

MIZORAM PUBLIC SERVICE COMMISSION
TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO
JUNIOR GRADE OF MIZORAM ENGINEERING SERVICE
UNDER POWER & ELECTRICITY DEPARTMENT, NOVEMBER, 2015

COMPUTER SCIENCE & ENGINEERING
PAPER - II

Time Allowed : 3 hours

Full Marks : 200

Attempt all questions.

Part A - Objective Type Questions (100 Marks)

All questions carry equal marks of 2 each.

*This Part should be answered only on the **OMR Response Sheet** provided.*

1. A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem.
 - (a) One
 - (b) Two
 - (c) Three
 - (d) Four
2. The address of a page table in memory is pointed by
 - (a) stack pointer
 - (b) page table base register
 - (c) page register
 - (d) program counter
3. The following program:

```
main()
{
    if(fork()>0)
        sleep(100);
}
```

results in the creation of
 - (a) an orphan process
 - (b) a zombie process
 - (c) a process that executes forever
 - (d) None of these
4. What is the mounting of file system?
 - (a) creating of a file system
 - (b) removing portion of the file system into a directory structure
 - (c) attaching portion of the file system into a directory structure
 - (d) deleting a file system
5. A page fault occurs when
 - (a) a page gives inconsistent data
 - (b) a page cannot be accessed due to its absence from memory
 - (c) a page is invisible
 - (d) All of the above

6. The data structure used for file directory is called
 - (a) mount table
 - (b) hash table
 - (c) file table
 - (d) process table
7. A process control block does not contain
 - (a) Program counter
 - (b) Bootstrap program
 - (c) Stack
 - (d) Code
8. The part of machine level instruction, which tells the central processor what to be done is
 - (a) Operation code
 - (b) Address
 - (c) Locator
 - (d) Flip-flop
9. A system program that combines the separately compiled modules of a program into a form suitable for execution
 - (a) Assembler
 - (b) Linking loader
 - (c) Cross compiler
 - (d) None of these
10. The strategy of allowing processes that are logically runnable to be temporarily suspended is called
 - (a) Preemptive scheduling
 - (b) Non-preemptive scheduling
 - (c) Shortest job first
 - (d) FCFS
11. The LRU algorithm pages out page
 - (a) That have been used recently
 - (b) That have not been used recently
 - (c) That have least used recently
 - (d) None of these
12. Semaphore are used to solve the problems of
 - (a) Race condition
 - (b) Process synchronisation
 - (c) Mutual exclusion
 - (d) None of these
13. Round-robin scheduling
 - (a) allows interactive tasks quicker access to the processor
 - (b) gives each task the same chance at the processor
 - (c) is quite complex to implement
 - (d) allows processor-bound tasks more time in the processor
14. _____ provides a larger size of virtual memory but requires virtual memory which provides multidimensional memory.
 - (a) Paging method
 - (b) Segmentation method
 - (c) Paging and segmentation method
 - (d) None of these
15. A direct method of deadlock prevention is to prevent the occurrences of
 - (a) Mutual exclusion
 - (b) Hold and wait
 - (c) Circular waits
 - (d) No preemption
16. What is dispatch latency?
 - (a) The time taken by the dispatcher to stop one process and start another
 - (b) The time taken by the processor to write a file into disk
 - (c) The whole time taken by all processors
 - (d) None of these

17. What is the name of the technique in which the operating system of a computer executes several programs concurrently by switching back and forth between them?
- (a) Partitioning (b) Multitasking
(c) Paging (d) Timesharing
18. Which of the following gets called when an object goes out of scope?
- (a) Constructor (b) Destructor
(c) main (d) virtual function
19. What is the output of following program code?

```
#include <iostream>
using namespace std;

int fun(int=0, int=0);
int main()
{
    cout << fun(5);
    return 0;
}

int fun(int x, int y)
{
    return (x+y);
}
```

- (a) Compile error (b) 5
(c) 0 (d) 10
20. Which of the following operators cannot be overloaded?
- (a) >> (b) ? :
(c) . (d) Both (b) and (c)
21. When a base class is privately inherited by the derived class, then
- (a) protected members of the base class become private members of derived class
(b) public members of the base class become private members of derived class
(c) both (a) and (b)
(d) only (b)
22. What is use of eof()?
- (a) Returns true if a file open for reading has reached the next character.
(b) Returns true if a file open for reading has reached the next word.
(c) Returns true if a file open for reading has reached the end.
(d) Returns true if a file open for reading has reached the middle.
23. Which of the following is not a type of constructor?
- (a) Copy Constructor (b) Friend Constructor
(c) Default Constructor (d) Parameterized Constructor

