

B.Tech.(CSE) Entrance Test Sample Paper with Answer Key

Name:

Total Time :- 2 Hours

Questions: 100 MCQs

Form Number:

Total Marks :- 200

SECTION-A **MATHEMATICS QUESTIONS**

- Age of Umesh will be 4 times the age of Reena in 6 years from today. If ages of Umesh and Mahesh are 7 times and 6 times the age of Reena respectively, what is present age of Umesh?
a. 64 years b. 30 years c. 48 years d. 42 years
- Consider a circular track of circumference= 1400 m. There are 2 bikes which start from point A and move in the opposite direction. Once they meet, they start moving in the opposite directions. The one that moves in the anticlockwise direction to the other one has a Speed in the ratio of 36:48 kmph. Find the Distance of the two bikes from A when they meet for the 15th Time?
a. 1200 b. 250 c. 350 d. none of these
- A cistern is filled by Pipe A and Pipe B together in 2.4 hours. Pipe A alone can fill the cistern at the rate of 100 litres per hour. Pipe B alone can fill the cistern in 4 hours. What is the capacity of the cistern?
a. 1200 litres b. 600 litres c. 1000 litres d. 500 litres
- Dean has a cardboard box whose length, breadth and height are in the ratio 1:2:3. He makes a new box such that the length, breadth and height got increased by 100%, 200% and 200% respectively. How much less is volume of old box than the new box?
a. 12 times less b. 16 times less c. 17 times less d. 24 times less
- If A and B are matrices, then which from the following is true ?
a. $AB \neq BA$ b. $(At)^t \neq A$ c. $A + B \neq B + A$ d. all are true
- If $|A| = 0$, then A is
a. 0 b. zero matrix c. singular matrix d. non-singular matrix
- If A is a symmetric matrix, then $A^t =$
a. 0 b. A c. $|A|$ d. diagonal matrix
- If 30% of the visitors to an ice cream shop had chocolate ice-cream, then what is the probability that 2 out of 3 people who entered the store on Saturday at 5 pm will have chocolate ice cream?
a. 0.16 b. 0.15 c. 0.19 d. 0.28
- A milkman had water and milk mixture in a can with water to milk ratio 5:7. He accidentally spills 9 liters of the mixture. He then fills the can with water equal in quantity to spilled mixture. This makes the water to milk ratio 9:7. How much milk did the can initially have?
a. 21 liters b. 24 liters c. 16 liters d. 20 liters

10. Tap P alone fills a cistern in 2 hours; while tap Q alone fills the same cistern in 3 hours. A new tap R is attached to the bottom of the cistern which can empty the completely filled cistern in 6 hours. Sunny started all three taps together at 9am. When will the tank be full?
 a. 10.30 am b. 11.15 am c. 12 pm d. 9.45 am
11. At a cricket match, out of the 2 lakh spectators, 90% were fans of team A, 85% of Team B, 70% of Team C, 75% of Team D and 80% of Team E. What is the minimum number of spectators who were fans of all five teams if it is given that each of these spectators supports at least one team?
 a. 5 b. 100 c. 1000 d. none of these
12. Find the value of x such that: $7_{Cx}-1 + 7_{Cx} = 8_{Cx}+2$
 a. 2 b. 3 c. 4 d. 5
13. Afsan is deciding which car to rent for a day for a class trip, from among anPinnova and a Bילו. The rate/km is in a ratio of 3:2, the seating capacity is in a ratio of 5:2. The Speeds are in the ratio of 7:4. Find out the ratio of the maximum cost incurred that day for the two car types, given that there is no wastage of capacity or Time?
 a. 60:28 b. 56:30 c. 105:16 d. 140:12
14. Which of the following defines a function f for which $f(-x) = -f(x)$?
 a. $f(x) = x^2$ b. $f(x) = \sin x$ c. $f(x) = \cos x$ d. $f(x) = \log x$
15. $\ln(x-2) < 0$ if and only if
 a. $x < 3$ b. $0 < x < 3$ c. $2 < x < 3$ d. $x > 2$
16. Rohan's age is five times Ajay's and seven-eighteenth of Meena's age. The sum of the ages of all three of them is 132 years. How much younger is Ajay to Meena?
 a. 56 years b. 83 years c. 27 years d. Cannot be determined
17. When Jaya divided surface area of a sphere by the sphere's volume, she got the answer as $1/18$ cm. What is the radius of the sphere?
 a. 24 cm b. 6 cm c. 54 cm d. 4.5 cm
18. The number of non-zero rows in an echlon form is called ?
 a. rank of a matrix b. cofactor of the matrix c. reduced echlon form
 d. conjugate of the matrix
19. Transpose of a rectangular matrix is a
 a. scaler matrix b. square matrix c. diagonal matrix d. rectangular matrix
20. Transpose of a column matrix is
 a. row matrix b. zero matrix c. column matrix d. diagonal matrix
21. When the area in square units of an expanding circle is increasing twice as fast as its radius in linear units, the radius is
 a. $\frac{1}{4\pi}$ b. $\frac{1}{4}$ c. $\frac{1}{\pi}$ d. 1
22. The set of all points (e^t, t) , where t is a real number, is the graph of y equals to
 a. $\frac{1}{e^x}$ b. e^x c. xe^x d. $\ln x$

