C 21125 (Pages : 16)

P.G. ENTRANCE EXAMINATION, APRIL 2022

MASTER OF COMPUTER APPLICATION (MCA)

Time : Two Hours Maximum : 400 Marks

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

1. Which of the following IP address class is a multicast address?

   (A) Class A. (B) Class B.

   (C) Class C. (D) Class D.

2. Which layer of the OSI reference model uses the ICMP (Internet Control Message Protocol) ?

   (A) Transport layer. (B) Data link layer.

   (C) Network layer. (D) Application layer.

3. What does DHCP stand for ?

   (A) Dynamic Host Configuration Protocol.

   (B) Dynamic Host Configuration Provider.

   (C) Digital Host Communication Provider.

   (D) Digital Host Communication Protocol.

4. Which of these is a Transmission media that can be used in LAN ?

   (A) Fibre optics. (B) Coaxial cable.

   (C) Microwave. (D) Satellite.

5. ———— topology requires a multipoint connection.

   (A) Star. (B) Mesh.

   (C) Ring. (D) Bus.

6. The view of total database content is :

   (A) Conceptual view. (B) Internal view.

   (C) External view. (D) Physical view.

7. Which type of database stores data in two-dimensional tables ?

(A) Network. (B) Hierarchical.

(C) Table. (D) Relational.

8. Key to represent relationship between tables is called :

(A) Primary key. (B) Secondary Key.

(C) Foreign Key. (D) None of these.

9. The database schema is written in :

(A) HLL. (B) DML.

(C) DDL. (D) DCL.

10. Which forms have a relation that contains information about a single entity ?

(A) 4 NF. (B) 2 NF.

(C) 5 NF. (D) 3 NF.

11. What is the number of outputs of a full adder circuit ?

(A) Two. (B) Three.

(C) Four. (D) One.

12. Find out the result of the BCD addition.

0110 + 0101 :

(A) 10001. (B) 11001.

(C) 1011. (D) 1111.

13. A JK flip-flop in the toggle mode has :

(A) K = 1 and J = 1. (B) K = 1 and J = 0.

(C) K = 0 and J = 1. (D) K = 0 and J = 0.

14. One of the following addressing modes is not possible in 8085 :

(A) Indexed addressing. (B) Indirect addressing.

(C) Direct addressing. (D) Indirect register address.

15. 8085 microprocessor has 5 hardware interrupts :

(A) RAP, RST 6.5. (B) RST 7.5, RST 5.5.

(C) INTR. (D) None of the above.

16. Mineral acids are :

(A) Naturally occurring. (B) Man-made.

(C) Include malic acid. (D) Include formic acid.

17. The concept of strong and weak acids and bases was given by :

(A) Lewis. (B) Newland.

(C) Al-Razi. (D) Pearson.

18. Distinction between a weak acid or strong acid can be made through :

(A) Litmus indicator. (B) Methyl orange indicator.

(C) Universal indicator. (D) Phenolphthalein indicators.

19. Which response lists all of the following properties of sulfur that are physical properties and not other properties ?

(I) It reacts with hydrogen when heated.

(II) It is a yellow solid at room temperature.

(III) It is soluble in carbon disulfide.

(IV) Its density is 2.97 g/cubic centimeter.

(V) It melts at 112 degrees Celsius.

(A) II, III, IV and V. (B) II, IV and V.

(C) I. (D) II, III and IV.

20. How many atoms are in one mole of CH_3OH ?

(A) 6. (B) 6.0×10^{23}.

(C) 12.0×10^{23}. (D) 3.

21. Two isomeric forms of a saturated hydrocarbon :

(A) Have the same structure.

(B) Have different compositions of elements.

(C) Have the same molecular formula.

(D) Have a different content of the isotopes of hydrogen.

22. What makes carbon such a unique element ?

(A) Elemental carbon comes in two forms, diamond and graphite.

(B) Carbon forms four bonds, although the ground state configuration would predict the formation of fewer bonds.

(C) To a greater extent than any other element, carbon can bond to itself to form straight chains, branched chains and rings.

(D) Carbon has two stable isotopes, carbon-12 and carbon-13.

23. The chemical symbol for manganese is :

(A) Mn. (B) Mo.

(C) Ma. (D) Mg.

24. Sulfur can be mined from the ground and the states exporting it around the world are :

(A) Poland and America. (B) China and India.

