

GENERAL INSTRUCTIONS TO CANDIDATES



- Please do not open this Booklet till you are told to do so.
- If the Question Paper Booklet does not contain 100 questions or if it is not of the medium opted or Answer Sheet is not in good condition, ask for change immediately.**
- Duration of the test is 2 hours.
- Before commencement of the exam, please fill up the necessary information in the space provided below and also in the answer sheet.
- Use HB pencil only to darken the circles for answers in the answer sheet.
- After each MCQ, four options are given. Choose the correct or most appropriate option and darken the appropriate circle against the question number in the OMR Answer Sheet, completely, as shown below, with HB Pencil.

Marking the Answers	
<p style="text-align: center;">Example :</p> <p>For Question No. 12, if the candidate considers the correct answer to be C, he is to mark as shown below (Correct Method)</p> <p style="text-align: center;">12 (A) (B) ● (D)</p>	<p style="text-align: center;">Not as shown below (Wrong method) :</p> <p>12 (A) (B) ⊗ (D)</p> <p>12 (A) (B) ⊗ (D)</p> <p>12 (A) (B) ● (D)</p> <p>12 (A) (B) ● (D)</p> <p>12 (A) ● ● (D)</p>

- Any answer marked in the question booklet will not be considered and no marks will be awarded.
- If a candidate wants to change the answer already darkened, he should erase it completely, with good quality eraser and ensure that no mark is visible after erasing.
- For each correct answer, one mark will be awarded. For each wrong answer, 1/4th of the mark earmarked for each question will be deducted. If more than one circle is darkened for a question, it will be treated as wrong answer. For questions not answered i.e. blanks, a zero will be given.
- Rough work, if any, must be done on the pages, specified as SPACE FOR ROUGH WORK only.
- When you have completed, even before time, please remain in your seat. The Invigilator will come to you and collect your Answer Sheet against acknowledgement on the admit card. No candidate can leave the examination hall till the end of the test.
- Candidate found copying or receiving or giving any help or defying instructions of the Invigilators or having/using mobile phone or smart watch or any other electronic gadget will be expelled from the examination and will also be liable for further punitive action.

Time : 2 Hours

Maximum Marks : 100

Total No. of Printed Pages : 24

Question Paper Booklet Code

X	C	E
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Roll No.

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Question Paper Booklet No.

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Name of the Candidate

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OMR Answer Sheet No.

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Signature of the Candidate

SEAL

(3)

XCE

✓ 1.

If $f(x) = kx^2$, $0 \leq x \leq 1$ is a probability density function of a random variable x , then the value of k is _____.

- (A) 0 (B) 3
(C) $\frac{1}{3}$ (D) 2

✓ 2.

The mean of 10 observations is 15. If one observation 12 is replaced by 22, what will be the new mean?

- ✓ (A) 16 (B) 14
(C) 17 (D) 18

✓ 3.

Which of the followings is a property of Arithmetic Mean?

- (A) Sum of deviations from Arithmetic Mean is always positive.
(B) Arithmetic Mean is not affected by extreme values.
(C) Sum of deviations from Arithmetic Mean is always zero.
(D) Arithmetic Mean cannot be calculated for grouped data.

4.

probability of getting pass in an examination is $\frac{x}{3}$. If the probability of getting fail is $\frac{2}{3}$, then the value of x is _____.

- (A) 2 (B) 3
(C) 1 (D) 0

5.

Two dice are rolled. What will be the probability that one dice have multiple of 3 and other dice have multiple of 2?

- (A) $\frac{1}{2}$ (B) $\frac{1}{3}$
(C) $\frac{1}{4}$ (D) $\frac{1}{5}$

XCE

(4)

XCE

6. In a circular arrangement of 5 persons facing centre, A is sitting between B and C, D is sitting immediate right of C, and E is sitting immediate left of B. Who is sitting between D and B?
- (A) A (B) B
(C) C ~~(D) E~~

7. Six persons A, B, C, D, E, and F are seated at a round table facing outside the centre but not necessarily in the same order. A sits at the immediate right of E. C sits after one person to the right of A. B sits beside A and F sits at the immediate right of D. How many persons are sitting between A & D?
- (A) 1 (B) 2
(C) 3 (D) 4

