

# DU JAT 2020

1. Choose from the options the most appropriate antonym of the given word.

NADIR

- A. clone
- B. peak
- C. reject
- D. timely

2. Choose from the options the most appropriate antonym of the given word.

PANDEMONIUM

- A. funny
- B. immediate
- C. peace
- D. phonetic

3. Choose from the options the most appropriate antonym of the given word.

ACRIMONIOUS

- A. courtesy
- B. latter
- C. agrarian
- D. economy

4. Read the statement and answer the question that follows.

A conservation group in the United States is trying to change the long-standing image of bats as frightening creatures. The group contends that bats are feared and persecuted solely because they are shy animals that are active only at night. Which of the following, if true, would cast the most serious doubt on the accuracy of the group's contention?

- A. Bats are steadily losing natural roosting places such as caves and hollow trees and are thus turning to more developed areas for roosting.
- B. Bats are the chief consumers of nocturnal insects and thus can help make their hunting territory more pleasant for humans.
- C. Bats are regarded as frightening creatures not only in the United States but also in Europe, Africa, and South America.
- D. Raccoons and owls are shy and active only at night; yet they are not generally feared and persecuted.

5. Read the statement and answer the question that follows.

Between 1975 and 1985, nursing-home occupancy rates averaged 87 percent of capacity, while admission rates remained constant, at an average of 95 admissions per 1,000 beds per year. Between 1985 and 1988, however, occupancy rates rose to an average of 92 percent of capacity, while admission rates declined to 81 per 1,000 beds per year.

If the statements above are true, which of the following conclusions can be most properly drawn?

- A. The average length of time nursing-home residents stayed in nursing homes increased between 1985 and 1988.
- B. The proportion of older people living in nursing homes was greater in 1988 than in 1975.
- C. Nursing home admission rates tend to decline whenever occupancy rates rise.
- D. The more beds a nursing home has, the higher its occupancy rate is likely to be.

6. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960's and 1970's sought to go beyond the traditional focus of political historians on leaders and government institutions by examining directly the political practices of ordinary citizens. Like the old approach, however, this new approach excluded women. The very techniques these historians used to uncover mass political behavior in the nineteenth-century United States – quantitative analyses of election returns, for example – were useless in analyzing the political activities of women, who were denied the vote until 1920. By redefining "political activity," historian Paula Baker has developed a political history that includes women. She concludes that among ordinary citizens, political activism by women in the nineteenth century prefigured trends in twentieth-century politics. Defining "politics" as "any action taken to affect the course of behavior of government or of the community," Baker concludes that, while voting and holding office were restricted to men, women in

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the nineteenth century organized themselves into societies committed to social issues such as temperance and poverty. In other words, Baker contends, women activists were early practitioners of nonpartisan, issue-oriented politics and thus were more interested in enlisting lawmakers, regardless of their party affiliation, on behalf of certain issues than in ensuring that one party or another won an election. In the twentieth century, more men drew closer to women's ideas about politics and took up modes of issue-oriented politics that Baker sees women as having pioneered.

The primary purpose of the passage is to-

A. Enumerate reason why both traditional scholarly methods and newer scholarly methods have limitations.

B. Identify a shortcoming in a scholarly approach and describe an alternative approach.

C. Provide empirical data to support a long-held scholarly assumption.

D. Compare two scholarly publications on the basis of their authors' backgrounds.

7. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960's and 1970's sought to go beyond the traditional focus of political historians on leaders and government institutions by examining directly the political practices of ordinary citizens. Like the old approach, however, this new approach excluded women. The very techniques these historians used to uncover mass political behavior in the nineteenth-century United States – quantitative analyses of election returns, for example – were useless in analyzing the political activities of women, who were denied the vote until 1920. By redefining "political activity," historian Paula Baker has developed a political history that includes women. She concludes that among ordinary citizens, political activism by women in the nineteenth century prefigured trends in twentieth-century politics. Defining "politics" as "any action taken to affect the course of behavior of

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The passage suggests which of the following concerning the techniques used by the new political historians described in the first paragraph of the passage?

A. They involved the extensive use of the biographies of political party leaders and political theoreticians.

B. They were conceived by political historians who were reacting against the political climates of the 1960s and 1970s.

C. They were of more use in analyzing the positions of United States political parties in the nineteenth century than in analyzing the positions of those in the twentieth century.

D. They were of more use in analyzing the political behavior of nineteenth-century voters than in analyzing the political activities of those who could not vote during that period.

8. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960's and 1970's sought to go beyond the traditional focus of political historians on leaders and government institutions by examining directly the political practices of ordinary citizens. Like the old approach, however, this new approach excluded women. The very techniques these historians used to uncover mass political behavior in the nineteenth-century United States – quantitative analyses of election

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It can be inferred that the author of the passage quotes Baker directly in the second paragraph primarily in order to-

A. Clarify a position before providing an alternative to that position.

B. Differentiate between a novel definition and traditional definitions.

C. Provide an example of a point agreed on by different generations of scholars.

D. Provide an example of the prose style of an important historian.

9. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960’s and 1970’s sought to go beyond the traditional focus of political historians on leaders and government institutions by examining directly the political practices of ordinary citizens. Like the old approach, however, this new approach excluded women. The very techniques these historians used to

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According to the passage, Paula Baker and the new political historians of the 1960’s and 1970’s shared which of the following?

A. A disregard for political theory and ideology.

B. An interest in the ways in which nineteenth-century politics prefigured contemporary politics.

C. A reliance on such qualitative techniques as the analysis of election returns.

D. An emphasis on the political involvement of ordinary citizens.

10. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960’s and 1970’s sought to go beyond the traditional focus of

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Which of the following best describes the structure of the first paragraph of the passage?

- A. Two scholarly approaches are compared, and a shortcoming common to both is identified.
- B. An outmoded scholarly approach is described, and a corrective approach is called for.
- C. An argument is outlined, and counterarguments are mentioned.
- D. A historical era is described in terms of its political trends.

11. Read the following excerpt and answer the questions that follow:

The new school of political history that emerged in the 1960’s and 1970’s sought to go beyond the traditional focus of political historians on leaders and government institutions by examining directly the political practices of ordinary citizens. Like the old approach, however, this new approach excluded women. The very techniques these historians used to uncover mass political behavior in the nineteenth-century

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The information in the passage suggests that a pre-1960’s political historian would have been most likely to undertake which of the following studies?

- A. An analysis of voting trends among women voters of the 1920’s.
- B. A study of male voters’ gradual ideological shift from party politics to issue-oriented politics.

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C. A biography of an influential nineteenth-century minister of foreign affairs.

D. An analysis of narratives written by previously unrecognized women activists.

12. Fill in the blanks with the most appropriate pair from among the 4 choices given.

The railway track ran \_\_\_\_\_ the road and \_\_\_\_\_ a car or two, I could not see any traffic when I travelled that way last summer.

- A. on, besides
- B. beside, besides
- C. by, apart
- D. over, beside

13. Fill in the blanks with the most appropriate pair from among the 4 choices given.

Even in the \_\_\_\_\_ Nordic countries, household chores are still not evenly distributed, but at least the language is changing. When a reporter asked a young Swedish father whether he helped with the child care, she was \_\_\_\_\_ for asking the wrong question. He did not "help, he did his share".

- A. elitist, reprimanded
- B. egalitarian, rebuked
- C. prejudiced, admonished
- D. nonpartisan, condemned

14. A sentence has been given in Active or Passive Voice. Change the voice by choosing the best option from among the 4 choices given.

You must investigate the matter thoroughly and submit a report.

A. The matter should be investigated thoroughly by you and a report submitted.

B. The matter may be investigated thoroughly by you.

C. The matter has to be investigated thoroughly by you and a report submitted.

D. Please submit a report after investigating the matter thoroughly.

15. A sentence has been given in Active or Passive Voice. Change the voice by choosing the best option from among the 4 choices given.

Do you imitate the fashion of others?

A. Is the fashion of others imitated by you?

B. Do others imitate your fashion?

C. Were you imitating the fashion of others?

D. Others are imitated by you?

16. A sentence has been given in Active or Passive Voice. Change the voice by choosing the best option from among the 4 choices given.

That man who is walking in front is known to me.

A. That man who is walking in front of me has been known to me.

B. Known to me is that man who is walking in front of me.

C. Known by me is that man walking in front.

D. I know that man who is walking in front of me.

17. There are 4 sentences marked W, X, Y, Z. Choose from the given options the most logical sequence of these 4 sentences. W. At first appearance, it looks just like an ordinary, harmless, grasshopper. X. On a closer look, one can see its wings that enable it to fly long distances. Y. For farmers, one of the most dangerous insect pests is the locust. Z. A locust flies in a swarm with other locusts and attacks crops and destroys them.

- A. WXYZ
- B. ZWXY
- C. YZWX
- D. XYZW

18. There are 4 sentences marked W, X, Y, Z. Choose from the given options the most logical sequence of these 4 sentences. W. The current pack of 52 cards became the norm in the seventeenth century. X. The earliest reference to playing cards is found in tenth century China. Y. In the olden days these cards were used for playing games and telling fortunes. Z. They then

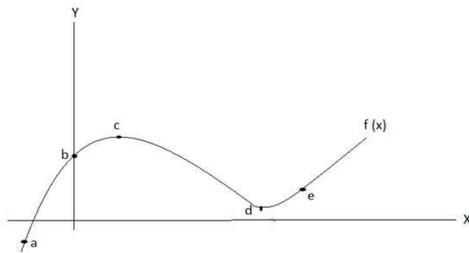
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appeared in Italy in the early fourteenth century.

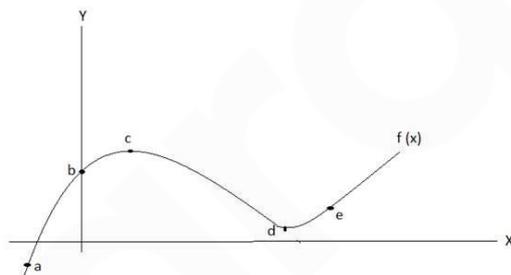
- A. XZYW
- B. ZYXW
- C. YWZX
- D. WXYZ

19. The figure provided below depicts the function  $f(x)$ . The values  $a, b, c, d$  and  $e$  are of the abscissa of the points shown in the figure. Decide which of the statements provided in the options is true?



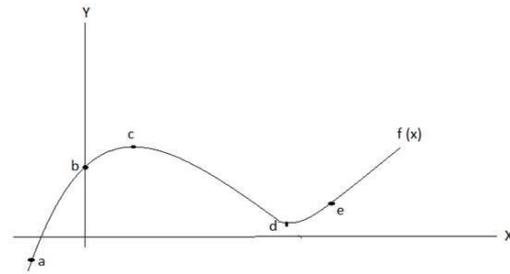
- A.  $f(a) = 0; f'(a) > 0; f''(a) < 0$
- B.  $f(a) > 0; f'(a) > 0; f''(a) < 0$
- C.  $f(a) < 0; f'(a) < 0; f''(a) > 0$
- D.  $f(a) < 0; f'(a) > 0; f''(a) < 0$

20. The figure provided depicts the function  $f(x)$ . The values  $a, b, c, d$  and  $e$  are of the abscissa of the points shown in the figure. Decide which of the statements provided in the options is true?



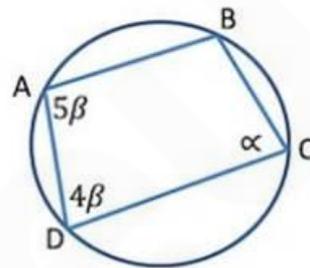
- A. 'e' is a stationary point
- B. 'e' is a point of inflexion
- C.  $f(x)$  is decreasing at 'e'
- D. The ordinate of  $f(x)$  is negative at 'e'

21. The figure provided depicts the function  $f(x)$ . The values  $a, b, c, d$  and  $e$  are of the abscissa of the points shown in the figure. Decide which of the statements provided in the options is true?



- A.  $f(b) > 0; f'(c) = 0; f''(d) > 0$
- B.  $f'(b) > 0; f''(c) = 0; f(d) > 0$
- C.  $f''(b) < 0; f(c) > 0; f'(d) = 0$
- D.  $f''(b) < 0; f(c) > 0; f'(d) > 0$

22.  $AB$  and  $CD$  are parallel lines. Find the angle  $a$ .



