

# NIMCET – 2022

## Mathematics

01. Area of the parallelogram formed by the lines  $y = 4x$ ,  $y = 4x + 1$ ,  $x + y = 0$  and  $x + y = 1$  is  
 (a)  $1/5$  (b)  $2/5$  (c)  $5$  (d)  $10$
02. The function  $f(x) = \frac{1}{x} \ln|x|$  is  
 (a) Differentiable at  $x = 0$  (b) Continuous at  $x = 0$   
 (c) Discontinuous at  $x = 0$  (d) Not differentiable at  $x = 0$
03. If  $x^m y^n = \sin x$ , then  $\frac{dy}{dx}$   
 (a)  $\frac{x^m y}{x^m y}$  (b)  $xy$  (c)  $x/y$  (d)  $y/x$
04. A straight line through the point  $(4, 5)$  is such that its intercept between the axes is bisected at A, then its equation is  
 (a)  $3x + 4y = 20$  (b)  $3x - 4y + 7 = 0$  (c)  $5x - 4y = 40$  (d)  $5x + 4y = 40$
05. If  $a^2 + b^2 = c^2 + d^2$ ,  $a^2 + c^2 = b^2 + d^2$  and  $a^2 + d^2 = b^2 + c^2$ , then the values  
 (a)  $2, -6$  (b)  $4, -2$  (c)  $4, -2$  (d)  $-4, 2$
06. The value of  $5^{\log_3 5}$  is  
 (a)  $\frac{5}{27}$  (b)  $\frac{27}{5}$  (c)  $\frac{9}{5}$  (d)  $\frac{5}{9}$
07. If  $a_1, a_2, \dots, a_n$  are in Arithmetic Progression with common difference then  $d$ , then the sum  $\sin a_1 + \cos a_2 + \sec a_3 + \dots + \operatorname{cosec} a_n$  is equal to  
 (a)  $\cot a_1 - \cot a_n$  (b)  $\sin a_1 - \sin a_n$  (c)  $\operatorname{cosec} a_1 - \operatorname{cosec} a_n$  (d)  $a_1 - a_n$
08. The value of  $\cot^{-1} \frac{5}{3} + \tan^{-1} \frac{2}{3}$  is  
 (a)  $6/17$  (b)  $3/17$  (c)  $4/17$  (d)  $5/17$
09. If  $a_1, a_2, \dots, a_n$  are any real number and  $n$  is any positive integer, then  
 (a)  $\sum_{i=1}^n a_i^n$  (b)  $\sum_{i=1}^n n a_i^n$  (c)  $\sum_{i=1}^n a_i^n$  (d) None of these

10. If  $\cos^2 \frac{x}{2} = \cos^2 \frac{y}{3}$ , then  $9x^2 - 12xy \cos \theta + 4y^2$  is equal to

- (a)  $36 \sin^2 \theta$       (b)  $36 \sin^2 \theta$       (c)  $36 \cos^2 \theta$       (d) 36

11. If the roots of the quadratic equation  $x^2 + px + q = 0$  are  $\tan 30^\circ$  and  $\tan 15^\circ$  respectively, then the value of  $2 + p - q$  is

- (a) 3      (b) 0      (c) 1      (d) 2

12. If  $\operatorname{cosec} \theta - \cot \theta = 2$ . Find  $\operatorname{cosec} \theta$  is

- (a)  $\frac{5}{3}$       (b)  $\frac{3}{5}$       (c)  $\frac{4}{5}$       (d)  $\frac{5}{4}$

13. Solution of the equation  $\tan^{-1} \frac{\sqrt{2-x} \sin \theta}{\sqrt{x-1}} = \frac{\theta}{2}$  are

- (a) 0, 1      (b) 1, -1      (c) 0, -1      (d) 0, -2

14. If  $a < b$ , then  $\int_a^b |x-a| |x-b| dx$  is equal to

- (a)  $\frac{b^2 - a^2}{2}$       (b)  $\frac{b^2 - a^2}{2}$       (c)  $\frac{b^3 - a^3}{2}$       (d)  $b^2 - a^2$

Let  $\hat{a} = 2i + 2j + k$  and  $\hat{b}$  be another vector such that  $\hat{a} \cdot \hat{b} = 14$  and  $\hat{a} \times \hat{b} = 3i + 8j + 8k$  the vector  $\hat{b} =$

15.

- (a)  $5i + 2j + 2k$       (b)  $5i + 2j + 2k$       (c)  $5i + 2j + 2k$       (d)  $3i + 4j + 4k$

16. Let  $a$  be the distance between lines  $-2x + y = 2$  and  $2x - y = 2$ , and  $b$  be the distance between the lines  $4x - 3y = 5$  and  $6y - 8x = 1$ , then

- (a)  $40b = 11\sqrt{5}a$       (b)  $40\sqrt{2}a = 11b$       (c)  $11\sqrt{2}b = 40a$       (d)  $11\sqrt{2}a = 40b$

17. The area enclosed within the curve  $|x| + |y| = 2$  is

- (a) 16 sq. units      (b) 24 sq. units      (c) 32 sq. units      (d) 8 sq. units

18. In a Harmonic Progression,  $p$ th term is  $q$  and  $q$ th term is  $p$ . Then  $pq$ th term is

- (a) 0      (b) 1      (c)  $pq$       (d)  $pq(p + q)$

19. Suppose that the temperature at a point  $(x, y)$  on a metal plate is  $T(x, y) = 4x^2 - 4xy + y^2$ . An ant, walking on the plate, traverses a circle of radius 5 centered at the origin. What is the highest temperature encountered by the ant?

