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(To be filled in the OMR Sheet)

प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
B

BBA (First Semester) Examination, February/March-2022

BBA-102(N)

Business Mathematics

(for Ex & B.P. Students)

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET)में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

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Rough Work / रफ कार्य

1. A combination of direct and inverse variations of one or more than one variables is known as:

   (A) direct variation

   (B) inverse variation

   (C) joint variation

   (D) complex variation

2. For which value of x will (x-1) (3-x) have its maximum?

   (A) 0

   (B) 1

   (C) 2

   (D) -2

3. What will be the point of maximum of the function $2x^3 + 3x^2 - 36x + 10$?

   (A) -1

   (B) -2

   (C) -3

   (D) -4

4. What is the minor of the element 5 in the determinant Δ ?

$$\Delta = \begin{vmatrix} 1 & 5 & 4 \\ 2 & 3 & 6 \\ 7 & 9 & 4 \end{vmatrix}$$

   (A) -34

   (B) 34

   (C) -17

   (D) 21

5. Find the minor and cofactor respectively for the element 3 in the determinant Δ

$$\Delta = \begin{vmatrix} 1 & 5 \\ 3 & 6 \end{vmatrix}$$

(A) M_{21}=-5, A_{21}=-5

(B) M_{21}=5, A_{21}=-5

(C) M_{21}=-5, A_{21}=5

(D) M_{21}=5, A_{21}=5

6. Find the cofactor of element -3 in the determinant Δ

$$\Delta = \begin{vmatrix} 1 & 4 & 4 \\ -3 & 5 & 9 \\ 2 & 1 & 2 \end{vmatrix}$$

(A) -4

(B) 4

(C) -5

(D) -3

7. Which of the following is the formula for calculating the inverse of the matrix?

(A) $(2/|A|)$ adj A

(B) $(1/|A|)$ adj A

(C) $(-1/|A|)$ adj A

(D) $(1/|2A|)$ adj A

8. Which of the below condition is incorrect for the inverse of a matrix A?

(A) The matrix A must be a square matrix

(B) A must be singular matrix

(C) A must be a non-singular matrix

(D) adj A≠0

9. Find the integral of $8x^3+1$.

(A) $2x^4+x+C$

(B) $2x^6-5x+C$

(C) $2x^4-x+C$

(D) $2x^4+x^2+C$

10. Find $\int(7x^2 - x^3 + 2x)\,dx$.

(A) $7x^3/3+x^4/5-2x^2+C$

(B) $7x^3/3+x^4/4+2x^{2/}2+C$

(C) $7\times5/9-x4/4+2x^{2/}2+C$

(D) $7x^3/3-x^4/4+x^2+C$

11. Ramesh's salary was reduced by 10% and then reduced salary was increased by 10%. What was his ultimate situation?

(A) Loss

(B) Gain

(C) Can't say

(D) None of these

12. 40% of greater number is equal to 60% of the smaller. If their sum is 150, then the greater number is:

(A) 70

(B) 80

(C) 90

(D) 60

13. Two students appeared at an examination. One of them secured 9 marks more than the other and his marks was 56% of the sum of their marks. The marks obtained by them are:

(A) 39, 31

(B) 41,31

(C) 42,33

(D) 40,33

14. Four quantities a, b, c and d are in proportion if and only if:

(A) ad = bc

(B) ab = cd

(C) Both (A) & (B)

(D) None

15. Find the amount Rs.8000 for 3 years at 5% per annum CI.

(A) 1381

(B) 9261

(C) 8451

(D) 1151

16. Find the amount after Simple Interest on Rs.5200 for 2 years at 6% p.a.

(A) Rs.5650

(B) Rs.5824

(C) Rs.5224

(D) Rs.6000

17. Interest obtained on a sum Rs.5000 for 3 years is Rs.1500. Find the rate %

(A) 8%

(B) 9%

(C) 10%

(D) 11%

18. If 3A = 4B = 6C; Find A: B: C

(A) 5: 3: 2

(B) 4: 1: 2

(C) 4: 5: 2

(D) 4: 3: 2

(For Q. No.19 & 20) : A certain sum was divided in the ratio 7: 5: 4 among A, B and C respectively. If the total sum is 8000.

