

**P.G./INTEGRATED P.G. ENTRANCE EXAMINATION, APRIL 2023****MASTER OF COMPUTER APPLICATION (MCA)**

Time : Two Hours

Maximum : 400 Marks

*Each answer carries 4 marks.**1 mark will be deducted for each wrong answer.*

1. Which of the following delays is faced by the packet traveling from one end system to another ?
  - (A) Propagation delay.
  - (B) Queuing delay.
  - (C) Transmission delay.
  - (D) All of the mentioned.
2. Two devices are in-network if \_\_\_\_\_.
  - (A) A process in one device is able to exchange information with a process in another device.
  - (B) A process is running on both devices.
  - (C) PIDs of the processes running on different devices are the same.
  - (D) A process is active and another is inactive.
3. The length of an IPv6 address is ?
  - (A) 32 bits.
  - (B) 64 bits.
  - (C) 128 bits.
  - (D) 256 bits.
4. Which of the following is true with regard to the ping command ?
  - (A) Ping stands for Packet Internet Generator.
  - (B) The ping command checks the port level connectivity between source destinations end points.
  - (C) Ping summarizes the packet loss and round-trip delay between two IP end points.
  - (D) The ping command activates the RARP protocol of the IP layer.
5. The private key in asymmetric key cryptography is kept by ?
  - (A) Sender.
  - (B) Receiver.
  - (C) Sender and Receiver.
  - (D) None of the these.

**Turn over**

6. Why the following statement is erroneous ?

```
SELECT dept_name ID avg salary
FROM instructor
GROUP BY dept_name ;
```

- (a) Dept\_id should not be used in group by clause.
- (b) Group by clause is not valid in this query.
- (c) Avg (salary) should not be selected.
- (d) None.

7. A primary key if combined with a foreign key creates :

- (A) Parent-Child relationship between the tables that connect them.
- (B) Many to many relationships between the tables that connect them.
- (C) Network model between the tables that connect them.
- (D) None of the above.

8. \_\_\_\_\_ is a set of column that identifies every row in a table.

- (A) Composite key.
- (B) Candidate key.
- (C) Foreign key.
- (D) Super key.

9. Which of the following is/are the DDL statements ?

- (A) Create.
- (B) Drop.
- (C) Alter.
- (D) All of the above.

10. Which can be used to delete all the rows if a table ?

- (A) Delete \* from table\_name
- (B) Delete from table\_name.
- (C) Delete table\_name.
- (D) all rows cannot be deleted at a time.

11. There are \_\_\_\_\_ general purpose registers in 8085 processor
- (A) 5. (B) 6.  
(C) 7. (D) 8.
12. What is true about microprocessor ?
- (A) Microprocessor is a controlling unit of a micro-computer.  
(B) It is fabricated on a small chip capable of performing ALU (Arithmetic Logical Unit) operations.  
(C) It also communicate with the other devices connected to it.  
(D) All of the above.
13. It determines the number of operations per second ?
- (A) Bandwidth. (B) Word Length.  
(C) Clock Speed. (D) Operations Speed.
14. Which of the following is not a CISC processors ?
- (A) IBM 370/168. (B) Dell 5435.  
(C) Intel 80486. (D) VAX 11/780.
15. At what PIN number there is a RESET pin, which is used to reset the microcontroller to its initial values ?
- (A) PIN 9. (B) B. PIN 20.  
(C) C. PIN 30. (D) D. PIN 35.
16. The addition of a neutron to the nucleus of an atom :
- (A) Increases the atomic mass of the atom.  
(B) Decreases the atomic mass of the atom.  
(C) Increases the charge on the nucleus.  
(D) Decreases the charge on the nucleus
17. Which of the following statements regarding natural radioactivity is true ?
- (A) It is spontaneous disintegration of atoms.  
(B) It is induced by bombardment with projectiles.  
(C) It is transmutation of atoms with projectiles.  
(D) It is dependent on temperature.

