

B.Sc. (IT) Entrance Test Sample Paper with Answer Keys

Name:

Roll Number:

Total Time :- 2 Hours

Questions: 100 MCQs

Total Marks :- 200

SECTION-A
MATHEMATICS QUESTIONS

- Let A and B have 3 and 6 elements respectively. What can be the maximum and minimum number of elements in $A \cup B$
 (a) 9 and 6 (b) 6 and 3 (c) 9 and 3 (d) 6 and 12
- $(1+i)^{10} + (1-i)^{10} =$
 (a) -1 (b) 1 (c) 0 (d) 2
- If $(1 \quad x \quad 1) \begin{pmatrix} 2 & 3 & 2 \\ 0 & 5 & 1 \\ 0 & 3 & 2 \end{pmatrix} \begin{pmatrix} 1 \\ 1 \\ x \end{pmatrix} = 0$, the value of x are:
 (a) 1, 8 (b) -1, 8 (c) -1, -8 (d) 1, -8
- The matrix $\begin{pmatrix} 0 & -4 & 1 \\ 4 & 0 & -5 \\ -1 & 5 & 0 \end{pmatrix}$ is
 (a) Orthogonal (b) Idempotent (c) Skew-symmetric (d) Symmetric
- $\lim_{n \rightarrow \infty} \left\{ \left(1 + \frac{1}{n}\right)^n + \left(1 + \frac{1}{n}\right)^{-n} \right\}$
 (a) exists and is equal to 0 (b) does not exist
 (c) exists and equal to $e + 1/e$ (d) exists and equal to e
- For differentiability of a function, continuity is
 (a) Sufficient (b) Necessary (c) Sufficient and Necessary (d) none of these
- Differential coefficient of $e^{\sqrt{x}}$ with respect to \sqrt{x} is -----
 (a) $e^{\sqrt{x}}$ (b) $\frac{e^{\sqrt{x}}}{2\sqrt{x}}$ (c) $e^{\sqrt{x}} \cdot \frac{\sqrt{x}}{2}$ (d) $e^{\sqrt{x}} \cdot 2\sqrt{x}$

8. Rolle's theorem is associated with his name, He is
 (a) An English mathematician (b) German mathematician
 (c) French mathematician (d) Russian mathematician
9. The slope of the curve $y = ae^{-x/b}$ at the point where it crosses the y-axis is -----
 (a) a/b (b) -a/b (c) b/a (d) -b/a
10. The maximum value of $\frac{\log x}{x}$ in $(0, \infty)$ is -----
 (a) e (b) 1/e (c) 1 (d) none of these
11. $\int \frac{\cos x \sin x}{1 + \sin^4 x} dx$ is equal to
 (a) $\frac{1}{2} \sin^{-1}(\tan^2 x)$ (b) $\frac{1}{2} \tan^{-1}(\sin^2 x)$ (c) $\frac{1}{2} \cos^{-1}(\cot^2 x)$
 (d) $\frac{1}{2} \cot^{-1}(\cos^2 x)$
12. $\int \frac{[x]}{x} dx$ is equal to
 (a) 2 (b) 0 (c) 1 (d) $\frac{1}{2}$
13. The coordinates of the foot of the perpendicular drawn from the point (2,3) to the straight line $x+y = 11$ are -----
 (a) (4,7) (b) (6,5) (c) (7,4) (d) (5,6)
14. Image of the point (2,3) along the line $y = x$ is -----
 (a) (-2, 3) (b) (3,2) (c) 2, -3 (d) (-2, -3)
15. The tangent at (3,4) to the circle $x^2 + y^2 = 16$ is -----
 (a) $3x + 4y = 0$ (b) $3x+4y = 16$ (c) $3x - 4y = 16$ (d) $4x+3y = 16$
16. Find $\lim_{x \rightarrow 0} \frac{\sqrt{1+x}-1}{x}$
 (a) 0 (b) 1 (c) ∞ (d) $\frac{1}{2}$
17. The function given by $f(x) = |x|$ at $x = 0$ is
 (a) continuous & differentiable (b) discontinuous & differentiable
 (c) continuous & not differentiable (d) discontinuous & not differentiable

