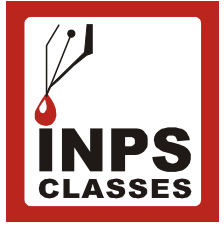# NIMCET – 2022

## 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 $f(x) = \begin{cases} (1+2x)^{1/x} & , x \neq 0 \\ e^2 & , x = 0 \end{cases}$ is

(a) Differentiable at $x = 0$ (b) Continuous at $x = 0$

(c) Discontinuous at $x = 0$ (d) Not differentiable at $x = 0$

**03.** If $x^m y^n = (x + y)^{m+n}$, then $\dfrac{dy}{dx}$ is

(a) $\dfrac{x + y}{xy}$ (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 $\hat{a} = \lambda\hat{i} + \hat{j} - 2\hat{k}, \hat{b} = \hat{i} + \lambda\hat{j} - 2\hat{k}, \hat{c} = \hat{i} + \hat{j} + \hat{k}$. and $[\hat{a}\ \hat{b}\ \hat{c}] = 7$, then the values

(a) 2, –6 (b) 4, –2 (c) 4, –2 (d) –4, 2

**06.** The value of $3^{3-\log_3 5}$ is

(a) $\dfrac{5}{27}$ (b) $\dfrac{27}{5}$ (c) $\dfrac{9}{5}$ (d) $\dfrac{5}{9}$

**07.** If $a_1, a_2 \ldots \ldots a_n$ be Arithmetic Progression with common difference then d, then the sum

$\sin d \left( \cos ec\, a_1 \cos ec\, a_2 + \cos ec\, a_2 \cos ec\, a_3 + \ldots + \cos ec\, a_{n-1} \cos ec\, a_n \right)$ is equal to

(a) $\cot a_1 - \cot a_n$ (b) $\sin a_1 - \sin a_n$ (c) $\cosec a_1 - \cosec a_n$ (d) $a_1 - a_0$.

**08.** The value of $\cot\left( \cos ec^{-1} \dfrac{5}{3} + \tan^{-1} \dfrac{2}{3} \right)$ is

(a) 6/17 (b) 3/17 (c) 4/17 (d) 5/17

**09.** If $a_1, a_2, \ldots \ldots a_n$ are any real number and n is any positive integer, then

(a) $n\sum_{i=1}^{n} a_i^2 < \left(\sum_{i=1}^{n} a_i\right)^2$ (b) $n\sum_{i=1}^{n} a_i^2 \geq \left(\sum_{i=1}^{n} a_i\right)^2$ (c) $\sum_{i=1}^{n} a_i^2 \geq \left(\sum_{i=1}^{n} a_i\right)^2$ (d) None of these

10. If $\cos^{-1}\dfrac{x}{2} + \cos^{-1}\dfrac{y}{3} = \phi$, then $9x^2 - 12xy\cos\phi + 4y^2$ is equal to

   (a) $-36\sin^2\phi$   (b) $36\sin^2\phi$   (c) $36\cos^2\phi$   (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) $5/3$   (b) $3/5$   (c) $4/5$   (d) $5/4$

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

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

14. If $a < b$, then $\int\limits_{a}^{b}\left(|x - a| + |x - b|\right)dx$, is equal to

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

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

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

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, $p^{\text{th}}$ term is q and $q^{\text{th}}$ term is p. Then $pq^{\text{th}}$ 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 $\left(\dfrac{x}{a}\right)^2 + \left(\dfrac{y}{b}\right)^2 = 1, (a > b)$ and $x^2 - y^2 = c^2$ cut at angles, then

   (a) $a^2 + b^2 = 2c^2$   (b) $b^2 - a^2 = 2c^2$   (c) $a^2 - b^2 = 2c^2$   (d) $a^2 - b^2 = c^2$

21. If $\left(\hat{a}\times\hat{b}\right)\times\hat{c} = \hat{a}\times\left(\hat{b}\times\hat{c}\right)$, 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 foot of tower are 30°, 45° and 60° 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 $a\hat{i}+a\hat{j}+c\hat{k}$, $\hat{i}+\hat{k}$ and $c\hat{i}+c\hat{j}+b\hat{k}$ 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 option (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 25 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 (x, y) is chosen at random inside the larger circle. Then the probability that the point has been taken from smaller circle is