8. Five persons A, B, C, D & E are sitting on a bench. A is immediately to the left of C. E is immediately to the left of D and right of A. D is to the left of B. Which person is sitting in the middle of the bench?
- (A) B ~~(B) E~~
(C) A (D) D

9. Six friends A, B, C, D, E and F sit in a row facing north.
- A and B have two persons between them.
C, who is at right end, is immediate right of A.
D is not neighbour of B.
E sits at left end.
- Who sits third from left?
- ~~(A) F~~ (B) A
(C) D (D) B

XCE

10. The sum of infinite terms of the geometric series $1 - \frac{1}{5} + \frac{1}{25} - \frac{1}{125} + \dots$ will be _____.

- (A) 1 (B) $\frac{5}{6}$
 (C) $\frac{6}{5}$ (D) $\frac{4}{5}$

11. If the sum of 4th and 8th term of an arithmetic progression (A.P.) is 120, then the 6th term of the A.P. is _____.

- (A) 10 (B) 70
 (C) 60 (D) 100

12. Find out the number of 5-digit even numbers that can be formed from digits 1 to 7 without repetition of any digit.

- (A) 720 (B) 360
 (C) 1080 (D) 840

13. If the first term of a geometric progression exceeds the second term by 4 and the sum of its terms till infinity is 100, then the common ratio is _____.

- (A) $\frac{1}{5}$ (B) $\frac{4}{5}$
 (C) $\frac{3}{5}$ (D) $\frac{2}{5}$

14. The sum of the first n terms of an arithmetic progression (A.P.) is $4n^2 + 3n$. The 10th term of the A.P. is _____.

- (A) 77 (B) 83
 (C) 81 (D) 79

(6)

XCE

15. If $x = 3 + \sqrt{8}$, then the value of $x + \frac{1}{x}$ is

(A) $3\sqrt{8}$

(B) 6

(C) $\sqrt{8}$

(D) $2\sqrt{8}$

16. The value of $\frac{\log_3 16 \times \log_{\sqrt{2}} 3}{\log_8 3 \times \log_9 4}$ is _____.

(A) 16

(B) 24

(C) $\frac{1}{16}$

(D) $\frac{1}{12}$

17. The product of two numbers is 7644 and their ratio is 12:13. Then, the smaller of two numbers is _____.

(A) 91

(B) 84

(C) 82

(D) 90

18. The simplified value of $\sqrt[4]{a^{6b}x^4} \sqrt{(a^3x^{-4})^{-b}}$ will be _____.

(A) x^{1+2b}

(B) x^{2b}

(C) 1

(D) $a^{\frac{3}{2}b}x^b$

19. If $a:b=3:4$, then the value of $\frac{2a+3b}{3a+2b}$ is

(A) 18/17

(B) 17/18

(C) 6/7

(D) 7/6

XCE

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(7)

XCE

20. A bag contains 5 red, 4 blue, and 3 green balls. Two balls are drawn at random without replacement. What is the probability that both balls are of different colours?

(A) $\frac{45}{66}$

(B) $\frac{47}{66}$

(C) $\frac{47}{132}$

(D) $\frac{45}{132}$

21. In a Shooting competition, A hit the target 6 out of 13 shots, and B hit 8 out of 11 shots. If they both try once, what is the probability that the target would be hit at least once?

(A) $\frac{21}{143}$

(B) $\frac{56}{143}$

(C) $\frac{74}{143}$

(D) $\frac{122}{143}$

22. A card is drawn at random from a well-shuffled deck of 52 cards. What is the probability that the card drawn is either a King or a Heart?

