Name of Post:	Junior Manager (Electrical/Mechanical/Civil/IT) under Assam Electricity Grid Corporation Limited (AEGCL)
Advt. No.	14/2023 dated 28.04.2023
Date of Exam.	26.11.2023

JM/AEGCL/IT/23

DO N **E ASKED TO DO SO**

Test Booklet No. : 00245

Series A

TEST BOOKLET
Paper—II
(INFORMATION TECHNOLOGY)

Time Allowed : 2 Hours **Full Marks : 100**

Read the following instructions carefully before you begin to answer the questions :

1. The name of the Subject, Roll Number as mentioned in the Admission Certificate, Test Booklet No. and Series are to be written legibly and correctly in the space provided on the Answer-Sheet with Black/Blue ballpoint pen.
2. **Answer-Sheet without marking Series as mentioned above in the space provided for in the Answer-Sheet shall not be evaluated.**
3. All questions carry equal marks.
   The Answer-Sheet should be submitted to the Invigilator.
   Directions for giving the answers : Directions for answering questions have already been issued to the respective candidates in the 'Instructions for marking in the OMR Answer-Sheet' along with the Admit Card and Specimen Copy of the OMR Answer-Sheet.
   Example :
   Suppose the following question is asked :
   The capital of Bangladesh is
   (A) Chennai
   (B) London
   (C) Dhaka
   (D) Dhubri
   You will have four alternatives in the Answer-Sheet for your response corresponding to each question of the Test Booklet as below :

   Ⓐ Ⓑ Ⓒ Ⓓ

   In the above illustration, if your chosen response is alternative (C), i.e., Dhaka, then the same should be marked on the Answer-Sheet by blackening the relevant circle with a Black/Blue ballpoint pen only as below :

   Ⓐ Ⓑ ● Ⓓ

   The example shown above is the only correct method of answering.
4. Use of eraser, blade, chemical whitener fluid to rectify any response is prohibited.
5. Please ensure that the Test Booklet has the required number of pages (16) and 100 questions immediately after opening the Booklet. In case of any discrepancy, please report the same to the Invigilator.
6. No candidate shall be admitted to the Examination Hall/Room 20 minutes after the commencement of the examination.
7. No candidate shall leave the Examination Hall/Room without prior permission of the Supervisor/Invigilator. No candidate shall be permitted to hand over his/her Answer-Sheet and leave the Examination Hall/Room before expiry of the full time allotted for each paper.
8. No Mobile Phone, Electronic Communication Device, etc., are allowed to be carried inside the Examination Hall/Room by the candidates. Any Mobile Phone, Electronic Communication Device, etc., found in possession of the candidate inside the Examination Hall/Room, even if on off mode, shall be liable for confiscation.
9. No candidate shall have in his/her possession inside the Examination Hall/Room any book, notebook or loose paper, except his/her Admission Certificate and other connected papers permitted by the Commission.
10. Complete silence must be observed in the Examination Hall/Room. No candidate shall copy from the paper of any other candidate, or permit his/her own paper to be copied, or give, or attempt to give, or obtain, or attempt to obtain irregular assistance of any kind.
11. This Test Booklet can be carried with you after answering the questions in the prescribed Answer-Sheet.
12. Noncompliance with any of the above instructions will render a candidate liable to penalty as may be deemed fit.
13. No rough work is to be done on the OMR Answer-Sheet. You can do the rough work on the space provided in the Test Booklet.

N.B. : There will be negative marking @ 0·25 per 1 (one) mark against each wrong answer.

SEAL

[No. of Questions : 100]

1. Which keyword is used to define a class in C++?

(A) Class

(B) Struct

(C) Object

(D) Typedef

2. Which of the following OOP features allows for the reuse of previously written code?

(A) Encapsulation

(B) Inheritance

(C) Abstraction

(D) Polymorphism

3. To use the OOPs paradigm, which header file is required by the C++ programming language?

(A) iostream.h

(B) stdio.h

(C) stdlib.h

(D) OOPs concepts can be implemented in C++ programs without a header file

4. In C++, object uses _____ operator to access the members.

(A) .

(B) *

(C) ::

(D) →

5. What will be the output of the following program?

```
#include<iostream.h>
using namespace.std;
int main( ){
  int i; char arr[30];
    for(i=0; i<6; i++)
          *(arr+i) = 65+i;
    *(arr+i) = ' ';
    cout<<arr;
  return(0);
}
```

(A) AAAAAA

(B) ABCDEF

(C) Error

(D) None of the above

6. Which of the following statements is/are false?

Statement—I :

In the object-oriented programming language, all function calls are resolved at compile time.

