - 4) Form
  22. HTML tag for text scrolling is \_\_\_\_\_
    - 1) <scroll> </scroll>
    - 2) <move> </move>
    - 3) <marque> </marque>
    - 4) <round></round>
  23. HTML tag for line break is \_\_\_\_\_
    - 1) <br/>
    - 2) <p/>
    - 3) <lbr/>
    - 4) <break/>

**ECET -2014**

  24. Which of these methods can be used to output a string in an applet ?
    - 1) display()
    - 2) print()
    - 3) drawstring()
    - 4) transient()

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  25. HTML document must always be saved with :
    - 1) .html
    - 2) .txt
    - 3) .doc
    - 4) .pdf
  26. To insert blank lines, which tags are used :
    - 1) <p>
    - 2) <bk>
    - 3) <br>
    - 4) <ba>
  27. HTML stands for :
    - 1) Hyper text marker language
    - 2) Hyper tab marker language
    - 3) High transfer markup language
    - 4) Hyper text markup language
  28. Which VB Script functions, which one is false among the following
    - 1) Variables must be declared before use
    - 2) Variables may not be declared before use
    - 3) Variables may be declared without data types
    - 4) Variables are used in VB script
  29. \_\_\_\_\_ tab enables you to view the current value of any variable or VB Script expression.
    - 1) Watch
    - 2) View
    - 3) Locate
    - 4) Current
  30. What does ASP stands for :
    - 1) All Standard Pages
    - 2) Active Server Pages
    - 3) Active Standard Pages
    - 4) A Server Page

**AP- ECET -2015**

  31. On the internet, servers are located
    - 1) in developed countries
    - 2) in USA
    - 3) anywhere
    - 4) in major cities
  32. A domain name is converted to IP address by
    - 1) DNS
    - 2) FTP
    - 3) www
    - 4) DHCP
  33. The following protects a private network from unauthorized access:
    - 1) firewall
    - 2) firewire
    - 3) https
    - 4) zip
  34. HTML uses the entity &nbsp; to insert the following in the displayed text:
    - 1) newline
    - 2) backspace
    - 3) space
    - 4) new black screen pointer
  35. The following statement declares an array with 10 elements in VB script
    - 1) <dr>
    - 2) <col>
    - 3) <img>
    - 4) <span>
  36. The following statement declares an array with

- 10 elements in VB script**
- 1) dim words [10]      2) dim woreds (9)
  - 3) dim words (10)      4) dim words (9)
- 37:** Any statement that starts with the following is treated as a comment in VB script
- 1) a slash    2) a slash followed by an asterisk
  - 3) a double quote    4) a single quote
- 38.** The output of the following code:
- ```
i=16
Do until i<15
i = i -2
response.write (i&"<br/>")
Loop
```
- 1) 13      2) 14      3) 15      4) blank
- 39.** In ASP, to move the next record in a Recordset, we use the method
- 1) next move      2) loop
  - 3) next      4) moveNext
- 40.** To access an ASP server component, first we have to
- 1) compile it      2) export the object
  - 3) edit the component
  - 4) create an object of it
- TS- ECET -2015**
- 41.** IP addresses are converted to
- 1) a hierarchy of domain names
  - 2) alphanumeric string
  - 3) a binary string
  - 4) a hexadecimal string
- 42.** A web page is located using a
- 1) uniform resource locator
  - 2) universal record linking
  - 3) universal record locator
  - 4) uniformly reachable links
- 43.** Which of the following is not a scripting language
- 1) HTML      2) XML
  - 3) javascript      4) postscript
- 44.** Hubs are present in the network
- 1) to interconnect the LAN with WANs
  - 2) to diagnose line failures, measure and manage traffic flow simplify re-configuring of LANs
  - 3) to interconnect the WANs with WANs
  - 4) to isolate intranet from internet
- 45.** HTML stands for
- 1) hyper tech markup language
  - 2) high tech markup language
  - 3) hyper text markup language
  - 4) high text markup language
- 46.** Which of the following HTML tags allows you to add a row in a table
- 1) <td>and</td>
  - 2) <br>and</br>
  - 3) <th>and</th>
  - 4) <tr> and </tr>
- 47.** Which of the following is the correct HTML tag for inserting a line break
- 1) <br>
  - 2) <lb>
  - 3) <break>
  - 4) <breakline>
- 48.** Which of the following tags is used to display pictures (i.e, images) in HTML
- 1) <GIF src = picture file>
  - 2) <PIC src = picture file>
  - 3) <GR src = picture file>
  - 4) <IMG src = picture file>
- AP- ECET -2016**
- 49.** URL stands for
- 1) uniform reservation locator
  - 2) uniform resource logic
  - 3) uniform resource locator
  - 4) both 1 and 2
- 50.** ASP. NET separates the HTML output from program logic using a feature named as
- 1) exception      2) code-behind
  - 3) code-front      4) both 1 and 3
- 51.** Find the odd one from the following tag of HTML
- 1) table      2) tr      3) td      4) form
- 52.** The first page of website is called
- 1) design page      2) home page
  - 3) first page      4) main page
- 53.** A GUI:
- 1) uses buttons, menus and icons
  - 2) should be easy for a user to manipulate
  - 3) stands for grpahic use interaction
  - 4) both 1 and 2