- A.  $50^\circ$
- B.  $60^\circ$
- C.  $70^\circ$
- D.  $80^\circ$

23. Pipes A, B and C together fill a tank in 5hrs. Pipe C is twice as fast as pipe B and pipe B is twice as fast as pipe A. How much time will pipe A alone take to fill the tank

- A. 20 hours
- B. 25 hours
- C. 35 hours
- D. 30 hours

$$f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

24. If

Then which of the following are correct?

- I.  $f(\theta) \times f(\varphi) = f(\theta + \varphi)$
  - II. The value of the determinant of the matrix  $f(\theta) \times f(\varphi)$  is 1.
  - III. The determinant of  $f(x)$  is an even function.
- A. Only I
  - B. Only II

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- C. Only III  
D. I, II and III

25. Let X be the set of all persons living in Delhi. The persons A and B in X are said to be related if the difference in their ages is at most 5 years. This relation is:-

- A. an equivalence relation  
B. a reflexive and transitive but not symmetric relation  
C. a symmetric and transitive but not reflexive relation  
D. a reflexive and symmetric but not transitive relation

26. Consider the following system of linear equations:

$$2x + 3y + 5z = 9$$

$$7x + 3y - 2z = 8$$

$$2x + 3y + \lambda z = \mu$$

Under what conditions does the above system of equations have a unique solution?

- A.  $\lambda = 5$  and  $\mu = 9$   
B.  $\lambda \neq 5$  and  $\mu$  has any real value  
C.  $\lambda \neq 5$  and  $\mu = 7$  only  
D.  $\lambda$  has any real value and  $\mu \neq 9$

27. The value of the infinite product  $6^{\frac{1}{2}} \times 6^{\frac{1}{2^2}} \times 6^{\frac{1}{2^3}} \times 6^{\frac{1}{2^4}} \times \dots$  is :

- A. 6  
B. 36  
C. 216  
D.  $\infty$

28. The number of real solutions of  $1 + |e^x - 1| = e^x(e^x - 2)$  is :

- A. 0  
B. 1  
C. 2  
D. 4

29. If the roots of the equation  $x^2 + 2ax + b = 0$  are real and distinct and they differ by at most  $2m$ , then  $b$  lies in the interval :

- A.  $(a^2 - m^2, a^2)$   
B.  $[a^2 - m^2, a^2)$   
C.  $[a^2, a^2 + m^2]$   
D.  $(a^2, a^2 + m^2)$

30. If the sum of the coefficients in the expansion

of  $(\alpha^2 x^2 - 2\alpha x + 1)^{51}$  vanish, then the value of  $\alpha$  is:

- A. 2  
B. -1  
C. 1  
D. -2

31. If  $[x]$  denotes the greatest integer less than or equal to  $x$ , then the solution set

of the inequality  $\frac{[x]-4}{6-[x]} > 0$  is:

- A.  $[4, 6)$   
B.  $[5, 6)$   
C.  $[5, 6]$   
D.  $(5, 6)$

32. If  $\frac{\log x}{3a+5b-8c} = \frac{\log y}{3b+5c-8a} = \frac{\log z}{3c+5a-8b}$  then  $xyz$  equals :

- A. 1  
B. 0  
C. -1  
D. 2

33. The product of roots of the equation  $\sqrt{9+x} + \sqrt{9-x} = 2$  is:

- A. 81  
B. 83  
C. -79  
D. -32

34. Persons A and B residing 5 kilometres apart decide to meet on the way by walking towards each other's residence. A walks at the speed of 5 km/hr while B does so at 4 km/hr. A starts walking 10 minutes after B has started. For how long will B walk before meeting A?

Choose the option closest to the answer

- A. 29 minutes  
B. 39 minutes  
C. 33 minutes  
D. 43 minutes



35. Which cannot be the number of elements in the power set of any finite set?

- A. 64
- B. 16
- C. 128
- D. 24

36. A depositor receives the same amount of interest from her two deposits with a bank earning interest at 8% and 20% per annum. What is the rate of interest received by the depositor on the entire deposit with the bank?

- A. 13.8%
- B. 11.4%
- C. 14%
- D. Information is insufficient

37. The number of ways in which 8 distinct hats can be distributed among 5 children is

- A.  $8^5$
- B.  $5^8$
- C.  $8P_5$
- D. 40

38. The number of ways in which an examiner can assign 60 marks to 10 questions, giving not less than 2 marks to any question is:-

- A.  ${}^{40}C_{10}$
- B.  ${}^{60}C_{10}$
- C.  ${}^{49}C_9$
- D.  ${}^{49}C_{10}$

39. If  $f(x) = |x^2 - 5x + 6|$ , then  $f'(x)$  is equal to :-

- A.  $5 - 2x$  if  $2 < x < 3$
- B.  $2x - 5$  if  $2 \leq x < 3$
- C.  $2x - 5$  if  $2 \leq x < 3$
- D.  $2x - 5$  if  $2 < x \leq 3$

40. The probability of the availability of dragon fruit in the market on any given day is 0.5. What is the minimum number of days that a person should visit the market so that the probability of finding the fruit on at least one day is more than 0.9?

- A. 2
- B. 3
- C. 4

D. 5

41. Let  $\alpha$  and  $\beta$  be the roots of the equation  $x^2 + x + 1 = 0$ . The equation whose roots are  $\alpha^{19}, \beta^7$  is

- A.  $x^2 - x - 1 = 0$
- B.  $x^2 - x + 1 = 0$
- C.  $x^2 + x - 1 = 0$
- D.  $x^2 + x + 1 = 0$

42. If prices rise by 20% from the year 2010 to 2011, the value of one rupee of 2011 equals Rs.  $1/1.2$  or Rs. 0.83 of the value of the rupee on 2010. Use this information to answer the following:

A person has an income of Rs. 400,000 in 2015 and prices rise at the rate of 10% each year for the next three years. How much additional income should be paid to the person in 2018 so that the value of her income in terms of the rupees of 2015 is the same as her income in 2015?

- A. Rs. 132,400
- B. Rs. 520,000
- C. Rs. 532,400
- D. Rs. 120,000

43.  $2^x + 2^y = 2^{x+y}$ , then the value of  $\frac{dy}{dx}$  at  $X = Y = 1$  is

- A. 0
- B. -1
- C. 1
- D. 2

44. The area enclosed between the curves  $y^2 = 4x$  and  $x^2 = 4y$  is :-

- A.  $\frac{16}{3}$
- B. 8
- C.  $\frac{32}{3}$
- D. 16

45. A laboratory blood test is 95% effective in detecting a certain disease when it is, in fact, present. However, the test also yields a "false positive" result for 1% of the healthy person tested. (That is, if a healthy person is tested, then, with probability 0.01, the test result will imply he has the disease). It is given that 0.5%



of the population actually has the disease. The probability that a person has the disease given that his test result is positive is:-

- A. 1
- B. 0.5
- C. 0.333
- D. 0.25

46. A boat covers a certain distance downstream in 1 hour, while it comes back in 1.5 hrs. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?

- A. 15 kmph
- B. 13 kmph
- C. 14 kmph
- D. 12 kmph

47. Statements given in column P are either necessary or sufficient for statements given beside these in column Q.

Column P	Column Q
I. $A \cup B = \emptyset$	$B = \emptyset$
II. $f'(a) = 0$	Differentiable function $f(x)$ has a maxima at $x = a$
III. $4x + 3 \geq 11$	$x \geq 1$
IV. $x < 4$	$x^2 < 16$

- A. I. Sufficient; II. Necessary; III. Sufficient; IV. Necessary
- B. I. Sufficient; II. Sufficient; III. Necessary; IV. Necessary
- C. I. Necessary; II. Necessary; III. Sufficient; IV. Sufficient
- D. I. Necessary; II. Sufficient; III. Sufficient; IV. Necessary

48. John invested an amount of Rs 12,000 at the rate of 10% per annum at simple interest and another amount at the rate of 20% per annum at simple interest. The total interest earned at the end of one year on the total amount invested became 14% per annum. Find the total amount invested.

- A. Rs 20,000
- B. Rs 22,000
- C. Rs 24,000
- D. Rs 25,000

49. The period of the function  $f(x) = \sin \frac{2x+3}{6\pi}$  is:-

6π is:-

- A. 2π
- B. 6π
- C. 6π<sup>2</sup>
- D. None of these

50.  $\lim_{x \rightarrow \infty} \frac{x^n}{e^x} = 0$ , (n integer), for

- A. no value of n
- B. all values of n
- C. Only negative values of n
- D. only positive values of n

51. In an examination, 65% students passed in Mathematics, 72% students passed in Economics and 45% passed in both. The percentage of students who failed in both the subjects is:-

- A. 12%
- B. 28%
- C. 8%
- D. 16%

52. Tea worth Rs. 126 per kg and Rs. 135 per kg is mixed with a third variety in the ratio 1:1:2. If the mixture is worth Rs. 153 per kg, the price of the third variety per kg should be:-

- A. Rs 169.50
- B. Rs 170
- C. Rs 175.50
- D. Rs 180

53. If  $\bar{A}$  and  $\bar{B}$  are the complementary events of A and B such that  $P(\bar{A}) = 0.4, P(\bar{B}) = 0.3$  and  $P(A \cup B) =$

0.9, then what is the value of  $P(\bar{A} \cup \bar{B})$  ?

- A. 0.2
- B. 0.5
- C. 0.6
- D. 0.7

54. Consider the function:

$$f(x) = \begin{cases} -2\sin x & \text{if } x \leq -\frac{\pi}{2} \\ B + A \sin x & \text{if } -\frac{\pi}{2} < x < \frac{\pi}{2} \\ \cos x & \text{if } x \geq \frac{\pi}{2} \end{cases}$$

which is continuous everywhere. What is the value of A?

- A. 1

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- B. 0
- C. -1
- D. -2

55. Consider the function:

$$f(x) = \begin{cases} -2\sin x & \text{if } x \leq -\frac{\pi}{2} \\ B + A \sin x & \text{if } -\frac{\pi}{2} < x < \frac{\pi}{2} \\ \cos x & \text{if } x \geq \frac{\pi}{2} \end{cases}$$

which is continuous everywhere. What is the value of B?

- A. 1
- B. 0
- C. -1
- D. -2

56. With which of the following company has the Ministry of Electronics and Information Technology (MeitY) signed a statement of intent to roll-out 'Build for Digital India'?

- A. Microsoft
- B. Facebook
- C. Google
- D. Apple

57. CMIE is a nomenclature for:-

- A. Centre for Monitoring Invasion and Espionage Public Limited
- B. Centre for Monitoring Indian Economy Private Limited
- C. Centre for Managing Import and Export Private Limited
- D. Centre for Monitoring Investment and E-commerce Private Limited

58. Central Vista Project is related to which of the following?

- A. A central government project to create a corridor between Delhi and Mumbai
- B. Expansion and Renovation of existing Indian Parliament Buildings
- C. A plan to construct a new office complex in Delhi
- D. A freight corridor connecting Delhi and Ahmedabad

59. Which female Indian cricketer won the BCCI C .K. Nayudu Lifetime Achievement award for 2019?

- A. Shefali Verma

- B. Harmanpreet Kaur
- C. Anjum Chopra
- D. Mithali Raj

60. Who among the following is the current National Security Advisor of India?

- A. Gulshan Kumar
- B. Ajit Doval
- C. Ravi Shankar Prasad
- D. Kanti Ghosh

61. Which company among the following was acquired by Walt Disney Co. in 2019?

- A. Viacom
- B. Warner Bros
- C. CBS Corporation
- D. 21<sup>st</sup> Century Fox

62. The Parker Probe mission launched by NASA was related to the study of-

- A. Moon
- B. Sun
- C. Jupiter
- D. Mars

63. Who among the following won the Nobel Peace Prize in the year 2019?

- A. Peter Handke
- B. Abiy ahmed
- C. Michel Mayor
- D. Michael Kremer

64. What is India's rank in "Ease of Doing Business Rankings" recently released by the World Bank in its report Doing Business 2020?

- A. 78
- B. 52
- C. 63
- D. 115

65. Who among the following is the current Chief Economist of the International Monetary Fund (IMF)?

- A. Kenneth Rogoff
- B. Gita Gopinath
- C. Maury Obstfeld
- D. Kristalina Georgieva

###COMMON###66###68###Directi on: Read the passage below carefully.