18. Find the angle between two vectors \vec{a} and \vec{b} with magnitude 1 and 2, respectively and such that $\vec{a} \cdot \vec{b} = 1$
 (a) $\pi/2$ (b) $\pi/3$ (c) 0 (d) π
19. Find λ if the vectors $\vec{a} = \hat{i} + 3\hat{j} + \hat{k}$, $\vec{b} = 2\hat{i} - \hat{j} - \hat{k}$ and $\vec{c} = \lambda\hat{i} + 7\hat{j} + 3\hat{k}$ are coplanar
 (a) $\lambda = 1$ (b) $\lambda = 2$ (c) $\lambda = -1$ (d) $\lambda = 0$
20. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ then $A(adjA)$ equals
 (a) $\begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 10 \\ 10 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 10 & 1 \\ 1 & 10 \end{bmatrix}$ (d) none of the above
21. If α, β, γ are the roots of $2x^3 - 3x^2 + 6x + 1 = 0$, then $\alpha^2 + \beta^2 + \gamma^2$ is
 (a) $15/4$ (b) -3 (c) $-15/4$ (d) $33/4$
22. The equation of the plane passing through the point $(3, -3, 1)$ and parallel to the plane $2x + 3y + 5z + 6 = 0$ is
 (a) $2x + 3y + 5z + 2 = 0$ (b) $2x + 3y + 5z - 2 = 0$ (c) $2x + 3y + 5z + 3 = 0$ (d) $2x + 3y + 5z - 3 = 0$
23. If $x + iy = \sqrt{2} + 3i$, then $x^2 + y^2$ is
 (a) 7 (b) 5 (c) 13 (d) $\sqrt{2} + 3$
24. Find the slope of the tangent to the curve $y = x^3 - x + 1$ at the point whose x-coordinate is 2
 (a) 11 (b) 0 (c) 2 (d) 7
25. Which of the following function is strictly decreasing on $(0, \pi/2)$?
 (a) x (b) $\sin x$ (c) $\cos x$ (d) $\tan x$
26. Find the value of the integral $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$
 (a) $\pi/2$ (b) $\pi/4$ (c) 0 (d) π
27. Find the order and the degree of the differential equation

$$\left(\frac{d^3 y}{dx^3}\right)^2 + 2\left(\frac{d^2 y}{dx^2}\right) - 5\left(\frac{dy}{dx}\right) + y = 0$$

 (a) order 2, degree 2 (b) order 2, degree 3 (c) order 3, degree 2 (d) order 3, degree 3

28. If $P(A)=6/11$, $P(B)=5/11$ and $P(A \cup B)=7/11$, find $P(A \cap B)$
 (a) $4/11$ (b) 1 (c) $30/121$ (d) $1/11$

29. Find the range of the function f given by $f(x) = 1 + 3\cos 2x$
 (a) $[-1,1]$ (b) $[0,4]$ (c) $[-2,4]$ (d) $[-2,1]$

30. If ω is one of the imaginary cube roots of unity, find the value of $\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$
 (a) 0 (b) 1 (c) ω^3 (d) ω

31. A square matrix $A = [a_{ij}]$ is called symmetric matrix if for all i and j
 (a) $a_{ij} = -a_{ij}$ (b) $a_{ij} = a_{ji}$ (c) $a_{ii} = a_{jj}$ (d) $a_{ij} = a_{ii}$

32. Area of the triangle whose vertices are $A(-1,-8)$, $B(-2,3)$ & $C(3,2)$ is
 (a) 10 sq. units (b) 20 sq. units (c) 15 sq. units (d) 30 sq. units

33. $\begin{vmatrix} 1 & \omega^2 & \omega^2 \\ \omega^2 & 1 & \omega \\ \omega^2 & \omega & 1 \end{vmatrix}$ is equivalent to
 (a) 0 (b) 1 (c) -3ω (d) 3ω

34.. $\lim_{x \rightarrow 1} \frac{x^3 - 1}{x - 1}$ is equivalent to
 (a) 3 (b) 0 (c) ∞ (d) 1

35. Solution of the differential equation $\frac{dy}{dx} = e^{x+y}$ is

(a) $e^{-y} = e^x + c$ (b) $-e^y = e^x + c$ (c) $e^y = -e^x + c$ (d) $-e^{-y} = e^x + c$