Turn over

18. Internal energy of the elements is assigned a value of \_\_\_\_\_ cal per mole at standard states.
- (A) 5. (B) 7.  
(C) 77. (D) 0.
19. The enthalpy of the elements in their standard states is taken as zero. So the enthalpy of formation of a compound may be :
- (A) Negative. (B) Positive.  
(C) Zero. (D) Negative or positive.
20.  $K_2O + H_2O \rightarrow$
- (A)  $K(OH)_3$ . (B) KOH.  
(C)  $KOH.H_2O$ . (D)  $KO + H_2 + O_2$ .
21. Soda water ( $H_2CO_3(aq)$ ) has a pH of :
- (A) 1. (B) 2.  
(C) 3. (D) 4.
22. Consider equation  $ZnO + NaOH + H_2O \rightarrow Na_2Zn(OH)_4$ . Moles of  $H_2O$  required to balance equation would be :
- (A) 3. (B) 5.  
(C) 1. (D) 2.
23. When there is a link between product and reactant with a transfer of proton that pair is called :
- (A) Acid pair. (B) Proton pair.  
(C) Conjugate pair. (D) Base pair.
24. Carboxylic acids produce salt plus water by reacting with :
- (A) Acids. (B) Bases.  
(C) Alkalis. (D) Water.
25. Phenolphthalein changes color in :
- (A) Acids. (B) Alkalis.  
(C) Water. (D) Salt solutions.

26. The mass and energy equivalent to 1 a.m.u. respectively are :
- (A)  $1.67 \times 10^{-27}$  g, 9.30 MeV.      (B)  $1.67 \times 10^{-27}$  kg, 930 MeV.  
(C)  $1.67 \times 10^{-27}$  kg, 1 MeV.      (D)  $1.67 \times 10^{-34}$  kg, 1 MeV
27. Number of electrons that constitute one ampere of current is :
- (A)  $265 \times 10^{16}$ .      (B)  $625 \times 10^{12}$ .  
(C)  $4.8 \times 10^{10}$ .      (D)  $625 \times 10^{16}$ .
28. When a body is projected upwards :
- (A) The time for the upward journey and downward journey are the same.  
(B) The upward journey takes more time.  
(C) The downward journey takes more time.  
(D) Can't be said.
29. The period of a geostationary (synchronous) satellite orbiting the earth over the equator is :
- (A) 16 hours.      (B) 12 hours.  
(C) 20 hours.      (D) 24 hours.
30. The motion of the pendulum of a wall clock is an example of :
- (A) Linear motion.      (B) Rotational motion.  
(C) Vibratory motion.      (D) None of the above.
31. The current carried in a PNP transistor is :
- (A) Free electrons.      (B) Acceptor ions.  
(C) Donor ions.      (D) Holes.
32. An inverter gate can be developed using :
- (A) Two diodes.  
(B) Resistance and capacitance.  
(C) Transistor.  
(D) Inductance and capacitance.

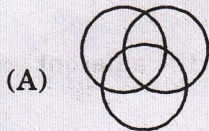
Turn over

33. An EMF source of 8.0 V is connected to a purely resistive electrical appliance. An electric current of 2.0 A flows through it. What is the resistance offered by the electrical appliances ?
- (A) 4 ohm. (B) 6 ohm.  
(C) 2 ohm. (D) 3 ohm.
34. Which of the following statements is true about inertia ?
- (A) Inertia is the property of a body by virtue of which the body is unable to change by itself the state of rest.  
(B) Inertia is the property of a body by virtue of which the body is able to change by itself the state of rest.  
(C) Inertia is the property of a body by virtue of which the body is unable to change by itself the direction of motion.  
(D) Inertia is the property of a body by virtue of which the body is unable to change by itself the state of rest and uniform Linear motion.
35. Photocell is a device to :
- (A) Store photons.  
(B) Measure light intensity.  
(C) Convert photon energy into mechanical energy.  
(D) Store electrical energy for replacing storage batteries.
36. Statements: Some actors are singers. All the singers are dancers.  
Conclusions :
- (I) Some actors are dancers.  
(II) No singer is actor.
- (A) Only (I) conclusion follows. (B) Only (II) conclusion follows.  
(C) Either (I) or (II) follows. (D) Both (I) and (II) follow.
37. Introducing a boy, a girl said, "He is the son of the daughter of the father of my uncle". How is the boy related to the girl ?
- (A) Son-in-law. (B) Nephew.  
(C) Uncle. (D) Brother.

38. Complete the series :

ATTRIBUTION, TTRIBUTIO, RIBUTIO, IBUTI, ?

- (A) IBU. (B) UT.  
(C) UTI. (D) BUT.
39. A, B, C, D and E are sitting on a bench, A is sitting next to B, C is sitting next to D, D is not sitting with E who is on the left end of the bench. C is on the second position from the right. A is to the right of B and E. A and C are sitting together. In which position A is sitting ?
- (A) Between B and D. (B) Between B and C.  
(C) Between E and D. (D) Between C and E.
40. If South-East becomes North, North-East becomes West and so on. What will West become ?
- (A) North-East. (B) North-West.  
(C) South-East. (D) South-West.
41. A number of friends decided to go on a picnic and planned to spend Rs. 96 on eatables. Four of them, however, did not turn up. As a consequence, the remaining ones had to contribute Rs. 4 each extra. The number of those who attended the picnic was :
- (A) 12. (B) 8.  
(C) 6. (D) 11.
42. Which of the following diagrams indicates the best relation between Elephant, Carnivorous and Tiger ?