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Six boys are sitting in a circle. Sameer is sitting opposite to Ramesh. Parth is sitting to the right of Ramesh but left of Deepak. Manjit is sitting left of Ramesh. Kapil is sitting right of Sameer and left of Manjit. Now Deepak and Kapil, Manjit and Ramesh mutually exchange their positions.

###DONE###

66.

Who will be sitting opposite to Manjit?

- A. Sameer
- B. Ramesh
- C. Kapil
- D. Deepak

67. Who will be sitting left of kapil?

- A. Deepak
- B. Parth
- C. Ramesh
- D. Sameer

68. Who will be sitting left to Parth?

- A. Sameer
- B. Manjit
- C. Ramesh
- D. Deepak

###COMMON###69###73###Directi  
on: Read the passage below very  
carefully.

In an auditorium the first five front row seats are reserved for VIPs. Let's name them VIP 1, VIP 2, VIP 3, VIP 4, and VIP 5. They are wearing traditional Yellow, Green, Purple, Red and Blue kurtas, but not in the same order. The name of the VIPs are Yudhistir, Bheem, Arjun, Nakul, and Sahdev, again not in any particular order. The organizer can recognise the VIPs from the color of their kurtas. - The VIP in the first seat is wearing a red kurta. - The VIP wearing a blue kurta is seated between the VIPs wearing red and green kurta. - The VIP in the fifth seat is wearing a purple kurta. - The VIP 4 wears a yellow kurta. - Yudhistir is seated next to Nakul. - Sahdev wears a green kurta. - Bheem is sitting between Arjun and Sahdev. - Nakul is on the fifth seat.

###DONE###

69.

Who is VIP 4?

- A. Yudhistir
- B. Bheem
- C. Arjun
- D. Sahdev

70. Who is seated on the first seat?

- A. Yudhistir
- B. Bheem
- C. Arjun
- D. Sahdev

71. Who is seated between VIP 2 and VIP 4?

- A. Yudhistir
- B. Bheem
- C. Arjun
- D. Sahdev

72. If Arjun and Nakul swapped their seats and then Yudhistir and Bheem swapped their seats. What is the color sequence of the kurtas from seat 1 to seat 5?

- A. Red, Blue, Green, Yellow, Purple
- B. Purple, Yellow, Green, Blue, Red
- C. Blue, Green, Yellow, Red, Purple
- D. Green, Red, Blue, Purple, Yellow

73. In the following options, three out of the four are same in a certain way to form a group. Find the odd one:

- A. 27
- B. 64
- C. 15
- D. 50

74. In the following options, three out of the four are same in a certain way to form a group. Find the odd one:

- A. DFIM
- B. PRUX
- C. OQTX
- D. JLOS

75. Find the alternative which will replace the question mark.

K/T: 16/20 :: J/R : ?

- A. 17/18
- B. 10/18
- C. 10/9
- D. 17/9

76. Find the alternative which will replace the question mark:

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JRKN: NNNK:: AYWD : ?

- A. EUZA
- B. DDDW
- C. ECAH
- D. EUAZ

77.If a certain language HEIGHT is coded as HGHEIT, what would be the code for the word REMOTE?

- A. EOERMT
- B. ROTEME
- C. RTOMEE
- D. RMETOE

78.Given that

$$2^0 \square 2^1 \square 2^2 \square 2^3 \square 2^4 \square 2^5 \square 2^6 \square$$

Where  $\square$  is either + or -.What is the right combination of these two mathematical operators to get the above result?

- A. + + - - + - +
- B. + - + - + - +
- C. + - - + + - +
- D. + + - + - - +

79.There are three people A, B, and C, and by profession they are Painter, Actor, and Designer, but not in the same order. They have kids X, Y, and Z, and also not in the same order. It is known that • A is the father of X, but not a Painter • B is either a Painter or a Designer • C is an Actor, and is father of Y • Z is the son of a Painter. What is the profession of X's father?

- A. Painter
- B. Actor
- C. Designer
- D. Not enough information to decide

80.What number should come next in the series?

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{8}, \frac{1}{30}, ?$$

- A. 1/64
- B. 1/48
- C. 1/144
- D. 1/72

81. Which one does not belong with others?

- I. Swine Flu

II. Middle East Respiratory Syndrome  
 III. Severe Acute Respiratory Syndrome  
 IV. Minamata Syndrome

- A. I
- B. II
- C. III
- D. IV

82.Brain : Synapses :: Lungs : ?

- A. Thorax
- B. Trachea
- C. Bronchioles
- D. Pleura

83.A pandemic is an epidemic that is spreading over multiple countries and continents. Which situation below is an example of a pandemic?

- A. A disease that affects a large number of people within a community, population, or region.
- B. A disease that is actively spreading and new cases substantially exceed from what was expected.
- C. A disease caused by a virus that mutates every fortnight and scientists are able to study how it is moving from one country to another from this mutation.
- D. A rare disease that is present all over the world for many decades.

84.Statements: All women athletes can dance. Some women dancers can play volleyball.

Conclusion I: Women athletes can play volleyball.

Conclusion II: Women volleyball players can dance.

- A. Only conclusion I follows
- B. Only conclusion II follows
- C. Either I or II follows
- D. Neither I nor II follows

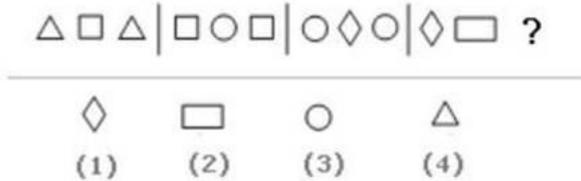
85.Find the next number in the sequence:-

6, 24, 60, 120, 210,.....

- A. 300
- B. 336
- C. 360
- D. 386

86.What is the missing symbol in the figure below?

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

87. One day, Aman observed the time in the mirror image of the clock as 4 hours and 40 minutes. What is the actual time shown by the clock?

- A. 8 hours 20 minutes
- B. 7 hours 40 minutes
- C. 7 hours 20 minutes
- D. 8 hours 40 minutes

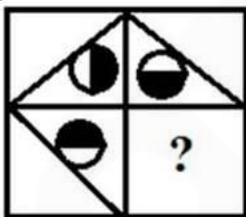
88. If + means divide, x means minus, % means multiply and - means plus, then find the value of  $8 + 2 \% 3 - 7 \times 4 = ?$

- A. 15
- B. 16
- C. 17
- D. 18

89. ZA5, Y4B, XC6, W3D, \_?\_

- A. E7V
- B. V2E
- C. VE5
- D. VE7

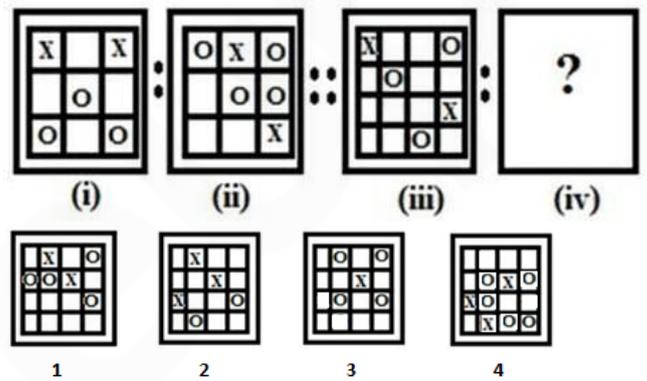
90. Identify the figure that completes the pattern.



- A.
- B.

- C.
- D.

91. There is some relationship between diagrams (i) and (ii). The same relationship persists between (iii) and (iv). Find the correct diagram for (iv) from the given options.



- A. 1
- B. 2
- C. 3
- D. 4

92. Aman and Asha got married on Sunday, 5<sup>th</sup> December 1993. In which year will they next celebrate their anniversary on a Sunday?

- A. 1997
- B. 1998
- C. 1999
- D. 2000

93. Here are some words translated from an artificial language. Agnos vergos means Coppersmith Barbet delnos deery vergos means Brown Headed Barbet flenus deery argos means Bald Headed Vulture Which word could mean "Brown Headed Vulture"?

- A. agnosvergosdeery
- B. delnosvergosdeery
- C. delnosdeeryargos
- D. delnosdeeryvergos



94. Choose the one that does not belong to the group.

- A. 6:18
- B. 4:13
- C. 5:16
- D. 7:22

95. Complete the sequence ACF, GIL, MOR, ?

- A. STW
- B. SUX
- C. TVX
- D. TVY

96. Read the statement and answer the question that follows.

A conservation group in the United States is trying to change the long-standing image of bats as frightening creatures. The group contends that bats are feared and persecuted solely because they are shy animals that are active only at night. Which of the following, if true, would cast the most serious doubt on the accuracy of the group's contention?

- A. Bats are steadily losing natural roosting places such as caves and hollow trees and are thus turning to more developed areas for roosting.
- B. Bats are the chief consumers of nocturnal insects and thus can help make their hunting territory more pleasant for humans.
- C. Bats are regarded as frightening creatures not only in the United States but also in Europe, Africa, and South America.
- D. Raccoons and owls are shy and active only at night; yet they are not generally feared and persecuted.

97. Read the statement and answer the question that follows.

Between 1975 and 1985, nursing-home occupancy rates averaged 87 percent of

capacity, while admission rates remained constant, at an average of 95 admissions per 1,000 beds per year. Between 1985 and 1988, however, occupancy rates rose to an average of 92 percent of capacity, while admission rates declined to 81 per 1,000 beds per year. If the statements above are true, which of the following conclusions can be most properly drawn?

- A. The average length of time nursing-home residents stayed in nursing homes increased between 1985 and 1988.
- B. The proportion of older people living in nursing homes was greater in 1988 than in 1975.
- C. Nursing home admission rates tend to decline whenever occupancy rates rise.
- D. The more beds a nursing home has, the higher its occupancy rate is likely to be.

98. The given pair of words has a specific relationship. Choose from among the given options the pair with a similar relationship.

Ocean: whale

- A. mountain: waterfall
- B. river: boat
- C. jungle: elephant
- D. desert: oasis

99. The given pair of words has a specific relationship. Choose from among the given options the pair with a similar relationship.

Amiable: truculent

- A. kindred: unrelated
- B. cold: freezing
- C. weather: climate
- D. trees: monkeys



###ANSWERS###

1. Ans. B.

It is apparent as all the other options are incorrect. An antonym refers to a word that is opposite in meaning to another word. 'Nadir' refers to rock bottom or the lowest point. For example- Losing my job was the nadir of my life. Option B 'peak' refers to the highest or the topmost point. Hence, Option B is correct because it is the antonym for 'Nadir'. Options A, C and D are incorrect because they are different in meaning to the given context.

2. Ans. C.

It is apparent as all the other options are incorrect. An antonym refers to a word that is opposite in meaning to another word. 'Pandemonium' refers to madness or uproar. For example- There was complete pandemonium in the stadium. Option C 'peace' refers to calmness or tranquility. Hence, Option C is correct because it is the antonym for 'Pandemonium'. Options A, B and D are incorrect because they are different in meaning to the given context.

3. Ans. A.

It is apparent as all the other options are incorrect. An antonym refers to a word that is opposite in meaning to another word. 'Acrimonious' refers to harsh or vicious behavior. For example- They have stopped talking after their acrimonious debate. Option A 'courtesy' refers to polite and civil behavior. Hence, Option A is correct because it is an antonym for 'acrimonious'. Options B, C and D are incorrect because they are different in meaning to the given context.

4. Ans. D.

It is apparent as all the other options are incorrect. Option D is incorrect because there is no such statement in the passage that infers about raccoons. Hence, Option D is the most serious doubt on the accuracy of the group's content. Options A, B and C are incorrect because they support the main idea portrayed by the given passage.

5. Ans. A.

It is apparent as all the other options are incorrect. Option A is correct because it highlights the main idea reflected in the passage. Options B, C and D are incorrect because they do not produce the conclusion of the given passage.

6. Ans. B.

It is apparent as all the other options are irrelevant. Option B is correct because the main idea reflected in the passage is to identify a shortcoming in a scholarly approach and describe an alternative approach. Options A, C and D are incorrect because they do not reaffirm the primary purpose of the passage.

7. Ans. D.

It is apparent as all the other options are inaccurate. Option D is correct because it accurately describes the techniques used by the new political historians in analyzing the political behavior of nineteenth-century voters. Options A, B and C are incorrect because they do not reaffirm the analysis of the techniques by the new political historians.