(C) India and Pakisthan. (D) Brazil and Poland.

25. The conversion of sulfur dioxide (SO) to sulfur trioxide (SO) is basically :

(A) Reversible reaction. (B) Irreversible reaction.

(C) Dynamic reaction. (D) Static reaction.

26. The minimum energy required to remove an electron is called :

(A) Stopping potential. (B) Kinetic energy.

(C) Work function. (D) None of these.

27. The waves used by artificial satellites for communication is :

(A) Microwaves. (B) Infrared waves.

(C) Radio waves. (D) X-rays.

28. Data signal with minimum error is generated by which among the following :

(A) Signal processing circuits. (B) Photodiode.

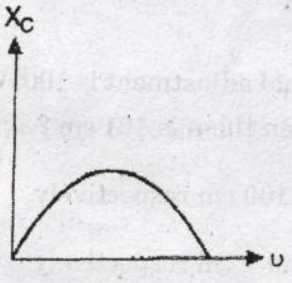
(C) Linear circuitry. (D) None of the above.

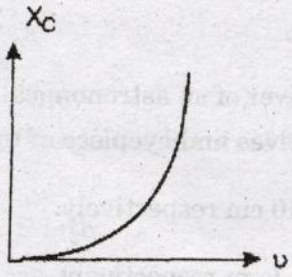
29. Which of the following has/have zero average value in a plane electromagnetic wave ?

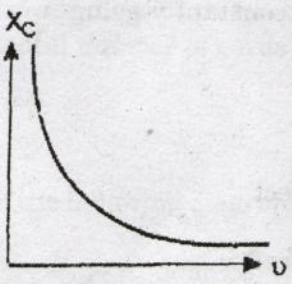
(A) Both magnetic and electric fields. (B) Electric field only.

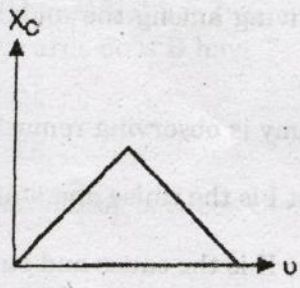
(C) Magnetic field only. (D) None of these.

30. Which of the following graphs represents the correct variation of capacitive reactance X_c with frequency v u ?

(A) 

(B) 

(C) 

(D) 

31. What is the unit of Astronomical Distance ?

(A) Light year. (B) Angstrom.

(C) Weber. (D) Lux.

32. A person stands at the middle point of a wooden ladder which starts slipping between a vertical wall and floor of a room, while continuing to remain in a vertical plane. The path traced by a person standing at the middle point of the slipping :

(A) A parabolic path. (B) A circular path.

(C) A straight path. (D) An elliptical path.

33. A prism has an angle 60° and refractive index $\sqrt{2}$, what is the angle of minimum deviation ?

(A) 90°. (B) 60°.

(C) 45°. (D) 30.

34. What is the focal length of a double concave lens with a radius of curvature 20 cm, if the refractive index of the glass with respect to the air is 5/3 ?

(A) 20 cm. (B) – 20 cm.

(C) 15 cm. (D) – 15 cm.

35. The magnifying power of an astronomical telescope in normal adjustment is 100. What is the focal length of the objectives and eyepiece of the distance between them is 101 cm ?

(A) 1 cm and 10 cm respectively. (B) 1 cm and 100 cm respectively.

(C) 10 cm and 1 cm respectively. (D) 100 cm and 1 cm respectively.

36. Statements :

I Standard of living among the middle-class society is constantly going up since part of few years.

II Indian Economy is observing remarkable growth.

(A) Statement I is the cause and statement II is its effect.

(B) Statement II is the cause and statement I is its effect.

(C) Both the statements I and II are effects of independent causes.

(D) Both the statements I and II are effects of some common cause.

37. Statements :

I Importance of Yoga and exercise is being realized by all sections of the society.

II There is an increasing awareness about health in the society particularly among middle ages group of people.

(A) Statement I is the cause and statement II is its effect.

(B) Statement II is the cause and statement I is its effect.

(C) Both the statements I and II are effects of independent causes.

(D) Both the statements I and II are effects of some common cause.

38. If A + B means A is the mother of B ; A – B means A is the brother B ; A % B means A is the father of B and A × B means A is the sister of B, which of the following shows that P is the maternal uncle of Q ?

(A) Q – N + M × P. (B) P + S × N – Q.