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

27. The value of $\int \dfrac{\left(x^2-1\right)dx}{x^3\sqrt{2x^4-2x^2+1}}$ is

(a) $2\sqrt{2-\dfrac{2}{x^2}+\dfrac{1}{x^4}}+c$   (b) $2\sqrt{2+\dfrac{2}{x^2}+\dfrac{1}{x^4}}+c$   (c) $\dfrac{1}{2}\sqrt{2-\dfrac{2}{x^2}+\dfrac{1}{x^4}}+c$   (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) $P(A^c - B^c) = P(A^c) - P(B^c)$

(c) $P(A\cup B)^c = P(A^c)P(B^c)$

(d) $P(A\,|\,B) = P(A) - P(B)$

29. Which of the following is NOT TRUE?

(a) $\lim\limits_{x\to\infty}\dfrac{x}{e^x} = 0$     (b) $\lim\limits_{x\to 0+}\dfrac{1}{xe^{1/x}} = 0$     (c) $\lim\limits_{x\to 0+}\dfrac{\sin x}{1+2x} = 0$     (d) $\lim\limits_{x\to 0+}\dfrac{\cos x}{1+2x} = 0$

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

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) $\dfrac{1}{2} A_{n+1}$    (c) $2A_n - 2$    (d) None of the above

33. If $D = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 2+x & 1 \\ 1 & 1 & 2+y \end{vmatrix}$, $x \neq 0, y \neq 0$ 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 sum 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 parallelopiped whose adjacent edges are $\hat{a} = 2\hat{i} + 3\hat{j} + 4\hat{k}, \hat{b} = \hat{i} + \alpha\hat{j} + 2\hat{k}, \hat{c} = \hat{i} + 2\hat{j} + \alpha\hat{k}$ is 15, then $\alpha$ 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 $f(x) = \dfrac{10^x - 10^{-x}}{10^x + 10^{-x}}$ is

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

38. Coordinate of focus of the parabola $4y^2 + 12x - 20y + 67 = 0$ is

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

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

    (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 distance 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 $f(x) = \log\left(x + \sqrt{x^2 + 1}\right)$ 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 $f(x) = \dfrac{\cos^{-1} x}{[x]}$ 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 $m \le x \le n,$ then chose then 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) $x = n\pi \pm \dfrac{\pi}{4}$ 　(b) $x = n\pi \pm \dfrac{\pi}{3}$ 　(c) $x = n\pi \pm \dfrac{\pi}{2}$ 　(d) $x = n\pi \pm \dfrac{2\pi}{3}$

**45.** $f(x) = x + |x|$ is continuous for

(a) $x \in (-\infty, \infty)$ 　(b) $x \in (-\infty, \infty) - \{0\}$ 　(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 $a \in R$ (the set of all real numbers), $a \ne -1,$ $\displaystyle\lim_{n \to \infty} \dfrac{\left(1^a + 2^a + \ldots + n^a\right)}{(n+1)^{a-1}\left[(na+1) + (na+2) + \ldots + (na+n)\right]} = \dfrac{1}{60}.$

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 directrice is $x = 9$, then the equation of 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 $\dfrac{x^2}{25} + \dfrac{y^2}{b^2} = 1$ and the hyperbola $\dfrac{x^2}{144} - \dfrac{y^2}{81} = \dfrac{1}{25}$ are coincide, then the value of $b^2$ is

(a) 25 　(b) 16 　(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 is a, then the height of the hill is

(a) $\dfrac{1}{2} b \tan \alpha \sec B$ 　(b) $\dfrac{1}{2} b \tan \alpha \, \mathrm{cosec} A$ 　(c) $\dfrac{1}{2} c \tan \alpha \sin C$ 　(d) $\dfrac{1}{2} a \tan \alpha \, \mathrm{cosec} A$