8. Ans. B.

It is apparent as all the other options are incorrect. Option B is correct because the author quotes Baker to differentiate between a novel definition and traditional definition. Options A, C and D are incorrect because they do not justify and support the given argument.

9. Ans. D.

It is apparent as all the other options are irrelevant. Option D is correct because both Baker and the new political historians share an emphasis on the political involvement of ordinary citizens. Options A, B and C are incorrect because they do not show a similarity between the new political historians and Baker.

10. Ans. A.

It is apparent as all the other options are incorrect. Option A is correct because the first stanza shows a comparison between the two scholarly approaches and identifies a shortcoming common to both approaches. Options B, C and D are

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incorrect because they do not describe the main idea reflected in the first stanza.

11. Ans. C.

It is apparent as all the other options are incorrect. Option C is correct because the passage suggests that a pre-1960's political historian would have been most likely to study a biography of an influential nineteenth-century minister of foreign affairs. Options A, B and D are incorrect because they do not reaffirm the main idea reflected in the passage, according to the context.

12. Ans. B.

It is apparent as all the other options are grammatically inaccurate. Option B is correct because the given sentence states that the railway track was situated beside the road and X couldn't see any traffic besides a car or two. Options A, C and D are incorrect because they form illogical sentences.

13. Ans. B.

It is apparent as all the other options are incorrect. Option B is correct because 'egalitarian' refers to a politically equal society, whereas 'rebuked' refers to reprimanding or scolding. Hence, Option B is correct because it matches the given context. Options A, C and D are incorrect because they do not match the context of the given statement.

14. Ans. C.

It is apparent as all the other options are incorrect. While changing a sentence from active to passive voice, the position of the object and subject is interchanged and the tense changes into the 3<sup>rd</sup> form of the verb. Hence, Option C is correct because it fulfils the given criteria. Options A, B and D are incorrect because they do not match the criteria explained.

15. Ans. A.

It is apparent as all the other options are incorrect. While changing a sentence from active to passive voice, the position of the object and subject is interchanged and the tense changes into the 3<sup>rd</sup> form of the verb. Hence, Option A is correct because it fulfils the given criteria. Options B, C and D are incorrect because they do not match the criteria explained.

16. Ans. D.

It is apparent as all the other options are incorrect. While changing a sentence from active to passive voice, the position of the object and subject is interchanged and the tense changes into the 3<sup>rd</sup> form of the verb. Hence, Option D is correct because it fulfils the given criteria. Options A, B and C are incorrect because they do not match the criteria explained.

17. Ans. C.

It is apparent as all the other options are grammatically incorrect. Option C is correct because the first sentence explains the context or the main idea behind the passage. Further, the next sentence explains about Locusts and its appearance. Options A, B and D are incorrect because they do not form logical sentences.

18. Ans. A.

It is apparent as all the other options indicate an illogical meaning. Option A is correct because the sentence begins by stating the earliest reference to playing cards in tenth century China, followed by fourteenth century Italy. Further, the sentences indicate the uses of these card games. Options B, C and D are incorrect because they do not produce logical sentences.

19. Ans. D.

From the given figure, it is clear that  $f(0) < 0$  and also at point 'a' graph is increasing so  $f'(a) > 0$ . Hence, option (D) will be the correct answer.

20. Ans. B.

From the given figure, it is clear that 'e' is a rising point of inflexion. Hence, option (B) is the correct answer.

21. Ans. A.

In the given graph:

$$f(a) < 0 \text{ and } f'(a) > 0$$

$$f(b) > 0$$

$$f'(c) = 0 \text{ and } f''(c) < 0$$

$$f'(d) = 0 \text{ and } f''(d) > 0$$

Hence, option (A) is the correct answer

22. Ans. D.

Since, AB and CD are parallel lines,

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So,  $5\beta + 4\beta = 180^\circ$  (Supplementary angles)  
 $\Rightarrow 9\beta = 180^\circ$   
 $\Rightarrow \beta = 20^\circ$

Now, since ABCD is a cyclic quadrilateral, so its opposite angles will be supplementary to each other.

$5\beta + \alpha = 180^\circ$   
 $\Rightarrow 5 \times 20^\circ + \alpha = 180^\circ$  ( $\because \beta = 20^\circ$ )  
 $\Rightarrow \alpha = 180^\circ - 100^\circ = 80^\circ$

23. Ans. C.

Let pipe A can fill a tank in '2x' hours, then pipe B will fill in 'x' hours and pipe C

will fill in  $\frac{x}{2}$  hours.

Now,  $\frac{1}{2x} + \frac{1}{x} + \frac{1}{x/2} = \frac{1}{5}$

$\Rightarrow \frac{1}{2x} + \frac{1}{x} + \frac{2}{x} = \frac{1}{5}$

$\Rightarrow \frac{1+2+4}{2x} = \frac{1}{5}$

$\Rightarrow \frac{7}{2x} = \frac{1}{5}$

$\Rightarrow x = \frac{35}{2}$

Hence, pipe A will fill the tank

in  $2 \times \frac{35}{2} = 35$  hours.

24. Ans. D.

$$f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Now,  $f(\theta)$

$$= \begin{bmatrix} \cos \theta & -\sin \theta & 0 \\ \sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix} \text{ and}$$

$$f(\phi) = \begin{bmatrix} \cos \phi & -\sin \phi & 0 \\ \sin \phi & \cos \phi & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$f(\theta) \times f(\phi) = \begin{bmatrix} \cos \theta & -\sin \theta & 0 \\ \sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \cos \phi & -\sin \phi & 0 \\ \sin \phi & \cos \phi & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} \cos \theta \cdot \cos \phi - \sin \theta \cdot \sin \phi & -\cos \theta \cdot \sin \phi - \sin \theta \cdot \cos \phi & 0 \\ \sin \theta \cdot \cos \phi + \cos \theta \cdot \sin \phi & -\sin \theta \cdot \sin \phi + \cos \theta \cdot \cos \phi & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} \cos(\theta + \phi) & -\sin(\theta + \phi) & 0 \\ \sin(\theta + \phi) & \cos(\theta + \phi) & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

From the above, we can say that  $f(\theta) \times f(\phi) = f(\theta + \phi)$

Again,  $f(\theta) \times f(\phi) = \cos^2(\theta + \phi) + \sin^2(\theta + \phi) = 1$

Also,  $|f(x)| = \cos^2 x + \sin^2 x = 1 \rightarrow$  constant function.

We know that constant function always be an even function.

Hence, all are correct.

25. Ans. D.

Given,  $X = \{\text{Set of all persons living in Delhi}\}$

$R = \{(A, B) : |A - B| \leq 5\}$

For reflexive,  $(A, A) \in R$

$(A, A) = |A - A| = 0, 0 \leq 5, (A, A) \leq 5$

Hence, R is reflexive.

Now, checking for symmetric,

Let  $(A, B) \in R$

$(A, B) = |A - B| \leq 5 \Rightarrow |B - A| \leq 5$

$\Rightarrow (B, A) \in R$

$\therefore (A, B) \in R \Rightarrow (B, A) \in R$

Therefore, we can say that R is symmetric.

Now, check for transitive,

Let  $(A, B) \in R$  and  $(B, C) \in R$

$(A, B) = |A - B| \leq 5, (B, C) = |b - c| \leq 5$

$|A - C| \leq |A - B| + |B - C| \leq 10$

$\Rightarrow |A - C| \leq 10$

$\therefore (a, c) \notin R$

Hence, R is not transitive.

Hence, we can say that 'R' is reflexive and symmetric but not transitive.

26. Ans. B.

Let  $A = \begin{bmatrix} 2 & 3 & 5 \\ 7 & 3 & -2 \\ 2 & 3 & \lambda \end{bmatrix}$

We know that for unique solution,  $|A| \neq 0$

$\Rightarrow 2(3\lambda + 6) - 3(7\lambda + 4) + 5(21 - 6) = 0$

$\Rightarrow 6\lambda + 12 - 21\lambda - 12 + 75 = 0$

$\Rightarrow -15\lambda + 75 = 0 \Rightarrow (-15)(\lambda - 5) = 0$

$\Rightarrow \lambda = 5$

So, we can say that system of equations have a unique solution for  $\lambda = 5$  and any real value of  $\mu$ .

27. Ans. B.

$6^{\frac{1}{2}} \times 6^{\frac{1}{2}} \times 6^{\frac{3}{8}} \times 6^{\frac{1}{4}} \times \dots$

$= 6^{\frac{1}{2}} \times 6^{\frac{2}{4}} \times 6^{\frac{3}{8}} \times 6^{\frac{4}{16}} \times \dots$

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$$= \frac{1}{6^2} + \frac{2}{4} + \frac{3}{8} + \frac{4}{16} + \dots$$

$$S = \frac{1}{2} + \frac{2}{4} + \frac{3}{8} + \frac{4}{16} + \dots$$

Let

$$\Rightarrow S = \frac{1}{2} + \frac{2}{2^2} + \frac{3}{2^3} + \frac{4}{2^4} + \dots \quad \dots(i)$$

$$\Rightarrow \frac{1}{2}S = \frac{1}{2^2} + \frac{2}{2^3} + \frac{3}{2^4} + \dots \quad \dots(ii)$$

After subtracting equation (ii) in (i),

$$S - \frac{1}{2}S = \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \dots$$

$$\Rightarrow \frac{S}{2} = \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \dots$$

(it is in Geometric series where first

term,  $a = \frac{1}{2}$  and common ratio,  $r = \frac{1}{2}$ )

$$\Rightarrow \frac{S}{2} = \frac{1/2}{1-1/2} \left[ \because S_{\infty} = \frac{a}{1-r} \right]$$

$$\Rightarrow \frac{S}{2} = \frac{1/2}{1/2} = 1$$

$$\Rightarrow S = 2$$

$$\text{So, } \frac{1}{6^2} + \frac{2}{4} + \frac{3}{8} + \frac{4}{16} + \dots = 6^2 = 36$$

Hence, required product = 36

28. Ans. B.

$$1 + |e^x - 1| = e^x (e^x - 2)$$

For  $|e^x - 1| \geq 0$ ,

$$1 + e^x - 1 = e^x (e^x - 2)$$

$$\Rightarrow e^x = e^x (e^x - 2)$$

$$\Rightarrow e^x (e^x - 2) - e^x = 0$$

$$\Rightarrow e^x (e^x - 2 - 1) = 0$$

$$\Rightarrow e^x (e^x - 3) = 0$$

$$\Rightarrow e^x (e^x - 3) = 0$$

$$\Rightarrow e^x = 0 \text{ or } e^x = 3$$

Now, for  $|e^x - 1| < 0$ ,

$$1 - (e^x - 1) = e^x (e^x - 2)$$

$$\Rightarrow 2 - e^x = e^x (e^x - 2)$$

$$\Rightarrow e^x = \frac{(2 - e^x)}{(e^x - 2)} = -1$$

Here,  $e^x = 0, -1$  or  $3$ , but we know that value of  $e^x$  never be  $0$  or  $-1$ . So, only one real solution is possible i.e.,  $e^x = 3$ .

29. Ans. B.

Let  $\alpha, \beta$  be the roots of  $x^2 + 2ax + b = 0$ .

$$\Rightarrow \alpha + \beta = -2a \text{ and } \alpha\beta = b$$

By hypothesis,

$$|\alpha - \beta| \leq 2m \text{ (according to the question)}$$

$$\Rightarrow (\alpha - \beta)^2 \leq 4m^2$$

$$\Rightarrow (\alpha + \beta)^2 - 4\alpha\beta \leq 4m^2 \quad [\because (a - b)^2 = (a + b)^2 - 4ab]$$

$$\Rightarrow 4a^2 - 4b \leq 4m^2$$

$$\Rightarrow a^2 - b \leq m^2$$

$$\Rightarrow a^2 - m^2 \leq b \dots(i)$$

It is given that roots are real and distinct of the given quadratic equation,

$$b^2 - 4ac > 0$$

$$\Rightarrow (2a)^2 - 4 \times 1 \times b > 0$$

$$\Rightarrow 4a^2 - 4b > 0$$

$$\Rightarrow a^2 - b > 0$$

$$\Rightarrow b < a^2 \dots(ii)$$

From equation (i) and (ii),

$$a^2 - m^2 \leq b < a^2$$

$$\Rightarrow b \in [a^2 - m^2, a^2)$$

Hence, option (B) is the correct answer.