43. Question : How many children does M have ?

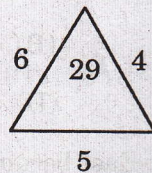
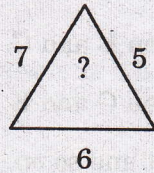
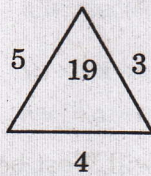
Statements :

- I. H is the only daughter of X who is wife of M.  
II. K and J are brothers of M.

Turn over

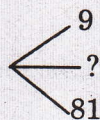
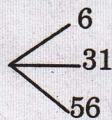
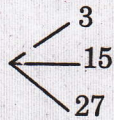
- (A) I alone is sufficient while II alone is not sufficient.  
 (B) II alone is sufficient while I alone is not sufficient.  
 (C) Either I or II is sufficient.  
 (D) Neither I nor II is sufficient.

44. Which one will replace the question mark ?



- (A) 25. (B) 37.  
 (C) 41. (D) 47.

45. Which one will replace the question mark ?



- (A) 45. (B) 41.  
 (C) 32. (D) 40.

46. Which traversal process all of the vertex descendants before we move to the adjacent vertex ?

- (A) Depth first. (B) Breadth first.  
 (C) Depth limited. (D) Width first.

47. Herder node is used as sentinel in \_\_\_\_\_.

- (A) Queues. (B) Stacks.  
 (C) Graphs. (D) Binary tree.

48. One can convert a binary tree into its mirror image by traversing it in \_\_\_\_\_.

- (A) Postorder. (B) Preorder.  
 (C) Inorder. (D) None of the above.

49. What is the worst-case run-time complexity of the binary search algorithm ?
- (A) A -  $O(n^2)$ . (B) B -  $O(n \log n)$ .  
 (C) C -  $O(n^3)$ . (D) D -  $O(n)$ .
50. Minimum number of spanning tree in a connected graph is :
- (A)  $n$ . (B)  $n^n - 1$ .  
 (C) 0. (D) 1.
51. Which one of the following is not a real time operating system ?
- (A) RTLinux. (B) Palm OS.  
 (C) QNX. (D) VxWorks.
52. The FCFS algorithm is particularly troublesome for \_\_\_\_\_.
- (A) Operating systems.  
 (B) Multiprocessor systems.  
 (C) Time sharing systems.  
 (D) Multiprogramming systems.
53. On systems where there are multiple operating system, the decision to load a particular one is done by \_\_\_\_\_.
- (A) Process control block. (B) File control block.  
 (C) Boot loader. (D) Bootstrap.
54. 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.

- (A) The waiting time for process P1 is 3 ms.  
 (B) The waiting time for process P1 is 0 ms.  
 (C) The waiting time for process P1 is 16 ms.  
 (D) The waiting time for process P1 is 9 ms.

Turn over

55. To avoid the race condition, the number of processes that may be simultaneously inside their critical section is :

- (A) 8. (B) 1.  
(C) 16. (D) 0.

56. Which of the following is not the member of class ?

- (A) Static function. (B) Friend function.  
(C) Const function. (D) Virtual function.

57. Which operator cannot be overloaded ?

- (A) +. (B) -.  
(C) \*. (D) ::.

58. What happens if the following C++ statement is compiled and executed ?

```
int *ptr = NULL ;
```

```
delete ptr;
```

- (A) The program is not semantically correct.  
(B) The program is compiled and executed successfully.  
(C) The program gives a compile-time error.  
(D) The program compiled successfully but throws an error during run-time.

59. Which is more effective while calling the C++ functions ?

- (A) Call by object. (B) Call by pointer.  
(C) Call by value. (D) Call by reference.

60. What is abstract class in C++ ?

- (A) Any Class in C++ is an abstract class.  
(B) Class from which any class is derived.  
(C) Class specifically used as a base class with atleast one virtual functions.  
(D) Class specifically used as a base class with atleast one pure virtual functions.