(C) P – M + N × Q. (D) Q – S%P.

39. If O and P, A and E and B and Q interchange their positions, then who will be the second person to the right of the person who is opposite to the person second of the right of P ?

(A) D. (B) A.

(C) E. (D) O.

40. Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P ?

(A) North. (B) South.

(C) South-East. (D) None of these.

41. A, B, C, D and E play a game of cards. A says to B, "If you give me three cards, you will have as many as E has and if I give you three cards, you will have as many as D has." A and B together have 10 cards more than what D and E together have. If B has two cards more than what C has and the total number of cards be 133, how many cards does B have ?

(A) 23. (B) 24.

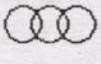
(C) 25. (D) 26.

42. Which of the following diagrams indicates the best relation between Class, Blackboard and School?

(A) 

(B) 

(C) 

(D) 

43. The last Sunday of March, 2006 fell on which date ?

Statements :

I The first Sunday of that month fell on 5 th.

II The last day of that month was Friday.

(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. Arrange the words given below in a meaningful sequence :

1 Protect ; 2 Pressure ; 3 Relief ; 4 Rain ; and 5 Flood :

(A) 2, 4, 3, 1,5. (B) 2, 4, 5, 1, 3.

(C) 2, 5, 4, 1, 3. (D) 3, 2, 4, 5, 1.

45. Arrange the words given below in a meaningful sequence :

1 Poverty ; 2 Population ; 3 Death ; 4 Unemployment ; and 5 Disease :

(A) 2, 3, 4, 5, 1. (B) 3, 4, 2, 5, 1.

(C) 2, 4, 1, 5, 3. (D) 1,2, 3, 4, 5.

46. ———— level is where the model becomes compatible executable code.

(A) Abstract level. (B) Application level.

(C) Implementation level. (D) All of the above.

47. Which of the following statement is true ?

(i) Using singly-linked lists and circular lists, it is not possible to traverse the list backward.

(ii) To find the predecessor, it is required to traverse the list from the first node in case of a singly linked list.

(A) (i)-only. (B) (ii)-only.

(C) both (i) and (ii). (D) None of the above.

48. In a circular queue, the value of r will be ————.

(A) $r = r + 1$. (B) $r = (r + 1)$ % [QUEUE_SIZE – 1].

(C) $r = (r + 1)$ % QUEUE_SIZE. (D) $r = (r - 1)$ % QUEUE_SIZE.

49. Which of the following is not the internal sort ?

(A) Merge sort. (B) Heap sort.

(C) Bubble sort. (D) Insertion sort.

50. When new data are to be inserted into a data structure, but there is not available space ; this situation is usually called ————————.

(A) Underflow. (B) Overflow.

(C) Saturated. (D) None of the above.

51. Banker's algorithm for resource allocation deals with :

(A) Deadlock prevention. (B) Deadlock avoidance.

(C) Deadlock recovery. (D) Mutual exclusion.

52. There are 200 tracks on a disc platter and the pending requests have come in the order - 36, 69, 167, 76, 42, 51, 126, 12 and 199. Assume the arm is located at the 100th track and moving towards track 200. If sequence of disc access is 126, 167, 199, 12, 36, 42, 51, 69 and 76 then which disc access scheduling policy is used ?

(A) Elevator. (B) Shortest seek-time first.

(C) C-SCAN. (D) First Come First Served.

53. Assume that in a certain computer, the virtual addresses are 64 bits long and the physical addresses are 48 bits long. The memory is word addressable. The page size is 8k Band the word size is 4 bytes. The Translation Look-aside Buffer (TLB) in the address translation path has 128 valid entries. At most how many distinct virtual addresses can be translated without any TLB miss ?

(A) 16×2^{10}. (B) 8×2^{20}.

(C) 4×2^{20}. (D) 256×2^{10}.

54. What is bootstrapping called ?

(A) Cold boot. (B) Cold hot boot.

(C) Cold hot strap. (D) Hot boot.

55. Which of the following does not interrupt the running process ?

(A) Timer interrupt. (B) Device.

(C) Power failure. (D) Scheduler process.

56. Which of the following typecasting is accepted by C language ?

(A) Widening conversions.

(B) Narrowing conversions.

(C) Widening and Narrowing conversions.

(D) None of the mentioned.

57. In C language, FILE is of which data type ?

(A) Int. (B) char *.

(C) struct. (D) None of the mentioned.