- (a) 125      (b) 120      (c) 0      (d) 25

20. If  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ ,  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = c^2$  cut at angles, then

- (a)  $\frac{2}{a} \sqrt{b^2 - 2c^2}$       (b)  $b^2 - a^2 - 2c^2$       (c)  $\frac{2}{a} \sqrt{b^2 - 2c^2}$       (d)  $a^2 - b^2 - c^2$

21. If  $\hat{a}, \hat{b}, \hat{c}$  are coplanar vectors, then

- (a)  $\hat{a}$  and  $\hat{b}$  are collinear (b)  $\hat{a}$  and  $\hat{b}$  are perpendicular  
 (c)  $\hat{a}$  and  $\hat{c}$  are collinear (d)  $\hat{a}$  and  $\hat{c}$  are perpendicular

22. Angle of elevation of the top of the tower from 3 points (collinear) A, B and C on a road leading to the tower are  $30^\circ, 45^\circ$  and  $60^\circ$  respectively. The ratio of AB and BC is

- (a)  $\sqrt{3}:1$  (b)  $\sqrt{3}:2$  (c)  $1:2$  (d)  $2:\sqrt{3}$

23. Let a, b and c be distinct non-negative numbers. If the vector  $a\hat{i} + b\hat{j} + c\hat{k}$ ,  $\hat{i} + \hat{k}$  and  $c\hat{j} + b\hat{k}$  lie in a plane, then c is equal to

- (a) The Arithmetic Mean of a and b  
 (b) The Geometric Mean of a and b  
 (c) The Harmonic Mean of a and b  
 (d) Equal to zero

24. There are two sets A and B with  $|A| = m$  and  $|B| = n$ . If  $|P(A)| - |P(B)| = 112$  then choose the wrong one (where  $|A|$  denotes the cardinality of A, and  $P(A)$  denotes the power set of A)

- (a)  $m + n = 11$  (b)  $2n - m = 1$  (c)  $2m - n = 1$  (d)  $3n - m = 5$

25. The mean of 25 observations was found to be 38. It was later discovered that 23 and 38 were misread as 32 and 36, then the mean is

- (a) 32 (b) 36 (c) 38 (d) 42

26. There are two circles in xy-plane whose equations are  $x^2 + y^2 - 2y = 0$  and  $x^2 + y^2 - 2y - 3 = 0$ . A point is chosen at random inside the larger circle. Then the probability that the point has been taken from the smaller circle is

- (a)  $1/3$  (b)  $2/3$  (c)  $1/2$  (d)  $1/4$

27. The value of  $\int_1^2 \frac{x^2 dx}{x^3 \sqrt{2x^4 - 2x^2 - 1}}$  is

- (a)  $2\sqrt{2 - \frac{2}{x^2} - \frac{1}{x^4}}$  (b)  $2\sqrt{2 - \frac{2}{x^2} - \frac{1}{x^4}}$  (c)  $-\frac{1}{2}\sqrt{2 - \frac{2}{x^2} - \frac{1}{x^4}}$  (d) None of the above

28. If  $0 < P(A) < 1$  and  $0 < P(B) < 1$ , and  $P(A \cap B) = P(A)P(B)$ , then

- (a)  $P(B | A) = P(B) - P(A)$  (b)  $P(A \cap B) = P(A)P(B)$   
 (c)  $P(A \cap B) = P(A)P(B)$  (d)  $P(A | B) = P(A) - P(B)$

29. Which of the following is NOT TRUE?

- (a)  $\lim_{x \rightarrow 0} \frac{x}{e^x} = 0$  (b)  $\lim_{x \rightarrow 0} \frac{1}{xe^{1/x}} = 0$  (c)  $\lim_{x \rightarrow 0} \frac{\sin x}{1 - 2x} = 0$  (d)  $\lim_{x \rightarrow 0} \frac{\cos x}{1 - 2x} = 0$

30. A four digit number is formed using the digits 1, 2, 3, 4, 5 without repetition. The probability that it is divisible by 3 is

- (a)  $1/3$  (b)  $1/4$  (c)  $1/5$  (d)  $1/6$

31. The correct expression for  $\cos^{-1}(-x)$  is

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

32. If  $\alpha$  and  $\beta$  are the roots of  $x^2 - x - 1 = 0$ , and  $A_n = \alpha^n + \beta^n$ , then Arithmetic Mean of  $A_{n-1}$  and  $A_n$  is

- (a)  $2A_{n-1}$       (b)  $\frac{1}{2}A_{n+1}$       (c)  $2A_{n+2}$       (d) None of the above

33. If  $D = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 2x & 1 \\ 1 & 1 & 2y \end{vmatrix}$ ,  $x \neq 0, y \neq 0$  then D is?