19. What amount did A receive?

(A) 3000

(B) 4500

(C) 3500

(D) 4000

20. What amount did C receive?

(A) 3500

(B) 2000

(C) 1500

(D) 2500

21. Find the value of x in the following.

x : 6 = 5: 11

(A) 50/11

(B) 30/11

(C) 60

(D) 66

22. 18 : x = 27 : 3

(A) 3

(B) 2

(C) 5

(D) 6

23. For what values of X are the numbers -2/7, X, -7/2 in GM

(A) -1

(B) 1

(C) Both (A) & (B)

(D) None of these

24. What is the Geometric Mean of the following numbers 2,4,8,16,32?

(A) 32

(B) 64

(C) 8

(D) 16

25. For what possible value of X are the numbers (x+9), (x-6) and 4 in GP

(A) 3

(B) 2

(C) 16

(D) None of these

26. The sum of the series 5+9+13+_____+49 is.

(A) 535

(B) 324

(C) 351

(D) 435

27. The third term of GP is 9. The product of its first five terms:

(A) 3^{10}

(B) 3^{12}

(C) 3^{9}

(D) 3^{5}

28. Differentiate w. r. t. x. $x^{-3/2}$

(A) $\frac{3}{2}x^{5/2}$

(B) $-\frac{3}{2}x^{5/2}$

(C) $-\frac{3}{2}x^{-5/2}$

(D) $\frac{3}{2}x^{-3/2}$

29. Differentiate w. r. t. x. $e^3 \log x$

(A) $e^3 \log x^3$

(B) $\frac{e^3}{x}$

(C) $\frac{x^2}{3}$

(D) $e \log x^3$

30. Find $\frac{dy}{dx}$ when $y = (x^2-3x+2)(x+2)$

(A) $x^2 - 2 + 4$

(B) $3x^2 - 2x - 4$

(C) $3x^2 - 2x + 4$

(D) $(x - 3)$

31. $y = (x^3+2x)^2$ find $\frac{dy}{dx}$

(A) $2(x^3+2x)(3x^2+2)$

(B) $2(2x^2+2)(3x^2+2)$

(C) $2(x^3+2x)(2x+2)$

(D) None of the above

32. $y = 3x^4 - 5x^2 + 7$ find y'

(A) $y' = 2x^2 - 10x$

(B) $y' = 3x^3 - 10x + 7$

(C) $y' = 12x^3 - 10x + 1$

(D) $y' = 12x^3 - 10x$

33. Find $I = \int (x + \frac{1}{x})^3 \, dx$

(A) $I = \frac{x^4}{4} + \frac{3x^3}{2} + 3\log x - \frac{1}{2x^2} + C$

(B) $I = \frac{x^3}{4} + \frac{x^3}{2} + 3\log x^2 - \frac{1}{2x^2} + C$

(C) $I = \frac{x^4}{4} + \frac{x^3}{2} + \frac{3}{2}\log x + C$

(D) None of these

34. $I = \int \sqrt{x}(x^2 + 2x + 3) \, dx$

(A) $\frac{1}{7}x^{7/2} + \frac{1}{5}x^{5/2} + 2x^{3/2} + c$

(B) $\frac{2}{7}x^{7/2} + \frac{4}{5}x^{5/2} + 2x^{3/2} + c$

(C) $\frac{2}{7}x^{7/2} + \frac{4}{5}x^{5/2} + x^{3/2} + c$

(D) None of the above

35. $I = \int \log x \, dx$

(A) x log x – x + c

(B) x log x – 1 + c

(C) log x –x + c

(D) None of the above

(For Q. No. 36 to 39) :

u={1,2,3,4,5,6,7,8,9,10}

If Set A = {1,2,3,4,5}, B = {2,3,4,6}, C = {1,2,3}

36. Find (A∩B)-

(A) {2,3,6}

(B) {1,2,3}

(C) {2,3,4}

(D) {3,2}

37. Find A:

(A) {1,2,3,4,5}

(B) {6,7,8,9}

(C) {6,7,8,9,10}

(D) {2,4,6,7,8}

38. Find A-B

(A) {1,5}

(B) {6}

(C) {5}

(D) None of the above

39. Find. A∩B∩C

(A) {2,3,4}

(B) {2,3}

(C) { }

(D) None of the above

40. General term of an arithmetic Progression is given by-

(A) $T_n = a + (n-1)\, d$

(B) $T_n = ar^{n-1}$

(C) $T_n = a + nd$

(D) None.

