C 2816 (Pages : 15) Name.....

Reg. No.....

U.G./P.G. ENTRANCE EXAMINATION, APRIL 2021

COMPUTER SCIENCE

Time : Two Hours Maximum : 100 Marks

Section I (1–50)

1. A 'C' variable cannot start with a ————————.

   (A) Number.

   (B) Any special symbol except underscore.

   (C) Both (A) and (B).

   (D) None of the above.

2. Pick up the false statement from the following :

   (A) A variable must be declared and defined at the same time.

   (B) A single variable cannot be defined with two different types in the same scope.

   (C) A variable defined once can be defined again with different scope.

   (D) All of the above.

3. What does it mean when we say that an algorithm X is asymptotically more efficient thanY ?

   (A) X will be a better choice for all inputs.

   (B) X will be a better choice for all inputs except possibly large inputs.

   (C) X will be a better choice for all inputs except possibly small inputs.

   (D) Y will be a better choice for small inputs.

4. Dijkstra's algorithm is based on :

   (A) Divide and conquer paradigm.

   (B) Backtracking paradigm.

   (C) Greedy Approach.

   (D) Divide and Conquer paradigm.

5. What will be the maximum possible length of an identifier ?

   (A) 31 characters. (B) 8 characters.

   (C) 64 characters. (D) Identifiers can be of any length.

6. Program code making use of a given module is called the ———————— of the module.

   (A) Client. (B) Docstring.

   (C) Modularity. (D) Interface.

7. Which type of language is JavaScript ?

   (A) Markup. (B) Programming.

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

8. Which of the following function of array object removes the last element from an array and returns that element ?

   (A) push(). (B) pop().

   (C) link(). (D) delete().

9. Original name of Javascript is :

   (A) LiveScript. (B) EScript.

   (C) Mocha. (D) JavaScripts.

10. A function definition expression is also known as :

    (A) Function call. (B) Function definition.

    (C) Function calling. (D) Function literal.

11. You have 10 users plugged into a hub running 10Mbps half-duplex. There is a server connected to the switch running 10Mbps half-duplex as well. How much bandwidth does each host have to the server ?

    (A) 100 kbps. (B) 1 Mbps.

    (C) 2 Mbps. (D) 10 Mbps.

12. Which protocol does DHCP use at the Transport layer ?

    (A) IP. (B) TCP.

    (C) UDP. (D) ARP.

13. In a network with dozens of switches, how many root bridges would you have ?

(A) 1. (B) 2.

(C) 5. (D) 12.

14. What is a stub network ?

(A) A network with more than one exit point.

(B) A network with more than one exit and entry point.

(C) A network with only one entry and no exit point.

(D) A network that has only one entry and exit point.

15. Which protocol does Ping use ?

(A) TCP. (B) ARP.

(C) ICMP. (D) BootP.

16. The internet is :

(A) A communication system for some cities of India

(B) A communication system for some states of India

(C) A communication system for the Indian government

(D) A large network of networks

17. Which of the following has the smallest default maximum physical receive packet size ?

(A) Token Ring [4 Mbps]. (B) Token Ring [16 Mbps].

(C) ARC net. (D) Ethernet.

18. Which of the following is not relevant for networking ?

(A) Bus hubs. (B) Mesh network.

(C) Stackable hubs. (D) Low-end stand alone hubs.

19. The most flexibility how devices are wired together is provided by :

(A) T-switched networks. (B) Star networks.

(C) Ring networks. (D) Bus networks.

20. Which of the following items is not used in local area network (LAN) ?

(A) Cable. (B) Printer.

(C) Modem. (D) Computer.

21. What are the main components of Big data ?

(A) MapReduce. (B) HDFS.

(C) YARN. (D) All of these.

22. ———— is the most popular high-level Java API in Hadoop Eco System.

(A) Scalding. (B) HCatalog.

(C) Cascalog. (D) Cascading.

23. Following represent column in NoSQL :

(A) Database. (B) Field.

(C) Document. (D) Collection.

24. Every address generated by the CPU is divided into two parts. They are ————.

(A) Frame bit and page number.

(B) Page number and page offset.

(C) Page offset and frame bit.

(D) Frame offset and page offset.

25. Size of the page is typically:

(A) Varied. (B) Power of 2.

(C) Power of 4. (D) None of the above.

26. The ———— register is written by the host to send output.

(A) Status. (B) Control.

(C) Data-in. (D) Data-out.

27. The ———— are reserved for events such as unrecoverable memory errors.

(A) Non maskable interrupts. (B) Blocked interrupts.