30. Ans. C.

To calculate sum of coefficient, put variable = 1. Here, variable is x, so put x = 1.

$$\text{Sum of coefficient} = (\alpha^2 - 2\alpha + 1)^{51}$$

Since, sum of coefficients in the given expansion vanishes,

$$\text{So, } (\alpha^2 - 2\alpha + 1)^{51} = 0$$

$$\Rightarrow [(\alpha - 1)^2]^{51} = 0$$

$$\Rightarrow (\alpha - 1)^{102} = 0$$

$$\Rightarrow \alpha - 1 = 0 \Rightarrow \alpha = 1$$

31. Ans. B.

$$\frac{[x] - 4}{6 - [x]} > 0$$

Given,

Here, check from option one by one,

Option (A), put x = 4,

$$\frac{[4] - 4}{6 - [4]} > 0$$

$$\frac{4 - 4}{6 - 4} > 0,$$

which is not possible.

Option (B), put x = 5,

$$\frac{[5] - 4}{6 - [5]} > 0$$

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$$\Rightarrow \frac{5-4}{6-5} > 0 \Rightarrow 1 > 0, \text{ which is possible.}$$

Option (c), put  $x = 6$ ,

$$\frac{[6]-4}{6-[6]} > 0$$

$$\Rightarrow \frac{6-4}{6-6} > 0, \text{ which is not possible.}$$

Hence, option (B) is the correct answer.

32. Ans. A.

$$\frac{\log x}{3a+5b-8c} = \frac{\log y}{3b+5c-8a} = \frac{\log z}{3c+5a-8b} = K$$

(say)

$$\Rightarrow \log x = k(3a + 5b - 8c) \dots(i)$$

$$\log y = k(3b + 5c - 8a) \dots(ii)$$

$$\log z = k(3c + 5a - 8b) \dots(iii)$$

Adding equation (i), (ii) and (iii),

$$\log x + \log y + \log z = k(3a + 5b - 8c + 3b + 5c - 8a + 3c + 5a - 8b)$$

$$\Rightarrow \log xyz = 0 \Rightarrow \log xyz = \log 1$$

$$\Rightarrow xyz = 1$$

33. Ans. D.

Given equation is:

$$\sqrt{9+x} + \sqrt{9-x} = 2$$

$$\Rightarrow \sqrt{9+x} = 2 - \sqrt{9-x}$$

Squaring both sides, we get:

$$9 + x = 4 + 9 - x - 4\sqrt{9-x}$$

$$\Rightarrow 4\sqrt{9-x} = 4 - 2x = 2(2-x)$$

$$\Rightarrow 2\sqrt{9-x} = (2-x)$$

Again squaring both sides, we get

$$4(9-x) = 4 + x^2 - 4x$$

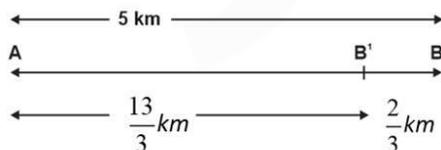
$$\Rightarrow 36 - 4x = x^2 - 4x + 4$$

$$\Rightarrow x^2 - 32 = 0 \dots(i)$$

Comparing equation (i) with standard quadratic equation  $ax^2 + bx + c = 0$ , we get :

$$\text{product of roots} = \frac{c}{a} = \frac{-32}{1} = -32$$

34. Ans. B.



Speed of B = 4 km/hr i.e B covers 4 km in 60 minutes.

Then, Distance covered by B in 10 minutes.

$$= \frac{10}{60} \times 4 = \frac{4}{6} = \frac{2}{3} \text{ km}$$

$$B' = \frac{13/3}{9}$$

Time taken to meet to A and

$$= \frac{13}{27} \text{ hr}$$

Total time taken to meet to A by B

$$= \frac{13}{27} + \frac{10}{60} = \frac{13}{27} + \frac{1}{6}$$

$$= \frac{26+9}{54} = \frac{35}{54} \text{ hours}$$

$$= \frac{35}{54} \times 60 = 38.89 \text{ minutes}$$

≈ 39 minutes (approx)

35. Ans. D.

We know that number of elements in the power set of any finite set is in the form of  $2^n$  where 'n' can be 1, 2, 3, .....

Now, after analysing the options we can say that 24 cannot be the number of elements in the power set of any finite set.

36. Ans. B.

Let depositor receives Rs. 400 each as interest for both deposits.

Principal amount on 8% interest

$$= \frac{400 \times 100}{8}$$

$$= \text{Rs. } 5000$$

Principal amount on 20% interest = 400

$$\frac{100}{20}$$

$$\times 20 = \text{Rs. } 2000$$

$$\text{Total Principal amount} = 5000 + 2000 =$$

$$\text{Rs. } 7000$$

$$\text{Total interest received} = 400 + 400 = \text{Rs.}$$

$$800$$

$$\text{Required rate of interest} = \frac{800}{7000} \times 100 =$$

$$11.4\%$$

37. Ans. B.

Required number of ways =  $5 \times 5 \times 5 \times$

..... 8 times.

$$= 5^8$$

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38. Ans. C.

Here, we have to assign 60 marks to 10 question.

Given that, minimum marks assigned to any question is 2.

So, maximum marks that can be assigned to any question will be 42.

Let  $x_i$  be the marks assigned to  $i^{\text{th}}$  question.

Then,  $2 \leq x_i \leq 42$

And,  $x_1 + x_2 + \dots + x_{10} = 60$

Put  $x_i = y_i - 2$  where  $y_i \geq 0$

$y_1 + y_2 + \dots + y_{10} = 40$

Formula to calculate number of non-negative integral solutions of above equation is:

$$\begin{aligned} n + r - 1 C_{r-1} \\ = 40 + 10 - 1 C_{10-1} \\ = 49 C_9 \end{aligned}$$

Hence, required number of ways = 49 C<sub>9</sub>

39. Ans. A.

$$f(x) = |x^2 - 5x + 6|$$

$$\bullet f(x) = |x^2 - 2x - 3x + 6| = |x(x - 2) - 3(x - 2)| = |(x - 2)(x - 3)|$$

Put  $x = 1$ ,

$$F(1) = |(1 - 2)(1 - 3)| = |(-1)(-2)| = 2$$

So, for  $2 < x < 3$ , values of  $f(x)$  will be negative.

$$\text{Now, } f(x) = -(x^2 - 5x + 6), 2 < x < 3$$

$$f'(x) = -(2x - 5), 2 < x < 3$$

$$= 5 - 2x, 2 < x < 3$$

40. Ans. C.

Let us assume that the probability of availability of dragon fruit on a particular day is independent of its availability on other days.

Under this assumption, the probability that in all the  $n$  days, dragon fruit is

$$\text{unavailable} = \left(\frac{1}{2}\right)^n$$

$\therefore$  The probability that dragon fruit is

$$\text{available on at least one day} = 1 - \left(\frac{1}{2}\right)^n$$

According to the question, we have

$$1 - \left(\frac{1}{2}\right)^n > \frac{9}{10}$$

$$\Rightarrow 1 - \frac{9}{10} > \left(\frac{1}{2}\right)^n$$

$$\Rightarrow \frac{1}{10} > \left(\frac{1}{2}\right)^n$$

Taking the logarithm to both sides, we have

$$-\log 10 > -n \log 2$$

$$\Rightarrow \log(10) < n \log(2)$$

$$\Rightarrow n > \frac{\log(10)}{\log(2)}$$

$$\Rightarrow n > \log_2(10) \Rightarrow n > 3.322$$

Hence, minimum number of days ( $n$ ) = 4.

41. Ans. D.

Given equation is  $x^2 + x + 1 = 0$

Since,  $\alpha$  and  $\beta$  are the roots of the given equation.

So,  $\alpha + \beta = -1$  and  $\alpha\beta = 1$

Now,  $x^2 + x + 1 = 0$

$$\bullet (x - \omega)(x - \omega^2) = 0$$

$$\bullet x = \omega, \omega^2$$

$\therefore \alpha = \omega, \beta = \omega^2$  ( $\because \omega, \omega^2$  are cube roots of unity)

Hence,  $\alpha^3 = \omega^3 = 1$

$$\beta^3 = [\omega^2]^3 = 1$$

$$\alpha\beta = \omega^3 = 1$$

$$\therefore \alpha^{19} = (\alpha^3)^6 \alpha = 1^6 \alpha = \alpha = \omega$$

$$\beta^7 = \beta^6 \beta = (\beta^3)^2 \beta = 1 \cdot \beta = \beta = \omega^2$$

$$\text{So, } \alpha^{19} + \beta^7 = \omega + \omega^2 = -1$$

$$\Rightarrow \alpha^{19} \cdot \beta^7 = \omega \cdot \omega^2 = \omega^3 = 1 [\because 1 + \omega + \omega^2 = 0, \omega^3 = 1]$$

We know that, standard quadratic equation is:

$$x^2 - (\text{sum of roots})x + \text{product of roots} = 0$$

Hence, equation whose roots are  $\alpha^{19}, \beta^7$  is

$$x^2 - (\alpha^{19} + \beta^7)x + \alpha^{19} \cdot \beta^7 = 0$$

$$\Rightarrow x^2 - (-1)x + 1 = 0$$

$$\Rightarrow x^2 + x + 1 = 0$$

42. Ans. A.

Additional income should be paid to the person in 2018

$$= 40000 + 44000 + 48400$$

$$= \text{Rs. } 132,400$$

43. Ans. B.

$$2^X + 2^Y = 2^{X+Y}$$

Differentiate both sides with respect to  $X$ ,

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$$2^x \log 2 + 2^y \log 2 \frac{dY}{dX} = 2^{x+y} \log_2 \left( 1 + \frac{dY}{dX} \right)$$

$$\left[ \because \frac{d(a^x)}{dx} = a^x \log a \right]$$

$$\Rightarrow 2^x + 2^y \frac{dY}{dX} = 2^{x+y} \left( 1 + \frac{dY}{dX} \right)$$

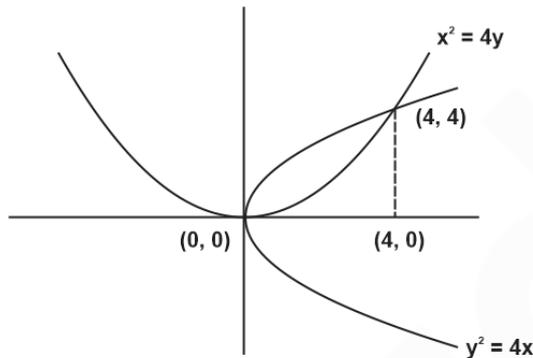
$$\Rightarrow 2^x + 2^y \frac{dY}{dX} = 2^{x+y} + 2^{x+y} \cdot \frac{dY}{dX}$$

$$\Rightarrow \frac{dY}{dX} (2^y - 2^{x+y}) = 2^{x+y} - 2^x$$

$$\Rightarrow \frac{dY}{dX} = \frac{2^{x+y} - 2^x}{2^y - 2^{x+y}}$$

$$\Rightarrow \frac{dy}{dx} \Big|_{x=y=1} = \frac{2^2 - 2^1}{2^1 - 2^2} = \frac{4 - 2}{2 - 4} = \frac{2}{-2} = -1$$

44. Ans. A.



Here,  $y = 2\sqrt{x}$ , and

$$x^2 = 4y = 4(2\sqrt{x}) = 8\sqrt{x}$$

$$\Rightarrow x^2 = 8(x)^{1/2} \Rightarrow x^{2-\frac{1}{2}} = 8$$

$$\Rightarrow x^{3/2} = 8$$

$$\Rightarrow x = 8^{2/3} = (2^3)^{2/3} = 4$$

Required area

$$= \int_0^4 \left( 2\sqrt{x} - \frac{x^2}{4} \right) dx$$

$$= \left[ \frac{2x^{3/2}}{3/2} - \frac{x^3}{12} \right]_0^4$$

$$= \left[ \frac{4}{3} x^{3/2} - \frac{x^3}{12} \right]_0^4$$

$$= \left( \frac{4}{3} (4)^{3/2} - \frac{4^3}{12} \right) - (0 - 0)$$

$$= \frac{4}{3} \times (2^2)^{3/2} - \frac{64}{12}$$

$$= \frac{4}{3} \times 8 - \frac{64}{12} = \frac{32}{3} - \frac{16}{3} = \frac{16}{3}$$

45. Ans. C.

Population who is actually affected with diseases,  $P(A) = 0.5\% = 0.005$

Population who is not affected with disease,  $P(\bar{A}) = 1 - 0.005 = 0.995$

Also,

$$P(B|A) = 0.95$$

$$P(B|\bar{A}) = 0.01$$

Required probability =  $\frac{0.95 \times 0.005}{0.95 \times 0.005 + 0.995 \times 0.01}$

$$= \frac{95 \times 5}{95 \times 5 + 995 \times 1} = \frac{95}{95 + 199}$$

$$= \frac{95}{294} = 0.323$$

$$\approx 0.333 \text{ (approx)}$$

46. Ans. A.

Let the speed of boat,  $S_B = x$  km/hr.