23. The present ages of Aman and Nina are 59 and 37 years, respectively. What was the ratio of the ages of Nina and Aman 13 years ago?
 a. 3:2 b. 46:25 c. 12:23 d. 8:3
24. Sam has a solid metal ball with diameter 6cm. He melts it and uses the material for making a solid cylinder. If the diameter of the cylinder is same as the ball, what would its height be?
 a. 4 cm b. 4.5 cm c. 6 cm d. 8 cm
25. Rajesh has a container which has a mixture of wine and water in it. Wine and water are in the ratio 4:1. Rajesh spills some of the mixture by accident. He then replaces the spilled amount with water of same quantity. But now the wine to water ratio became 3:2. How much water did Rajesh add?
 a. 3/5 b. 1/2 c. 1/4 d. 2/7
26. Chaman has two big cans of wine and water mixture. Chaman mixes the contents of both the cans in a big container. The new mixture has half water and half wine. In what quantity did Chaman mix contents of Can 1 and 2 if Can 2 has wine to water ratio of 2:3 and Can 1 has wine to water ratio 5:3?
 a. 5:3 b. 4:5 c. 5:4 d. 2:5
27. A group of 100 people plays carom, snooker and chess. 90 people play chess, 80 people play snooker and 80 people play carom. Find the maximum number of people who play all three games, if each person plays at least one game.
 a. 70 b. 75 c. 65 d. none of these
28. $\int_0^8 \frac{dx}{\sqrt{1+x}} =$
 a. 1 b. 3/2 c. 2 d. 4
29. The average age of 10 students and their teacher is 15 years. The average age of the first seven students is 15 yr and that of the last three is 11 yr. What is the teacher's age?
 a. 33 years b. 30 years c. 27 years d. 24 years
30. Paper charge is \$ 60 per kg. How much expenditure would be there to cover a cube of edge 10m with a paper, if one kg of paper covers 20 sq.m. area?
 a. \$ 2250 b. \$ 3600 c. \$ 2700 d. \$ 1800
31. Two matrices A and B are multiplied to get AB if
 a. both are rectangular b. both have same order c. no of columns of A is equal to columns of B
 d. no of rows of A is equal to no of columns of B
32. A table is set up which can seat 5 people from 4 Adults and 6 children. Find the probability that the table seats at least 2 children?
 a. 31/42 b. 124/126 c. 41/42 d. 3/26
33. For a drama, 3 students need to be selected out of 6 students A, B, C, D, E and F. If A is already selected, what is the probability of selecting C also?
 a. 0.5 b. 0.2 c. 0.3 d. 0.4

34. A cistern has two taps attached to it. Tap B can empty the cistern in 45 minutes. But Tap A can fill the cistern in just 30 minutes. Rohit started both taps unknowingly but realized his mistake after 30 minutes. He immediately closed Tap B. Now after this, in how much time will the cistern be filled?

- a. 30 minutes b. 45 minutes c. 15 minutes d. 20 minutes

35. Of the 200 candidates who were interviewed for an admin position at Noesis, 100 had a two-wheeler, 70 had a credit card and 140 had a mobile phone. 40 of them had both, a two-wheeler and a credit card, 30 had both, a credit card and a mobile phone and 60 had both, a two wheeler and mobile phone and 10 had all three. How many candidates had none of the three?

- a. 0 b. 20 c. 10 d. 18

36. Find the maximum value of $16C_x$ for any natural number x.

- a. 6 b. 4 c. 7 d. 8

37. Ram and Shyam's average age is 65 years. The average age of Ram, Shyam and John is 53 years. What is the age of John?

