

ALL INDIA OPEN TEST SERIES

for

TARGET NTSE-2017-18

FULL TEST – 1

(23rd October 2017)

MAT, ENGLISH & SAT
(OBJECTIVE)

*Please handover this booklet only after the
examination is over.*

ANSWERS
&
SOLUTIONS

FIITJEE**TARGET NTSE-2017-18****ANSWERS, HINTS & SOLUTIONS****FULL TEST – 1****MAT****(Paper – 1)****CODE : 1013****921 FIITJEE students qualified in (2016-17) for NTSE Stage II****ALL INDIA OPEN TEST SERIES**

Q. No.	ANSWERS	Q. No.	ANSWERS
1.	D	30.	D
2.	D	31.	B
3.	D	32.	A
4.	D	33.	B
5.	D	34.	B
6.	B	35.	B
7.	D	36.	C
8.	D	37.	B
9.	B	38.	C
10.	A	39.	D
11.	D	40.	D
12.	B	41.	B
13.	A	42.	D
14.	D	43.	C
15.	D	44.	B
16.	D	45.	C
17.	B	46.	D
18.	B	47.	D
19.	D	48.	D
20.	D	49.	B
21.	D	50.	A
22.	D		
23.	D		
24.	D		
25.	B		
26.	D		
27.	A		
28.	B		
29.	D		

HINTS & SOLUTIONS

1. D

Sol. 'Guild' is synonym of 'Association'.
Similarly, 'Fleet' is synonym of 'Armada'.

2. D

Sol. Only 761 is a prime number.

3. D

Sol. First two digits \div Third digit = 9

$$\text{i.e. } 728 \Rightarrow \frac{72}{8} = 9$$

$$455 \Rightarrow \frac{45}{5} = 9$$

$$546 \Rightarrow \frac{54}{6} = 9, \text{ But } 284 \Rightarrow \frac{28}{4} = 7$$

4. D

Sol. The pattern is as follows:

$$\text{In the first figure: } (18 + 47 + 37 + 23) = 125 = (5)^3$$

So, the number inside the small square = 5

$$\text{In the second figure: } (31 + 82 + 62 + 41) = 216 = (6)^3$$

So, the number inside the small square = 6

Similarly, Let the missing number be x

$$\text{In the second figure: } (15 + 18 + x + 18) = (4)^3 = 64$$

$$\text{or, } x = 64 - 51 = 13$$

Therefore, missing number = 13

5. D

Sol. The pattern is as follows:

$$\text{In the first figure: } (14 + 9 + 12 + 5) = \frac{40}{4} = 10$$

$$\text{In the second figure: } (9 + 8 + 7 + 6) = \frac{30}{4} = 7.5$$

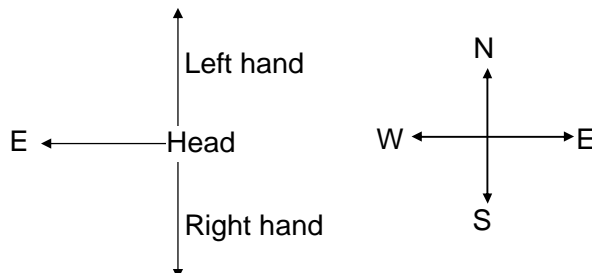
Similarly,

$$\text{In the third figure: } (5 + 6 + 4 + 3) = \frac{18}{4} = 4.5$$

Therefore, missing number = 4.5

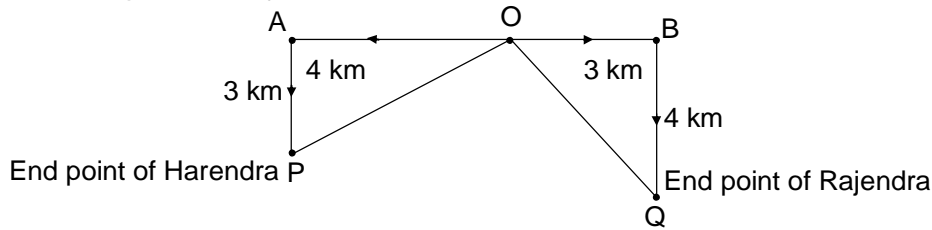
6. B

Sol.



7. D

Sol. O = Starting point
P = End point of Harendra
Q = End point of Rajendra



The movements of Harendra and Rajendra are as shown in figure i.e. O to A & A to P and O to B & B to Q respectively.

