

FIITJEE**TARGET NTSE-2017-18****ANSWERS, HINTS & SOLUTIONS****PART TEST – 1****MAT****(Paper – 1)****CODE : 1001****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.	C
2.	B	31.	D
3.	D	32.	B
4.	B	33.	B
5.	D	34.	C
6.	A	35.	C
7.	A	36.	D
8.	D	37.	C
9.	D	38.	B
10.	C	39.	A
11.	C	40.	D
12.	A	41.	B
13.	B	42.	C
14.	C	43.	D
15.	A	44.	B
16.	C	45.	A
17.	A	46.	C
18.	A	47.	D
19.	D	48.	C
20.	B	49.	A
21.	A	50.	B
22.	C		
23.	B		
24.	B		
25.	C		
26.	D		
27.	D		
28.	B		
29.	C		

HINTS & SOLUTIONS

1. C

Sol. If x is the weight of the new student, then

$$(30 \times 45) + x - 47 = 30 \times (45.2)$$

$$\therefore x = 53$$

2. B

Sol. Sunday's + Monday's + Tuesday's temperature = $3 \times 37.3^\circ \text{C} = 111.9^\circ \text{C}$

$$\therefore \text{Monday's} + \text{Tuesday's} = 111.9^\circ \text{C} - 40^\circ \text{C} = 71.9^\circ \text{C}$$

(Monday's + Tuesday's + Wednesday's) temperature = $3 \times 38.7^\circ \text{C} = 116.1^\circ \text{C}$

$$\therefore \text{Wednesday's temperature} = 116.1^\circ \text{C} - 71.9^\circ \text{C} = 44.2^\circ \text{C}$$

3. D

Sol. The weight of the remaining four = $6 \times 65 - (70 + 48) = 390 - 118 = 272$

$$\therefore \text{Average weight of the remaining four} = 272 \div 4 = 68 \text{ kgs}$$

4. B

Sol. $(25 \times 15.56 - 20 \times 15.6) \div 5 = 15.4$

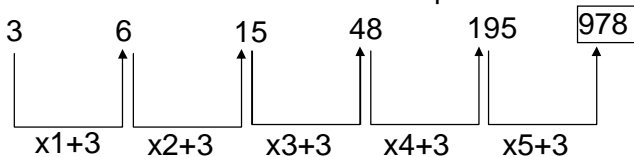
5. D

Sol. Income on 6th day in rupees is –

$$15 \times 70 - 5 \times 60 - 9 \times 80 = 30$$

6. A

Sol. In the given series, each previous element is multiplied by 1, 2, 3, 4 and 5, respectively and then 3 is added in such multiplication to obtain the next element.

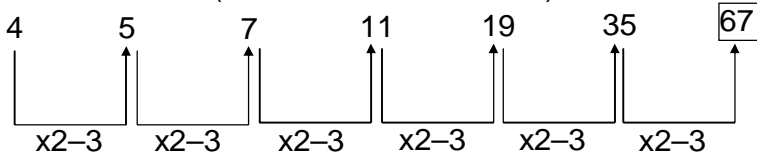


$$\therefore ? = 978$$

7. A

Sol. In the given series

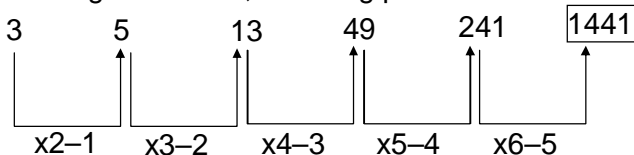
Next element = (Previous element $\times 2 - 3$)



$$\therefore ? = 67$$

8. D

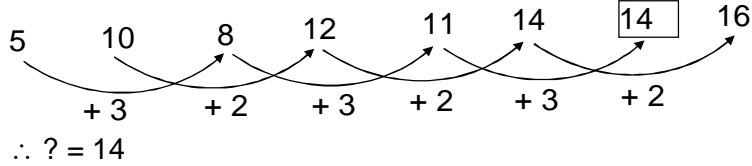
Sol. In the given series, following pattern is used.



$$\therefore ? = 1441$$

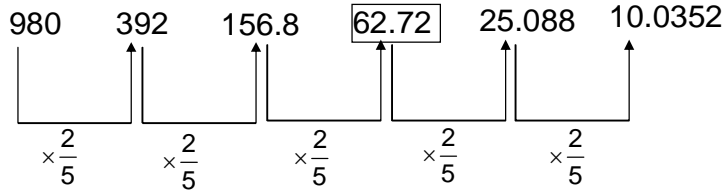
9. D

Sol. There are two alternative series:



10. C

Sol. The pattern is as follows:



11. C

Sol. As, $(6 \times 8) + 3 = 51$

$$(15 \times 4) + 5 = 65$$

$$\text{Similarly, } (20 \times 5) + 20 = 120$$

12. A

Sol. Moving in anti – clockwise direction in each of the figures,
We have

$$\frac{3 \times 4 \times 8}{2} = 48$$

And

$$\frac{9 \times 2 \times 18}{2} = 162$$

Similarly

$$\frac{4 \times 20 \times 15}{2} = 600$$

Hence, option A is correct.

13. B

Sol. As, $(14 \times 4 - 20) \div 12 = 3$

$$(9 \times 9 - 42) \div 13 = 3$$

$$\text{and } (12 \times 8 - 19) \div 7 = 11$$

$$\text{Similarly, } (20 \times 10 - 40) \div 20 = 8$$

14. C

Sol. The pattern in the question is:

$$4^2 + 5^2 = 16 + 25 = 41, 2^2 + 1^2 = 4 + 1 = 5$$

$$7^2 + 6^2 = 49 + 36 = 85$$

15. A

Sol. As, $(7 \times 4) - (9 \times 2) = 10$

and $(15 \times 5) - (18 \times 3) = 21$

Similarly, $(19 \times 3) - (16 \times 2) = 25$

Hence, option A is the correct.

