Birla Institute of Technology & Science, Pilani
Pilani Campus

Sample Questions for the Business Analytics Aptitude Test (2021)

Section 1 (Management Aptitude Section)

1. The new vaccine can be administered to all, _____ to those under 18.
   a) Accept
   b) Except
   c) Expect
   d) Access

2. Arrange the following words in a meaningful sequence: 1. Tree, 2. Branch, 3. Leaf, 4. Forest, 5. Woods.
   a) 1, 2, 3, 4, 5
   b) 3, 2, 1, 4, 5
   c) 3, 2, 1, 5, 4
   d) 5, 4, 3, 2, 1

3. In each of the following questions find out the alternative which will best replace the question mark.
   Flock : Bird :: ? : Wolf
   a) Group
   b) Pack
   c) Bunch
   d) Herd

4. Choose the word which is different from the rest.
   a) Electron
   b) Neutron
   c) Proton
   d) Radon

5. Identify the incorrect usage of the term 'pass'.
   a) Pass on the salt please.
   b) He passed the test with flying colors.
   c) I am a 2020 pass out MBA.
   d) Her father sadly passed away last week.

6. Choose the option which is opposite to the meaning of 'pertinent'
   a) Germane
   b) Irrelevant
   c) Impertinent
   d) Impatient

7. Spot the error in the following: (1) The reason why he is rejected (2) is because (3) he is unexperienced.
   (4) No error
   a) 1
   b) 2
   c) 3
   d) 4

8. When someone explains the events in order of their occurrence, it is called a/an
    a) Anthology
    b) Chronology
    c) Ontology
    d) Theology

9. Arrange the following sentences to form a coherent paragraph.
    P. According to the residents, the name of the town comes from the name of the famous Jat warrior, who belonged to the Pilania gotra.
    Q. It is said that the warrior courageously fought and sacrificed his life to protect a fort in the town from invasion by enemies.
    R. Pilani is a small town lying in the Shekhawati region of Rajasthan.
    S. Currently the town is most notably famous for Birla Institute of Technology & Science, and for Central Electronics Engineering Research Institute.
    T. In order to honor the sacrifice of the fighter, the ruler of the place named the town after him.
    a) PQRST
    b) PQTSR
    c) RPQST
    d) RPQTS

10. Consider the underlined phrase in the following sentence for grammatical correctness. Jaisamand lake is one of the most beautiful artificial lake in Rajasthan.
    a) most beautiful artificial lakes in
    b) most artificial beautiful lakes in
    c) most artificial beautiful lake in
    d) no correction required

For questions numbered 13-16, read the following paragraph.

A vaccine is a substance that is introduced into the body to prevent infection or to control disease due to a certain pathogen, which is a disease-causing organism, such as a virus, bacteria or parasite. The vaccine "teaches" the body how to defend itself against the pathogen by creating an immune response. Preventive vaccines work to protect an individual from infection or disease by introducing a small component or a non-harmful form of the pathogen (called the foreign antigen) into the body. The body produces an immune response to the pathogen by generating antibodies (via the humoral response), killer cells (via the cell-mediated response), or both. A small group of memory B-cells and T-cells remain in the body and can quickly initiate a strong immune response, i.e., by producing antibodies, and helping the production of killer T-cells or antibodies, respectively. The next time the real pathogen is encountered, the immune system remembers it and mounts a much larger, quicker response than it would have if the individual had never received the vaccine. This is known as "immune memory".

11. What are the examples of pathogens?
    a) Bacteria
    b) Parasite
    c) Virus
    d) All of the above

12. Preventive vaccines introduce a small amount or component of pathogens into the body as
    a) Native antigen
    b) Foreign antigen
    c) Antibodies
    d) T-cells

13. When a vaccine is introduced into the body, the body produces an immune response by generating
    a) Antibodies
    b) Killer cells
    c) Either or both of the above
    d) None of the above

14. Immune systems remember the pathogen via
    a) A-cells
    b) B-cells
    c) T-cells
    d) Both b) and c)

15. A facility where children are left by their parents for short periods in the supervision of childminders is called a
    a) Crash
    b) Crèche
    c) Crème
    d) Cradle

16. "Your alma mater leaves an impression on your life." What does the term 'alma mater' mean here?
    a) Friends
    b) Love interest
    c) Biological mother
    d) School or university

17. "She was feeling under the weather." Select the closest interpretation.
    a) She was getting irritated by the weather.
    b) She was not feeling well.
    c) She was caught in the rain.
    d) She was feeling very emotional.