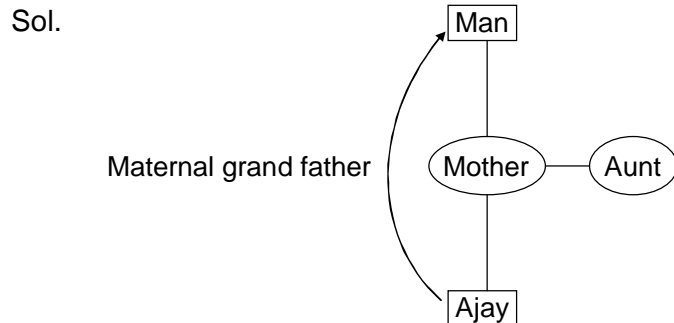
Therefore, the required distance from the starting point.

$$O = OP = OQ = \sqrt{4^2 + 3^2} = \sqrt{25} = 5 \text{ km}$$

8. D

Sol. According to the question,
1st of the month = Saturday
So, 8th of the month = Second Saturday = Holiday
22nd of the month = Second Saturday = Holiday
Also, 2nd of the month = Sunday = Holiday
So, 9th of the month = Sunday = Holiday
16th of the month = Sunday = Holiday
23rd of the month = Sunday = Holiday
30th of the month = Sunday = Holiday
So, total number of Holidays = 2 (Second Saturdays) + 5 (Sundays) = 7
So, number of working days = (30 - 7) days = 23 days.

9. B



Ajay's mother's father → maternal grandfather
Daughter of maternal grandfather → mother or aunt
Mother or aunt's father → maternal grandfather himself.

10. A

Sol. H @ K ⇒ H is sister of K.
K \$ L ⇒ K is father of L.
L # M ⇒ L is daughter of M.

$$= \left(4 - \frac{5}{11}\right) = \frac{39}{11} \text{ minutes}$$

So, Loss in day i.e., 24 hours

$$= 24 \times 60 \times \frac{39}{11} \times \frac{1}{69}$$

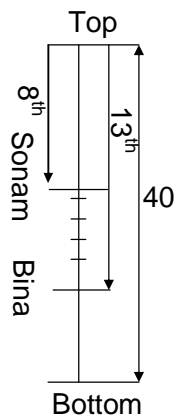
$$= \frac{18720}{253} = 73 \frac{251}{253} \text{ minutes}$$

Therefore, the clock loses in a day i.e. in 24 hours = $73 \frac{251}{253}$ minutes.

17. B

Sol. Sonam's rank from the top = 8th

Bina's rank from the top = (8 + 5) = 13th



So, Bina's rank from the bottom

$$= (40 - 13) + 1 = 27 + 1 = 28.$$

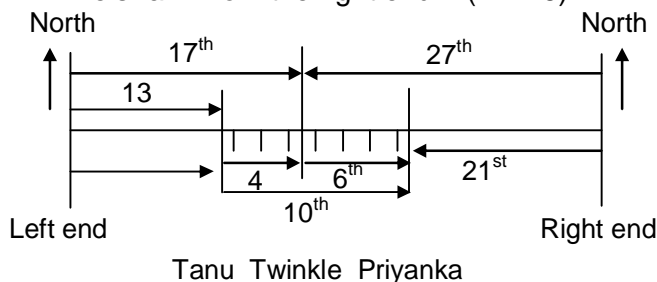
18. B

Sol. Priyanka's rank from the right end = 21st

Tanu's rank from the left end = 13th

Twinkle's rank from the left end = 17th

Twinkle's rank from the right end = (21 + 6) = 27th



So, total number of girls in the given row $(17 + 27) - 1 = 43$.

19. D

Sol. The given sequence of number follows the pattern:

13 + (1 × 3), 16 + (1 × 6), 22 + (2 × 2), 26 + (2 × 6), 38 + (3 × 8) and so on

Therefore, missing number = 62 + (6 × 2).

20. D

Sol. The given sequence of number follows the pattern:
 $13 + (1^2 + 3^2)$, $23 + (2^2 + 3^2)$, $36 + (3^2 + 6^2)$ and so on
 There, missing number = $81 + (8^2 + 1^2) = 146$

21. D

Sol. The terms of the given series are 3×1^2 , 3×2^2 , 3×3^2 , 3×4^2 , 3×5^2 , 3×6^2
 Therefore, missing number = $3 \times 7^2 = 3 \times 49 = 147$.