58. What will be the final value of x in the following C code ?

```
#include <stdio.h>

void main()
{
int x = 5 * 9 / 3 + 9;

}
```

(A) 3.75. (B) Depends on compiler

(C) 24. (D) 3.

59. What is the 16-bit compiler allowable range for integer constants ?

(A) – 3.4e38 to 3.4e38. (B) – 32767 to 32768.

(C) – 32668 to 32667. (D) – 32768 to 32767.

60. What is the output of this statement "printf("%d", (a++))" ?

(A) The value of $(a + 1)$. (B) The current value of a.

(C) Error message. (D) Garbage.

61. If expected value of an estimator is equal to its respective parameter then it is called :

(A) Biased estimator. (B) Unbiased estimator.

(C) Estimator. (D) None of these.

62. Baye's estimator is always a function of :

(A) Minimal sufficient statistic. (B) Sufficient statistic.

(C) Both A and B. (D) None of these.

63. Normal Distribution is symmetric is about ————————.

(A) Variance. (B Mean.

(C) Standard Deviation. (D Covariance.

64. Normal Distribution is also known as ————————.

(A) Cauchy's Distribution. (B) Laplacian Distribution.

(C) Gaussian Distribution. (D) Lagrangian Distribution.

65. The expected value of a random variable is its ————————.

(A) Mean. (B) Standard Deviation.

(C) Mean Deviation. (D) Variance.

66. In random experiment, observations of random variable are classified as ————————.

(A) Events. (B) Composition.

(C) Trials. (D) Functions.

67. Company A produces 10% defective products, Company B produces 20% defective products and C produces 5% defective products. If choosing a company is an equally likely event, then find the probability that the product chosen is defective.

(A) 0.22. (B) 0.12.

(C) 0.11. (D) 0.21.

68. Runs scored by batsman in 5 one day matches are 50, 70, 82, 93 and 20. The standard deviation is ————————.

(A) 25.79. (B) 25.49.

(C) 25.29. (D) 25.69.

69. A random variable X can take only two values, 2 and 4 i.e., P (2) = 0.45 and P (4) = 0.97. What is the Expected value of X ?

(A) 3.8. (B) 2.9.

(C) 4.78. (D) 5.32.

70. In a card game Reena wins 3 Rs. if she draws a king or a spade and 7 Rs. if a heart or a queen from a pack of 52 playing cards. If she pays a certain amount of money each time, she will lose the game. What will be the amount so that the game will come out a fair game ?

(A) 15. (B) 6.

(C) 23. (D) 2.

71. Find the Missing Term in Multiples of 6 : 6, 12, 18, 24, _, 36, 42, _ 54, 60.

(A) 32, 45. (B) 30, 48.

(C) 24, 40. (D) 25, 49.

72. If g and f are two one-to-one functions, then their composition of fog is :

(A) Onto. (B) One to one function.

(C) Bijective. (D) None of these.

73. A vector field which has a vanishing divergence is called as _____.

(A) Solenoidal field. (B) Rotational field.

(C) Hemispheroidal field. (D) Irrotational field.

74. Let R = {(3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6)} be a relation on the set A = {3, 6, 9, 12} be a relation on the set A = {3, 6, 9, 12}. The relation is :

(A) Reflexive and transitive only. (B) Reflexive only.

(C) An equivalence relation. (D) Reflexive and symmetric only.

75. The values of k for which the quadratic equation $kx^2 + 1 = kx + 3x - 11x^2$ has real and equal roots are :

(A) {–11, 3}. (B) {5, 7}.

(C) {5, –7}. (D) None of these.

76. If the sum of three numbers in A.P. is 12 and the sum of their cubes is 288, then the numbers are

(A) 2, 4, 6. (B) 1, 4, 7.

(C) 1, 3, 5. (D) None of these.

77. The maximum value of the function $y = x(x-1)^2, 0 \le x \le 2$:

(A) 0. (B) 4/27.

(C) – 4. (D) None of these.

78. Let A be a 2 × 2 matrix with real entries. Let I be the 2 × 2 identity matrix. Denote by tr (A), the sum of diagonal entries of A. Assume that A2 = I.

Statement –1 : If A ≠ I and A ≠ – I, then det A = – 1.

Statement –2 : If A ≠ I and A ≠ – I, then tr (A) ≠ 0.

(A) Statement – 1 is false, Statement – 2 is true.