(A) $\frac{13}{52}$

(B) $\frac{17}{52}$

(C) $\frac{4}{13}$

(D) $\frac{15}{52}$

23. If the standard deviation of a Poisson distribution is 3, then $P(X=0)$ is _____.

(A) e^{-6}

(B) e^{-3}

(C) e^{-9}

(D) e^{-1}

XCE

24. Interview method is used for collection of _____.
- (A) Primary data (B) Secondary data
(C) Discrete data (D) Continuous data
25. Q's mother is the sister of P and daughter of S. A is the son of P and Brother of H. G is the father of H. How is G related to S?
- (A) Nephew (B) Son-in-law
(C) Grandfather (D) Father-in-law
26. A is brother of B. P is the sister of Q. B is the son of P. How is A related to P?
- (A) Brother (B) Son
(C) Father (D) Uncle
27. Sharma points to a girl and says "She is the mother of my son's wife's daughter". What is the relation of the girl with Sharma?
- (A) Mother (B) Daughter
(C) Sister (D) Daughter-in-law
28. P is the sister of Q. R is the mother of Q. S is the father of C. R is the sister of S. T is the mother of S. What is the relation of P with T?
- (A) P is Mother of T (B) T is P's Grand Mother
(C) P is Sister of T (D) T is Brother of P
29. Dr. Madhu said, "The engineer who is my brother is the son of the only Professor in our family." If the Professor is Mr. Murli, how is Mr. Murli related to Dr. Madhu?
- (A) Uncle (B) Father
(C) Brother (D) Cousin

30. Evaluate $\lim_{x \rightarrow \infty} \frac{x^2 + 2x + 2}{3x^2 + x + 1}$.

(A) $\frac{1}{3}$

(B) $\frac{2}{3}$

(C) $\frac{3}{8}$

(D) 2

31. Let the function $f : R \rightarrow R$ is defined by $f(x) = x^2 + 3$, then $f^{-1}(12)$ is

(A) $\sqrt{3}$

(B) 3

(C) 9

(D) 12

32.

In a class, 50 students have expressed that they like Mathematics, while 66 students like Accountancy. Among these, 36 students like both Mathematics and Accountancy. Based on this information, determine how many students in the class like either Mathematics or Accountancy?

(A) 14

(B) 20

(C) 52

(D) 80

33.

Relation on integers is defined by :

$$aRb \Leftrightarrow a - b \text{ is divisible by } 5.$$

This relation is _____.

(A) Reflexive only

(B) Symmetric only

(C) Equivalence relation

(D) Neither symmetric nor transitive

+

XCE

39. If $2x + 3y + 2 = 0$ is the regression equation of x on y and the arithmetic mean of y is -2 , then arithmetic mean of x is _____.

- (A) 4 (B) 6
(C) -2 (D) 2

40. The mean of a binomial distribution is 4 and the variance is 3.2. If $p < 0.5$, find the value of p .

- (A) 0.2 (B) 0.4
(C) 0.1 (D) 0.3

41. The mean and mean deviation of a normal distribution are 13.5 and 4.8 respectively. Then the third quartile of the normal distribution is _____.

- (A) 6.25 (B) 17.55 *Mo*
(C) 4.05 (D) 1.75

42. In a binomial distribution, the probability of success is 0.7. The variance for $n = 15$ is _____.

- ~~(A) 4.50~~ (B) 3.15
(C) 7.35 (D) 2.10

43. For a Binomial Distribution with mean = 4 and variance = 3, what are the values of n and p ?

- (A) $n = 16, p = 0.25$ (B) $n = 12, p = 1/3$
(C) $n = 8, p = 0.5$ (D) $n = 16, p = 0.75$

44. The covariance between two variables X and Y is 4. The standard deviation of X is 10 and the correlation coefficient between X and Y is 0.4. Find the standard deviation of Y .

- (A) 1 (B) 2
(C) 3 (D) 4

$$\frac{4 \times 16}{0.4}$$

XCE

45. Mutually Exclusive classification of class intervals _____.
- (A) Excludes both the class limits
 - (B) Excludes the upper class limit but includes the lower class limit
 - (C) Includes the upper class limit but excludes the lower class limit
 - (D) Include both the class limits
46. Which of the following statement is true?
- (A) Mean of the statistic is known as Standard Error
 - ~~(B)~~ Mean deviation of the statistic is known as Standard Error
 - (C) Standard deviation of the statistic is known as Standard Error
 - (D) Geometric mean of the statistic is known as Standard Error
47. Which one of the following parts is used to show the units of measurement?
- ~~(A)~~ Body
 - (B) Caption
 - (C) Box-head
 - (D) Stub
48. Data that is classified according to an attribute or characteristic of the items under study is referred to as _____.
- (A) Qualitative data
 - (B) Chronological data
 - (C) Geographical data
 - (D) Quantitative data
49. A researcher wants to study the effectiveness of a new treatment by surveying the most experienced doctors in a city. He selects 50 doctors based on their reputation and years of experience. Which type of sampling method is used in this survey?
- ~~(A)~~ Simple Random Sampling
 - ~~(B)~~ Stratified Sampling
 - (C) Judgment Sampling
 - (D) Systematic Sampling

(13)

XCE

50.