### TS- ECET -2016

54. A file that specifies how the screen is divided into frames is called as  
 1) frame table      2) table link  
 3) framediv        4) frameset
55. Which of the following tag helps to add a paragraph break after the text in HTML document  
 1) <PARAGRAPH>    2) <P>  
 3) <BR>            4) <NEXTLINE>
56. How to define target in new page in HTML  
 1) <a href = "http://....com/" target = "blank">clickHere</a>  
 2) <a href= "http://....com/" target = "blank">click here </a>  
 3)<a href="http//....com/" target="@blank"> click here <t/a>  
 4) <a href= "http://....com/" target = "#blank">click here</a>.
57. XLL definition is used along with XML to specify the  
 1) data type of the contents of XML document  
 2) presentation of XML document  
 3) links with other documents  
 4) structure of XML document
58. To connect database to ASP, \_\_\_ object is created in the first step  
 1) DBMS connection    2) ADO connection  
 3) ASP conection     4) ODBC connection

### AP- ECET -2017

59. What is the syntax in HTML for creating a link on a webpage  
 1) <LINK SRC = "myexams.html">  
 2) <A SRC = "myexams.html">  
 3) <BODY LINK = "myexams.html">  
 4) <A HREF = "myexams.html">
60. What is the output of the following PHP code  

```
<?php
$x=10;
$y = 20;
if($x > $y + $y !=3)
print "today";
print "today";
else
print "tomorrow";
?>
```

 1) tomorrow            2) today  
 3) error              4) no output

61. Which one is the method of connection object in ADO.Net  
 1) open()            2) new()  
 3) connection open()    4) connection start()
62. Which one of the following statements instantiates the mysqli class in PHP programming  
 1) mysqli=new mysqli()  
 2) \$mysqli=new mysqli()  
 3) \$mysqli>new. mysqli()  
 4) mysqli->new. mysqli()
63. Which of the following function is used to erase all session variables stored in the current session  
 1) session\_destroy()    2) session\_unset()  
 3) session\_change()    4) session\_remove()
64. How can you make a bulleted list with numbers  
 1) <dl>    2) <ol>    3) <list>    4) <ul>

### TS- ECET -2017

65. Which of the following is not a basic HTML document structure  
 1) title    2) body    3) head    4) footer
66. Which is not considered a JavaScript operator  
 1) new    2) this    3) delete    4) typeof
67. Which of the following attributes of the font tag is used to choose the type of font in HTML  
 1) type            2) text-type  
 3) face            4) font-type
68. The \_\_\_ filter applies transparency effects dynamically, without using a graphics editor to hard-code transparency into the image  
 1) flip            2) blur  
 3) shadow          4) chroma
69. What is the result of the following command:\$a=1 + "apple";  
 1) \$a is assigned the value "apple."    2) \$a is assigned the value 1  
 3) \$a is assigned the value "apple."    4) it is an error
70. Which of the following is not a method of the window object  
 1) alert()          2) move()  
 3) conform()        4) close()
71. What is the output of the following PHP code  

```
$a=array(2, 3, 4, 1); $x=$a[3]; $y=$a[2]; print
"y=$y x=$x ";
```