Statement—II :

In the procedural programming language, all function calls are resolved at compile time.

(A) Only I

(B) Only II

(C) Both I and II

(D) Neither I nor II

7. Identify the process of defining multiple functions with the same name but different parameters in a class.

(A) Function inheritance

(B) Function encapsulation

(C) Function overloading

(D) Function overriding

8. Identify the access specifier used to declare members that are accessible only within the class itself.

(A) Public

(B) Private

(C) Protected

(D) Internal

9. Identify the function that is automatically invoked when an object is created.

(A) Allocator

(B) Initializer

(C) Constructor

(D) Destructor

10. Which of the following statements is/are true?

Statement—I :

In DBMS, DDL is used to create and modify the structure of objects in a database.

Statement—II :

In DBMS, DCL is used for accessing and manipulating data in a database.

(A) Only I

(B) Only II

(C) Both I and II

(D) Neither I nor II

11. An attribute that has more than one value for a particular entity is

(A) composite attribute

(B) key attribute

(C) multivalued attribute

(D) derived attribute

12. The relation STUDENT_DETAILS has 8 attributes out of which Roll_No and Reg_No always take unique values. Therefore these two attributes are _____ keys as they both are candidates for _____ key.

(A) primary, candidate

(B) composite, primary

(C) candidate, composite

(D) candidate, primary

13. Which of the following factors must be considered while creating a table in SQL?

(A) Default value

(B) Primary key

(C) Data types

(D) All of the above

14. Which type of join returns only the rows that have matching values in both tables being joined?

(A) Inner join

(B) Outer join

(C) Left join

(D) Right join

15. What is the process of combining tables based on a related column between them called?

(A) Aggregation

(B) Normalization

(C) Joins

(D) Indexing

16. Identify the process of reducing data redundancy in a database system.

(A) Normalization

(B) Denormalization

(C) Indexing

(D) Partitioning

17. Data in a database at a particular moment in time is called

(A) current set of occurring

(B) database instance

(C) snapshot

(D) All of the above

18. The attribute which is ***not*** the part of any candidate key is called

(A) prime attribute

(B) non-prime attribute

(C) atomic attribute

(D) composite attribute

19. Which of the following is an example of single-user single-tasking operating system?

(A) Windows

(B) Linux

(C) MS-DOS

(D) macOS

20. A page fault occurs due to

(A) the deadlock

(B) the page present in memory

(C) the page not present in memory

(D) None of the above

21. Which of the following statements is true in terms of deadlock?

(A) A condition where each process is terminated and started again.

(B) A condition where each process is blocked and waiting for others to release resources.

(C) A condition where each process is blocked except the child process.

(D) A condition where each process is ready to be executed one-by-one.

22. There is a component of operating system (OS) which is responsible for managing memory resources. Identify it.

(A) Kernel

(B) Scheduler

(C) File system

(D) Memory manager

23. Which scheduling algorithm ensures that each process gets an equal amount of CPU time?

(A) Round Robin (RR)

(B) First Come First Served (FCFS)

(C) Shortest Job Next (SJN)

(D) Shortest Remaining Time Next (SRTN)