(C) Maskable interrupts. (D) None of the mentioned.

28. A processor performing fetch or decoding of different instruction during the execution of another instruction is called :

(A) Pipelining. (B) Super scaling.

(C) Parallel computation. (D) None of these.

29. Two processors A and B have clock frequencies of 700 Mhz and 900 Mhz respectively. Suppose A can execute an instruction with an average of 3 steps and B can execute with an average of 5 steps. For the execution of the same instruction which processor is faster ?

(A) A. (B) B.

(C) Both take the same time. (D) Insufficient Information.

30. In order to extend the connectivity of the processor bus, we use :

(A) SCSI bus. (B) PCI bus.

(C) Multiple bus. (D) Controllers.

31. The control of jobs running with in a system is :

(A) Job min. (B) Job monitoring.

(C) Job step. (D) Job stream.

32. The term memory refers to which one of the following :

(A) Storage. (B) Logic unit.

(C) Input Device. (D) Output Device.

33. The light pen was developed in the year :

(A) 1922. (B) 1950.

(C) 1994. (D) 1992.

34. What process prepares the magnetic surface of a disk by creating concentric circles, called tracks, around the disk ? (Each track is further divided into sectors.)

(A) Formatting. (B) Tracking.

(C) Copying. (D) Editing

35. The range of frequencies available for data transmission is known a :

(A) Byte. (B) Bits.

(C) Bandwidth. (D) Network.

36. A ———————— on an attribute of a relation is a data structure that allows the database system to find those tuples in the relation that have a specified value for that attribute efficiently, without scanning through all the tuples of the relation.

(A) Reference. (B) Assertion.

(C) Index. (D) Timestamp.

37. Values of one data type can be converted to another domain using which of the following ?

(A) Convert. (B) Drop type.

(C) Alter type. (D) Cast.

38. Which of the following is not Armstrong's Axioms?

(A) Pseudotransitivity rule. (B) Augmentation rule.

(C) Reflexivity rule. (D) Transitivity rule.

39. A domain is ———————— if elements of the domain are considered to be invisible units.

(A) Atomic. (B) Substructure.

(C) Subatomic. (D) Subset.

40. Which of the following is a tuple generating dependencies ?

(A) Functional dependancy.

(B) Non- functional dependancy.

(C) Multi valued dependencies.

(D) Equality-generating dependencies

41. Which of the following is an abstract data type ?

(A) Int. (B) Float.

(C) Stirng. (D) Class.

42. Which of the following is correct ?

(A) A class is an instance of its objects.

(B) An object is an instance of its class.

(C) A class is an instance of the data type that the class have.

(D) An object is an instance of the data type of the class.

43. What does Local Time represent ?

(A) Date without time. (B) Time without Date.

(C) Date and Time. (D) Date and Time with timezone.

44. Which of the following is the fastest memory ?

(A) Secondary memory. (B) Auxiliary memory.

(C) Cache memory (D) Virtual memory.

45. 5G was introduced in :

(A) July 2016. (B) July 2019.

(C) June 2021. (D) July 2018.

46. What does MIME stands for :

(A) Multipurpose Internet Mail Extra.

(B) Multiple Internet Mail end.

(C) Multipurpose Internet Mail extensions.

(D) None of the above.

47. G-mail belongs to the.

(A) Google Mail. (B) Yahoo Mail.

(C) Great Mail. (D) None of the above.

48. 1 yottabyte = ————————

(A) 1024 TB. (B) 1024 EB.

(C) 1024 ZB. (D) 1024 GB.

49. VDU stands for :

(A) Virtual Display Unit. (B) Visual Display Unit.

(C) Virtual Detection Unit. (D) Visual Demand Unit.

50. Which of the following is used in main memory ?

(A) SRAM. (B) DRAM.

(C) PROM. (D) DDR.

Section II (51–60)

51. A semiconductor has ———————— temperature co-efficient of resistance.

(A) Positive. (B) Negative.

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

52. When a pure semiconductor is heated, its resistance ————————.

(A) Goes up. (B) Goes down.

(C) Remains Same. (D) Zero.

53. A hole in a semiconductor is defined as ————————.

(A) A free electron.

(B) The incomplete part of an electron pair bond.

(C) A free neutron.

(D) A free proton.

54. When negative voltage feedback is applied to an amplifier, its voltage gain ————————.

(A) Is increased. (B) Is reduced.

(C) Remains the same. (D) None of the above.