22. D

Sol. The pattern is as follows:
 $\begin{array}{c} \underline{L \ E \ T \ H} \quad \underline{A \ R \ G \ Y} \\ \swarrow \quad \searrow \\ \text{Reverse} \\ \underline{Y \ G \ R \ A} \quad \underline{L \ E \ T \ H} \\ +1 \downarrow +1 \downarrow +1 \downarrow +1 \downarrow \quad +1 \downarrow +1 \downarrow +1 \downarrow +1 \downarrow \\ \underline{Z \ H \ S \ B} \quad \underline{M \ F \ U \ I} \end{array}$
 Similarly,
 $\begin{array}{c} \underline{M \ A \ N \ G} \quad \underline{R \ O \ V \ E} \\ \swarrow \quad \searrow \\ \text{Reverse} \\ \underline{E \ V \ O \ R} \quad \underline{M \ A \ N \ G} \\ +1 \downarrow +1 \downarrow +1 \downarrow +1 \downarrow \quad +1 \downarrow +1 \downarrow +1 \downarrow +1 \downarrow \\ \underline{F \ W \ P \ S} \quad \underline{N \ B \ O \ H} \end{array}$

23. D

Sol. According to the question

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Numerical Value (odd)	1	3	5	7	9	11	13	15	17	19	21	23	25	27

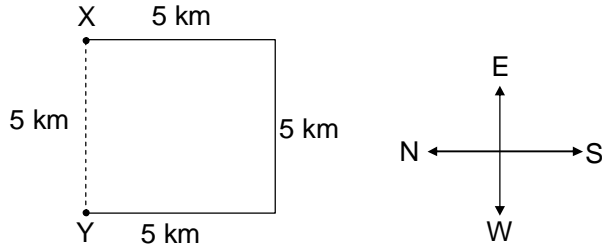
Therefore, the total value of the letters of the word
 INDIAN = I + N + D + I + A + N
 = $17 + 27 + 7 + 17 + 1 + 27 = 96$

24. D

Sol. The pattern is as follows:
 2 5 9 is $2^5 + 9 = 41$
 Similarly 3 4 8 is $3^4 + 8 = 89$

25. B

Sol. From Statement-I:
 Z → equidistant from X and Y.
 So, directions are unknown.
 Therefore, Statement-I is not sufficient.
 From Statement-II:
 Distances and directions have been given properly.



So, 'X' is to the 'North' of 'Y'.
Therefore, Statement-II is sufficient.

26. D

Sol. From Statement-I:

Word	Code	
Come and go	→ pit ka ja	...(i)
go and tell	→ ja ma ka	...(ii)
From (i) & (ii), we get		
and go	→ ka ja	...(iii)
Using (iii) in (i), we get		
'come'	$\xrightarrow{\text{code}}$	'pit'

Therefore, the data in both the statements I and II together are necessary to answer the given question.

27. A

Sol. The third, the sixth, the eighth and the eleventh letters of the word

CO M PU T E R I S E
 1 2 3 4 5 6 7 8 9 10 11 are M, T, R and E respectively.

The only meaningful word obtained from these letters = T E R M
 1 2 3 4

Therefore, the last letter of the word 'T E R M' = M.

28. B

Sol. According to the given arrangement.

Farthest neighbour in the alphabetical order is DY separated by maximum number of letter i.e. 20 in the English alphabet.

29. D

Sol. According to the given arrangement, P has O and Q as its neighbours as in the English alphabet.

30. D

Sol. According to the given arrangement, number of letters between L and Y = 12 (as in the English alphabet)

Number of letters between F and L = 5 (as in the English alphabet)

So, the required letters are Y, L and F.

31. B

Sol. Age of teacher = Total age of (students + teacher)
 = Total age of students
 = $31 \times 14 - 30 \times 13.5$
 = $434 - 405$
 = 29 years

32. A

Sol.

Only Sprit

Vessel 1		Vessel 2
$8/11$		$5/6$
$4/5$		
$\frac{25 - 24}{30}$		$\frac{44 - 40}{55}$
$\frac{1}{30} : \frac{4}{55} = 55 : 120 = 11 : 24$		

Option (A) fits the conditions of the problem as if there are 11 litres in the first vessel, there would be 8 litres of spirit. Also it means that we would be taking 24 litres from the second vessel.

33. B

Sol. $100 \xrightarrow[\text{Sales increase}]{50\% \uparrow} 150 \xrightarrow[\text{Price drop}]{?} 82.5 \text{ (final sales figure)}$

Hence, the required price drop is $67.5/150 = 45\%$ drop. Thus there is a drop of $250 \times 0.45 = 112.5$.

34. B

Sol.

Total cost (assume) = 100
 Recovered amount = $65 + 0.85 \times 32.5 + 0.7 \times 32.5$
 $= 65 + 27.625 + 22.75 = 115.375$
 Hence, profit percent = 15.375%

35. B

Sol.

Go through trial and error of the options. You will get:
 $20000 \times (1.3) = 26000$ (@ simple interest)
 $20000 \times 1.1 \times 1.1 \times 1.1 = 26620$ @ compound interest.
 $26620 - 26000 = 620$
 Thus 20000 is the correct answer.