36. Area of the region bounded between the line $x = 3$ and curve $y^2 = 4x$ is
 (a) $2\sqrt{3}$ sq. units (b) $4\sqrt{3}$ sq. units (c) 0 (d) $8\sqrt{3}$ sq. units

37. In a simultaneous throws of a pair of dies, the probability of getting a doublet of prime numbers is

(a) $\frac{1}{12}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

38. The function $\begin{cases} |x|, & x \neq 0 \\ 1, & x = 0 \end{cases}$ is

- (a) continuous at every point (b) continuous at origin (c) discontinuous at origin
(d) discontinuous at everywhere

39. The equation of tangent to the curve $\sqrt{x} + \sqrt{y} = \sqrt{a}$ at the point $\left(\frac{a^2}{4}, \frac{a^2}{4}\right)$ is

- (a) $x + y = a$ (b) $x + y = 2a$ (c) $x + y = a^2$ (d) $2x + 2y = a^2$

40. $\lim_{x \rightarrow a} \frac{\log x - \log a}{x - a}$ is

- (a) 0 (b) $\frac{1}{a}$ (c) ∞ (d) a

41. If $y = \sqrt{\log x + \sqrt{\log x + \sqrt{\log x + \dots \infty}}}$ then $\frac{dy}{dx}$ is

- (a) 0 (b) $\frac{1}{x}$ (c) $\frac{1}{x(2y-1)}$ (d) $\frac{1}{2y-1}$

42. The solution of differential equation $\frac{dy}{dx} + 2y = e^{-x}$ is

- (a) $ye^{-x} = 2e^x + c$ (b) $ye^{2x} = e^x + c$ (c) $y = e^x + c$ (d) none of these.

43. $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

- (a) 0 (b) 1 (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{4}$.

44. $\int e^x (\sin x + \cos x) dx$ is

- (a) $e^x \cos x + c$ (b) $\sin x + c$ (c) $e^x + c$ (d) $e^x \sin x + c$.

45. Equation of normal to the curve $y = 2x^2 + 3 \sin x$ at $x = 0$ is

- (a) $x + 3y = 0$ (b) $x + y = 0$ (c) $3x + y = 0$ (d) $x = y$.

46. $\lim_{x \rightarrow 0} \frac{\sin x - x}{x}$

- (a) ∞ (b) 0 (c) 1 (d) not defined

47. $\lim_{x \rightarrow 0} \frac{\tan x - x}{x}$
 (a) ∞ (b) 0 (c) $\frac{\pi}{2}$ (d) not defined
48. $\lim_{x \rightarrow 0} \frac{e^{ax} - e^{-ax}}{\log(1 + bx)}$
 (a) $2a/b$ (b) $3a/b$ (c) a/b (d) 0
49. $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sec^2 x - 2 \tan x}{1 + \cos 4x}$
 (a) $1/3$ (b) $1/2$ (c) $1/4$ (d) $1/6$
50. $\lim_{x \rightarrow 0} \frac{\cos x - \log(1 + x) - 1 + x}{\sin^2 x}$
 (a) 0 (b) 1 (c) 2 (d) 3
51. $\lim_{x \rightarrow \infty} \frac{x^n}{e^x}$
 (a) 1 (b) 0 (c) -1 (d) 2
52. $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$
 (a) 1 (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) 0
53. $y^2 = (x-a)(x-b)(x-c)$ is symmetric about
 (a) x-axis (b) y-axis (c) both the axis (d) none of the axis
54. $\int_0^{\pi/2} (\sin^2 x \cos^2 x) dx$
 (a) 1 (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{8}$ (d) 0
55. The area bounded by the curve $x^{1/2} + y^{1/2} = a^{1/2}$ and co-ordinate axes is
 (a) $a^2/6$ (b) $a/2$ (c) $a/3$ (d) $a^2/8$
56. The area bounded by the curves $y = x^3$ and $y = 4x^2$ is
 (a) $\frac{32}{3}$ (b) $\frac{64}{3}$ (c) $\frac{16}{3}$ (d) $\frac{8}{3}$
57. If $(x+2y) dx + (2x + y) dy = 0$, then its solution is
 (a) $y^2 + 4xy + x^2 = c$ (b) $y + 4xy + x = c$ (c) $y = x$ (d) $y^2 = x$