24. Default constructor has
- (a) Single argument
 - (b) Multiple arguments
 - (c) No argument
 - (d) Cannot say
25. In multi-level inheritance, the middle class acts as
- (a) Base class
 - (b) Derived class
 - (c) Both (a) and (b)
 - (d) None of these
26. To have a pointer to class member it must be declared as
- (a) Public
 - (b) Private
 - (c) Protected
 - (d) All of these
27. From which stream does the program receive data?
- (a) Cin
 - (b) Cout
 - (c) Cerr
 - (d) All of these
28. In which file mode open() fails if the file already exists?
- (a) ios::trunk
 - (b) ios::nocreate
 - (c) ios::write
 - (d) ios::noreplace
29. In which method is address of object implicitly passed to the called function?
- (a) Pass-by-value
 - (b) Pass-by-reference
 - (c) Both (a) and (b)
 - (d) None of these
30. The Java compiler translates source code into
- (a) Machine code
 - (b) Assembly code
 - (c) Byte code
 - (d) JVM code
31. Polymorphism is achieved by
- (a) Overloading
 - (b) Encapsulation
 - (c) Dynamic Binding
 - (d) Overriding
32. Runtime polymorphism is achieved by
- (a) Friend function
 - (b) Virtual function
 - (c) Function overloading
 - (d) Operator overloading
33. Exception handling is targeted at
- (a) Run-time error
 - (b) Compile time error
 - (c) Logical error
 - (d) All of these
34. Assume that we have constructor functions for both base class and derived class. Now consider the declaration in main(). `Base * P = New Derived;` in what sequence will the constructor be called?
- (a) Derived class constructor followed by Base class constructor.
 - (b) Base class constructor followed by derived class constructor.
 - (c) Base class constructor will not be called.
 - (d) Derived class constructor will not be called.
35. An object is
- (a) a variable of class datatype.
 - (b) same as a class.
 - (c) just like a global variable.
 - (d) collection of data-members and member functions.

48. Random scan systems are designed for
- (a) Line drawing application
 - (b) Pixel drawing application
 - (c) Color drawing application
 - (d) None of these
49. What is the name given to the process of converting each primitive from its geometric definition into set of pixels that make up the primitive in the image space?
- (a) Rasterization
 - (b) Scan conversion
 - (c) (b) only
 - (d) Both (a) and (b)
50. Vector graphics is composed of
- (a) Pixels
 - (b) Paths
 - (c) Palette
 - (d) All of these

Part B - Short Answer Questions (100 Marks)

All questions carry equal marks of 5 each.

This Part should be answered only on the Answer Booklet provided.

1. Explain the process state transition diagram.
2. Explain how virtual memory is implemented using demand paging.
3. Two files named “Sort1” and “Sort2” contain sorted list of integers. Write a program that reads the contents of both the files and stores merged list in sorted order in a new file named “Combine”.
4. How do you distinguish a Thread from a process? What are the benefits of thread? **(2+3=5)**
5. What is a deadlock situation in multiprogramming environment? What are the conditions to create the deadlock? **(2+3=5)**
6. What do you mean by CPU scheduling? Discuss CPU/IO burst cycle.
7. A virtual memory system has 6K words of address space and 3K words of memory space. Page references are made by CPU in following sequence: 3, 2, 0, 3, 4, 1, 2, 2, 0 Find out the pages that are available at the end if the replacement algorithm used is
 - (a) LRU
 - (b) FIFO. Assume the page and block size of 1k words.
8. How is polymorphism achieved at
 - (a) Compile time
 - (b) Run time
9. Write a program to define a class STRING. Use overloaded == operator to compare 2 strings.
10. Explain the use of a destructor with the help of an example.
11. Briefly explain the need of inheritance in object oriented programming.
12. List the five rules for defining static members in a class.
13. What do you understand by visibility labels? Briefly explain.
14. Explain inline function with example.
15. What is exception handling? What are the steps for exception handling in C++? Give example.
16. Use Bresenham’s line drawing algorithm to find all points of a line between (2,0) and (6,5).
17. Write the properties of Bezier curves.
18. Define image. Explain the representation and storage of a digital image. **(1+4=5)**
19. What do you mean by aspect ratio? Discuss about Flat panel display. **(1+4=5)**
20. What is the necessity for 3D clipping and windowing algorithm? Explain any one 3D clipping algorithm.