- (a) Divisible by x and y      (b) Divisible by x but not by y  
 (c) Divisible by (x + 1) and (y + 1)      (d) Divisible by (1 + x) but not (1 + y)

34. In a triangle ABC, if the tangent of half the difference of two angles is equal to one third of the tangent of the angles, then the ratio of the sides opposite to the angle is

- (a) 2 : 1      (b) 1 : 2      (c) 3 : 1      (d) 1 : 1

35. If the volume of a parallelepiped whose adjacent edges are  $a^2i^2 + 3j^2 + 4k^2, b^2i^2 + j^2 + 2k^2, c^2i^2 + 2j^2 + k^2$  is 15, then  $\Delta$  is equal to

- (a) 1      (b) 5/2      (c) 9/2      (d) 0

36. The first three moments of a distribution about 2 are 1, 16, 40 respectively. Then mean and variance of the distribution are

- (a) (2, 16)      (b) (2, 15)      (c) (3, 15)      (d) (1, 16)

37. Inverse of the function  $f(x) = \frac{10 - 10^x}{x - 10^x}$  is

- (a)  $\log_{10} \frac{2 - x}{x}$       (b)  $\frac{1}{2} \log_{10} \frac{1 - x}{1 + x}$       (c)  $-\log_{10} \frac{2 - x}{x}$       (d)  $\frac{1}{4} \log_{10} \frac{2 - x}{2 + x}$

38. Coordinate of focus of the parabola  $4x^2 - 20y + 67 = 0$  is

- (a)  $\left(\frac{5}{4}, \frac{17}{4}\right)$       (b)  $\left(\frac{17}{4}, \frac{5}{4}\right)$       (c)  $\left(\frac{17}{4}, \frac{5}{2}\right)$       (d)  $\left(\frac{5}{2}, \frac{17}{4}\right)$

39. Which term of the series  $\frac{\sqrt{5}}{3}, \frac{\sqrt{5}}{4}, \frac{1}{\sqrt{5}}, \dots$  is  $\frac{\sqrt{5}}{13}$ ?

- (a) 12      (b) 11      (c) 10      (d) 9

40. A particle is at rest at the origin. It moves along the x-axis with an acceleration  $x - x^2$ , where x is the displacement of the particle at time t. The particle next comes to rest after it has covered a distance

- (a) 1      (b) 1/2      (c) 3/2      (d) 2

41. The function  $f(x) = \log_k x$  is
- (a) an even function (b) an odd function  
(c) a periodic function (d) neither an even nor an odd function
42. The domain of the function  $f(x) = \frac{\cos^{-1} x}{[x]}$  is
- (a)  $[-1, 0) \cup \{1\}$  (b)  $[-1, 1]$  (c)  $[-1, 1)$  (d) None of the above
43. A survey is done among a population of 200 people who like either tea or coffee. It is found that 60% of the population like tea and 72% of the population like coffee. Let  $x$  be the number of people who like both tea and coffee. Let  $m \leq x \leq n$ , then choose the correct option.
- (a)  $n - m = 56$  (b)  $n - m = 28$  (c)  $n - m = 32$  (d)  $n + m = 92$
44. The solutions of the equation  $4\cos^2 x - 6\sin^2 x = 5$  are
- (a)  $x = n\pi \pm \frac{\pi}{4}$  (b)  $x = n\pi \pm \frac{\pi}{3}$  (c)  $x = n\pi \pm \frac{\pi}{2}$  (d)  $x = n\pi \pm \frac{2\pi}{3}$
45.  $f(x) = x|x|$  is continuous for
- (a)  $x \in \mathbb{R}$  (b)  $x \in \mathbb{R} \setminus \{0\}$  (c) only  $x > 0$  (d) No value of  $x$
46. The 10th and 50th percentiles of the observations 32, 49, 23, 29, 118 respectively are
- (a) 21, 32 (b) 23, 32 (c) 23, 33 (d) 22, 31
47. For  $a \in \mathbb{R}$  (the set of all real numbers),  $a \neq 1$ ,  $\lim_{n \rightarrow \infty} \frac{1 + a + a^2 + \dots + a^n}{n+1} = \frac{1}{20}$
- Then one of the values of  $a$  is
- (a) 5 (b) 8 (c)  $-15/2$  (d)  $-17/2$
48. The eccentricity of an ellipse, with its centre at the origin is  $1/3$ . If one of the directrices is  $x = 9$ , then the equation of the ellipse is
- (a)  $9x^2 - 8y^2 = 72$  (b)  $8x^2 - 9y^2 = 72$  (c)  $8x^2 - 7y^2 = 56$  (d)  $7x^2 - 8y^2 = 56$
49. If the foci of the ellipse  $\frac{x^2}{25} + \frac{y^2}{9} = 1$  and the hyperbola  $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$  coincide, then the value of  $b^2$  is
- (a) 25 (b)  $16\frac{b}{2}$  (c) 64 (d) 49
50. If the angle of elevation of the top of a hill from each of the vertices A, B and C of a horizontal triangle is  $\alpha, \beta$  and  $\gamma$  respectively, then the height of the hill is
- (a)  $\frac{1}{2} \tan \alpha \sec \beta$  (b)  $\frac{1}{2} b \tan \alpha \operatorname{cosec} A$  (c)  $-\frac{1}{2} \tan \alpha \sin C$  (d)  $\frac{1}{2} a \tan \alpha \operatorname{cosec} A$