41. The sum of an infinite Geometric Progression is given by-

(A) $S_n = \frac{a(1-r^n)}{(1-r)}$

(B) $S_n = \frac{a(r^n-1)}{r-1}$

(C) $S_\alpha = \frac{a}{1-r}$

(D) $S_\alpha = \frac{a}{1-r^n}$

42. Which among the following is correct.

(A) $P = \frac{SI \times 100}{R \times T}$

(B) $P = \frac{R \times T}{SI \times 100}$

(C) $P = \frac{R \times SI}{100 \times T}$

(D) $P = \frac{R \times T}{SI}$

43. Which among the following is a void set.

(A) $A = \{\varphi\}$

(B) ϕ

(C) B = { }

(D) (B) & (C)

44. A Set that contains all sets in a given contest is called the Set.

(A) Sub Set

(B) Power Set

(C) Universal

(D) None of these

(For Q. No.45 & 46) : Which among the following are true:

45. (A) $A \cap B \subset A$

(B) For equal Sets $A \cap B = \phi$

(C) $A \cap B \neq B \cap A$

(D) None of these

46. (A) $n(A \cup B) = n(A) + n(B)$

(B) $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

(C) $n(A \cup B) = n(A) + n(B) + n(A \cap B)$

(D) None of these

(For Q. No.47 & 48) : Find the differential of the following functions.

47. $y = 3x^4$

(A) $4x^3$

(B) $12x^3$

(C) $12x^2$

(D) $3x^3$

48. $y = 2\sqrt{x}$

(A) $\frac{1}{\sqrt{x}}$

(B) $\sqrt{x}$

(C) $\frac{x}{2}$

(D) $\frac{1}{2}\sqrt{x}$

(For Q. No.49 & 50) : Find the integral of the following functions.

49. $\int 3\sqrt{x}\, dx$

(A) $2x^{3/2}$

(B) $\frac{3}{\sqrt{x}}$

(C) $2x^{1/3}$

(D) None

50. $\int \frac{2}{\sqrt{x}}\, dx$

(A) $4\sqrt{x}$

(B) $2\sqrt{x}$

(C) $\frac{4}{\sqrt{x}}$

(D) None

51. If $A=\begin{bmatrix}1 & -2 & 1\\ 2 & 1 & 3\end{bmatrix}$ and $B = \begin{bmatrix}2 & 1\\ 3 & 2\\ 1 & 1\end{bmatrix}$, then $(AB)^t$ is equal to:

(A) $\begin{bmatrix}-3 & -2\\ 10 & 7\end{bmatrix}$

(B) $\begin{bmatrix}-3 & 10\\ -2 & 7\end{bmatrix}$

(C) $\begin{bmatrix}-3 & 7\\ 10 & 2\end{bmatrix}$

(D) None of these

52. Find the inverse of the matrix $A = \begin{bmatrix}1 & 3\\ 2 & 7\end{bmatrix}$

(A) $\begin{bmatrix}7 & -3\\ -2 & 1\end{bmatrix}$

(B) $\begin{bmatrix}5 & -3\\ -2 & 1\end{bmatrix}$

(C) $\begin{bmatrix}1 & -3\\ -2 & 1\end{bmatrix}$

(D) $\begin{bmatrix}1 & -3\\ 2 & 1\end{bmatrix}$

53. For any square matrix A , $A \cdot A^t$ is a:

(A) Unit Matrix

(B) Symmetric Matrix

(C) Skew – symmetric Matrix

(D) Diagonal Matrix

54. The matrix $\begin{bmatrix} 0 & -1 & 5 \\ 4 & 0 & 3 \\ 1 & 2 & 0 \end{bmatrix}$ is a:

(A) Skew symmetric matrix

(B) A symmetric matrix

(C) A diagonal matrix

(D) An upper triangular matrix.