18. For the following word given below, a contextual usage is provided. Pick the word from the alternatives given that is closest in meaning in the given context.
    ESCHEW: Despite calls for increased controls, the government eschewed coercion.
    a) Avoided
    b) Enforced
    c) Maintained
    d) Resorted to

19. What is the next number in the series: 5, 11, 21, 43, 85, ?

    a) 170
    b) 171
    c) 169
    d) 168

20. Two tanks of similar volume are full of a mixture of oil and water. In the first, the ratio of oil and water is 3:4 and in the second, it is 5:9. If both these tanks are poured in a larger tank, what would be the resultant ratio of oil and water?
    a) 11/17
    b) 17/11
    c) 11/28
    d) 17/28

21. Dr. Doolittle moves East and then turns to his right and keeps walking. After that, he again turns right and walks a certain distance and then finally walks to the left. In which direction is he walking now?
    a) North
    b) South
    c) East
    d) West

22. In a certain code PILANI is written as KROZMR. How is BITS written in that code?
    a) XRGH
    b) YRGH
    c) XRHG
    d) YRHG

23. Consider the following statements: Coronavirus has wreaked havoc on the world. Thankfully, research conducted in the universities and pharmaceutical companies resulted in the rapid development of a number of vaccines. Therefore, government should continue invest more in promoting basic sciences among the students.

The conclusion in the above argument is based on which of the following assumptions?
    a) Research in universities is more important.
    b) Research in pharmaceutical companies is more important.
    c) We need more students in universities so that the companies get the workforce.
    d) We need more students in basic sciences so some of them become scientists.

Instructions for 24-26

Aashi, Barkha, Charu, and Dhwani are three MBA batchmets who work in four different companies: City Group, Genpact, HSBC Analytics, and MuSigma, not necessarily in that order. Aashi is from Delhi, while the other three are from one of the following cities – Pune, Hyderabad, and Bangalore. Genpact employee is from Pune. Barkha works in City Group. Charu is not from Pune. Aashi does not work for MuSigma.

24. Which company does Aashi work in?
    a) City Group
    b) Genpact
    c) HSBC Analytics
    d) MuSigma

25. Who is MuSigma employee?
    a) Aashi
    b) Barkha
    c) Charu
    d) Dhwani

26. Which city is Dhwani from?
    a) Delhi
    b) Pune
    c) Hyderabad
    d) Bangalore

27. In a clock having a circular scale of 12 hours, when time changes from 6:40pm to 6:44pm, by how many degrees the angle formed by the hour hand and minute hand changes?
    a) 20
    b) 21
    c) 22
    d) 23

28. Which year was *not* a leap year?
    a) 1700
    b) 1800
    c) 1900
    d) 2000

29. Three persons A, B and C gave these statements:
    A: Either Donald Biden or Joe Trump won the election.
    B: Donald Biden won.
    C: Neither Donald Biden nor Joe Trump won the election.
    Of these persons, only one person is wrong.
    Who won the elections?
    a) Donald Biden
    b) Joe Trump
    c) Data Inadequate
    d) None of these

30. Five friends P, Q, R, S, T are sitting on a round table (not necessarily in the same order). There is one person between P and R. Q is sitting between P and T. Who are the neighbors of S?
    a) P and T
    b) P and Q
    c) T and R
    d) P and R

31. Consider the following two statements and select the appropriate option:
    I. The government has imposed lockdown to contain the disease.
    II. The incidence rate of the disease is rapidly increasing.
    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 independent causes.
    d) Both the statements I and II are mutually dependent.

32. Consider the statements. Statements are followed by four conclusions (1), (2), (3) and (4). Choose the conclusions which logically follow from the given statements.
    Statements: All humans are atoms. All atoms are hollow.
    Conclusions: (1) Some atoms are humans. (2) Some hollows are humans. (3) Some humans are not hollow. (4) All hollows are atoms.
    a) Only (1) and (2)
    b) Only (1) and (3)
    c) Only (1) and (4)
    d) Only (2) and (4)

33. Ms. Nidhi wants to put up fencing around three sides of her rectangular yard and leave a side of 20 feet unfenced. If the yard has an area of 680 square feet, how many feet of fencing does she need?
    a) 34
    b) 40
    c) 68
    d) 88

34. A toy store regularly sells all stock at a discount of 20 percent to 40 percent. If an additional 25 percent were deducted from the discount price during a special sale, what would be the lowest possible price of a toy costing Rs.16 before any discount?
    a) Rs.5.60
    b) Rs.7.20
    c) Rs.8.80
    d) Rs.9.60