55. The gain of an amplifier without feedback is 100 db. If a negative feedback of 3 db is applied, the gain of the amplifier will become ————————.

(A) 300db. (B) 13db.

(C) 97db. (D) 204db.

56. The most commonly used emitter in receiving tube is :

(A) Oxide coated. (B) Thoriated tungsten.

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

57. A latch always uses :

(A) Negative Feedback. (B) Transistors

(C) Current. (D) Positive Feedback.

58. A SCR is usually turned on by :

(A) Breakover. (B) A gate trigger.

(C) Brakdown. (D) Holding current.

59. Inverter converts :

(A) DC to AC. (B) AC to DC.

(C) Both A and B. (D) None of the above.

60. A switching regulator is considered :

(A) Quiet. (B) Noisy.

(C) Inefficient (D) Linear.

Section III (61–70)

61. When a body falls freely under gravity, then the work done by the gravity is :

(A) Negative. (B) Zero.

(C) Positive. (D) Infinite.

62. A pressure cooker reduces cooking time for food, because ————————.

(A) Heat is more evenly distributed in the cooking space.

(B) Cooking involves chemical changes helped by a rise in temperature.

(C) The higher pressure inside the cooker crushes the food material.

(D) Boiling point of water involved in cooking is increased.

63. The length of a simple pendulum executing simple harmonic motion is increased by 21 %. The percentage increase in the time period of the pendulum of increases length is ?

(A) 10.5 %. (B) 11.5 %.

(C) 20.5 %. (D) 13.5 %.

64. The disc of a siren containing 60 holes rotates at a constant speed of 360 r.p.m. The emitted sound is in unison with a tuning fork of frequency.

(A) 100 Hz. (B) 200 Hz.

(C) 360 Hz. (D) 180 Hz.

65. As an object approaches the speed of light, it's mass becomes :

(A) Infinite. (B) Double.

(C) Half. (D) Triple.

66. The elastic scattering of photons is called as :

(A) Raman Scattering. (B) Atmospheric scattering.

(C) Conserved Scattering. (D) Rayleigh Scattering.

67. Which statement is incorrect ?

(A) Reversible cycle has more efficiency than an irreversible one.

(B) All reversible cycles have the same efficiency.

(C) Carnot cycle is a reversible one.

(D) Carnot cycle has the maximum efficiency of the cycles.

68. A solid weight 6kg in air. If its density is 2000 kgm^{-3}, what will be its apparent weight in water ?

(A) 4 kg. (B) 2.5 kg.

(C) 3 kg. (D) 7.5 kg.

69. The kinetic energy of a body becomes four times of its initial value, then new momentum will ———————.

(A) Double the initial value. (B) Tripple the initial value.

(C) Half the initial value. (D) Remain constant.

70. A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is :

(A) 0.8F. (B) 0.08F.

(C) IF. (D) 0.024F.

Section IV (71–80)

71. Consider the circular region $x^2 + y^2 = 81$, What is the maximum value of the function ?

$f(x, y) = x^6 + y^2\left(3x^4 + 1\right) + x^2.\left(3y^4 + 1\right) + y^6.$

(A) 90. (B) 80.

(C) $81 + 81^3$. (D) 100.

72. Find the minimum value of the function $f(x, y) = x^2 + y^2 + 199$ over the real domain :

(A) 12. (B) 13.

(C) 0. (D) 199.

73. The n^{th} roots of any number are in ————————.

(A) Arithmetic progression.

(B) Geometric progression.

(C) Harmonic progression.

(D) No specific pattern.

74. Find the sum of series 1 + 1/2 + 1/4 + ———————— up to 6 terms.

(A) 63/32. (B) 32/63.

(C) 26/53. (D) 53/26.

75. If three positive numbers are inserted between 4 and 512 such that the resulting sequence is a G.P., which of the following is not among the numbers inserted ?

(A) 256. (B) 16.

(C) 64. (D) 128.

76. $f(x) = 9 - x^2$ ———————— $\sqrt{}$. Find the range of the function.

(A) R. (B) R^+.

(C) $[-3, 3]$. (D) $[0, 3]$.

77. $\sin^{-1} x + \cos^1 x =$ ————————.

(A) $\pi/2$. (B) π.

(C) $\pi/3$. (D) 2π.

78. Find the order of the differential equation + 15 cos x = 0.

(A) 4. (B) 3.

(C) 2. (D) 1.

79. Which of the following relations is symmetric and transitive but not reflexive for the set $I = \{4, 5\}$?

(A) $R = \{(4, 4), (5, 4), (5, 5)\}$.