36. C

Sol.

The overall ratio is: 21 : 35 : 55. Dividing 333 in 111 parts (21 + 35 + 55) each part will be 3 and Class III will have the highest number of pupils $\rightarrow 55 \times 3 = 165$.

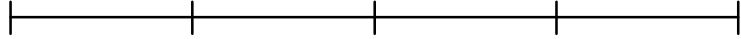
37. B


Sol.


Total work to be done = $8 \times 12 = 96$ man-days.
 or total work to be done = $20 \times 10 = 200$ woman-days.
 Since, the work is the same, we can equate $96 \text{ man-days} = 200 \text{ woman-days}$.
 Hence, 1 man-day = 2.08333 woman-days
 Now, if 12 men and 15 women are working on the work we get
 12 men are equal to $12 \times 2.08333 = 25$ women
 Hence, the work done per day is equivalent to 25 + 15 women working per day.
 That is, 40 women working per day.
 Hence, $40 \times \text{no. of days} = 200 \text{ woman days}$
 Number of days = 5 days.

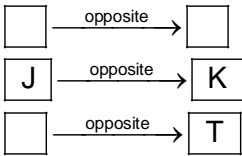
38. C
 Sol. The train that leaves at 6 am would be 75 km ahead of the other train when it starts. Also, the relative speed being 36 kmph, the distance from Mumbai would be:
 $(75/36) \times 136 = 283.33$ km

39. D
 Sol. $30/(15 + x) + 30/(15 - x) = 4$ hrs 30 min.
 At $x = 5$, the equation is satisfied.

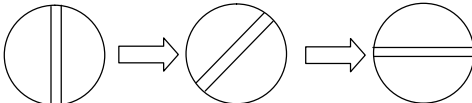
40. D
 Sol. Professor Student Advocate Author Businessman

 According to above figure it is clear that from the left end author is at 4th place.

41. B
 Sol. Professor Student Advocate Author Businessman

 According to above figure it is clear that advocate is in the exactly middle of the queue.

42. D
 Sol. Professor Author Businessman Student Advocate

 According to above figure it is clear that businessman is standing to the left of student after exchange their positions.

43. C
 Sol. 
 By observing this it is clear that J & K are on the opposite faces. So, option (A), (B) and (D) are not possible. So, the answer is (C).

44. B
 Sol. By comparing first and third dice
 $6 \xrightarrow{\text{opposite}} 3$
 $2 \xrightarrow{\text{opposite}} 5$
 $4 \xrightarrow{\text{opposite}} 1$

45. C
 Sol. 

46. D
 Sol. Arrow inside the circle rotate 135° clockwise in next figure. By observing this answer is option (D).

47. D
 Sol. 13 cuts $\rightarrow 13/3 = 4.33$

So cuts will be 4, 4, 5
 $(4 + 1) (4 + 1) (5 + 1) = 150$

48. D

Sol. $\frac{63 - 36}{36} \times 100 = \frac{2700}{36} = 75\%$

49. B

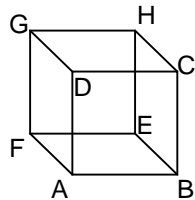
Sol. Hockey + Cricket

$$63 + 81 = 144$$

So, amount spend on Hockey and Cricket together = $\frac{2,00,00,000}{360} \times 144 = 80,00,000$

50. A

Sol.



ABEF → Red

DCHG → Black

ABCD → Green

EFGH → Blue

AFGH → White

BCHE → Brown

So, adjacent to green is black, white, brown and red.

FIITJEE**TARGET NTSE-2017-18****ANSWERS**

FULL TEST – 1
ENGLISH LANGUAGE TEST
(Paper – 2)

CODE : 1014

921 FIITJEE students qualified in (2016-17) for NTSE Stage II

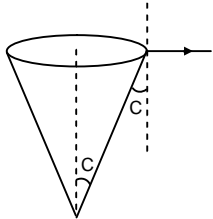
ALL INDIA OPEN TEST SERIES

Q. No.	ANSWERS	Q. No.	ANSWERS
1.	C	30.	B
2.	B	31.	A
3.	A	32.	A
4.	C	33.	A
5.	A	34.	C
6.	B	35.	D
7.	C	36.	B
8.	B	37.	D
9.	D	38.	B
10.	A	39.	A
11.	B	40.	B
12.	D	41.	D
13.	B	42.	B
14.	D	43.	B
15.	A	44.	D
16.	A	45.	C
17.	A	46.	D
18.	C	47.	A
19.	B	48.	B
20.	C	49.	D
21.	B	50.	C
22.	D		
23.	A		
24.	C		
25.	B		
26.	B		
27.	D		
28.	A		
29.	C		