(B) Statement – 1 is true, Statement – 2 is true, Statement – 2 is a correct explanation for Statement –1

(C) Statement –1 is true, Statement – 2 is true ; Statement – 2 is not a correct explanation for Statement – 1.

(D) Statement – 1 is true, Statement – 2 is false.

79. The statement $p \to (q \to q)$ is equivalent to :

(A) $p \to (p \to q)$. (B) $p \to (p \vee q)$.

(C) $p \to (p \wedge q)$. (D) $p \to (p \leftrightarrow q)$.

80. The conjugate of a complex number is $1/i - 1$. Then the complex number is :

(A) $-1/i - 1$. (B) $1/i + 1$.

(C) $1/i - 1$. (D) $-1/i + 1$.

81. If A2 – A + I = 0, then the inverse of A is :

(A) A + I. (B) A.

(C) A – I. (D) I – A.

82. If (cos A–B) = 3/5 and tan A tan B = 2, then :

(A) cos A cos B = 1/5. (B) cos A cos B = – 1/5.

(C) sin A sin B = – 2/5. (D) sin A sin B = – 1/5.

83. The sum of the digits in the unit place of all the numbers formed with the help of 3, 4, 5, 6 taken all at a time :

(A) 432. (B) 108.

(C) 36. (D) 212.

84. The period of $|\sin(3x)|$ is :

(A) 2π. (B) $2\pi/3$.

(C) $\pi/3$. (D) 3π.

85. The three solutions of the equation $f(x) = 0$ are -4, 8 and 11. Therefore, the three solutions of the equation $f(2x) = 0$ are :

(A) -2, 4, and 11/2. (B) -8, 16 and 22.

(C) -4, 8, and 11. (D) 2, 19/2 and 7/2.

86. Numerical integration using Trapezoidal rule gives the best result for a single variable function, which is :

(A) Linear. (B) Parabolic.

(C) Logarithmic. (D) Hyperbolic.

87. Define $[x]$ as the greatest integer less than or equal to x, for each $x \in (-\infty, \infty)$. If $y = [x]$, then area under y for $x \in [1, 4]$ is :

(A) 1. (B) 3.

(C) 4. (D) 6.

88. A real square matrix is called skew-symmetric if :

(A) $A^T = A$. (B) $A^T = A^{-1}$.

(C) $A^T = -A$. (D) $A^T = A + A^{-1}$.

89. The determinant of a 2×2 matrix is 50. If one eigenvalue of the matrix is 10, the other eigen value is :

(A) 5. (B) 10.

(C) 50. (D) None.

90. 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.

91. The equation solved roots which are not actual roots of original equation are classified as :

(A) Extrinsic roots. (B) Intrinsic roots.

(C) Extraneous roots. (D) False roots.

92. If $4x \equiv 2 (\text{mod } 6)$ and $3x \equiv 5 (\text{mod } 8)$ then one of the value of x is :

(A) 34. (B) 23.

(C) 26. (D) 32.

93. Which one of the following statements is false ?

(A) A subring of the ring of integers Z, is an ideal of Z.

(B) A subring of a field is a subfield.

(C) A field has no proper ideals.

(D) A commutative ring with unity is a field if it has no proper ideals.

94. The dimension of the vector space of all 6×6 real skew-symmetric matrices is :

(A) 15. (B) 21.

(C) 30. (D) 36.

95. The greatest common divisor of $11 + 7i$ and $18 - i$ in the ring of Gaussian integers Z [i] is :

(A) $3i$. (B) $2 + i$.

(C) $1 + i$. (D) 1.

96. In triangle ABC, if AB = BC and $\angle B = 70°$, $\angle A$ will be :

(A) 70°. (B) 110°.

(C) 55°. (D) 130°.

97. A triangle in which two sides are equal is called :

(A) Scalene triangle. (B) Equilateral triangle.

(C) Isosceles triangle. (D) None of the above.

98. The linear equation $3x - 11y = 10$ has :

(A) Unique solution. (B) Two solutions.

(C) Infinitely many solutions. (D) No solutions.

99. The graph of linear equation $x + 2y = 2$, cuts the y-axis at :

(A) (2, 0). (B) (0, 2).

(C) (0, 1). (D) (1, 1).

100. A median of a triangle divides it into two :

(A) Congruent triangles. (B) Isosceles triangles.

(C) Right triangles. (D) Equal area triangles.