35. If basis points are defined so that 1 percent is equal to 100 basis points, then 82.5 percent is how many basis points greater than 62.5 percent?
    a) 0.02
    b) 2
    c) 0.2
    d) 2000

36. If a real estate agent received a commission of 6 percent of the selling price of a certain house, what was the selling price of the house?
    (I) The selling price minus the real estate agent's commission was $84,600.
    (II) The selling price was 250 percent of the original purchase price of $36,000.
    a) Statement (I) ALONE is sufficient, but statement (II) alone is not sufficient.
    b) Statement (II) ALONE is sufficient, but statement (I) alone is not sufficient.
    c) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
    d) EACH statement ALONE is sufficient.

37. Ms. Janaki and Ms. Devi each received a salary increase. Which one received the greater rupee increase?
    (I) Janaki's salary increased 8 percent.
    (II) Devi's salary increased 5 percent.
    a) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
    b) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
    c) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
    d) Statements (1) and (2) TOGETHER are NOT sufficient.

38. Ms. Kajol can drive from her home to her office by one of two possible routes. If she must also return by one of these routes, what is the distance of the shorter route?
    (I)   When she drives from her home to her office by the shorter route and returns by the longer route, she drives a total of 42 kilometers.
    (II) When she drives both ways, from her home to her office and back, by the longer route, she drives a total of 46 kilometers.
    a)   Statement (I) ALONE is sufficient, but statement (II) alone is not sufficient.
    b)   Statement (II) ALONE is sufficient, but statement (I) alone is not sufficient.
    c)   BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
    d)   EACH statement ALONE is sufficient.

39. Sixty percent of the members of a university cricket team are seniors and 45 percent of those seniors are in the university hockey team. If one member of the university cricket team is randomly selected, what is the probability that the member is a senior hockey team member?
    a)   0.15
    b)   0.27
    c)   0.30
    d)   0.45

40. If n is a positive integer such that n! is divisible by 840, what is the least possible value of n?
    a)   7
    b)   8
    c)   12
    d)   14

41. Krishna and Siva, working together can paint a room in 5 hours. If Mahesh helps Krishna and Siva paint the room, the three of them can paint the room in 4 hours. What amount of time (in hours) would it take Mahesh, working alone, to paint the room?
    a)   6
    b)   8
    c)   10
    d)   15

42. The arithmetic average of 20 numbers is A. The arithmetic average of 10 of the number is 16. In terms of A, what is the arithmetic average of the remaining 10 numbers?
    a)   A-8
    b)   16-A
    c)   16-2A
    d)   2A-16

43. A family's monthly budget allocates Rs. 3,600 for their home loan payment plus food and utilities in the ratio of 5:3:1, respectively. What is the rupee amount allocated for food?
    a)   Rs.2000
    b)   Rs.1600
    c)   Rs.1200
    d)   Rs.800

44. In a survey of 500 students regarding pet ownership of cats and dogs, c students own at least one cat, d students own at least one dog, and b students own at least one dog and at least one cat. How many students own neither a cat nor a dog?
    a) 500-c-d+b
    b) 500-c-d-b
    c) 500-c+d
    d) 500-c-d

45. One plant grew 6 inches while a second plant grew 250% more than the first plant grew. How much, in inches, did the second plant grow?
    a) 6
    b) 8
    c) 12
    d) 15

46. The attendance on the first day of a 3-day festival was 20% greater than the attendance on the final day of the festival. If the attendance on the first day was 11,418, what was the attendance on the final day of the festival?
    a) 3806
    b) 5190
    c) 9134
    d) 9515

47. A rectangular flower garden is twice as long as it is wide. If its perimeter is 180 feet, what is the garden's length, in feet?
    a) 60
    b) 70
    c) 80
    d) 90

48. Thirty plants are needed for an experiment. If the plant seeds have a germination rate of 60%, the number of seeds planted should be at least how many?
    a) 40
    b) 42
    c) 48
    d) 50

49. Ninety percent of a large field is cleared for planting. Of the cleared land, 50% is planted with blueberry plants and 40% is planted with strawberry plants. If the remaining 360 acres of cleared land is planted with gooseberry plants, what is the size, in acres, of the original field?
    a) 2916
    b) 3240
    c) 3600
    d) 4000

50. The number of squares is 4 times the number of circles, and the number of circles is twice the number of triangles. What is the ratio of the number of squares to the number of triangles?
    a) 8:1
    b) 4:1
    c) 1:2
    d) 1:4