55. If $\begin{bmatrix} x+y & 2x+z \\ x-y & 2z+w \end{bmatrix} = \begin{bmatrix} 4 & 7 \\ 0 & 10 \end{bmatrix}$ then values of x,y,z and w are:

(A) 2,2,3,4

(B) 2,3,1,2

(C) 3,3,0,1

(D) None of these.

56. If A is an m×n matrix such that AB and BA are both defined, then B is a:

(A) $m \times n$ matrix

(B) $n \times m$ matrix

(C) $n \times n$ matrix

(D) $m \times m$ matrix

57. What time period is taken when interest is calculated quarterly?

(A) Twice as much of given time

(B) Half as much of given time

(C) Same as given

(D) None of these

58. What should be percentage gain on a product when it is sold for Rs.120 with a gain of Rs.20.

(A) 20%

(B) 25%

(C) 22%

(D) 16.25%

59. The ratio of 10km/hr. to 30km. per hour is:

(A) 3:1

(B) 1:3

(C) 1:2

(D) 2:1

60. The fraction 2/5 converted to percentage is:

(A) 20%

(B) 50%

(C) 40%

(D) 30%

61. The n^{th} term of an A.P. is given by $a_n = 3 + 4n$. The common difference is:

(A) 7

(B) 3

(C) 4

(D) 1

62. If the sum of three numbers is an A.P. is 9 and their product is 24, then numbers are:

(A) 2,4,6

(B) 1,5,3

(C) 2,8,4

(D) 2,3,4

63. If a,b,c are in AP then:

(A) $b = a + c$

(B) $2b = a + c$

(C) $b^2 = a + c$

(D) $2b^2 = a + c$

64. The third term of a geometric progression is 4. The product of the first five terms is:

(A) 4^3

(B) 4^5

(C) 4^4

(D) None of these

65. A student has to obtain 33%of the total marks to pass. He got 125 marks and failed by 40 marks. The maximum marks are:

(A) 300

(B) 500

(C) 800

(D) 1000

66. The first term of a GP is 1. The sum of the third term and fifth term is 90. the common ratio of GP is:

(A) 1

(B) 2

(C) 3

(D) 4

67. If 10% of m is the same as 20% of n then m:n is:

(A) 2:1

(B) 1:2

(C) 10:20

(D) 1:20

68. If P is 40% less than Q then Q is how much % more than P?

(A) 60%

(B) 66.66%

(C) 40%

(D) 33.33%

69. Akshay lends a Sum of money for 10 years at 5% Simple Interest. Bobby lends double that Amount for 5 years at the same Rate of interest. Which statement is true?

(A) Akshay and Bobby will get the same Amount as Interest

(B) Akshay will get twice the Amount of Interest that Bobby would get

(C) Bobby will get twice the Amount of Interest that Akshay would get

(D) Akshay will get Thrice the Amount of Interest that Bobby would get

70. What is the sum that Amounts to ₹840 in 5 Years at the rate of 8% per annum Simple Interest?

(A) ₹{100×840/100×(5+8)}

(B) ₹{100×840/(100+5)×8}

(C) ₹{840×5×8/100}

(D) ₹{(100+5)×8×100/840}

71. Find the transpose of a matrix A $=\begin{bmatrix} 2 & 3 & 1 \\ 0 & 2 & -1 \end{bmatrix}$

(A) $A^1=\begin{bmatrix} 2 & 0 \\ 3 & -2 \\ 1 & 1 \end{bmatrix}$

(B) $\begin{bmatrix} -2 & 0 \\ -3 & 2 \\ -1 & -1 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 0 \\ 3 & 2 \\ 1 & -1 \end{bmatrix}$

(D) None.

72. What type of matrix is the following- $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

(A) I_3

(B) Identity matrix

(C) Both (A) & (B)

(D) None.

73. Kabir paid Rs.9600 as interest on a loan he took 5 years ago at 16% rate of simple interest. What was the amount he took as loan?

(A) Rs.16400

(B) Rs.12000

(C) Rs.12500

(D) Rs.18000

74. Guddi invested some money in a bank at rate of 6% per annum. At simple interest, after 9 years, she got Rs. 8470. How many did she invest?