# Reasoning

01. Select the pair of words, which are related in the same way as the capitalized words are related to e  
Frugal : Extravagant

- (a) Predecessor : Precursor (b) Criticise : Advocate  
(c) Teacher : Philanthropist (d) Hermit : Philosopher

02. Fill in the blank : HEC, JGE, LIG, NKI, \_\_\_\_\_.

- (a) PMK (b) HGF (c) KMP (d) ONM

03. Replace the question mark with an appropriate image to complete the analogous pair.



- (a)  (b)  (c)  (d) 

04. Deepak, Rahul, Manoj and Vinod are brothers. Who is the heaviest?

I. Rahul is heavier than Deepak and Vinod, but lighter

II. than Manoj. Deepak is lighter than Rahul and Manoj, but

(a) Data available in the statements together are not sufficient.

(b) Statement II alone is sufficient, but statement I alone is not sufficient.

(c) Either I or II is sufficient.

(d) Statement I alone is sufficient, but statement II alone is not sufficient.

05. Select the related word from the given alternatives.

MELT : LIQUID :: FREEZE : ?

- (a) PUSH (b) CONDENSE (c) ICE (d) SOLID

06. Identify the fifth number in the series : 122, 144, 166, 188, ?

- (a) 210 (b) 310 (c) 345 (d) 234

07. Today is Wednesday. What would be the day after 61 days?

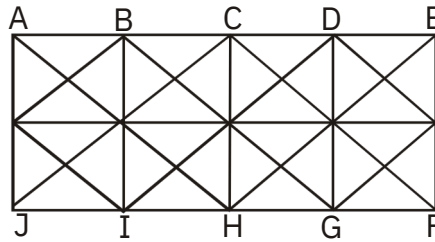
- (a) Sunday (b) Monday (c) Tuesday (d) Saturday

08. Fill in the blank : JAK, KBL, LCM, MDN, \_\_\_\_\_

- (a) NEO (b) OEP (c) MEN (d) PEQ

09. DNN, FQQ, HTT, \_\_\_\_\_, LZZ  
 (a) JWW (b) IWW (c) JVV (d) JXX

10. In the following figure, find the total number of squares.



- (a) 24 (b) 20 (c) 36 (d) 18
11. Find the synonym that is most nearly similar in meaning to the word : DEBACLE  
 (a) Catastrophe (b) Dandy (c) Opulence (d) Corker

12. Looking at the portrait of a man, Manu said, “Her mother is the wife of my father’s son and I have no other children and sister.” Whose portrait was Manu looking at?

- (a) His son (b) His daughter (c) His nephew (d) His father

13. Identify the sixth number in the series : 6, 11, 21, 36, 56, ?

- (a) 82 (b) 21 (c) 81 (d) 52

14. U, V, W, X and T are sitting on a bench. T is sitting next to U, V is sitting next to W, W is not sitting with X, X is on the left end of the bench. V is in the second position from the right. T is to the right of U and X. U and W are sitting together. In which position T is sitting?

- (a) Between U and V (b) Between X and W (c) Between V and X (d) Between U and W

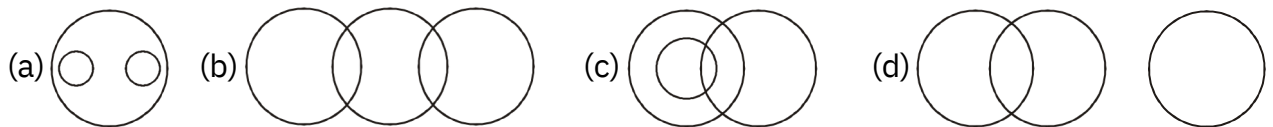
15. If in a certain language, KOLKOTA is coded as LPMLPUB, how is MUMBAI coded in that code?

- (a) NVNBCJ (b) OVNBH (c) NUNBCH (d) NVNCBJ

16. Select the pair of words, which are related in the same way as the capitalized words are related to each other.  
 BUTTERFLY : FREEDOM

- (a) Frog : Water (b) Self-reliant : Buoyant (c) Horse : Speed (d) Chicken : Rooster

17. Which of the following diagrams correctly represents lions, elephants and animals?



18. Choose the word opposite in meaning to the given word : AGGRAVATE

- (a) Abate (b) Tranquilize (c) Intensify (d) Alleviate

19. Which of the following is the odd one from the given alternatives?

- (a) Diving (b) Driving (c) Swimming (d) Sailing

20. Comprehension:

In each question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts.

Read the conclusion and then decide which of the following given conclusions logically follows from the two given statements, disregarding commonly known facts.

Statements :No women teacher play. Some women teachers are athletes.

Conclusions:

I. Male athletes can play.

II. Some athletes can play.

(a) Neither I nor II follows

(b) Only conclusions I follows

(c) Either I or II follows

(d) Only conclusions II follows

21. Comprehension:

In each question below are given two statements followed by two conclusion numbered I and II. You take the given two statements to be true even if they seem to be at variance from commonly known facts.