51. In a survey of 600 students, 75% indicated they like orange juice, 40% indicated they like apple juice, and 30% indicated they like grape juice. If all of the survey participants like at least one of these juices and 35% of them like exactly two of these juices, how many survey participants like only one of these juices?
    a) 210
    b) 250
    c) 260
    d) 360

52. Last year, the ratio of nonfiction to fiction books in a home library was 1 to 30. This year, the number of nonfiction books increased by 5 and the number of fiction books increased by 50, making the ratio of nonfiction to fiction books 1 to 25. What was the number of nonfiction books last year?
    a) 15
    b) 12
    c) 10
    d) 8

<div align="center">Section 2 (Analytics Aptitude Section)</div>

1. Rank the matrix $X = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 4 & 2 & 3 & 0 \\ 1 & 0 & 0 & 0 \\ 4 & 0 & 3 & 0 \end{bmatrix}$
    a) 0
    b) 1
    c) 2
    d) 3

2. Which of the following is not a type of matrix?
    a) Square Matrix
    b) Scalar Matrix
    c) Trace Matrix
    d) Term Matrix

3. Multiplication of a matrix with a scalar constant is called?
    a) Complex multiplication
    b) Linear multiplication
    c) Scalar multiplication
    d) Constant multiplication

4. In the matrix equation $A\Pi = \alpha$. which of the following is a necessary condition for the existence of at least one solution for the unknown vector Π?
    a) Augmented matrix $[A\alpha]$ must have the same rank as matrix A
    b) Vector α must have only non-zero elements
    c) Matrix A must be singular
    d) None of these

5. Determinant of the matrix $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 500 & 1 & 0 & 0 \\ 500 & 400 & 1 & 0 \\ 500 & 400 & 300 & 1 \end{bmatrix}$ is

    a) 100
    b) 400
    c) 1
    d) None of the above

6. The system of equations:
$2\theta + 4\omega = 10$,
$5\theta + 10\omega = 25$ has

    a) no solution
    b) only one solution
    c) only two solutions
    d) infinite solutions

7. Find the value of ε for which the matrix $\Delta = \begin{bmatrix} 3-\varepsilon & 2 & 2 \\ 2 & 4-\varepsilon & 1 \\ -2 & -4 & -1-\varepsilon \end{bmatrix}$ is singular.

    a) 0, 1
    b) 1, 3
    c) 0, 3
    d) 3, 2

8. If the equation $a(y + z) = x$, $b(z + x) = y$, $c(x + y) = z$ have non-trivial solutions then the value of $\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c}$ is:
    a) 1
    b) 2
    c) -1
    d) -2

9. If the system of equations $\alpha + \epsilon\beta - \gamma = 0$, $3\alpha - \epsilon\beta - \gamma = 0$ & $\alpha - 3\beta + \gamma = 0$ has non-zero solution, then ϵ is equal to
    a) -1
    b) 0
    c) 1
    d) 2

10. Find the equation of plane passing through the points $\omega(1, 1, 1)$, $\theta(3, -1, 2)$, $\Pi(-3, 5, -4)$.
    a) $x + 2y = 0$
    b) $x - y = 2$
    c) $x + y = 2$
    d) None of the above

11. The value of θ, so that the line $\frac{1-x}{3} = \frac{7y-14}{2\theta} = \frac{z-3}{2}$ and $\frac{7-7x}{3\theta} = \frac{y-5}{1} = \frac{6-z}{5}$ intersect at right angle, is
    a) $\frac{10}{11}$
    b) $\frac{70}{11}$
    c) $\frac{10}{7}$
    d) $\frac{70}{9}$

12. The equation of the locus of the point whose distance from y-axis is half the distance from origin is
    a) $x^2 + 3y^2 = 0$

    b) $x^2 - 3y^2 = 0$

    c) $3x^2 + y^2 = 0$

    d) $3x^2 - y^2 = 0$

13. If the point (16,-10) lies on the locus $\frac{x^2}{25} - \frac{y^2}{36} = \pi$, then the value of π is
    a) 0
    b) 1
    c)3
    d) None of the above

14. $\int_0^{2\pi} sin\left(\frac{\pi}{4} + \frac{x}{2}\right) dx$
    a) $-2\sqrt{2}$
    b) -2
    c) $\sqrt{2}$
    d) $2\sqrt{2}$

15. $\lim\limits_{\theta \to 2} \frac{\theta^2-4}{\theta^2+4}$ is:
    a) 1
    b) $-\frac{1}{2}$
    c) 0
    d) -1