Speed of stream,  $S_S = 3$  km/hr (Given)

So, speed in downstream =  $(x + 3)$  km/hr

Speed in upstream =  $(x - 3)$  km/hr

Therefore,  $1(x + 3) = 1.5(x - 3)$

$$\Rightarrow x + 3 = \frac{15}{10}(x - 3)$$

$$\Rightarrow 10x + 30 = 15x - 45$$

$$\Rightarrow 5x = 75 \Rightarrow x = 15$$

Hence, speed of boat in still water = 15 km/hr

47. Ans. A.

We know that, if statement, P is necessary for statement Q then there must be condition that  $\rightarrow$  If Q is true then P will be true, case of sufficient.

Now, (i)  $A \cup B = \phi$ , for  $B = \phi$

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• It is not necessary, so it will be case of sufficient.

(ii)  $f'(a) = 0$ , for differentiable function  $f(x)$  has a maxima at  $x = a$

• It is true, so it is case of necessary.

Same as (iii) is case of sufficient and (iv) is case of necessary.

Hence, option (A) is correct.

48. Ans. A.

Let the second amount = P

According to the question.

$$\frac{12000 \times 10 \times 1}{100} + \frac{P \times 20 \times 1}{100} = \frac{(12000 + P) \times 14 \times 1}{100}$$

•  $120000 + 20P = 168000 + 14P$

•  $6P = 48000$  •  $P = 8000$

Hence, total amount invested =  $12000 + 8000$

= Rs. 20,000

49. Ans. C.

We know that period of  $\sin x = 2\pi$

Period of  $\sin ax = \frac{2\pi}{a}$   
Same, as period

of  $\sin \frac{2x+3}{6\pi} = \sin \left( \frac{2x}{6\pi} + \frac{3}{6\pi} \right) =$

$\sin \left( \frac{x}{3\pi} + \frac{1}{2\pi} \right)$  will be,

$$\frac{2\pi}{1/3\pi} = 2\pi \times 3\pi = 6\pi^2$$

Hence, required period =  $6\pi^2$

50. Ans. B.

$\lim_{x \rightarrow \infty} \frac{x^n}{e^x} = 0$ , Here we check it for  $n = 2$  and  $n = -2$ .

Put  $n = 2$   $\lim_{x \rightarrow \infty} \frac{x^2}{e^x}$

$\left( \frac{\infty}{\infty} \right)$  form, using L' Hopital's rule)

$$\lim_{x \rightarrow \infty} \frac{2x}{e^x}$$

(again  $\frac{\infty}{\infty}$  form, so again using L' Hopital's rule)

$$= \lim_{x \rightarrow \infty} \frac{2}{e^x} = 2 \lim_{x \rightarrow \infty} \frac{1}{e^x} = 2 \times 0 = 0$$

Now, put  $n = -2$ ,  $\lim_{x \rightarrow \infty} \frac{x^{-2}}{e^x} = \lim_{x \rightarrow \infty} \frac{1}{x^2 e^x} = \frac{1}{\infty} = 0$

$$\lim_{x \rightarrow \infty} \frac{x^n}{e^x} = 0$$

So, we can say that  $\lim_{x \rightarrow \infty} \frac{x^n}{e^x} = 0$  will be for all values of n.

51. Ans. C.

Students passed in mathematics = 65%

Students passed in economics = 72%

Students passed in both subjects = 45%

Total passed students =  $65 + 72 - 45 = 92\%$

Percentage of students who failed in both the subjects =  $100 - 92 = 8\%$

52. Ans. C.

Assume that price of third variety of tea Rs. x per kg.

Then, according to the question,

$$\frac{126 \times 1 + 135 \times 1 + x \times 2}{1+1+2} = 153$$

•  $261 + 2x = 612$  •  $2x = 351$  •  $x = 175.5$

Hence, price of third variety of tea = Rs. 175.5 per kg.

53. Ans. C.

$$P(\bar{A}) = 0.4 \Rightarrow P(A) = 1 - 0.4 = 0.6$$

$$P(\bar{B}) = 0.3 \Rightarrow P(B) = 1 - 0.3 = 0.7$$

We know that,

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

$$\Rightarrow 0.9 = 0.6 + 0.7 - P(A \cap B)$$

$$\Rightarrow P(A \cap B) = 1.3 - 0.9 = 0.4$$

$$\text{So, } P(\bar{A} \cup \bar{B}) = 1 - P(A \cap B) = 1 - 0.4 = 0.6$$

54. Ans. C.

Firstly checking at  $-\frac{\pi}{2}$ ,

Since, function is continuous,

So, LHL = RHL

$$\lim_{h \rightarrow 0} -2 \sin \left( -\frac{\pi}{2} - h \right) = \lim_{h \rightarrow 0} B + A \sin \left( -\frac{\pi}{2} + h \right)$$

$$-2 \sin \left( -\frac{\pi}{2} \right) = B + A \sin \left( -\frac{\pi}{2} \right)$$

$$\Rightarrow 2 \sin \left( \frac{\pi}{2} \right) = B - A \sin \frac{\pi}{2}$$

$$\Rightarrow B - A = 2 \dots \dots \dots (i) \left[ \because \sin \frac{\pi}{2} = 1 \right]$$

Now, check at  $\frac{\pi}{2}$ ,  
LHL = RHL

$$\Rightarrow \lim_{h \rightarrow 0} B + A \sin \left( \frac{\pi}{2} - h \right) = \cos \left( \frac{\pi}{2} + h \right)$$

$$\Rightarrow B + A \sin \frac{\pi}{2} = \cos \frac{\pi}{2}$$

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$$\Rightarrow B + A = 0 \dots \dots (ii) \left[ \because \sin \frac{\pi}{2} = 1, \cos \frac{\pi}{2} = 0 \right]$$

From (i) and (ii),

$$B = 1, A = -1$$

55. Ans. A.

Firstly checking at  $-\frac{\pi}{2}$ ,

Since, function is continuous,

So, LHL = RHL

$$\lim_{h \rightarrow 0} -2 \sin \left( -\frac{\pi}{2} - h \right) = \lim_{h \rightarrow 0} B + A \sin \left( -\frac{\pi}{2} + h \right)$$

$$-2 \sin \left( -\frac{\pi}{2} \right) = B + A \sin \left( -\frac{\pi}{2} \right)$$

$$\Rightarrow 2 \sin \left( \frac{\pi}{2} \right) = B - A \sin \frac{\pi}{2}$$

$$\Rightarrow B - A = 2 \dots \dots (i) \left[ \because \sin \frac{\pi}{2} = 1 \right]$$

Now, check at  $\frac{\pi}{2}$ ,

LHL = RHL

$$\Rightarrow \lim_{h \rightarrow 0} B + A \sin \left( \frac{\pi}{2} - h \right) = \cos \left( \frac{\pi}{2} + h \right)$$

$$\Rightarrow B + A \sin \frac{\pi}{2} = \cos \frac{\pi}{2}$$

$$\Rightarrow B + A = 0 \dots \dots (ii) \left[ \because \sin \frac{\pi}{2} = 1, \cos \frac{\pi}{2} = 0 \right]$$

From (i) and (ii),

$$B = 1, A = -1$$

56. Ans. C.

The Ministry of Electronics and Information Technology (MeitY) and Google on Saturday signed a statement of intent to roll-out 'Build for Digital India', a program that will give engineering students a platform to develop market-ready, technology-based solutions that address key social problems.

57. Ans. B.

CMIE, or Centre for Monitoring Indian Economy, is a leading business information company. It was established in 1976, primarily as an independent think tank.

58. Ans. B.

The new Parliament building is part of the Central Vista redevelopment project and has envisioned it as a triangular building, with a common central secretariat. It also

aims at revamping the 3-km-long Rajpath, from Rashtrapati Bhavan to India Gate.

59. Ans. C.

Former India captain and member of the 1983 World Cup-winning team Krishnamachari Srikkanth will be the recipient of this year's prestigious CK Nayudu Lifetime Award given by the BCCI. Former India women's captain Anjum Chopra is the co-recipient of the lifetime achievement award for the year 2019

60. Ans. B.

Ajit Kumar Doval, KC (born 20 January 1945) is the 5th and current National Security Advisor to the Prime Minister of India. He previously served as the Director of the Intelligence Bureau in 2004-05, after spending a decade as the head of its operation wing.

61. Ans. D.

Acquisitions have helped Disney expand its reach in media and entertainment including 21st Century Fox, which it acquired in 2019 for \$71 billion.

62. Ans. B.

The Parker Solar Probe is a NASA Space Probe launched in 2018 with the mission of making observations of the outer corona of the Sun. On 29 October 2018, at about 18:04 UTC, the spacecraft became the closest-ever artificial object to the Sun.

63. Ans. B.

The Nobel Peace Prize 2019 was awarded to Abiy Ahmed Ali "for his efforts to achieve peace and international cooperation, and in particular for his decisive initiative to resolve the border conflict with neighboring Eritrea."

64. Ans. C.

India jumps to the 63rd position in the World Bank's Ease of Doing Business 2020 report. In the 2019 report, India had improved its rank on six out of the 10 parameters relating to starting and doing business in a country.

65. Ans. B.

Gita Gopinath (born 8 December 1971) is an Indian American economist who has been the Chief Economist of the International Monetary Fund since 2019.

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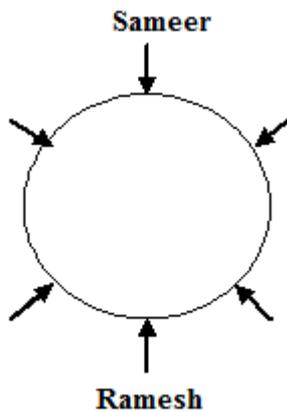


In that role, she is the Director of the IMF's Research Department and the Economic Counsellor of the Fund.

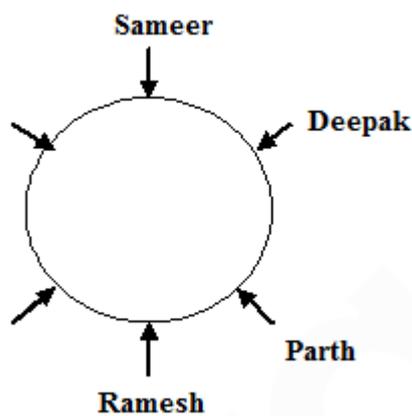
66. Ans. A.

Steps:

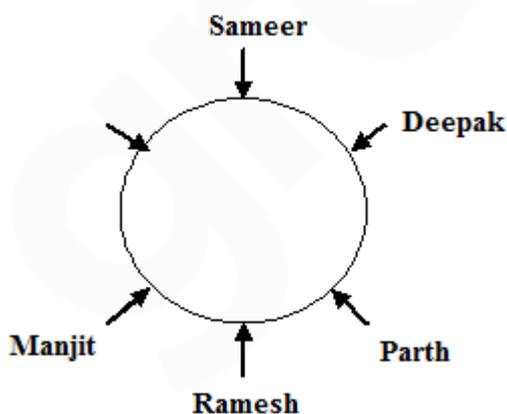
1] Sameer is sitting opposite to Ramesh.



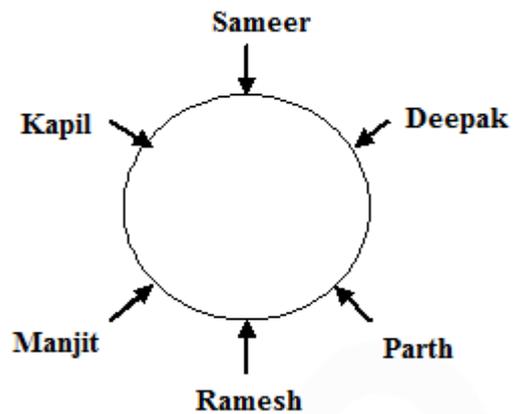
2] Parth is sitting to the right of Ramesh but left of Deepak.