Find the next term in the series $\overbrace{11}^{+1}, \overbrace{12}^{+2}, \overbrace{14}^{+3}, \overbrace{17}^{+5}, \overbrace{22}^{+8}, \overbrace{30}^{+13}, \underline{\hspace{2cm}}$.

(A) 42

~~(B) 43~~

(C) 38

(D) 41

51.

For a given Revenue function $R(x) = 100x - 2x^2$, the maximum revenue occurs at $x = \underline{\hspace{2cm}}$.

(A) 20

(B) 25

(C) 30

~~(D) 50~~

52.

If $x^y = y^x$, then $\frac{dy}{dx} = \underline{\hspace{2cm}}$.

(A) $\frac{y(x \log y - y)}{x(y \log x - x)}$

(B) $\frac{y(x \log y + y)}{x(y \log x - x)}$

(C) $\frac{y(x \log y - y)}{x(y \log x + x)}$

(D) $\frac{x(x \log y - y)}{y(y \log x - x)}$

53.

If $x(m) = am^2$, $y(m) = a/m^2$, then find the value of $\frac{dy}{dx}$.

(A) $\frac{1}{m^2}$

(B) $\frac{-1}{m^2}$

(C) $\frac{1}{m^4}$

(D) $\frac{-1}{m^4}$

54.

Calculate the integral $\int \frac{x^{25}}{x^{26}} dx$.

(A) $\log x + C$

(B) $\log x$

(C) C

(D) $2 \log x$

XCE

55. Ravi deposits some amount in bank for $5\frac{1}{2}$ years at the simple interest rate of 7% per annum. Ravi receives ₹ 66,480 at the end of term. Compute the amount of initial deposit by Ravi in the Bank.

- (A) ₹ 48,000 (B) ₹ 50,000
(C) ₹ 45,000 (D) ₹ 51,000

56. The future value of an annuity of ₹ 2000 made annually for 8 years at interest rate of 14% per annum, compound annually is _____. (Given that $(1.14)^8 = 2.8526$)

- (A) ₹ 26,465.71 (B) ₹ 26,646.57
(C) ₹ 20,000.55 (D) ₹ 18,564.52

57. The simple interest at the rate of $p\%$ per annum for p years will be ₹ p . Then, the principal is _____.

- (A) ₹ p (B) ₹ $100 p$
(C) ₹ $\frac{100}{p^2}$ (D) ₹ $\frac{100}{p}$

58. The compound interest for ₹ 15,000 at 20% per annum for 2 years compounded semi-annually is _____.

- (A) ₹ 9,661.50 (B) ₹ 6,961.50
(C) ₹ 9,691.50 (D) ₹ 6,696.15

59. Mr. Amit bought a car for ₹ 3,00,000 by making a down payment ₹ 50,000 and decided to pay equal annual payment for 10 years. How much would be each payment if the interest on unpaid amount is 18% per annum, compound annually? (Given that $P(10, 0.18) = 4.49409$)

- (A) ₹ 55,628.61 (B) ₹ 55,266.86
(C) ₹ 55,555.28 (D) ₹ 50,000.00

XCE

60. When the two regression coefficients are given as $b_{xy} = 0.6$ and $b_{yx} = 0.9$, determine the value of the coefficient of correlation.

- (A) 0.73 (B) 0.90
(C) 0.82 (D) 0.54

61. The Spearman's Rank correlation coefficient between Economics and Accountancy marks for a class student is $\frac{75}{99}$ and the sum of Square of differences in ranks for Economics and Accountancy marks is 40. What is the number of students in the class?

- (A) 10 (B) 15
(C) 18 (D) 20

62. For a set of observations on variables x and y , the following summary statistics are given:

$$n = 5, \sum x = 10, \sum y = 25, \sum xy = 70, \sum x^2 = 30.$$

The regression equation of y on x is expressed as:

$$y = a + bx.$$

What is the value of the slope b ?

- (A) 0.5 (B) 1.0
(C) 1.5 (D) 2.0

63.

The product of the price index and the quantity index are equal to the corresponding value index in _____.