Read the conclusion and then decide which of the following given conclusions logically follows from given statements, disregarding commonly known facts.

Statements :All mangoes are golden in colour. No golden-coloured things are cheap.

Conclusions:

I. All mangoes are cheap.

II. Golden-coloured mangoes are not cheap.

(a) Neither I or II follows

(b) Only conclusions II follows

(c) Only conclusions I follows

(d) Either I or II follows

22. Comprehension:

In each question below are given two statements followed by two conclusion numbered I and II. You take the given two statements to be true even if they seem to be at variance from commonly known facts.

Read the conclusion and then decide which of the following given conclusions logically follows from given statements, disregarding commonly known facts.

Statements :

Conclusions:All young scientists are open-minded. No open-minded men are superstitious.

I. No scientist is superstitious

II. No young people are superstitious.

(a) Either I or II follows

(b) Neither I or II follows

(c) Only conclusions II follows

(d) Only conclusions I follows

23. Six books are labelled A, B, C, D, E and F are placed side by side. Books B, C, E and F have green covers while others have yellow covers. Book A, B and D are new while the rest are old volumes. Book A, B are law reports while the rest are medical extracts. Which two books are old medical extracts and how are they covered?

(a) B and C

(b) E and F

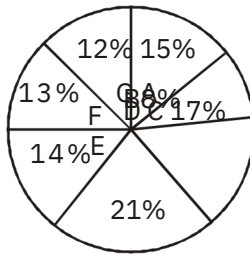
(c) C and F

(d) C and E

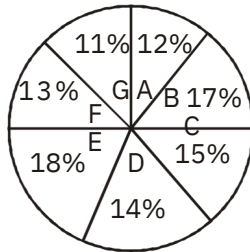
24. Find out the wrong number in the FOLLOWING series.  
 30, -5, -45, -90, -145, -195, -255.  
 (a) -145                      (b) -255                      (c) -5                      (d) -195.

25. Find out the wrong number in the FOLLOWING series.  
 2, 5, 10, 17, 26, 38, 50, 65  
 (a) 26                      (b) 38                      (c) 65                      (d) 50

26. The following questions are based on the pie-charts given below: Percentage-wise distribution of students studying in Arts and Commerce in seven different institutions Different institutions – A, B, C, D, E, F, G.  
 Total number of students studying Arts = 3800.

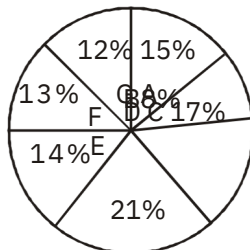


Total number of students studying commerce = 4200

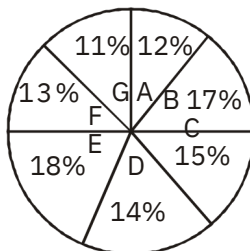


What is the total number of students studying Arts in Institutes A and G together?

- (a) 1206                      (b) 1226                      (c) 1026                      (d) 1126
27. The following questions are based on the pie-charts given below: Percentage-wise distribution of students studying in Arts and Commerce in seven different institutions Different institutions – A, B, C, D, E, F, G.  
 Total number of students studying Arts = 3800.



Total number of students studying commerce = 4200

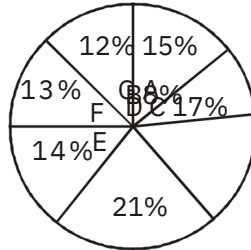


How many students from Institute B study Arts and Commerce?

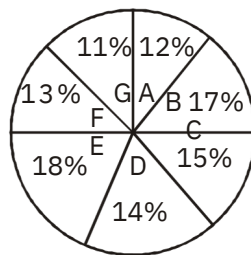
- (a) 1108                      (b) 1180                      (c) 1018                      (d) 1208

28. The following questions are based on the pie-charts given below: Percentage-wise distribution of students studying in Arts and Commerce in seven different institutions Different institutions – A, B, C, D, E, F, G.

Total number of students studying Arts = 3800.



Total number of students studying commerce = 4200



The ratio of the number of students studying Arts to that studying Commerce in institute E is:

- (a) 27 : 14                      (b) 19 : 28                      (c) 19 : 27                      (d) 19 : 16

29. Statement: Many shops in the local market have extended their shops and occupied most part of the footpath in front of their shops.

Cause of Action:

- I. The civic authority should immediately activate a task force to clear all the footpaths encroached by shop owners.
- II. The civic authority should charge hefty penalty to the shop owners for occupying the footpath.
- III. The civic authority should setup a monitoring system so that encroachments do not recur in future.

- (a) None follows      (b) II and III follows      (c) I and II follow      (d) All I, II and III follows

30. Statement: There is a significant increase in the number of patients affected by some disease in a city.

Cause of Action:

- I. Municipal corporation of the city should take immediate action.
- II. This problem should be raised in the UNESCO.
- III. Hospitals in the city should be equipped properly for the treatment of the patients.