 1) y=4 x=1            2) y=2 x=4  
 3) y=1 x=4            4) y=4 x=2

AP- ECET -2018

72. Which of the following statement is true  
 1) attribute names must be in uppercase  
 2) attribute values must be quoted  
 3) attribute minimization is mandatory  
 4) attribute value must not be quoted
73. What will be the output of the following PHP code?
- ```
<?php
$color = "maroon";
$var = $color [2];
echo "$var";
?>
```
- 1) A      2) Error      3) \$ var      4) r
74. Correct HTML tag for the largest heading is  
 1) <head>      2) <h6>  
 3) <heading>      4) <h1>
75. Which one of the following functions will convert a string to all uppercase letters?  
 1) strtoupper()      2) uppercase()  
 3) str\_uppercase()      4) strupercase()
76. Which attribute is used to extend the lifetime of a cookie  
 1) higher-age      2) increase-age  
 3) max-age      4) lifetime
77. If you are using the DataSet and you have to display the data in sorted order what will you do?  
 1) use sort method of data table  
 2) use sort method of dataset  
 3) use data view object with each sort  
 4) use datapaging and sort the data
78. What are the three primary kinds of parameters?  
 1) input, integer, string      :  
 2) integer, string, datetime  
 3) int, varchar, nvarchar  
 4) input, output, inputoutput

79. Which of the following is not the method of DataAdapter  
 1) Fill      2) Schema  
 3) ReadData      4) Update
80. Which of the following method of the command object is best suited when you have aggregate functions in a SELECT statement?  
 1) executescalar      2) executereader  
 3) executeNonQuery      4) execute
81. ADO.NET provides the ability to create and process in memory databases called  
 1) views      2) relations  
 3) tables      4) datasets
- TS- ECET -2018
82. \_\_\_\_\_ is a web's native protocol  
 1) SLIP      2) TCP/IP      3) HTTP      4) PPP
83. Which of the following protocols is used for email services  
 1) SMAP      2) SMTP  
 3) SMIP      4) SMOP
84. Which of the following attributes is mandatory for image tag in HTML  
 1) align      2) border      3) hspace      4) src
85. The \_\_\_\_\_ statement is ideal when someone wants to output a blend of static text and dynamic information stored within one or several variables  
 1) echo()      2) printf()  
 3) print()      4) sprintf()
86. What is type juggling in PHP  
 1) PHP does not require explicitly type definition in a variable declaration  
 2) PHP supports automatic type casting  
 3) PHP allows mapping string to an array  
 4) PHP functions need to have data type for indexing
87. Which of the following tags is used to insert JavaScript code in HTML  
 1) <jscode>      2) <script>  
 3) <javascript>      4) <code>

88. The \_\_\_\_\_ superglobal is a catch all of sorts, recording variables passed to a script via the GET, POST and COOKIE methods.

- 1) \$GLOBALS
- 2) \$\_SESSION
- 3) \$\_ENV
- 4) \$\_REQUEST

89. The \_\_\_\_\_ function in PHP defines a constant by assigning a value to a name

- 1) define()
- 2) const()
- 3) contant()
- 4) define\_constant()

## SPACE FOR IMPORTANT NOTES

### PREVIOUS ECET BITS KEY

01-2	02-2	03-1	04-2	05-3
06-3	07-4	08-1	09-2	10-2
11-1	12-2	13-4	14-3	15-2
16-4	17-1	18-3	19-3	20-1
21-4	22-3	23-1	24-3	25-1
26-3	27-4	28-2	29-1	30-2
31-3	32-1	33-1	34-3	35-4
36-4	37-4	38-2	39-4	40-4
41-3	42-1	43-1	44-2	45-3
46-4	47-1	48-4	49-3	50-4
51-4	52-4	53-4	54-4	55-3
56-2	57-3	58-2	59-4	60-2
61-1	62-2	63-2	64-2	65-4
66-2	67-3	68-4	69-2	70-2
71-1	72-2	73-2	74-1	75-1
76-1	77-2	78-2	79-1	80-4
81-2	82-3	83-2	84-1	85-1
86-2	87-2	88-1	89-3	

**PUT YOUR FULL EFFORTS  
DON'T WORRY ABOUT  
RESULTS  
THEY ARE BOUND TO COME  
TO YOU**