61. What are the variables whose calculation is done according to the weight, height, and length known as ?
- (A) Flowchart variables. (B) Discrete variables.  
(C) Continuous variables. (D) Measuring variables.
62. A problem in mathematics is given to three students A, B and C. If the probability of A solving the problem is  $1/2$  and B not solving it is  $1/4$ . The whole probability of the problem being solved is  $63/64$  then what is the probability of solving it ?
- (A)  $1/8$ . (B)  $1/64$ .  
(C)  $7/8$ . (D)  $1/2$ .
63. If A and B are two mutually exclusive events with  $P(\bar{A}) = 5/6$  and  $P(B) = 1/3$  then  $P(A/\bar{B})$  is equal to \_\_\_\_\_.
- (A)  $1/4$ . (B)  $1/2$ .  
(C) 0, since mutually exclusive. (D)  $5/18$ .
64. What is the probability of an impossible event ?
- (A) 0. (B) 1.  
(C) Not defined. (D) Insufficient data.
65. For larger values of 'n', Binomial Distribution \_\_\_\_\_.
- (A) Loses its discreteness. (B) Tends to Poisson Distribution.  
(C) Stays as it is. (D) Gives oscillatory values.
66. If 'm' is the mean of a Poisson Distribution, then variance is given by \_\_\_\_\_.
- (A)  $m^2$ . (B)  $m^{1/2}$ .  
(C) m. (D)  $m/2$ .
67. The statistic used for estimating a parameter of a population is called :
- (A) Estimator. (B) Estimate.  
(C) Both (A) and (B). (D) Neither (A) nor (B).

Turn over

68. Branch of statistical inference which assumes that the underlying population distribution is known as :
- (A) Parametric statistical inference.
  - (B) Non-parametric statistical inference.
  - (C) Distribution free methods.
  - (D) All the above.
69. For two unbiased estimators  $T_1$  and  $T_2$ , if  $V(T_1) > V(T_2)$ , then :
- (A)  $T_1$  is more efficient than  $T_2$ .
  - (B)  $T_2$  is more efficient than  $T_1$ .
  - (C)  $T_1$  and  $T_2$  are equally efficient.
  - (D) None of the above.
70. To test if the given normal population has a specified variance, we make use of :
- (A) Z - test.
  - (B)  $t$  - test.
  - (C) F - test.
  - (D)  $\chi^2$  -test
71. If  $x$  is a set and the set contains an integer which is neither positive nor negative then the set  $x$  is \_\_\_\_\_.
- (A) Set is Empty.
  - (B) Set is Non-empty.
  - (C) Set is Finite..
  - (D) Set is both Non- empty and Finite.
72. If  $x \in \mathbb{N}$  and  $x$  is prime, then  $x$  is \_\_\_\_\_ set.
- (A) Infinite set.
  - (B) Finite set.
  - (C) Empty set.
  - (D) Not a set.
73. What is the Cartesian product of set A and set B, if the set  $A = \{1, 2\}$  and set  $B = \{a, b\}$  ?
- (A)  $\{(1, a), (1, b), (2, a), (b, b)\}$ .
  - (B)  $\{(1, 1), (2, 2), (a, a), (b, b)\}$ .
  - (C)  $\{(1, a), (2, a), (1, b), (2, b)\}$ .
  - (D)  $\{(1, 1), (a, a), (2, a), (1, b)\}$ .
74. Convert the set  $x$  in roster form if set  $x$  contains the positive prime number, which divides 72.
- (A)  $\{\emptyset\}$ .
  - (B)  $\{2, 3\}$ .
  - (C)  $\{2, 3, 7\}$ .
  - (D)  $\{3, 5, 7\}$ .

75. A line which cuts a pair of parallel lines is called :
- (A) Tangent. (B) Chord.  
(C) Traversal. (D) Intersector.
76. An amount of Rs. 10,000 becomes Rs. 20,736 in 2 years. If the rate of interest is compounded half yearly, what is the annual rate of interest ?
- (A) 25 %. (B) 20 %.  
(C) 40 %. (D) 30 %.
77.  $4950/6 + 112 \times 1.75 = ? \times 2$  :
- (A) 510.5. (B) 505.2.  
(C) 515.5. (D) None of the above.
78. If  $P^x = Q^y = R^z$  and  $Q/P = R/Q$ , then  $2z/(x+z) = ?$
- (A)  $y/z$ . (B)  $y/x$ .  
(C)  $x/y$ . (D)  $z/y$ .
79. A, B and C can complete a piece of work in 14, 6 and 12 days respectively. Working together, they will complete the work in :
- (A) 19/9 days. (B) 27 days.  
(C) 28/9 days. (D) 25/8 days.
80. Consider  $\triangle ABD$  such that angle  $ADB = 20^\circ$  and C is a point on BD such that  $AB = AC$  and  $CD = CA$ . Then the measure of angle ABC is :
- (A)  $30^\circ$ . (B)  $40^\circ$ .  
(C)  $45^\circ$ . (D)  $60^\circ$ .
81.  $4^2 + |4| + |-4| - 4^2 = ?$
- (A) -4. (B) 0.  
(C) 4. (D) 8.
82.  $\sqrt[1]{\sqrt{64}} = ?$
- (A)  $\sqrt{2}$ . (B) 2.  
(C) 4. (D) 8.