58. $\frac{dy}{dx} = e^{2x-y} + x^3 e^{-y}$, then

(a) $e^y = (e^{2x}/2) + x^4/4 + c$ (b) $e^y = (e^{2x}/2) + c$ (c) $e^y = x^4/4 + c$ (d) $y^2 = x$

59. $(x^2+1)\frac{dy}{dx} + (y^2+1) = 0$, $y(0)=0$, then

(a) $y = \frac{1-x}{1+x}$ (b) $y = \frac{-x}{1+x}$ (c) $y = \frac{x}{1+x}$ (d) $y = \frac{x^2}{1+x}$

60. $y' + y = e^{e^x}$, then

(a) $y e^x = e^{e^x} + c$ (b) $y = e^{e^x} + c$ (c) $y = e^{e^x} + x$ (d) $y e^x = e^{-x} + c$

SECTION- B

APTITUDE TEST

61. A magician bought a rabbit for Rs. 60 and a pigeon for Rs. 70. How much is the pigeon more expensive than the rabbit in percentage?

- a. 10%
- b. 12.5%
- c. 16.66%
- d. 17.8%

62. A newspaper salesman sells 40% of his newspapers. He now has 360 newspapers left. How many newspapers did he have to begin with?

- a. 560
- b. 660
- c. 600
- d. 480

63. A Man has Rs. 480 in the denominations of one-rupees, five-rupee notes and ten-rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has?

- a. 60
- b. 75

c.40
d.90

64. As a Christmas present, Jolly gave her two sons Rs. 2000, which she divided between them in a ratio of 2:3. How much did the son receiving the larger portion get?

- a.Rs. 800
- b.Rs. 1,200
- c.Rs. 1,400
- d.Rs. 1,666

65. 12 members were present at a board meeting. Each member shook hands with all of the other members before & after the meeting. How many hand shakes were there?

- a) 130
- b) 134
- c) 132
- d) 135

66. An emergency vehicle travels 10 miles at a speed of 50 miles per hour. How fast must the vehicle travel on the return trip if the round-trip travel time is to be 20 minutes?

- a) 75 miles per hour
- b) 70 miles per hour
- c) 65 miles per hour
- d) 80 miles per hour

67. Mary and John can do a piece of work in 24 days; John and Vino in 30 days; Vino and Mary in 40 days. If Mary, John and Vino work together they will complete the work in :

- a) 10 days
- b) 20 days
- c) 17 days
- d) 15 days

68. My friend collects antique stamps. She purchased two, but found that she needed to raise money urgently. So she sold them for Rs. 8000 each. On one she made 20% and on the other she lost 20%. How much did she gain or lose in the entire transaction?

- a) She lost Rs 500.67
- b) She lost Rs 666.67
- c) She gain Rs 666.67
- d) She gain Rs 500.67

69. Find the sum of the first 50 common terms of 12,16,20,... and 18,24,30,....

- a) 15900
- b) 12700
- c) 19990
- d) 18400

70. The time showed by an analog clock at a moment is 11 am then 1234567890 hours later it will show the time as:

- a)11am
- b)11pm
- c)5am
- d)4pm

71. Square of two more than a two digit number is multiplied and divided by 2 and 5 respectively. If twice of the result is equal to 500 then find the number?

- a) 45 b) 23 c) 87 d) 47

72. Pick Odd One Out:

- 16, 25, 36, 72, 144, 196, 255
a. 36 b. 72 c. 196 d. 225

73. In a marathon Jack finished after Jane, and came in ahead of Bill. Mike beat Jane, but finished after Lee. Where did Mike finish?

- a. First
b. Second
c. Third
d. Fourth

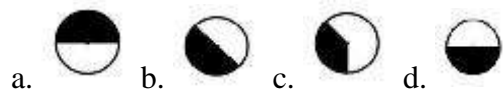
74. All Italians speak Greek. All Greek speakers have cars. Which of the following **MUST** be true?