(B) $R = \{(4, 4), (5, 5)\}$.

(C) $R = \{(4, 5), (5, 4)\}$.

(D) $R = \{(4, 5), (5, 4), (4, 4)\}$.

80. A function $f : N \to N$ is defined by $f(x) = x^2 + 12$. What is the type of function here ?

(A) Bijective. (B) Surjective.

(C) Injective. (D) Neither surjective nor injective

Section V (81–90)

81. A and B are two events such that $P(A) = 0.4$ and $P(A \cap B) = 0.2$. Then $P(A \cap B)$ is equal to _____.

(A) 0.4. (B) 0.2.

(C) 0.6. (D) 0.8.

82. A problem in mathematics is given to three students A, B and C. If the probability of A solving the problem is ½ and B not solving it is ¼. The whole probability of the problem being solved is 63/64 then what is the probability of solving it ?

(A) $\frac{1}{8}$. (B) $\frac{1}{64}$.

(C) $\frac{7}{8}$. (D) $\frac{1}{2}$.

83. Let A and B be two events such that the occurrence of A implies occurrence of B, But not vice-versa, then the correct relation between P (a) and P (b) is ?

(A) $P(A) < P(B)$. (B) $P(B) \geq P(A)$.

(C) $P(A) = P(B)$. (D) $P(A) \geq P(B)$.

84. Two unbiased coins are tossed. What is the probability of getting at most one head ?

(A) $\frac{1}{2}$. (B) $\frac{1}{3}$.

(C) $\frac{1}{6}$. (D) $\frac{3}{4}$.

85. If A and B are two events, then the probability of exactly one of them occurs is given by ————————.

(A) $P(A \cap B) + P(A \cap B)$. (B) $P(A) + P(B) - 2P(A)P(B)$.

(C) $P(A) + P(B) + 2P(A)P(B)$. (D) $P(A) + P(B) - P(A \cap B)$.

86. Three companies A, B and C supply 25 %, 35 % and 40 % of the notebooks to a school. Past experience shows that 5 %, 4 % and 2 % of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A ?

(A) $\frac{44}{69}$. (B) $\frac{25}{69}$.

(C) $\frac{13}{24}$. (D) $\frac{11}{24}$.

87. Previous probabilities in Bayes Theorem that are changed with help of new available information are classified as ————————.

(A) Independent probabilities. (B) Posterior probabilities.

(C) Interior probabilities. (D) Dependent probabilities.

88. 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.

89. The random variables X and Y have variances 0.2 and 0.5 respectively. Let Z = 5X – 2Y. The variance of Z is ?

(A) 3. (B) 4.

(C) 5 (D) 7.

90. Find the number of ways of arranging the letters of the words DANGER, so that no vowel occupies odd place.

(A) 36. (B) 48.

(C) 144. (D) 96.

Section VI (91–100)

91. Anthrocene is isomeric with :

(A) Phenanthrene. (B) Benzene.

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

92. In infrared spectrography which frequency range is known as the fingerprint region :

(A) 400-1400 cm^{-1}. (B) 1400-900 cm^{-1}.

(C) 900-600 cm^{-1}. (D) 1500-700 cm^{-1}.

93. The product from blast furnace is called :

(A) Cast iron. (B) Wrought iron.

(C) Pig iron. (D) Steel.

94. Which class of compounds shows H-bonding even more than alcohols.

(A) Phenols. (B) Carboxylic acids.

(C) Ethers. (D) Aldehydes.

95. ———————— fibers are made of polyamides.

(A) Dacron. (B) Nylon.

(C) Ryon. (D) Orion.

96. Th crate constant of a reaction is $5.8 \times 10^{-2} s^{-1}$, order of the reaction is :

(A) First. (B) Zero.

(C) Third. (D) Second.

97. Which of the following oxides is amphoteric ?

(A) CO_2. (B) CaO.

(C) SiO_2. (D) SnO_2.

98. What is the oxydation number of the central metal atom in the co-ordination compound $[Pt(NH_3)3Cl]Cl$:

(A) – 1. (B) + 1.

(C) 0. (D) + 2.

99. Work done in a free expansion process is ?

(A) +ve. (B) –ve.

(C) Zero. (D) Infinite.

100. The acid which redduces Fehling solution is :

(A) Methanoic acid. (B) Ethanoic acid.

(C) Butanoic acid. (D) Propanoic acid.

(100 × 1 = 100 marks)