FIITJEE**TARGET NTSE-2017-18****ANSWERS, HINTS & SOLUTIONS****FULL TEST – 1****SAT****(Paper – 3)****CODE : 1015****921 FIITJEE students qualified in (2016-17) for NTSE Stage II****ALL INDIA OPEN TEST SERIES**

Q. No.	ANSWERS	Q. No.	ANSWERS	Q. No.	ANSWERS	Q. No.	ANSWERS
1.	A	31.	C	61.	B	91.	D
2.	D	32.	D	62.	B	92.	D
3.	C	33.	C	63.	D	93.	B
4.	C	34.	B	64.	C	94.	A
5.	D	35.	C	65.	D	95.	B
6.	C	36.	C	66.	A	96.	D
7.	A	37.	D	67.	D	97.	D
8.	B	38.	C	68.	A	98.	D
9.	A	39.	A	69.	A	99.	C
10.	A	40.	C	70.	A	100.	A
11.	A	41.	B	71.	A		
12.	D	42.	B	72.	D		
13.	C	43.	D	73.	D		
14.	B	44.	D	74.	A		
15.	B	45.	B	75.	A		
16.	C	46.	C	76.	B		
17.	B	47.	C	77.	C		
18.	D	48.	C	78.	A		
19.	A	49.	C	79.	A		
20.	C	50.	B	80.	A		
21.	D	51.	D	81.	B		
22.	B	52.	C	82.	B		
23.	C	53.	B	83.	C		
24.	B	54.	C	84.	D		
25.	D	55.	A	85.	A		
26.	A	56.	A	86.	A		
27.	B	57.	D	87.	B		
28.	C	58.	B	88.	A		
29.	A	59.	B	89.	C		
30.	B	60.	B	90.	B		

HINTS & SOLUTIONS

1. A
 Sol. Static friction can have any value between zero to $\mu_s N$ but kinetic friction is always $\mu_k N$.
2. D
 Sol. Work done by magnetic force is zero since it is always perpendicular to velocity.
3. C
 Sol. Doppler's effect.
4. C
 Sol. Resistivity is reciprocal of conductivity.
5. D
 Sol. Current through Q & R is less than P.
6. C
 Sol. $C = \sin^{-1}\left(\frac{1}{\mu}\right)$
 $= \sin^{-1}\left(\frac{3}{4}\right)$
- 
7. A
 Sol. Fusion reaction take place at high temperature because K.E. is high enough to overcome repulsion between nuclei.
8. B
 Sol. Weight of iceberg = weight of displaced water
 $Vd\rho = (V - V_1)D\rho$
 % fraction of visible iceberg
 $\frac{V_1}{V} \times 100 \approx 10\%$
9. A
 Sol. $p = \sqrt{2mK}$
10. A
 Sol. The nature of lens changes if the refractive index of incident zone is greater than refractive index of refracted zone.
11. A
 Sol. $\frac{1}{30} = \frac{1}{f_1} + \frac{1}{f_2}$
 $f_1 = -ve$ (concave)
 $f_2 = +ve$ (convex)

$$\left| \frac{P_1}{P_2} \right| = \left| \frac{f_2}{f_1} \right| = \frac{2}{3}$$

By solving $f_1 = -15$ cm, $f_2 = +10$ cm.

12. D

Sol.
$$\left(\frac{T_2}{T_1} \right)^2 = \left(\frac{R_2}{R_1} \right)^3$$

$$= \left(\frac{2.5R + R}{6R + R} \right)^3 = \left(\frac{1}{2} \right)^3$$

$$T_2 = \frac{T_1}{(2)^{3/2}}$$

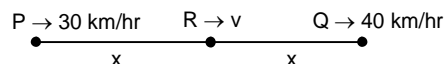
$$T_1 = 24 \text{ hr} ; T_2 = \frac{24}{2\sqrt{2}} = 6\sqrt{2} \text{ h}$$

13. C

Sol. Let v be the velocity at midway and acceleration a .
By using equation of motion.

$$v^2 - 30^2 = 2ax$$

$$40^2 - v^2 = 2ax$$



14. B

Sol. According to Lenz's law, the induced current will flow in a direction that opposes fall in magnetic flux lined with the loop. Hence, induced current will flow in the same direction as the original current.

15. B

Sol. The boiling point of acetone is 329.2 K (56.2°C).

16. C

Sol. During perspiration, sweat evaporates from surface of body by absorbing heat from the body making it cool.