- (A) Time reversal test (B) Factor reversal test
(C) Circular test (D) Unit test

XCF

70. Find the next term of the series: 7, 8, 18, 57, 232, 1165, _____.
- (A) 6996 (B) 5840
(C) 4672 (D) 6990
71. In a certain Language, 'SUBJECT' is written as 'UWDLGEV' then 'MENTION' will be written as OGPKJP.
- (A) OGKVPQP (B) NOFUPOJ
(C) OGVPKJP (D) ~~OGPVKQP~~
72. If 'DOCTOR' is coded as 423527 and 'PATIENT' is coded as 8651905, then how is 'OPERATION' coded? 297681205
- (A) ~~289765120~~ (B) 297681205
(C) 298765120 (D) 286712065
73. If the word 'CODE' is coded as 1357 and 'GAMER' is coded as 24678, what word does the number 84178 represent?
- (A) ROVER (B) RCEAR
(C) ~~RACER~~ (D) RAECR
74. Ram started walking 2 kms towards the Sun in the morning. He turned right and walked 2 kms. Then, he turned right and walked 2 kms. Finally he turned left and walked 2 kms. In which direction is he walking now?
- (A) ~~South~~ (B) North
(C) ~~East~~ (D) ~~West~~

XCE

75. Find the effective interest rate, if nominal rate is 12% per annum, quarterly compounding.
- (A) 12% (B) 12.36%
 (C) 12.55% (D) 13%
76. Raju deposit ₹ 20,000 in a nationalized bank for 3 years at an annual interest rate of 8%, with the interest compounded every quarter. Find out how much interest Raju earns in the first year and the second year.
- (A) ₹ 1,632 & ₹ 1,712 (B) ₹ 1,684 & ₹ 1,738
 (C) ₹ 1,648 & ₹ 1,784 (D) ₹ 1,696 & ₹ 1,746
77. Rakesh requires ₹ 1,00,000 to buy a scooter after 4 years. What will be the approximate present value of ₹ 1,00,000 if the interest rate is 10% per annum?
- (A) ₹ 67,800 (B) ₹ 68,300
 (C) ₹ 70,935 (D) ₹ 71,430
78. If the difference between the annually compounded interest and simple interest on a certain sum of money at 8% per annum for 3 years is ₹ 788. Then the principle amount is _____.
- (A) ₹ 39,175 (B) ₹ 39,475
 (C) ₹ 39,975 (D) ₹ 40,475
79. What will be the approximate future value of an annuity of ₹ 1000 made annually for 5 years at interest rate of 7% per annum, compounded annually? (Given $(1.07)^5 = 1.40255$)
- (A) ₹ 8,025 (B) ₹ 5,750
 (C) ₹ 7,013 (D) ₹ 6,412
80. A machine depreciates at a rate of 10% per year on its beginning-of-year value. If it is sold for ₹ 6,000 after 9 years, what was its original purchase price?
- (A) ₹ 14,587 (B) ₹ 15,488
 (C) ₹ 14,875 (D) ₹ 15,888

XCE

81. What is the approximate real wage of a worker earning ₹ 12,500 nominal wage, when the cost of living index is 250 (base 100)?

- (A) ₹ 3,125 (B) ₹ 4,500
(C) ₹ 5,000 (D) ₹ 6,250

82. If $\sum p_0q_0 = 400$ and $\sum p_nq_0 = 720$ and Paasche's index number is 125, then the Fisher's index number is _____.

- (A) 125 (B) 250
(C) 150 (D) 180

83. A price index with base 2000 shows:

Index for 2010: 140

Index for 2020: 210.

952.38

What is the index for 2010 when base is shifted to 2020?