- a. All Italians have cars
b. All Greek speak Italian
c. All with cars are Italian
d. All Greek speakers are Italian

75. If the radius of a circle is increased by 20% then the area is increased by :

- a. 44%
b. 120%
c. 144%
d. 40%

76. What is the next shape in series?



77. Complete the series CMM, EOO, GQQ, _____, KUU

- a. GRR
b. GSS
c. ISS
d. ITT



78. If $3/p = 6$ and $3/q = 15$ then $p - q = ?$
- $1/3$
 - $2/5$
 - $3/10$
 - $5/6$
 - None of the above
79. A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work. Approximately at what time will the work (to print one lakh books) be finished?
- 11:30 A.M.
 - 12 noon
 - 12:30 P.M.
 - 1:00 P.M.
80. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?
- 564
 - 645
 - 735
 - 756
 - None of these
81. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?
- 360
 - 480
 - 720
 - 5040
 - None of these
82. In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?
- 810
 - 1440
 - 2880
 - 50400
 - 5760
83. A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?

- a. 32
- b. 48
- c. 64
- d. 96
- e. None of these

84. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share?

- a. Rs. 500
- b. Rs. 1500
- c. Rs. 2000
- d. None of these

85. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

- a. 2 : 3 : 4
- b. 6 : 7 : 8
- c. 6 : 8 : 9
- d. None of these

86. In a mixture 60 litres, the ratio of milk and water 2 : 1. If this ratio is to be 1 : 2, then the quantity of water to be further added is:

- a. 20 litres
- b. 30 litres
- c. 40 litres
- d. 60 litres

87. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age?

- a. 2 times
- b. $2\frac{1}{2}$ times
- c. $2\frac{3}{4}$ times
- d. 3 times

88. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

- a. 6 hours
- b. 10 hours
- c. 15 hours

d. 30 hours

89. A vessel is filled with liquid, 3 parts of which are water and 5 parts syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup?

a.

$$\frac{1}{3}$$

b.

$$\frac{1}{4}$$

c.

$$\frac{1}{5}$$

d.

$$\frac{1}{7}$$

90. How many liters of a 90% of concentrated acid needs to be mixed with a 75% solution of concentrated acid to get a 30 liter solution of 78% concentrated acid?

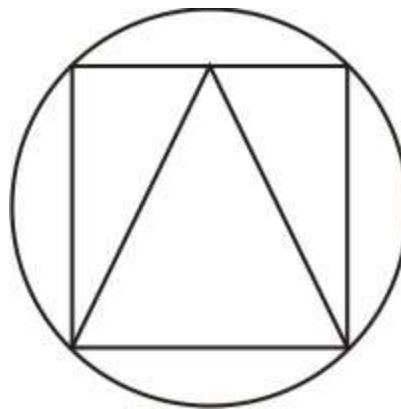
a. 3

b. 4

c. 6

d. 10

91. Find the ratio of the area of square to area of triangle.



a. 1:2

b. 2:1

c. 2:3

d. 3:2

9. (b)
10. (b)
11. (b)
12. (b)
13. (d)
14. (b)
15. (b)
16. (d)
17. (c)
18. (b)
19. (d)
20. (a)
21. (c)
22. (b)
23. (b)
24. (a)
25. (c)
26. (b)
27. (c)
28. (a)
29. (c)
30. (a)
31. (b)
32. (d)
33. (c)
34. (a)
35. (d)
36. (d)
37. (a)
38. (c)
39. (d)
40. (b)
41. (c)
42. (b)
43. (d)
44. (d)
45. (a)
46. (b)
47. (b)
48. (a)
49. (b)
50. (a)
51. (b)
52. (c)

- 53. (a)
- 54. (c)
- 55. (d)
- 56. (b)
- 57. (a)
- 58. (a)
- 59. (a)
- 60. (a)

Section B

- 61. (c)
- 62. (c)
- 63. (d)
- 64. (b)
- 65. (c)
- 66. (a)
- 67. (b)
- 68. (b)
- 69. (a)
- 70. (c)
- 71. (b)
- 72. (b)
- 73. (b)
- 74. (a)
- 75. (a)
- 76. (d)
- 77. (c)
- 78. (c)
- 79. (d)
- 80. (d)
- 81. (c)
- 82. (d)
- 83. (c)
- 84. (c)
- 85. (a)
- 86. (d)
- 87. (a)
- 88. (c)
- 89. (c)
- 90. (c)
- 91. (b)
- 92. (c)
- 93. (a)
- 94. (c)



- 95. (a)
- 96. (a)
- 97. (d)
- 98. (b)
- 99. (d)
- 100. (a)