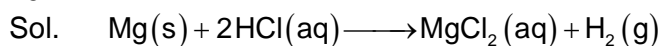
17. B

Sol. Law of definite proportions states that the elements in a compound are always present in a definite proportion by mass.

18. D

Sol. Molecules are the smallest particles of a compound.

19. A



Magnesium is oxidized to magnesium chloride. So, it is the reducing agent.

20. C

Sol. H_2SO_4 : Strong acid and CH_3COOH : Weak acid. The rest are strong acids, strong bases and neutral salts respectively.

21. D
Sol. Tooth enamel is made up of calcium phosphate.
22. B
Sol. Lead oxide is amphoteric in nature.
23. C
Sol. $3\text{Fe(s)} + 4\text{H}_2\text{O(g)} \longrightarrow \text{Fe}_3\text{O}_4\text{(s)} + 4\text{H}_2\text{(g)}$
24. B
Sol. Rutherford selected gold foil because he wanted as thin layer as possible.
25. D
Sol. Acetic acid(CH_3COOH) has the highest melting point of 290 K(17°C) among the given compounds.
26. A
Sol. Alcohols produce aldehydes on partial oxidation and carboxylic acids on complete oxidation.
27. B
Sol. Atomic radii - C : 77 pm, N : 74 pm, O = 66 pm
Difference between C and N = 77 - 74 = 3 pm
Difference between N and O = 74 - 66 = 8 pm
28. C
Sol. When sewage mixed with river water it increases BOD.
29. A
Sol. Vitamin A, D, E, K – Fat soluble vitamins
Vitamin B, C – Water soluble vitamins
30. B
Sol. Impulse follow the path during pulse generation – SA node → AV node → BOH → Purkinje fibres → Heart muscle
31. C
Sol. Optimum pH required for pepsin is 1.6 - 2.4.
32. D
Sol. Homology – A correspondence of structures in two life forms with a common evolutionary origin.
33. C
Sol. Tadpole – Ammonotelic
Frog – Ureotelic
34. B
Sol. Glycolysis – Cytoplasm
Kreb's cycle – Mitochondrial matrix
Light reaction – Grana
Calvin cycle – Stroma

35. C
Sol. Endocrine system and nervous system both are interconnected.
36. C
Sol. Meristematic cells of meristematic tissue are living and undifferentiated cell of permanent tissues are differentiated in nature.
37. D
Sol. According to cell theory activities of an organism are the result of functions and interaction of the constituents of cell.
38. C
Sol. Syngamy leads association of two nuclei while triplet fusion association of three nuclei.
39. A
Sol. Alternation of sexual and asexual phase in obelia is called metagenesis.
40. C
Sol. By the feed back mechanism hypothalamus regulates the secretions of anterior lobe of pituitary gland and ant lobe of pituitary gland regulates the secretions of other endocrine glands (Gonds, adrenal cortex, thyroid).
41. B
Sol. $AP = \frac{1}{\sqrt{3}}$, $PD = \frac{2}{\sqrt{3}}$ and $CD = \sqrt{3}$
42. B
Sol. $\angle AOB = 90^\circ$ Ratio = $\frac{\frac{1}{2}2r.r}{\frac{1}{2}r^2 \sin 90^\circ} = \frac{2}{1}$
43. D
Sol. Given sequence is A.P. $a = 1$, $d = \frac{1}{2}$.
44. D
Sol. $AB = 13$ $BN = 5$, $AM = 12 \Rightarrow MN = 4$
45. B
Sol. In – radius = 1 \therefore Area = π
46. C
Sol. Multiply numerator and denominator by $\sqrt[16]{5} - 1$
47. C
Sol. $a^2 + a + 3 = 0$
 $(a + 1)(a + 2)(a + 3)(a + 4) = (a^2 + 5a + 4)(a^2 + 5a + 6)$

$$= (4a + 1)(4a + 3) = 16(a^2 + a) + 3 = -45$$

48. C

Sol. $x = \frac{(\sqrt[3]{9} - \sqrt[3]{3} + 1)(\sqrt[3]{3} + 1)}{\sqrt[3]{3} + 1} = \frac{4}{\sqrt[3]{3} + 1} \Rightarrow \frac{4}{x} = \sqrt[3]{3} + 1$

49. C

Sol. $(P + 1)(3 - 2P) + (2P + 1)(2P - 1) + 2(P + 1)(1 - 3) = 0$
 $\Rightarrow 2P^2 - 3P - 2 = 0$

50. B

Sol. Let volume of cone is $\frac{1}{3}\pi r^2 h$. New volume $= \frac{1}{3}\pi \frac{36r^2}{25} \cdot \frac{17h}{20}$.
 % Change $= \frac{112\pi r^2 h}{1500} \times \frac{100 \times 3}{\pi r^2 h} = 22.4\%$