- (a) Only III follow      (b) All follow      (c) I and II follow      (d) I and III follow

31. Direction: Read the following information carefully and answer the questions.

Five Dramas A, B, C, D and E have to be staged in 6 hour where 1 hour needs to be given per drama.

- 1. A break of 1 hour has to be taken in third or fourth hour.
- . Drama show cannot be started with A and cannot end in C.

2

.

3 D has to follow B immediately with no break in between.

. A cannot be done immediately after D.

4 A has to precede E immediately with no break in between.

. Which hour is a break hour?

5 (a) 5th (b) 2nd (c) 3rd (d) 4th

32. Direction: Read the following information carefully and answer the questions.

Five Dramas A, B, C, D and E have to be staged in 6 hour where 1 hour needs to be given per drama.

1 A break of 1 hour has to be taken in third or four hour.

. Drama show cannot be started with A and cannot end in C.

2 D has to follow B immediately with no break in between.

. A cannot be done immediately after D.

3 A has to precede E immediately with no break in between.

. Which is the drama to be staged first?

4 (a) A (b) D (c) B (d) None of these

33. Direction: Read the following information carefully and answer the questions.

5 Five Dramas A, B, C, D and E have to be staged in 6 hour where 1 hour needs to be given per drama.

1 A break of 1 hour has to be taken in third or four hour.

. Drama show cannot be started with A and cannot end in C.

2 D has to follow B immediately with no break in between.

. A cannot be done immediately after D.

3 A has to precede E immediately with no break in between.

. Which is the drama staged immediately after the break?

4 (a) A (b) D (c) B (d) None of these

34. Direction: Read the following information carefully and answer the questions.

5 Five Dramas A, B, C, D and E have to be staged in 6 hour where 1 hour needs to be given per drama.

1 A break of 1 hour has to be taken in third or four hour.

. Drama show cannot be started with A and cannot end in C.

2 D has to follow B immediately with no break in between.

. A cannot be done immediately after D.

3 A has to precede E immediately with no break in between.

. Which drama is staged immediately after D?

4 (a) None of these (b) E (c) B (d) C

.  
5

35. Direction: Read the following information carefully and answer the questions.  
 Five Dramas A, B, C, D and E have to be staged in 6 hour where 1 hour needs to be given per drama.  
 1 A break of 1 hour has to be taken in third or four hour.  
 . Drama show cannot be started with A and cannot end in C.  
 2 D has to follow B immediately with no break in between.  
 . A cannot be done immediately after D.  
 3 A has to precede E immediately with no break in between.  
 . Which drama is staged immediately after E?  
 4 (a) C (b) A (c) E (d) None of these
36. A person's present age two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. What is the present age of the mother?  
 5 (a) 40 (b) 60 (c) 30 (d) 50
37. Running at the same constant rate, 6 identical machines can produce a total of 270 bottles per minute. At this rate, how many bottles could 10 such machines produce in 4 minutes?  
 (a) 2700 (b) 648 (c) 10800 (d) 1800
38. At what time, in minutes, between 3 o'clock and 4 o'clock both the needles will coincide each other?  
 (a)  $\frac{51}{11}$  (b)  $\frac{124}{11}$  (c)  $\frac{134}{11}$  (d)  $\frac{164}{11}$
39. The greatest number which on dividing 1657 and 2037 leaves remainders 6 and 5 respectively is  
 (a) 127 (b) 123 (c) 235 (d) 305
40. 1. A is the brother of B.  
 2. C is the father of A.  
 3. D is brother of E.  
 4. E is the daughter of B.  
 Then, the uncle of D is?  
 (a) B (b) C (c) E (d) A

## Computer

01. The Boolean expression  $AB \oplus AB' \oplus A'C \oplus AC$  is unaffected by the value of the Boolean variable  
 (a) C (b) A (c) B (d) None of these
02. Suppose the largest n bit number requires, 'd' digits in decimal representation. Which of the following is between 'n' and 'd' approximately correct.  
 (a)  $d = 2n$  (b)  $n = 2d$  (c)  $d < n \log_{10} 2$  (d)  $d > n \log_{10} 2$
03. FFFF will be the last memory location in a memory is size  
 (a) 32 k (b) 16 k (c) 64 k (d) 1 k

04. Which of the following is equivalent to the Boolean expression :  $\overline{X} \overline{Y}$
- (a)  $XY$                       (b)  $\overline{Y}X$                       (c)  $\overline{X}Y$                       (d)  $\overline{X}\overline{Y}$
05. 'Floating point representation' is used to represent
- (a) Integers                      (b) Real numbers                      (c) Boolean Values                      (d) Whole numbers
06. If a processor clock is rated as 2500 million cycles per second, then its clock period is
- (a)  $2.50 \times 10^{-10}$  sec (b)  $4.00 \times 10^{-10}$  sec (c)  $1.00 \times 10^{-10}$  sec (d) None of these
07. The minimum number of NAND gates required for implementing of Boolean expression,  $AB + ABC + A$  is
- (a) 1                                      (b) 0                                      (c) 2                                      (d) 3
08. The maximum and minimum value represented in signed 16 bit 2's complement representations are
- (a) -16384 and 16383 (b) 0 and 32767 (c) -32768 and 32767 (d) 0 and 65535
09. Write the simplified form of the Boolean expression  $\overline{A} \overline{B} \overline{C} + \overline{A} B \overline{C} + \overline{A} B C + A \overline{B} \overline{C} + A \overline{B} C + A B \overline{C} + A B C$
- (a)  $\overline{A} \overline{C}$                       (b)  $A + C$                       (c)  $A \overline{B} \overline{C}$                       (d)  $A + D$
10. If a signal passing through a gate is inhibited by sending a low into one of the inputs, and the output of the gate is a(n):
- (a) OR                                      (b) NOR                                      (c) NAND                                      (d) AND