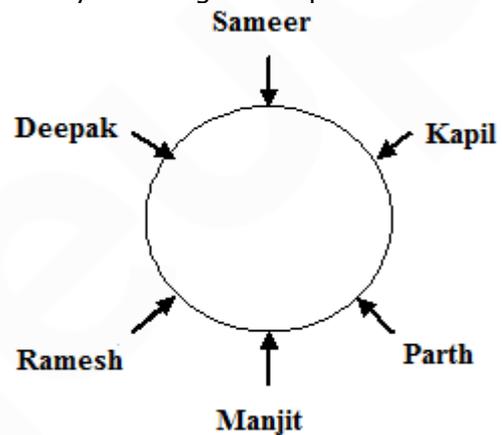
3] Manjit is sitting left of Ramesh.



4] Kapil is sitting right of Sameer and left of Manjit.



5] Deepak and Kapil, Manjit and Ramesh mutually exchange their positions.

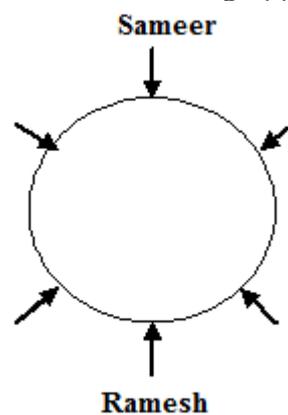


Clearly, Sameer sits opposite to Manjit.

67. Ans. B.

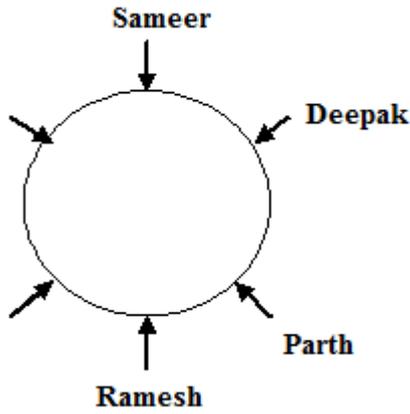
Steps:

1] Sameer is sitting opposite to Ramesh.

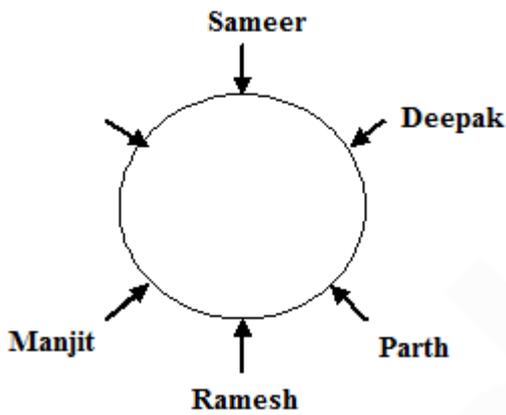


2] Parth is sitting to the right of Ramesh but left of Deepak.

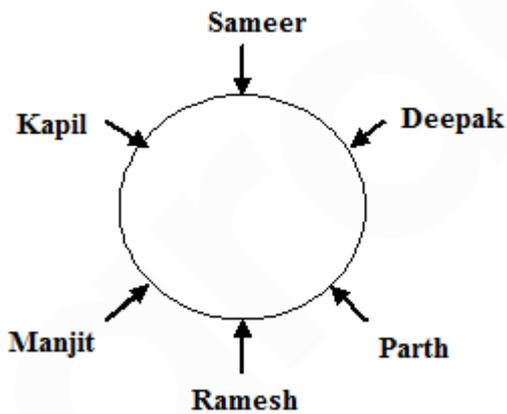




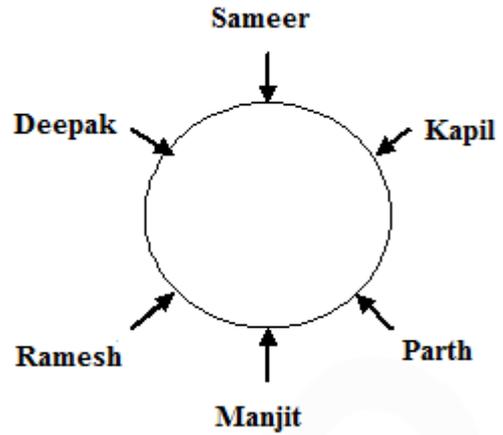
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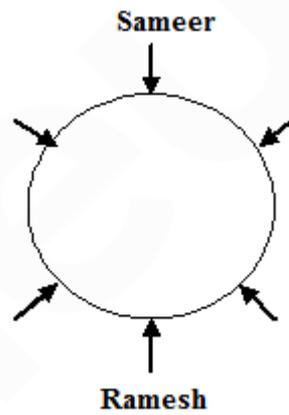
5] Deepak and Kapil, Manjit and Ramesh mutually exchange their positions.



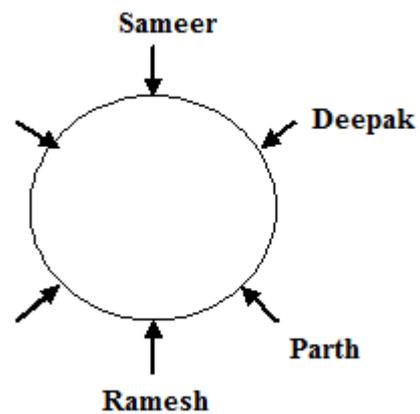
Clearly, Parth sits just to the left of Kapil.  
68. Ans. B.

Steps:

1] Sameer is sitting opposite to Ramesh.

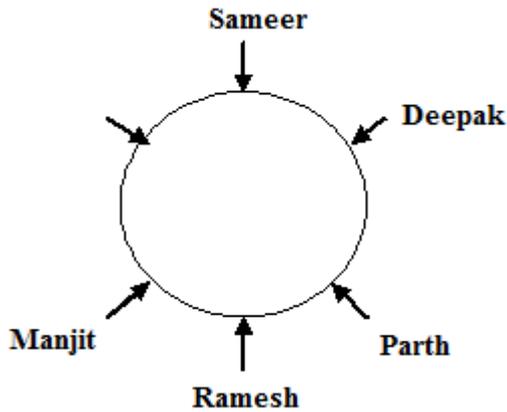


2] Parth is sitting to the right of Ramesh but left of Deepak.

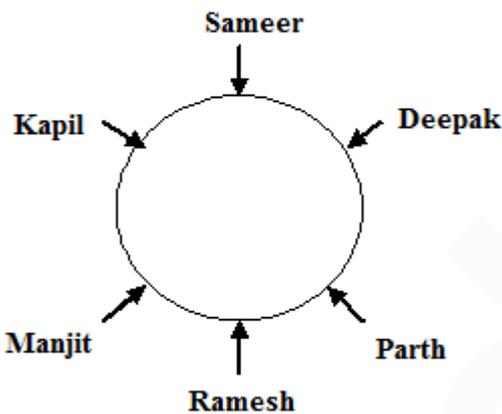


3] Manjit is sitting left of Ramesh.

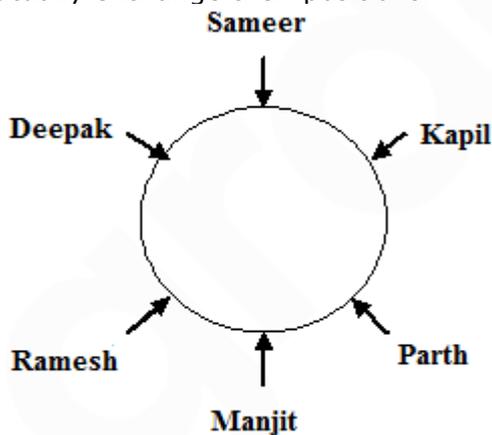
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4] Kapil is sitting right of Sameer and left of Manjit.



5] Deepak and Kapil, Manjit and Ramesh mutually exchange their positions.



Clearly, Manjit sits just to the left of Parth.

69. Ans. A.

VIPs: VIP 1, VIP 2, VIP 3, VIP 4, and VIP 5

Kurtas: Yellow, Green, Purple, Red and Blue

Names: Yudhistir, Bheem, Arjun, Nakul, and Sahdev

Steps:

1] The VIP in the first seat is wearing a red kurta.

2] The VIP wearing a blue kurta is seated between the VIPs wearing red and green kurta.



3] The VIP in the fifth seat is wearing a purple kurta.

4] The VIP 4 wears a yellow kurta.



5] Nakul is on the fifth seat.

6] Yudhistir is seated next to Nakul.



7] Sahdev wears a green kurta.

8] Bheem is sitting between Arjun and Sahdev.



Clearly, Yudhistir is VIP 4.

70. Ans. C.

VIPs: VIP 1, VIP 2, VIP 3, VIP 4, and VIP 5

Kurtas: Yellow, Green, Purple, Red and Blue

Names: Yudhistir, Bheem, Arjun, Nakul, and Sahdev

Steps:

1] The VIP in the first seat is wearing a red kurta.

2] The VIP wearing a blue kurta is seated between the VIPs wearing red and green kurta.



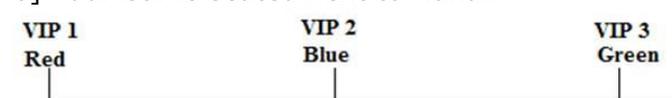
3] The VIP in the fifth seat is wearing a purple kurta.

4] The VIP 4 wears a yellow kurta.



5] Nakul is on the fifth seat.

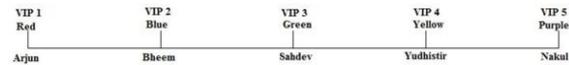
6] Yudhistir is seated next to Nakul.



7] Sahdev wears a green kurta.

8] Bheem is sitting between Arjun and Sahdev.

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Clearly, Arjun sits on the first seat.

71. Ans. D.

VIPs: VIP 1, VIP 2, VIP 3, VIP 4, and VIP 5

Kurtas: Yellow, Green, Purple, Red and Blue

Names: Yudhistir, Bheem, Arjun, Nakul, and Sahdev

Steps:

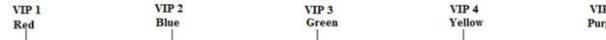
1] The VIP in the first seat is wearing a red kurta.

2] The VIP wearing a blue kurta is seated between the VIPs wearing red and green kurta.



3] The VIP in the fifth seat is wearing a purple kurta.

4] The VIP 4 wears a yellow kurta.



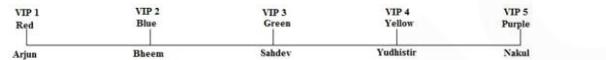
5] Nakul is on the fifth seat.

6] Yudhistir is seated next to Nakul.



7] Sahdev wears a green kurta.

8] Bheem is sitting between Arjun and Sahdev.



Clearly, Sahdev sits between VIP 2 and VIP 4.

72. Ans. B.

VIPs: VIP 1, VIP 2, VIP 3, VIP 4, and VIP 5

Kurtas: Yellow, Green, Purple, Red and Blue

Names: Yudhistir, Bheem, Arjun, Nakul, and Sahdev

Steps:

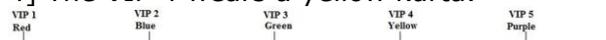
1] The VIP in the first seat is wearing a red kurta.

2] The VIP wearing a blue kurta is seated between the VIPs wearing red and green kurta.



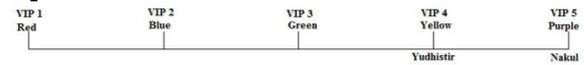
3] The VIP in the fifth seat is wearing a purple kurta.

4] The VIP 4 wears a yellow kurta.



5] Nakul is on the fifth seat.

6] Yudhistir is seated next to Nakul.



7] Sahdev wears a green kurta.

8] Bheem is sitting between Arjun and Sahdev.



9] Arjun and Nakul swapped their seats and then Yudhistir and Bheem swapped their seats.



Clearly, the correct order is "Purple, Yellow, Green, Blue and Red" from seat 1 to seat 5.

73. Ans. A.

Observation:

A.  $27 \div (27 - 1)$  is not divisible by 7.

B.  $64 \div (64 - 1)$  is divisible by 7.

C.  $15 \div (15 - 1)$  is divisible by 7.

D.  $50 \div (50 - 1)$  is divisible by 7.

Therefore, "27" is the odd one.