# Reasoning

**01.** Select the pair of words, which are related in the same way as the capitalized words are related to each other.

**Frugal : Extravagant**

(a) Predecessor : Precursor        (b) Criticise : Advocate

(c) Teacher : Philanthropist        (d) Hermit : Philosopher

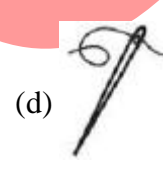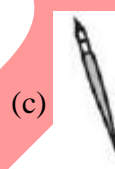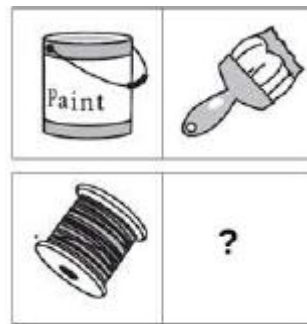**02.** Fill in the blank : HEC, JGE, LIG, NKI, _____.

(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 than Manoj.

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

(a) Data in both 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

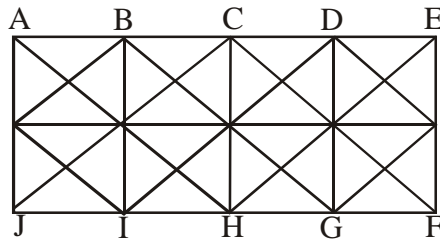**08.** Fill in the blank : JAK, KBL, LCM, MDN, _____

(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 brother 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 who 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. T and V 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) OVNBBH       (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?
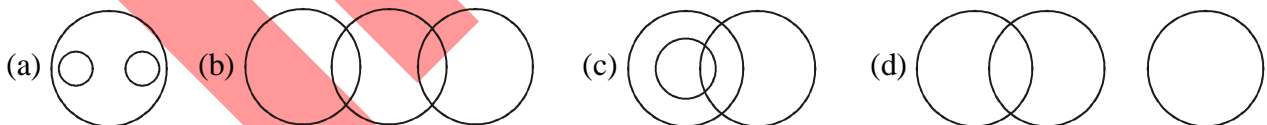


**18.** Choose the word opposite in meaning to the given word : **MITIGATE**

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

**19.** Which of the following is to 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 conclusion 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 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 :** All mangoes are golden in colour. No golden-coloured things are cheap.

**Conclusions:**

**I.** All mangoes are cheap.

**II.** Golden-coloured mangoes are not chap.

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

**Conclusions:**

**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 and C are law reports while the rest are medical extracts. Which two books are old medical extracts and have green covers?

(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 and G.

Total number of students studying Arts = 3800.
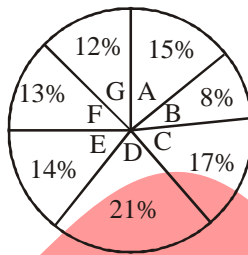


Total number of students studying commerce = 4200
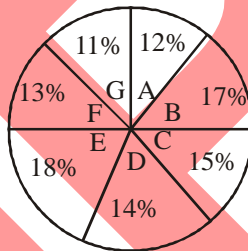


**What is the total number of students studying Arts in Institutes A and G together?**

(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 and G.

Total number of students studying Arts = 3800.
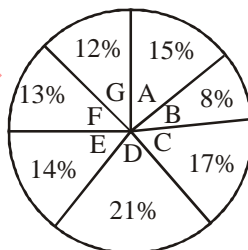


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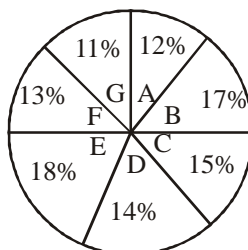
**How many students from Institute B study Arts and Commerce?**

(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 and G.

Total number of students studying Arts = 3800.
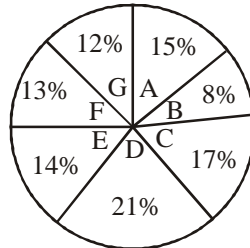


Total number of students studying commerce = 4200
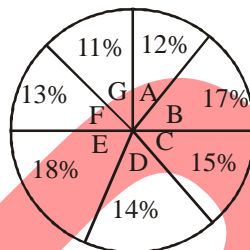


**The ratio of the number of students studying Arts to that studying Commerce in institute E is:**

(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 the 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 four hour.