## English

01. "Bite the bullet" means
- (a) to stop a conflict                                      (b) to become mad
- (c) to accept something that is difficult or unpleasant                                      (d) to analyse your faults
02. What can you call a person who leads an unconventional style or living?
- (a) Cynic                                      (b) Bohemian                                      (c) Altruist                                      (d) Agnostic
03. Fill in the blanks with the correct option.
- Technical writing demands \_\_\_\_\_ use of language.
- (a) Poetic                                      (b) Factual                                      (c) Figurative                                      (d) Dramatic
04. The county cleared this path and paved it with packed gravel, so they have a peaceful place to hike. Which of the following alternatives to the underlined portion would NOT be acceptable?
- (a) path, paving                      (b) path and then paved (c) path before paving (d) path paved
05. Select the correct form of verb/subject verb agreement.
- The principal, along with his assistants, \_\_\_\_\_ the meeting.
- (a) are attending                      (b) attend                                      (c) is attending                                      (d) attending

06. Select correct articles.

He is ..... M.A. with PhD and teaches in ..... university.

- (a) the, the                      (b) an, the                      (c) a, an                      (d) a, the

07. Fill in the blank with the most appropriate option.

Kedar \_\_\_\_\_ this project for a month and now he is about to join a new project.

- (a) guides                      (b) guided                      (c) has been guiding (d) guiding

08. Comprehension:

Read the following passage carefully and answer the questions: You might think you've experienced VR, and you might have been pretty impressed. Particularly, if you're a gamer, there are some great experiences to be had out there (or rather, in there) today. But over the next few years, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space Invaders. And although the games will be amazing, the effects of this transformation will be far broader, touching on our work, education, and social lives. Today's most popular VR applications involve taking total control of user's sense (sight and hearing, particularly) to create a totally immersive experience that places the user in a fully virtual environment that feels pretty realistic. Climb up something high and look down, and you're likely to get a sense of vertigo. If you see an object moving quickly towards your head, you'll feel an urge to duck out of the way.

Very soon, VR creators will extend this sensory hijacking to our other facilities – for example, touch – to deepen that sense of immersion. At the same time, the devices we use to visit these virtual worlds will become cheaper and lighter, removing the friction that can currently be a barrier. I believe extended reality (XR) – a term that covers virtual reality (VR), augmented reality (AR), and mixed reality (MR) – will be one of the most transformative tech trends of the next five years. It will be enabled and augmented by other tech trends, including super-fast networking, that will let us experience VR as if it were a movie. And artificial intelligence (AI) will provide more personalized virtual worlds to explore, even giving us realistic virtual characters to share our experiences with.

Q. The passage states all the following about VR applications except.

- (a) Future AI will allow us to share our experiences with realistic virtual characters  
(b) Vertigo is a major feature of all AI applications  
(c) VR applications creates a virtual environment that feels pretty realistic  
(d) VR applications takes control of the user's senses

09. Comprehension:

Read the following passage carefully and answer the questions: You might think you've experienced VR, and you might have been pretty impressed. Particularly, if you're a gamer, there are some great experiences to be had out there (or rather, in there) today. But over the next few years, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space Invaders. And although the games will be amazing, the effects of this transformation will be far broader, touching on our work, education, and social lives. Today's most popular VR applications involve taking total control of user's sense (sight and hearing, particularly) to create a totally immersive experience that places the user in a fully virtual environment that feels pretty realistic. Climb up something high and look down, and you're likely to get a sense of vertigo. If you see an object moving quickly towards your head, you'll feel an urge to duck out of the way. Very soon, VR creators will extend this sensory hijacking to our other facilities – for example, touch and smell – to deepen that sense of immersion. At the same time, the devices we use to visit these virtual worlds will become cheaper and lighter, removing the friction that can currently be a barrier.

I believe extended reality (XR) – a term that covers virtual reality (VR), augmented reality (AR), and mixed reality (MR) – will be one of the most transformative tech trends of the next five years. It will be enabled and augmented by other tech trends, including super-fast networking, that will let us experience VR as a cloud service just like we currently consume music and movies. And artificial intelligence (AI) will provide us with more personalized virtual worlds to explore, even giving us realistic virtual characters to share our experiences with.