24. The purpose of using virtual memory in an operating system is

(A) to increase CPU speed

(B) to expand the physical memory capacity

(C) to protect the OS from malware

(D) to manage peripheral devices

25. What is the full form of FAT?

(A) File Attribute Table

(B) File Allocation Table

(C) Font Allocation Table

(D) Format Allocation Table

26. The size of virtual memory is based on

(A) CPU

(B) RAM

(C) address bus

(D) data bus

27. Which one of the following errors will be handled by an operating system?

(A) Lack of paper in printer

(B) Connection failure in the network

(C) Power failure

(D) All of the above

28. Identify the data structure which follows the Last In First Out (LIFO) principle.

(A) Queue

(B) Stack

(C) Linked list

(D) Tree

29. Which of the following data structures allows deletion at both ends of the list but insertion at only one end?

(A) Circular queue

(B) Priority queue

(C) Output-restricted dequeue

(D) Input-restricted dequeue

30. Which of the following sorting algorithms is based on the divide-and-conquer strategy?

(A) Shell sort

(B) Quicksort

(C) Heap sort

(D) Merge sort

31. The worst-case time complexity of the linear search algorithm is

(A) $O(1)$

(B) $O(\log n)$

(C) $O(n)$

(D) $O(n \wedge 2)$

32. What happens if a POP operation is performed on an empty stack?

(A) Stack overflow error will occur

(B) Stack underflow error will occur

(C) The top element is removed and returned

(D) The stack remains unchanged

33. Find the data structure which represents a collection of elements with no particular order.

(A) Stack

(B) Queue

(C) Array

(D) Set

34. Which data structure type is used to represent a hierarchical structure with a set of connected nodes?

(A) Graph

(B) Tree

(C) Stack

(D) Heap

35. Identify the data structure which provides FIFO access to elements.

(A) Stack

(B) Heap

(C) Queue

(D) Hash table

36. Which data structure represents a collection of interconnected nodes with no specific starting point?

(A) Tree

(B) Graph

(C) Stack

(D) Queue

37. A microprocessor consists of

(A) ALU

(B) control unit

(C) register array

(D) All of the above

38. The maximum number of different addresses that can be addressed by the address bus of 8085 is

(A) 2^8

(B) 2^16

(C) 2^32

(D) None of the above

39. The instruction JNC 16-bit refers to jump to a 16-bit address if

(A) carry flag is reset

(B) carry flag is set

(C) parity flag is reset

(D) zero flag is set

40. With reference to the 8085 microprocessor, which of the following statements are correct?

Statement—I :

INR is 1-byte instruction.

Statement—II :

OUT is 2-byte instruction.

Statement—III :

STA is 3-byte instruction.

(A) I and II only

(B) II and III only

(C) I and III only

(D) I, II and III

41. While a program is being executed in the 8085 microprocessor, the program counter (PC) of the microprocessor contains

(A) the memory address of the instruction that is being currently executed

(B) the memory address of the instruction that is to be executed next

(C) the number of instructions that have already been executed

(D) the total number of instructions in the current program still to be executed

42. Identify the addressing mode which is used when the operand is specified directly in the instruction.

(A) Immediate addressing

(B) Direct addressing

(C) Indirect addressing

(D) Register addressing

43. Which instruction is used to transfer control to a subroutine in assembly language?

(A) JMP

(B) CALL

(C) RET

(D) LOOP

44. Identify the addressing mode which is used when the operand is specified through a memory address stored in a register.

(A) Immediate addressing

(B) Direct addressing

(C) Indirect addressing

(D) Register addressing

45. Identify the instruction which is used to store a value from a register to memory in assembly language programming.

(A) MOV

(B) LOAD

(C) STORE

(D) PUSH

46. The role of a DNS server in computer networking is

(A) to provide wireless access to device on a network

(B) to forward data packet between different networks

(C) to convert domain name into IP address

(D) to manage and assign IP addresses to devices on a network

47. Which of the following is ***not*** a type of network topology?

(A) Circuit

(B) Star

(C) Mesh

(D) Bus

48. Which networking device operates at the physical layer of the OSI model?

(A) Switch

(B) Router

(C) Hub

(D) Repeater

49. Which of the following protocols is used for secure communication over the Internet?

(A) HTTP

(B) FTP

(C) HTTPS

(D) SMTP

50. The purpose of subnetting in computer networking is

(A) to extend the range of available IP address

(B) to increase the security of a network

(C) to manage and assign IP addresses to devices on a network

(D) to split a large network into smaller networks

51. Which layer of OSI model is responsible for ensuring reliable end-to-end communication between application on different hosts?

(A) Network layer

(B) Transport layer

(C) Presentation layer

(D) Application layer

52. Which protocol is commonly used to retrieve e-mail from a mail server?

(A) SMTP

(B) POP3

(C) HTTP

(D) FTP

53. Find the layer of the OSI model that is responsible for the transmission of raw data between devices.

(A) Data-link layer

(B) Network layer

(C) Physical layer

(D) Transport layer

54. Which networking device operates at the data-link layer of the OSI model and forwards data based on MAC address?

(A) Router

(B) Hub

(C) Switch

(D) Repeater

55. Which device is used to amplify and regenerate network signals to extend the range of a network?

(A) Router

(B) Hub

(C) Repeater

(D) Switch

56. Which principle(s) is/are used in the digitization of multimedia content?

I : Quantization

II : Sampling

(A) Only I

(B) Only II

(C) Both I and II

(D) Neither I nor II

57. What is the purpose of synchronization in multimedia presentation?

(A) To ensure proper coordination between audio and video elements

(B) To enhance the visual quality of images and videos

(C) To compress multimedia files for efficient storage

(D) To convert multimedia data into different file formats

58. AM stations are allowed carrier frequencies anywhere between

(A) 55–150 kHz

(B) 350–1200 kHz

(C) 530–1700 kHz

(D) 750–2500 kHz

59. If an image has a width of 4 inches and an aspect ratio of 3 : 2, then what is its height?

(A) $\frac{16}{3}$ inches

(B) $\frac{8}{3}$ inches

(C) $\frac{2}{3}$ inch

(D) $\frac{4}{3}$ inches

60. What small program can be embedded inside a GIF (Graphics Interchange Format) image?

(A) Web bug

(B) Cookie

(C) Spyware application

(D) Spam

61. Which of the following describes the quality of sound that distinguishes it from other sounds of the same pitch and loudness?