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

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

**4.** A cannot be done immediately after D.

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

**Which hour is a break hour?**

(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.

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

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

**4.** A cannot be done immediately after D.

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

**Which is the drama to be staged first?**

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

**33.** **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.

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

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

**4.** A cannot be done immediately after D.

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

**Which is the drama staged immediately after the break?**

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

**34.** **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.

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

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

**4.** A cannot be done immediately after D.

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

**Which drama is staged immediately after D?**

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

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.

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

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

4. A cannot be done immediately after D.

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

**Which drama is staged immediately after E?**

(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?

(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) $5\dfrac{1}{11}"$        (b) $12\dfrac{4}{11}"$        (c) $13\dfrac{4}{11}"$        (d) $16\dfrac{4}{11}"$

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 $AB + AB' + A'C + AC$ 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 relations between 'n' and 'd' approximately correct.

(a) $d = 2^n$        (b) $n = 2^d$        (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 : $(X + Y) \cdot (X + \bar{Y}) \cdot (\bar{X} + Y)$

(a) XY  (b) $\bar{Y}X$  (c) $\bar{X}Y$  (d) $\bar{X}\bar{Y}$

**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, $AB + A\bar{B}C + A\bar{B}\bar{C}$ 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 $(A + C)(AD + AD') + AC + C$

(a) $A + C'$  (b) $A + C$  (c) $A' + C$  (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 is high, the gate is a(n):

(a) OR  (b) NOR  (c) NAND  (d) AND

# English

**01.** "Bite and 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 <u>path and paved</u> it with packed gravel, so they have a peaceful place to hike and bike.

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 year, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space lnvaders. 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 (Al) will provide us with 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 Al will allow us to share our experiences with realistic virtual characters

(b) Vertigo is a major feature of all Al 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 year, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space lnvaders. And although the games will be amazing, the effects of this transformation will be far broader, touching on our work, education, and social lives.
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**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 year, in VR as in all fields of technology, we're going to see things that make what is cutting-edge today look like space lnvaders. 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.
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**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 grammatically 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
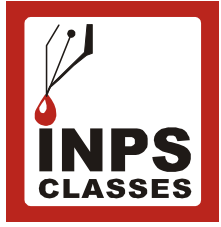
**20.** Fill in the blank.

**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. (a) | 06. (b) | 07. (a) | 08. (a) | 09. (b) | 10. (b) |
| 11. (c) | 12. (d) | 13. (c) | 14. (d) | 15. (a) | 16. (a) | 17. (d) | 18. (b) | 19. (a) | 20. (c) |
| 21. (c) | 22. (a) | 23. (b) | 24. (c) | 25. (c) | 26. (d) | 27. (c) | 28. (c) | 29. (d) | 30. (c) |
| 31. (b) | 32. (b) | 33. (c) | 34. (a) | 35. (c) | 36. (c) | 37. (b) | 38. (c) | 39. (b) | 40. (c) |
| 41. (b) | 42. (a) | 43. (a) | 44. (a) | 45. (a) | 46. (b) | 47. (d) | 48. (b) | 49. (b) | 50. (d) |

### Reasoning

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 01. (b) | 02. (a) | 03. (d) | 04. (d) | 05. (d) | 06. (a) | 07. (b) | 08. (a) | 09. (a) | 10. (a) |
| 11. (a) | 12. (a) | 13. (c) | 14. (a) | 15. (d) | 16. (c) | 17. (a) | 18. (c) | 19. (b) | 20. (a) |
| 21. (b) | 22. (b) | 23. (b) | 24. (a) | 25. (b) | 26. (c) | 27. (c) | 28. (c) | 29. (d) | 30. (d) |
| 31. (c) | 32. (c) | 33. (d) | 34. (c) | 35. (d) | 36. (a) | 37. (d) | 38. (c) | 39. (a) | 40. (d) |

### Computer

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 01. (c) | 02. (c) | 03. (c) | 04. (a) | 05. (b) | 06. (b) | 07. (b) | 08. (c) | 09. (b) | 10. (c) |

### English

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