74. Ans. B.

Logic: First letter moves two steps forward to give the second letter; second letter moves three steps forward to give the third letter; third letter moves four steps forward to give the fourth letter.

Observation:

A. DFIM  $\diamond$  D + 2 = F; F + 3 = I; I + 4 = M

B. PRUX  $\diamond$  P + 2 = R; R + 3 = U; U + 3 = X

C. OQTX  $\diamond$  O + 2 = Q; Q + 3 = T; T + 4 = X

D. JLOS  $\diamond$  J + 2 = L; L + 3 = O; O + 4 = S

Clearly, only 'PRUX' is not following the logic.

75. Ans. A.

Logic: Position of K in the reverse alphabet series (Z to A) is '16' and position of T in the alphabet series (A to Z) is '20'.

Hence,  $K/T = 16/20$

Following the same logic, we get:

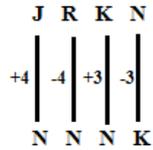
Position of J in the reverse alphabet series (Z to A) is '17' and position of R in the alphabet series (A to Z) is '18'.

Therefore,  $J/R = 17/18$

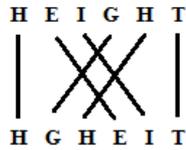
76. Ans. A.

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77. Ans. B.



78. Ans. D.

Observation:

$$1. 2^0 + 2^1 + 2^2 - 2^3 - 2^4 + 2^5 - 2^6 + 2^7 =$$

$$1 + 2 + 4 - 8 - 16 + 32 - 64 + 128 = 79$$

$$2. 2^0 + 2^1 - 2^2 + 2^3 - 2^4 + 2^5 - 2^6 + 2^7 =$$

$$1 + 2 - 4 + 8 - 16 + 32 - 64 + 128 = 87$$

$$3. 2^0 + 2^1 - 2^2 - 2^3 + 2^4 + 2^5 - 2^6 + 2^7 =$$

$$1 + 2 - 4 - 8 + 16 + 32 - 64 + 128 = 103$$

$$4. 2^0 + 2^1 + 2^2 - 2^3 + 2^4 - 2^5 - 2^6 + 2^7 =$$

$$1 + 2 + 4 - 8 + 16 - 32 - 64 + 128 = 47$$

Therefore, “++-+---+” is the correct choice.

79. Ans. C.

People: A, B, C

Profession: Painter, Actor, Designer

Kids: X, Y, Z

Steps:

1] A is the father of X, but not a painter.

Person	Profession	Kid	Negative
A (Father)		X	Painter*
B			
C			

2] C is an actor and father of Y.

It means A is a designer, and Z is B's kid.

Person	Profession	Kid
A (Father)	Designer	X
B	Painter	Z
C (Father)	Actor	Y

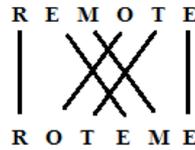
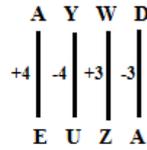
Clearly, X's father is a designer.

80. Ans. C.

Generalized pattern of the series:

$$nth \text{ term} = \frac{1}{(n-1)! + (n!)} ; \text{for } n \geq 1$$

$$1st \text{ term} = \frac{1}{(0!) + (1!)} = \frac{1}{1+1} = \frac{1}{2}$$



$$2nd \text{ term} = \frac{1}{(1!) + (2!)} = \frac{1}{1+2} = \frac{1}{3}$$

$$3rd \text{ term} = \frac{1}{(2!) + (3!)} = \frac{1}{2+6} = \frac{1}{8}$$

$$4th \text{ term} = \frac{1}{(3!) + (4!)} = \frac{1}{6+24} = \frac{1}{30}$$

$$5th \text{ term} = \frac{1}{(4!) + (5!)} = \frac{1}{24+120} = \frac{1}{144}$$

81. Ans. D.

Swine flu, MERS and SARS are all respiratory illnesses that are caused by the same large family of viruses called coronavirus. This virus from an animal can infect humans and then rapidly spread among people. Symptoms include fever, cough, sore throat, shortness of breath etc. While Minamata syndrome is a neurological disease which is caused by severe mercury poisoning. Symptoms include muscle weakness, numbness, ataxia etc.

82. Ans. C.

Synapses are the main passageway into the brain. Synapses connect neurons in the brain to neurons in the rest of the body. Similarly, Bronchi are the main passageway into the lungs. Bronchioles carry oxygen rich air into the lungs and carry carbon dioxide rich air out of the lungs.

83. Ans. C.

A. A disease that affects a large number of people within a community, population or region is called an epidemic. So, situation I is not an example of a pandemic.

B. Clearly, a pandemic spreads over multiple countries and continents. So, situation II is not an example of a pandemic as by reading the given situation, we cannot say that the disease is spreading only in one country or in more than one country.

C. A disease caused by a virus that mutates every fortnight and scientists are able to study how it is moving from one country to another from this mutation is the perfect example of a pandemic.

D. A rare disease is any disease that affects a small percentage of the

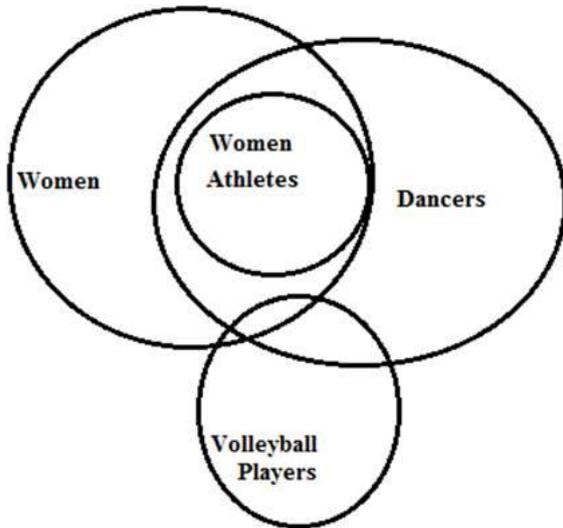
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population. Clearly, it cannot be the example of a pandemic.

84. Ans. D.

Least possible Venn diagram:



Conclusions I: Women athletes can play volleyball  $\diamond$  It does not follow as there is no direct relation between women athletes and volleyball players. So, it's possible but not definite.

Conclusions II: Women volleyball players can dance  $\diamond$  It does not follow as some women dancers can play volleyball but it does not mean that all women volleyball players can dance. So, it's possible but not definite.

Therefore, neither conclusion I nor conclusion II follows.

85. Ans. B.

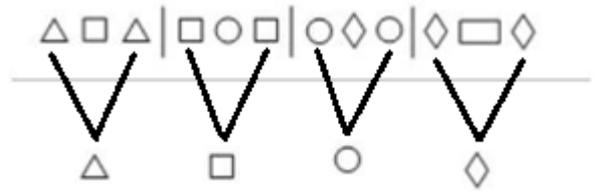
Series: 6, 24, 60, 120, 210, a

- $(1 \times 2 \times 3) = 6;$
- $(2 \times 3 \times 4) = 24;$
- $(3 \times 4 \times 5) = 60;$
- $(4 \times 5 \times 6) = 120;$
- $(5 \times 6 \times 7) = 210$

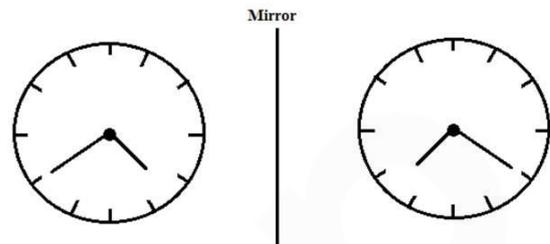
So, missing term (a) =  $(6 \times 7 \times 8) = 336$

86. Ans. A.

In the given three pictures, the first figure and the third figure are the same. The first figure in the fourth picture is of a diamond shape, so the third (missing) figure will also be of a diamond shape.



87. Ans. C.



Clearly, in the mirror image, the image flips horizontally.

So, actual time in the clock = 7 hours 20 minutes

88. Ans. A.

Sign	Meaning
+	$\div$
$\times$	-
%	$\times$
-	+

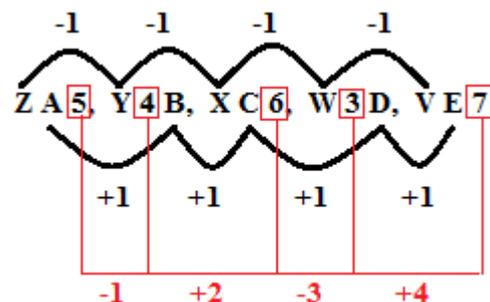
Given expression:  $8 + 2 \% 3 - 7 \times 4$

Decoded

expression:

$$8 \div 2 \times 3 + 7 - 4 = 4 \times 3 + 7 - 4 = 12 + 7 - 4 = 15$$

89. Ans. D.

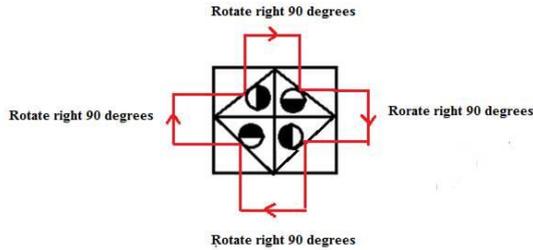


90. Ans. D.

Clearly, the circle is rotating 90 degrees to the right in the clockwise direction.

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91. Ans. A.

Logic: The number of "X" is same in both the figures (i) and (ii) but the number of "O" in figure (ii) is one more than the number of "O" in figure (i). Clearly, only figure 1 follows the given logic.

92. Ans. C.

Normal year jump + 1 gain; Leap year jump + 2 gain

Year	Gain day
1994	1
1995	1
1996 (leap year)	2
1997	1
1998	1
1999	1
<b>Total days</b>	<b>7</b>

It means, Sunday + 7 days = Sunday  
Therefore, in 1999 they will celebrate their anniversary on a Sunday.

93. Ans. C.

"Agnos vergos"  $\diamond$  "Coppersmith Barbet"  
"delnos deery vergos"  $\diamond$  "Brown Headed Barbet"

"flenus deery argos"  $\diamond$  "Bald Headed Vulture"

From statement 1 and 2, code for "Barbet" = "vergos"

So, from statement 2, code for "Brown headed" = "delnos deery"

From statement 3, code for "Vulture" = "flenus/argos"

From the given options, code for "Brown Headed Vulture" = "delnosdeeryargos"

94. Ans. A.

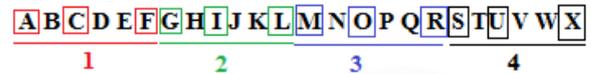
Logic: (Number) : (Number  $\times$  3 + 1)

Observation:

1. 6 : 18  $\diamond$  6 : (6  $\times$  3)
2. 4 : 13  $\diamond$  4 : (4  $\times$  3 + 1)
3. 5 : 16  $\diamond$  5 : (5  $\times$  3 + 1)
4. 7 : 22  $\diamond$  7 : (7  $\times$  3 + 1)

95. Ans. B.

Logic: The first letter of the first group moves two steps forward to give the middle letter of the first group, which moves three steps forward to give the third letter of the first group. The third letter of the first group moves one step forward to give the first letter of the second group and so on.



So, required group = SUX

96. Ans. D.

Observation:

A. This can provides an alternative theory as to why bats can be ill-treated because they come into contact with humans as they are losing their wandering places and moving into human territory. However, the main argument is that humans mistreat bats because they are shy. So, this option does nothing to doubt this argument.

B. It does nothing to address the main reason the group thinks bats are feared and mistreated.

C. It actually supports the given idea and doesn't state anything against the intention.

D. It is actually against the given idea as the raccoons and owls exhibit the same characteristics as bats yet people do not persecute raccoons and owls.

97. Ans. A.

Observation:

A. The average length of time nursing-home residents stayed in nursing homes increased between 1985 and 1988. Although admission rates declined, average length of stay increased and occupancy rates were increased by this event. So, this explains the discrepancy properly.

B. Older people are not mentioned and discussed in the given passage.

C. There is no relationship mentioned between increased admission rates and declining occupancy rates.

D. No conclusion of this sort can be drawn because hospital capacity is not discussed in the passage.

98. Ans. C.

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Clearly, the latter lives in the former.  
As we know that whale lives in the ocean  
and similarly, elephant lives in the jungle.  
99. Ans. A.  
"Amiable" is the antonym of "Truculent".  
Similarly, "Kindred" is the antonym of  
"unrelated".

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