51. D

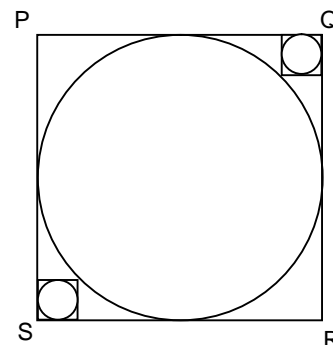
Sol. Radius of the bigger circle $= x/2$

Let the side of small square $= a\sqrt{2} = \frac{x\sqrt{2} - x}{2}$

Or $a = \frac{x(\sqrt{2} - 1)}{2\sqrt{2}}$

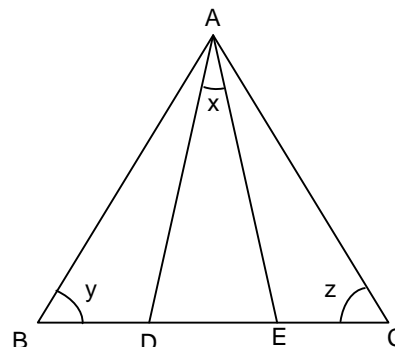
Radius of the smaller circle $= \frac{1}{2}$ (length of the side of the smaller square)

$$= \frac{1}{2} \left(\frac{x(\sqrt{2} - 1)}{2\sqrt{2}} \right) = \frac{x(\sqrt{2} - 1)}{4\sqrt{2}}$$



52. C

Sol. As $AD = BD \Rightarrow \angle DBA = \angle DAB = y$
 and $AE = EC \Rightarrow \angle EAC = \angle ECA = z$
 Thus, in $\triangle ABC$ $\angle A + \angle B + \angle C = 180$
 $\Rightarrow (y + x + z) + y + z = 180$
 $\Rightarrow 2(y + z) = 180 - x$
 $\Rightarrow y + z = 90 - \frac{x}{2}$



53. B
Sol. $SR = 6$ and $TR = 3$ (as T is a mid – point)

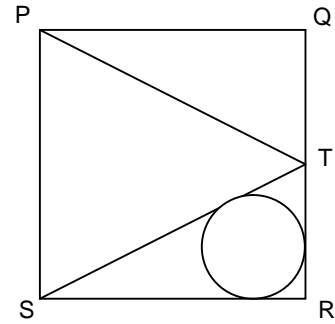
$$ST = \sqrt{6^2 + 3^2} = \sqrt{45} = 3\sqrt{5}$$

Area of $\Delta STR = r \times s$

Where, r = Radius of circle inscribed
and s = Semi – perimeter of triangle

$$\Rightarrow \frac{1}{2} \times 3 \times 6 = r \times \left(\frac{6+3+3\sqrt{5}}{2} \right)$$

$$\Rightarrow \frac{18}{9+3\sqrt{5}} = r = \frac{6}{3+\sqrt{5}}$$



54. C
Sol. Let $\alpha = 1$ and $\beta = ?$

$$\therefore \alpha\beta = c/a = \frac{(a-b)}{(b-c)}$$

$$\Rightarrow \beta = \frac{(a-b)}{(b-c)}$$

55. A
Sol. Area = C.S.A. of cone + CSA of cylinder + area of base
 $= \pi \times 5 \times 13 + 2 \times \pi \times 5 \times 7.5 + \pi \times 5 \times 5$
 $= 165\pi$

56. A
Sol. $100 \left[\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \dots + \frac{1}{99.100} \right]$
 $= 100 \left[\frac{1}{1} - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \dots + \frac{1}{99} - \frac{1}{100} \right]$
 $= 100 \left[1 - \frac{1}{100} \right]$
 $= 100 \times \frac{99}{100}$
 $= 99$