(A) Amplitude

(B) Frequency

(C) Timbre

(D) Phase

62. Which file format is commonly used for compressing and storing audio files?

(A) MP3

(B) GIF

(C) JPEG

(D) WAV

63. In an HTML document, the correct sequence of the tags for starting a Web page is

(A) HTML, Head, Title, Body

(B) HTML, Title, Head, Body

(C) Head, Title, HTML, Body

(D) HTML, Body, Title, Head

64. Which programming language is used to define the structure and presentation of Web content?

(A) JavaScript

(B) HTML

(C) CSS

(D) PHP

65. Identify the type of memory which is non-volatile and retains data even when the power is turned off.

(A) RAM

(B) Cache memory

(C) ROM

(D) Register

66. Which of the following uses a small set of simple instructions?

(A) RISC

(B) CISC

(C) MIPS

(D) ARM

67. Which component of a CPU is responsible for temporarily storing intermediate calculation results?

(A) Control unit

(B) ALU

(C) Register

(D) Cache memory

68. Identify the computer memory which has the fastest access time but the smallest storage capacity.

(A) ROM

(B) RAM

(C) Cache memory

(D) Hard disk

69. Computer address bus is

(A) unidirectional

(B) bidirectional

(C) multidirectional

(D) None of the above

70. A combinational logic circuit that is used when it is desired to send data from two or more sources through a single transmission line is known as

(A) encoder

(B) multiplexer

(C) decoder

(D) demultiplexer

71. Which of the following statements about memory and storage is correct?

(A) Memory is slow, storage is fast.

(B) Memory is fast, storage is slow.

(C) Memory is permanent, storage is temporary.

(D) Memory is temporary, storage is permanent.

72. Which of the following gates are known as universal gates?

(A) NAND, NOR

(B) NOT, AND

(C) NAND, NOR and AND

(D) XOR, OR

73. A 16-bit register consists of

(A) 8 flip-flops

(B) 32 flip-flops

(C) 16 flip-flops

(D) 12 flip-flops

74. Which memory organization scheme divides the main memory into fixed-size blocks and uses a page table for address translation?

(A) Segmentation

(B) Paging

(C) Virtual memory

(D) Cache memory

75. How many bits are required to represent a single hexadecimal digit?

(A) 2 bits

(B) 4 bits

(C) 8 bits

(D) 16 bits

76. What is the decimal equivalent of the octal number $(575)_8$?

(A) $(381)_{10}$

(B) $(454)_{10}$

(C) $(556)_{10}$

(D) $(55)_{10}$

77. What is the hexadecimal equivalent of the binary number $(101010)_2$?

(A) A

(B) B

(C) 2A

(D) 32

93. Which component on the mother-board stores the firmware and system settings of the computer?

(A) BIOS

(B) RAM

(C) CPU

(D) GPU

94. Which interface is commonly used for transmitting high quality audio and video signals between devices such as from a blue-ray player to a TV?

(A) USB

(B) HDMI

(C) VGA

(D) Ethernet

95. What is the purpose of defragmenting a hard drive?

(A) To optimize the file storage and improve system performance

(B) To remove malware and viruses from the computer

(C) To clean up temporary files and free up disk space

(D) To update the device drivers for better compatibility

96. What is the purpose of updating device drivers on a laptop?

(A) To extend the battery life of a laptop

(B) To optimize the network connection speed

(C) To improve the compatibility and performance of hardware devices

(D) To remove unwanted software and toolbars from the browser

97. When a peripheral device needs immediate attention from the operating system, it generates

(A) spool

(B) page file

(C) interrupt

(D) stack

98. _____ is also called the visual or logical architecture as it tells us how the data are organized in a database.

(A) Data dictionary

(B) Data instance

(C) Data constraint

(D) Data schema

99. The purpose of inter-process communication (IPC) in an operating system is

(A) to enable the concurrent execution of multiple processes

(B) to manage the execution of multiple threads within a process

(C) to allocate resources fairly and effectively among processes

(D) to facilitate communication and data sharing between processes

100. Which architectural design enables the CPU to execute multiple threads concurrently within a single process?

(A) Pipelining

(B) Superscalar

(C) Multithreading

(D) Multiprocessing

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

SEAL

★★★