16. Let $f(2)=4$ and $f'(2)=4$.Then $\lim\limits_{\theta \to 2} \frac{(\theta f(2)-2f(\theta))}{(\theta-2)}$
    a) 2
    b) -2
    c) -4
    d) 4

17. For real A, let $f(A) = A^3 + 5A + 1$, then
    a) f is one-one but not onto R
    b) f is onto R but not one-one
    c) f is one-one and onto R
    d) f is neither one-one nor onto R

18. Solve: x(y − 1) dx + (x + 1) dy = 0. If y = 3 when x = 2.
    a) 1.80
    b) 1.48
    c) 1.55
    d) None of the above

19. The order and degree of the differential equation $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^{\frac{1}{2}} + x^{\frac{1}{3}} = 0$ respectively are
    a) 2 and not defined
    b) 2 and 2
    c) 2 and 3
    d) None of the above

20. The Newton-Raphson method is also called as _____
    a) Tangent method
    b) Secant method
    c) Chord method
    d) Diameter method

21. Newton-Raphson method to solve equation having formula
    a) $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
    b) $x_{n+1} = x_n + \frac{f(x_n)}{f'(x_n)}$
    c) $x_n = x_{n+1} - \frac{f(x_{n+1})}{f'(x_{n+1})}$
    d) $x_{n+1} = x_{n+1} - \frac{f'(x_n)}{f(x_n)}$

22. Let f(x) be an equation such that f(α) f(β) > 0 for two real numbers a and b. Then
    a) at least one root of f(x) = 0 lies in (α, β)
    b) no root lies in (α, β)
    c) either no root or an even number of roots lie in (α, β)
    d) None of these.

23. How many permutations of the letters of the word UMBRELLA are there?
    a) 600
    b) 120
    c) 240
    d) None of the above

24. $_{12}^{\rho}C = _{6}^{\rho}C$, the value of ρ is:
    a) 12
    b) 14
    c) 16
    d) 18

25. When two coins are tossed simultaneously, what are the chances of getting at least one tail?
    a) 3/4
    b) 1/5
    c) 4/5
    d) 1/4

26. A box has 5 black and 3 green shirts. One shirt is picked randomly and put in another box. The second box has 3 black and 5 green shirts. Now a shirt is picked from second box. What is the probability of it being a black shirt?
    a) 4/9
    b) 29/72
    c) 8/72
    d) 3/16

27. If the probability of a machine producing a defective part is 0.05, what is the probability of finding exactly 5 defective parts from a sample of 100? (Assume that the process follows a binomial distribution and round answer to four places.)
    a) 0.0500
    b) 0.0900
    c) 0.1800
    d) 0.5000

28. Which of the following is not a member of the class?
    a) Static Function
    b) Friend Function
    c) Virtual Function
    d) Const Function

29. Which of the following is the correct class of the object cout?
    a) iostream
    b) istream
    c) ostream
    d) ifstream

30. A set of arithmetic operators are:
    a) +, - , *, /, %
    b) <, >, >=, <=
    c) &&, ||, !
    d) None of the above

31. C++ language has been developed by
    a) Dennis Ritchie
    b) Ken Thompson
    c) Martin Richard
    d) Bjarne Stroustrup

32. Which is used to associate entities with one another?
    a) Entity
    b) Relationship
    c) Identifier
    d) Attributes

33. An _____ is a variable representing a collection of homogeneous type of elements.
      a) arrangement
      b) array
      c) assortment
      d) group

34. Which of the following data structure is non-linear type?
      a) Strings
      b) Lists
      c) Stacks
      d) None of the above

35. If there's no base criteria in a recursive program, the program will
      a) not be executed.
      b) executes until all conditions match.
      c) executes infinitely.
      d) obtains progressive approach.

36. A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is?
      a) Queue
      b) Circular queue
      c) Dequeue
      d) Priority queue

37. In Boolean algebra, the OR operation is performed by which properties?
      a) Associative properties
      b) Commutative properties
      c) Distributive properties
      d) All of the Mentioned

38. $A(A + B) = ?$
      a) AB
      b) 1
      c) (1 + AB)
      d) A

39. Boolean algebra deals with variables that can have?
      a) two discrete values
      b) three discrete values
      c) four discrete values
      d) five discrete values

40. Which Boolean Identities law proof A+A=A ?
      a) Idempotent Law
      b) Complement Law
      c) Double Complement Law
      d) Identity Law