57. D
Sol. $a = b - d$, $c = b + d$

$$a + b + c = \frac{3}{2}$$

$$\Rightarrow b = \frac{1}{2}$$

$$b^4 = (b-d)^2 (b+d)^2$$

$$\Rightarrow b^4 = (b^2 - d^2)^2$$

$$\Rightarrow \pm b^2 = b^2 - d^2$$

$$\Rightarrow d = \sqrt{2}b [\because d \neq 0]$$

$$a = b - d \Leftrightarrow \frac{1}{2} - \frac{1}{\sqrt{2}}$$

58. B

Sol. $(b - d)b(b + d) = 4$

$$b(b^2 - d^2) = 4$$

$$\therefore d^2 \geq 0$$

$$b(b^2) \geq 4$$

$$b^3 = 4$$

$$b = \sqrt[3]{4}$$

$$= 2^{\frac{2}{3}}$$

59. B

Sol. It is the sum of 5 terms in GP, with $a = 1$ and $r = x$

$$\Rightarrow \frac{x^5 - 1}{x - 1} = 0$$

$$\Rightarrow x^5 = 1$$

60. B

Sol. $\frac{1 - \sin \theta}{\cos \theta} = \frac{a + 1}{a - 1}$

$$\frac{(1 - \sin \theta)^2}{1 - \sin \theta} = \frac{(a + 1)^2}{(a - 1)^2}$$

$$\frac{1}{\sin \theta} = \frac{(a^2 + 1)}{2a}$$

$$\sin \theta = \frac{2a}{a^2 + 1}$$

$$\cos \theta = \frac{a^2 - 1}{a^2 + 1} c$$

61. B

Sol. After its formation Duma was dissolved within seventy five days.

62. B

Sol. The author of the pamphlet called 'What is the Third Estate' was Abbe Sieyes.

63. D

Sol. Hitler crated many police departments to have complete control over the administration.

64. C

Sol. After Forest Act Villagers could not make the use of the forest products.

65. D
Sol. The Gollas, Kurumas lived in Karnataka and Andhra Pradesh.
66. A
Sol. He used Suit in 1890. Lungi Kurta in 1913, dressed like peasants in 1915 and finally started wearing short dhoti from 1921.
67. D
Sol. Political prisoners could be detained for two years only. Jallianwalla Bagh massacre took place in April 1919.
68. A
Sol. The powerful guilds did not allow the new members to start production unit in the urban areas.
69. A
Sol. Church was troubled by the writing against the church power so they prohibited the publication of some of the books.
70. A
Sol. Being inspired by the French Revolution the people in the other European countries began to spread the ideas of liberty, equality and rights through Jacobin club.
71. A
Sol. 1910 → Completion of the trans – indo- China rail network
1930 → Formation of the Vietnamese Communist Party
1907 → Establishment of Tonkin Free School
1887 → Formation of French Indo-China
72. D
Sol. Ganga → National Waterway No. 1
Brahmaputra → National Waterway No. 2
Godavari & Krishna → National Waterway No. 14
Mahanadi & Brahmaputra → National Waterway No. 5
73. D
Sol. National Thermal Power Corporation is the major power producing corporation in India.
74. A
Sol. Water logging → Punjab
Mining → Orissa
Wind → Rajasthan
Overgrazing → Madhya Pradesh
75. A
Sol. India produces all types of food grains in its varied terrain.
76. B
Sol. During Chandragupta Maurya's reign, dams, lakes and irrigation systems were extensively built

77. C
Sol. Tajikistan is not the part of the Indian sub-continent.
78. A
Sol. National Population Policy 2000 provides a policy framework for imparting free and compulsory school education upto 14 years of age.
79. A
Sol. Western ghat is higher so the wind rises with the height and rains.
80. A
Sol. The Chambal, The Sind, The Betwa and The Ken are the rivers which flow from southwest to northeast due to slope.
81. B
Sol. Godawari is the largest South Indian river.
82. B
Sol. Tropical evergreen → cinchona
Tropical deciduous → sandalwood
Montane → deodar
Mangrove → coconut
83. C
Sol. In India there is a freedom to choose any profession.
84. D
Sol. Power was exercised by government elected by the people was the common feature in both the governments.
85. A
Sol. Nelson Mandela opposed this policy of apartheid.
86. A
Sol. Election commission prepares the voter list and conducts the election in free and fair manner.
87. B
Sol. Ministry of Commerce and Industry.
88. A
Sol. The Tamils whose forfathers came from India as plantation workers are called Indian Tamil in Srilanka.
89. C
Sol. Communalism believes that the people of different religions cannot live together.
90. B
Sol. Movement is not an organisation and depends on spontaneous mass participation.

91. D
Sol. Democracy does not lead to disintegration necessarily.
92. D
Sol. The subjects that do not fall in any of the three lists come under Residuary List.
93. B
Sol. Keeping military away from controlling government is a foundational challenge of democracy.
94. A
Sol. Urban area has pull factors.
95. B
Sol. National Rural Employment Guarantee Act is for rural area.
96. D
Sol. MNC does not employ labour only from its own country.
97. D
Sol. The National Consumer Disputes Redressal Commission is the Consumer Court at the National Level.
98. D
Sol. National Sample Survey Organisation/NSSO carries out survey for determining the poverty line in India.
99. C
Sol. Information technology comes under tertiary sector.
100. A
Sol. It is a rural bank.