Q. 'Duck out of something' means

- (a) To avoid doing something                      (b) To hit something hard  
 (c) To fall down                                        (d) To meet with an accident

10. Comprehension:

Read the following passage carefully and answer the questions: You might think you've experienced VR, and you might have been pretty impressed. Particularly, if you're a gamer, there are some great experiences to be had out there (or rather, in there) today. But over the next few years, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space Invaders. And although the games will be amazing, the effects of this transformation will be far broader, touching on our work, education, and social lives. Today's most popular VR applications involve taking total control of user's sense (sight and hearing, particularly) to create an immersive experience that places the user in a fully virtual environment that feels realistic. Climb up something high and look down, and you're likely to get a sense of vertigo. If you see an object moving quickly towards your head, you'll feel an urge to duck out of the way. Very soon, VR creators will extend this sensory hijacking to our other faculties – for example, touch and smell – to deepen that sense of immersion. At the same time, the devices we use to visit these virtual worlds will become cheaper and lighter, removing the friction that can currently be a barrier. I believe extended reality (XR) – a term that covers virtual reality (VR), augmented reality (AR), and mixed reality (MR) – will be one of the most transformative tech trends of the next five years. It will be enabled and augmented by other tech trends, including super-fast networking, that will let us experience VR as a cloud service just like we currently consume music and movies. And artificial intelligence (AI) will provide us with more personalized virtual worlds to explore, even giving us realistic virtual characters to share our experiences with.

Q. Select an antonym for the word 'argument' from the options given below:

- (a) Aggrandize            (b) Curtail                      (c) Inflate                      (d) Reinforce

11. Read the following sentence to find if there is any error in any part: If I were him / I would teach / him a lesson / No error

- (a) him a lesson            (b) No error                      (c) If I were him            (d) I would teach

12. Fill in the blanks with the correct preposition

Jugdish is waiting for me \_\_\_\_\_ the campus.

- (a) On                              (b) At                              (c) In                              (d) Out

13. Select the word which means the same as the following:

To read something carefully

- (a) Presume                      (b) Perverse                      (c) Peruse                      (d) Persiflage

14. Select the one which best expresses the same sentence in indirect/direct speech:

He said, "I am glad to be here this evening."

- (a) He says he was glad to be here his evening    (b) He said he was glad to be here this evening.  
 (c) He said that he was glad to be there that evening    (d) He asked he is glad to be here this evening

15. Choose the antonym:

**BOLD**

- (a) Nervous            (b) Timid            (c) Fearful            (d) Coy

16. Which of the phrases given below should replace the phrase printed in bold to make the sentence correct.

He is addicted to smoke.

- (a) addicted with smoking   (b) addict of smoke   (c) used to smoke   (d) addicted to smoking

17. Choose the correct alternative with the correct choice given below each statement.

You are to conform \_\_\_\_\_ the rules of the institute.

- (a) with            (b) to            (c) on            (d) of

18. Choose the synonym.

**LIBERAL**

- (a) Generous            (b) Affectionate            (c) Sober            (d) Reactionary

19. Identify the word that is similar in meaning to the underlined word.

Raghu make adulatory remarks about the waiter who served the food.

- (a) Complimentary   (b) Ironic            (c) Derogatory            (d) Slanderous

20. Fill in the blank.

Neither Peter nor I \_\_\_\_\_ responsible for this blunder.

- (a) am            (b) are            (c) is            (d) were

# NIMCET – 2022

## Answer Key

### Mathematics

01. (a)	02. (b)	03. (d)	04. (d)	05.	06. (b)	07. (a)	08. (a)	09. (b)	10. (b)
11. (c)	12. (d)	13. (c)	14. (d)	(a)	16. (a)	17. (d)	18. (b)	19. (a)	20. (c)
21. (c)	22. (a)	23. (b)	24. (c)	15.	26. (d)	27. (c)	28. (c)	29. (d)	30. (c)
31. (b)	32. (b)	33. (c)	34. (a)	(a)	36. (c)	37. (b)	38. (c)	39. (b)	40. (c)
41. (b)	42. (a)	43. (a)	44. (a)	25.	46. (b)	47. (d)	48. (b)	49. (b)	50. (d)

### <sup>(c)</sup>Reasoning

01. (b)	02.	03. (d)	04. (d)	<sup>35</sup> 05.	06.	07. (b)	08.	09. (a)	10.
11. (a)	(a)	13. (c)	14. (a)	(c)	(a)	17. (a)	(a)	19. (b)	(a)
21. (b)	<del>12.</del> (b)	23.	24.	<sup>45</sup> <del>25.</del>	<del>26.</del>	27. (c)	<del>28.</del>	29. (d)	<del>30.</del>
31. (c)	<del>32.</del> (c)	(b)	(a)	(a)	(c)	37. (d)	(c)	39. (a)	(a)

### <sup>35</sup>Computer

01. (c)	02. (c)	<sup>(d)</sup> 03. (c)	<sup>(c)</sup> 04. (a)	<sup>(d)</sup> 05. (b)	<sup>(a)</sup> 06. (b)	07. (b)	<sup>(c)</sup> 08. (c)	09. (b)	<sup>(d)</sup> 10. (c)
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### English

01.	02. (b)	03. (b)	04. (d)	05. (c)	06.	07. (c)	08. (b)	09.	10. (b)
(c)	12. (a)	13. (c)	14. (c)	15. (b)	(b)	17. (b)	18. (a)	(a)	20. (a)
11.					16.			19.	
(b)					(d)			(a)	