Turn over

83. If  $a = b$  and  $b = c$ , then  $a = c$ . This property is called ?  
(A) Reflexive. (B) Transitive.  
(C) Trichotomy. (D) Symmetric.
84. If  $x^2 + 1 = 0$ , then  $x = ?$   
(A) 1. (B)  $i$ .  
(C)  $\pm 1$ . (D)  $\pm i$ .
85. What is the 31<sup>st</sup> term of the sequence: 1, 4, 7, 10, \_\_\_\_\_ ?  
(A) 90. (B) 91.  
(C) 92. (D) 93.
86. If  $2^x = 32$ , then  $x = ?$   
(A) 2. (B) 3.  
(C) 4. (D) 5.
87. The line  $y = mx + c$  intersects the circle  $x^2 + y^2 = a^2$  at the most of \_\_\_\_\_ points.  
(A) 1. (B) 2.  
(C) 3. (D) 4.
88. The perpendicular distance from the point  $(3, -4)$  to the line  $3x^2 - 4x + 10 = 0$ .  
(A) 7. (B) 8.  
(C) 9. (D) 10.
89.  $n(n-1) \times \dots \times 3 \times 2 \times 1 = ?$   
(A)  $n!$ . (b)  ${}^n C_r$ .  
(B)  ${}^n P_r$ . (D)  $n$ .
90. If  $f(x) = 10^x$  then  $f^{-1}(x) = ?$   
(A)  $e^x$ . (B)  $\ln x$ .  
(C)  $\log x$ . (D)  $10e^x$ .

91. For a certain distribution, if  $\sum(X - 20) = 25$ ,  $\sum(X - 25) = 0$ , and  $\sum(X - 35) = -25$ , then is equal to :
- (A) 20. (B) 25.  
(C) 35. (D) -20.
92. The  $n^{\text{th}}$  term of an arithmetic progression  $a + (a + d) + (a + 2d) + \dots$  is
- (A)  $a + nd$ . (B)  $a + (n - 1)d$ .  
(C)  $a + (n + 1)d$ . (D)  $2a + (n + 1)d$ .
93. The proposition  $\sim p \vee (p \vee q)$  is a :
- (A) Tautology. (B) Contradiction.  
(C) Logical equivalence. (D) None of the above.
94. A vector field with a vanishing curl is called as \_\_\_\_\_.
- (A) Irrotational. (B) Solenoidal.  
(C) Rotational. (D) Cycloidal.
95. Vector Analysis was discovered by :
- (A) Sir James Chadwick  
1. Sir Willard Gibbs.  
2. Sir Anaximander.  
3. Sir Ehzebeth Friedmann.
- (A) For two invertible matrices A and B of suitable orders, the value of  $(AB)^{-1}$  is :
- (A)  $(BA)^{-1}$ . (B)  $B^{-1}A^{-1}$ .  
(C)  $A^{-1}B^{-1}$ . (D)  $(AB^T)^{-1}$ .
96. The matrix product  $AB = O$ , then :
- (A)  $A = O$  and  $B = O$ . (B)  $A = O$  or  $B = O$ .  
(C) A is null matrix. (D) None of these.

Turn over

97. The number of solution of the following equations  $x_2 - x_3 = 1$ ,  $-x_1 + 2x_3 = -2$ ,  $x_1 - 2x_2 = 3$  is :
- (A) Zero. (B) One.  
(C) Two. (D) Infinite.
98. Which of the following is not true ?
- (A) Every skew-symmetric matrix of odd order is non-singular.  
(B) If determinant of a square matrix is non-zero, then it is non-singular.  
(C) Adjoint of symmetric matrix is symmetric.  
(D) Adjoint of a diagonal matrix is diagonal.
99. The system of equations  $x_1 - x_2 + x_3 = 2$ ,  $3x_1 - x_2 + 2x_3 = -6$  and  $3x_1 + x_2 + x_3 = -18$  has :
- (A) No solution. (B) Exactly one solution.  
(C) Infinite solutions. (D) None of these.
100. The values of variables that make the equation true are classified as :
- (A) Roots of equation. (B) Value of equation.  
(C) Solution of equation. (D) Degree of equation.