- (A) 57.14 (B) 66.67
(C) 75.00 (D) 133.33

84. Which formula correctly represents Fisher's Price Index?

- (A) $\sqrt{\left[\frac{\sum p_1q_0}{\sum p_0q_0} \times \frac{\sum p_1q_1}{\sum p_0q_1}\right]} \times 100$
(B) $\left(\frac{\sum p_1q_0}{\sum p_0q_0}\right) \times 100$
(C) $\left(\frac{\sum p_1q_1}{\sum p_0q_1}\right) \times 100$
(D) $\sqrt{\left[\frac{\sum p_0q_1}{\sum p_1q_0}\right]} \times 100$

XCE

85. Two groups of students have harmonic means of 50 and 30 for their test scores, with 10 students in the first group and 15 students in the second group. What will be the combined harmonic mean of the two groups?
- (A) 15.35 (B) 35.71
(C) 38.11 (D) 42.50
86. The arithmetic mean (A.M.) of two positive numbers exceeds their harmonic mean by 30. If their A.M. is 45, Then, their geometric mean will be _____.
- (A) $27\sqrt{2}$ (B) $25\sqrt{3}$
(C) 42 (D) $15\sqrt{3}$
87. If third quartile and first quartile are 64.5 and 22 respectively, then the quartile deviation is
- (A) 42.5 (B) 21.25
(C) 36.25 (D) 30.5
88. The given frequency distribution is :

X	1	2	3	4	5	6	7
Y	5	9	12	17	14	10	6

The arithmetic mean of the Frequency distribution is _____.

- (A) 2.99 (B) 3.06
(C) 4.10 (D) 4.71
89. What will be the mean deviation for the numbers {2, 4, 7, 8, 9, 12} from the mean?
- (A) 2.14 (B) 2.33
(C) 2.55 (D) 2.67

XCE

0. Six students ~~A, B, C, D, E~~ and ~~F~~ are sitting in a bench facing north. C is sitting second to the right of F. A is sitting extreme left end of the bench. E is sitting second to the right of C. D is sitting immediate left of E. Who is sitting between F and C?

- (A) A
(C) E

- ~~(B) B~~
(D) D

91. Puru started from his house towards west. After walking a distance of 25 m, he turned to the right and walked 10 m. He then again turned to the right and walked 15 m. After this, he is to turn right at 135° and to cover 30 m. In which direction should he go?

- (A) West
~~(C) South-West~~

- (B) South
(D) South-East

92. Vishal started from his house toward west. After walking a distance 30 meters, he turned towards right and walk 20 meters. He then turned left and moved a distance of 10 meters, turned to his left again and walked 40 meters. He now turn to left and walk 5 meters, finally he turns to left. In which direction he is walking now?

- ~~(A) North~~
(C) East

- (B) South
(D) South West

93. Anil's house faces east. From the back-side of the house, he walks straight 50 meters, then turns to the right and walks 50 meters. Finally he turns towards left and stops after walking 25 meters. Now, in which direction is Anil from the starting point?

- (A) South-East
(C) South-West

- (B) North-East
~~(D) North-West~~

94. If $A \times B$ means A is to the south of B; $A + B$ means A is to the north of B; $A \% B$ means A is to the east of B; $A - B$ means A is to the west of B; then in $P \% Q + R - S$, in which direction is S with respect to Q?

- (A) South-West
(C) North-East

- ~~(B) South-East~~
(D) North-West

XCE

95. Four cards are drawn at random from a standard deck of 52 playing cards without replacement. In how many ways it can be done such that the selected cards consist of exactly one Jack and three Aces?
- (A) 2304 (B) 2440
(C) 2260 (D) 2164
96. A group consists of 7 men and 5 women. In how many ways can a group of 4 members be selected if the group has no women?
- (A) 70 (B) 30
(C) 24 (D) 35
97. A loan of ₹ 1,00,000 is repaid in 3 equal annual instalments at 10% per annum interest, compounded annually. Find the amount of each instalment. (Given $P(3,0.1) = 2.48685$)
- (A) ₹ 41,211 (B) ₹ 41,311
(C) ₹ 39,800 (D) ₹ 40,212
98. In how many years will ₹ 50,000 become ₹ 75,000 at 8% per annum compound interest? (Given $\log(1.5) = 0.1761$ and $\log(1.08) = 0.0334$)
- (A) 4.8 years (B) 5.1 years
(C) 5.3 years (D) 5.6 years
99. If ₹ 50,000 grows to ₹ 80,525.5 in 5 years, the compound annual growth rate (CAGR) is _____.
- (A) 9% (B) 10%
(C) 11% (D) 12%
100. In how many ways 5 Indians and 5 Americans people are seated around a table so that no two Indians are in adjacent positions?
- (A) $3! \times 4!$ (B) $3! \times 5!$
(C) $4! \times 5!$ (D) $4! \times 6!$