(A) Rs.5250

(B) Rs.6550

(C) Rs.6400

(D) Rs.5500

75. In 4 years the simple interest on certain sum of money is 9/25 of the principal. The annual rate of interest is:

(A) 4%

(B) 4(1/2)%

(C) 9%

(D) 10%

76. Find SI on ₹1000 for 5 years @ 4% p.a.

(A) 300

(B) 200

(C) 500

(D) None

77. If 20%of an electricity bill is deducted, then Rs.100 is still to be paid. How much was the original bill?

(A) Rs.110

(B) Rs.115

(C) Rs.120

(D) Rs.125

78. Evaluate:

28% of 400 + 45% of 250

(A) 220.3

(B) 224.5

(C) 190.3

(D) 150

(For Q.No.79 to 81) : In how many ways can we arrange the word 'UNIVERSITY'

79. So that all the vowels come together?

(A) 7!

(B) 7! * 4!

(C) (7! * 4!) / 2!

(D) None of the above

80. So that no vowel comes together?

(A) (7! * 4!)/2!

(B) 10! / 2!

(C) (10! / 2!) – (7! * 4!)/2!

(D) None of these

81. So that every word begins with U

(A) 9! / 2!

(B) 10! / 2! - 2

(C) 10!

(D) None of the above

82. A box contains 3 white, 5 black and 2 red balls. In how many ways can three black balls be drawn from the box?

(A) 29

(B) 36

(C) 48

(D) 10

83. How many words can be formed by using all letters of word ALIVE.

(A) 86

(B) 95

(C) 105

(D) 120

84. In how many ways can the letters of the word INDIA be arranged:

(A) 48

(B) 60

(C) 28

(D) 36

85. A _____ is an ordered collecting of objects.

(A) Relation

(B) Function

(C) Set

(D) Proposition

86. Power set of empty set has exactly _____ subset.

(A) One

(B) Two

(C) Zero

(D) Three

87. Which of the following two sets are equal?

(A) A = {1,2} and B = {1}

(B) A = {1,2} and B = {1,2,3}

(C) A = {1,2,3} and B = {2,1,3}

(D) A = {1,2,4} and B = {1,2,3}

88. The set of positive integers is_____

(A) Infinite

(B) Finite

(C) Subset

(D) Empty

89. If n(A)=20 and n(B)=30 and $n(A \cup B) = 40$ then $n(A \cap B)$ is:

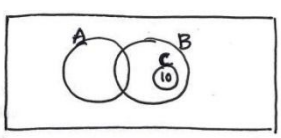
(A) 20

(B) 30

(C) 40

(D) 10

90. In the given figure the if n(A)=20,n(U)=50,n(C)=10 and n(A∩B)=5 then n(B)=?



(A) 35

(B) 20

(C) 30

(D) 10

91. If U = {1,2,3,4,5} and A = {2,4} then A' should be:

(A) {2,4,5}

(B) {2,4}

(C) {1,2,3,4,5}

(D) {1,3,5}

92. Complement of a set B is denoted by:

(A) B'

(B) B^o

(C) {B}

(D) B^2

93. If A and B matrices are of same order and A + B = B + A, this law is known as:

(A) Distributive law

(B) Commutative law

(C) Associative law

(D) Cramer's law

94. If a matrix has equal number of columns and rows then it is said to be a:

(A) Row matrix

(B) Identical matrix

(C) Square matrix

(D) Rectangular matrix

95. We can add two matrices having real numbers A and B if their:

(A) Order is same

(B) Rows are same

(C) Columns are same

(D) Elements are same

96. If A, B and C matrices are of same order and (A+B) + C = A + (B+C), this law is known as:

(A) Cramer's law

(B) Distributive laws

(C) Commutative law

(D) Associative law

97. A scalar matrix having each element equal to 1 is said to be-

(A) Unit to identical matrix

(B) Rectangular matrix

(C) Square matrix

(D) Diagonal matrix

98. If the number of rows in A matrix are equal to the number of column in B matrix, then A and B are comfortable for:

(A) Product

(B) Division

(C) Transpose

(D) Making identity

99. In real numbers, the additive identity is:

(A) 1

(B) 3

(C) 0

(D) -1

100. In a : b = c : b, b and c are called:

(A) Antecedent

(B) Extreme

(C) Consequent

(D) Mean

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