- a. 29 years b. 31 years c. 59 years d. 45 years

38. Ramesh has a metal cube. He paints all sides of the cube with green color. He divides the cube into smaller cubes of volume 1 cu.m. each. How many of these smaller cubes will not have green color on even one of its sides if the volume of larger cube is 27 cu.m.?

- a. 9 b. 1 c. 0 d. 3

39. If the order of matrix A is $m \times p$. And the order of B is $p \times n$. Then the order of matrix AB is ?

- a. $n \times p$ b. $m \times n$ c. $n \times p$ d. $n \times m$

40. Additive inverse of a matrix A is

- a. $\text{adj } A|A|$ b. A^2 c. $|A|$ d. A

41. For a non-trivial solution $|A|$ is

- a. $|A| > 0$ b. $|A| < 0$ c. $|A| \neq 0$ d. $|A| = 0$

42. What is the probability of forming the word "ADDS" by picking 4 cards at random and kept in the same order out of 50 cards given with 10 cards having "A", 10 having "S" and the remaining 30 having "D" on it?

- a. $2^2/5^2$ b. $15/[(48-1)(48+1) \times 4]$ c. $1/50^2$ d. $10/47$

43. A Number is selected at random from first thirty natural numbers. What is the chance that it is a multiple of either 3 or 13?

- a. $17/30$ b. $2/5$ c. $11/30$ d. $4/15$

44. Sunil started a juice (lemon syrup + water) counter. Initially he had 140 liter juice which had 30% water in it. He sold 20 liters of the juice. Then he added equal amount of lemon syrup and water. Now the ratio of water to lemon syrup became 1:2. How much water was added later on?

- a. 9 liters b. 12 liters c. 14 liters d. 20 liters

45. If $p(x) = (x+2)(x+k)$ and if the remainder is 12 when $p(x)$ is divided by $x-1$, then k equals to

- a. 2 b. 3 c. 6 d. 11

70. The pressure of 1 bar is equivalent to how many pascals?
 a. 1,000,000 b. 100,000 c. 10,000 d. 1000
71. What is the SI unit of intensity?
 a. Joule/m² b. kg/m² c. N/m² d. watt/m²
72. What is the unit of potential difference?
 a. Watt b. Coulomb c. Volt d. Weber
73. Which of the following is equivalent to a volt?
 a. watt/coulomb b. joule/coulomb c. joule/watt d. watt/joule
74. One electron volt is equivalent to _____ joules.
 a. 1.6×10^{-17} b. 1.6×10^{-18} c. 1.6×10^{-19} d. 1.6×10^{-20}
75. What is the unit of capacitance?
 a. Farad b. Weber c. Coulomb d. Gauss
76. Which of the following is equivalent to the unit “farad”?
 a. coulomb/volt b. joule/volt c. joule/coulomb d. coulomb/joule
77. What is the unit of electric current?
 a. Volt b. Watt c. Ampere d. Coulomb
78. Which of the following is equivalent to the unit “ampere”?
 a. joule/second b. volt/second c. coulomb/second d. watt/second
79. What is the unit of resistance?
 a. Ohm b. Watt c. Volt d. Ampere
80. Ohm is equivalent to which of the following?
 a. coulomb/ampere b. watt/ampere c. volt/ampere d. joule/ampere
81. What is the unit of luminous intensity?
 a. Footcandle b. Lumen c. Candela d. Lux
82. What is the unit of luminous flux?
 a. Candela b. Lumen c. Lux d. Footcandle
83. Which of the following is equivalent to the unit “candela”?
 a. lumen/m² b. footcandle/steradian c. lux/steradian d. lumen/steradian
84. What is the unit of luminous efficiency?
 a. lumen/watt b. lumen/volt c. lumen/ampere d. lumen/coulomb
85. What is the unit of illumination?
 a. Lux b. Lumen c. Candela d. Lumen/watt
86. Lux is equivalent to which combination of units?
 a. lumen/cm² b. lumen/ft² c. lumen/m² d. lumen/in²

87. Footcandle is equivalent to which combination of units?
a. lumen/cm² b. lumen/ft² c. lumen/m² d. lumen/in²
88. How many dynes are there in one newton?
a. 10,000 b. 100,000 c. 1,000,000 d. 1000
89. What is an elemental unit of energy?
a. Quartz b. Quark c. Photon d. Quantum
90. What refers to the mass which is accelerated at the rate of one foot per second when acted on by a force of one pound?
a. Slug b. Erg c. Dyne d. BTU

SECTION-C CHEMISTRY QUESTIONS

91. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotised and then heated with cuprous bromide. The reaction mixture so formed contains
a. mixture of o- and p-bromotoluenes b. mixture of o- and p-dibromobenzenes
c. mixture of o- and p-bromoanilines d. mixture of o- and m-bromotoluenes
92. Phenol, when it first reacts with concentrated sulphuric acid and then with concentrated nitric acid, gives
a. 2,4,6-trinitrobenzene b. o-nitrophenol c. p-nitrophenol d. nitrobenzene
93. Larger number of oxidation states are exhibited by the actinoids than those by the lanthanoids, the main reason being
a. 4f orbitals more diffused than the 5f orbitals
b. lesser energy difference between 5f and 6d than between 4f and 5d orbitals
c. more energy difference between 5f and 6d than between 4f and 5d orbitals
d. more reactive nature of the actinoids than the lanthanoids
94. Which of the following factors is of no significance for roasting sulphide ores to the oxides and not subjecting the sulphide ores to carbon reduction directly?
a. Metal sulphides are thermodynamically more stable than CS₂
b. CO₂ is thermodynamically more stable than CS₂
c. Metal sulphides are less stable than the corresponding oxides
d. CO₂ is more volatile than CS₂
95. α -D-(+)-glucose and β -D-(+)-glucose are
a. conformers b. epimers c. anomers d. enantiomers
96. Which one of the following is the correct statement?
a. Boric acid is a protonic acid

- b. Beryllium exhibits coordination number of six
- c. Chlorides of both beryllium and aluminium have bridged chloride structures in solid phase
- d. $B_2H_6 \cdot 2NH_3$ is known as 'inorganic benzene'

97. Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is

- a. R_4Si
- b. $RSiCl_3$
- c. R_2SiCl_2
- d. R_3SiCl

98. In a compound atoms of element Y from ccp lattice and those of element X occupy $\frac{2}{3}$ rd of tetrahedral voids. The formula of the compound will be

- a. X_4Y_3
- b. X_2Y_3
- c. X_2Y
- d. X_3Y_4

99. Amount of oxalic acid present in a solution can be determined by its titration with $KMnO_4$ solution in the presence of H_2SO_4 . The titration gives unsatisfactory result when carried out in the presence of HCl , because HCl

- a. gets oxidised by oxalic acid to chlorine
- b. furnishes H^+ ions in addition to those from oxalic acid
- c. reduces permanganate to Mn^{2+}
- d. oxidises oxalic acid to carbon dioxide and water

100. Which one of the following pairs of species have the same bond order?

- a. CN^- and NO^+
- b. CN^- and CN^+
- c. O^- and CN^-
- d. NO^+ and CN^+

Answer Key

- | | | |
|-------|-------|--------|
| 1. d | 36. d | 70. b |
| 2. d | 37. a | 71. d |
| 3. b | 38. b | 72. c |
| 4. c | 39. b | 73. b |
| 5. a | 40. a | 74. c |
| 6. c | 41. d | 75. a |
| 7. b | 42. d | 76. a |
| 8. c | 43. b | 77. c |
| 9. a | 44. b | 78. c |
| 10. a | 45. b | 79. a |
| 11. d | 46. d | 80. c |
| 12. b | 47. b | 81. c |
| 13. c | 48. c | 82. b |
| 14. b | 49. d | 83. d |
| 15. c | 50. c | 84. a |
| 16. b | 51. c | 85. a |
| 17. c | 52. d | 86. c |
| 18. d | 53. a | 87. b |
| 19. d | 54. a | 88. b |
| 20. a | 55. d | 89. d |
| 21. c | 56. b | 90. a |
| 22. d | 57. b | 91. a |
| 23. c | 58. d | 92. b |
| 24. a | 59. d | 93. b |
| 25. c | 60. d | 94. a |
| 26. b | 61. a | 95. c |
| 27. b | 62. c | 96. c |
| 28. d | 63. d | 97. b |
| 29. c | 64. b | 98. a |
| 30. d | 65. b | 99. c |
| 31. c | 66. a | 100. a |
| 32. c | 67. d | |
| 33. c | 68. a | |
| 34. d | 69. a | |
| 35. c | | |