16. C

Sol. $B \xrightarrow{-1} A$ Similarly $S \xrightarrow{-1} R$

$E \xrightarrow{+1} F$ $E \xrightarrow{+1} F$

$L \xrightarrow{-1} K$ $L \xrightarrow{-1} K$

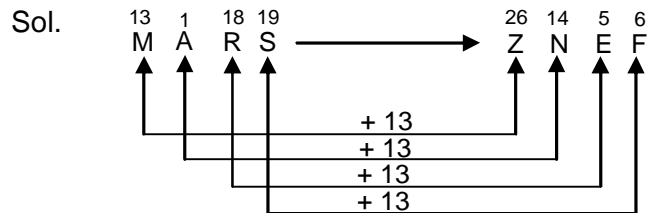
$I \xrightarrow{+2} K$ $D \xrightarrow{+2} F$

$E \xrightarrow{-1} D$ $O \xrightarrow{-1} N$

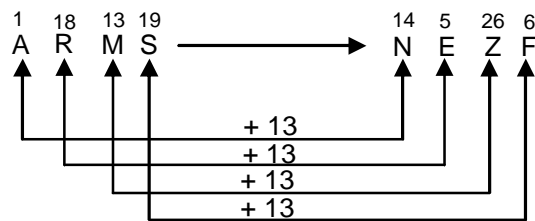
$F \xrightarrow{+2} H$ $M \xrightarrow{+2} O$

\therefore SELDOM \Rightarrow RFKFNO

17. A

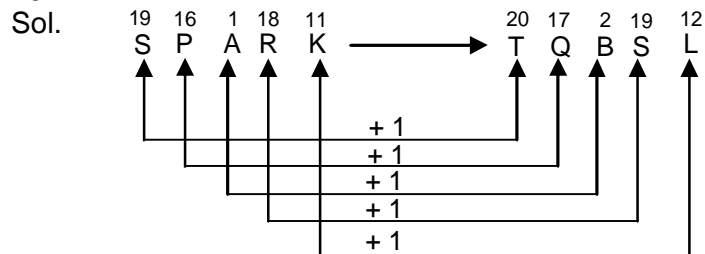


Similarly,

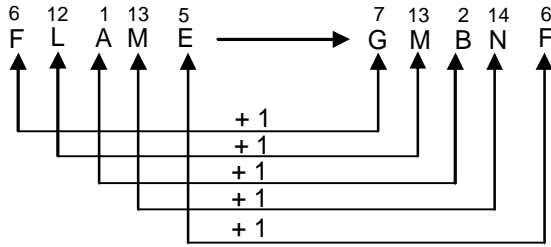


\therefore ARMS \Rightarrow NEZF

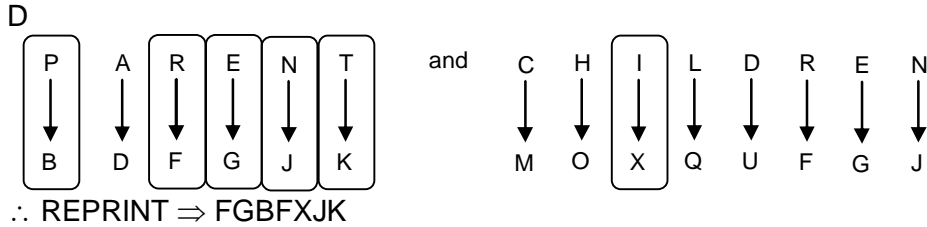
18. A



Similarly,



19. Sol.



20. Sol.

B

S → F Similarly V → L
 T → N O → B
 O → B T → N
 V → L E → K
 E → K S → F

∴ VOTES ⇒ LBNKF

21. Sol.

A

As, $2463 \rightarrow (2 + 4 + 6) \times 3 = 12 \times 3 = 36$

And $5552 \rightarrow (5 + 5 + 5) \times 2 = 15 \times 2 = 30$

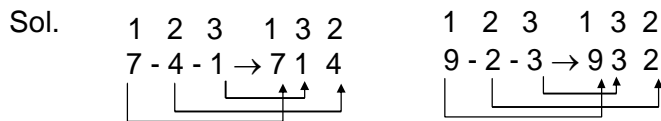
Similarly, $6732 \rightarrow (6 + 7 + 3) \times 2 = 16 \times 2 = 32$

22. Sol.

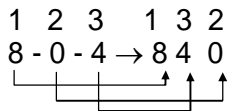
C

∴ ? = 143

23. B



Similarly,



24. B

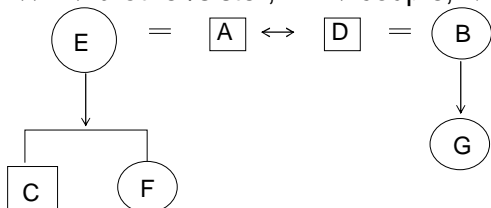
Sol. As, $4 - 4 \Rightarrow 4 \times 4 + 1 = 17$
 $6 - 6 \Rightarrow 6 \times 6 + 1 = 37$
 $2 - 2 \Rightarrow 2 \times 2 + 1 = 5$
 Similarly, $5 - 5 \Rightarrow 5 \times 5 + 1 = 26$

25. C

Sol. As, $4 - 4 \Rightarrow 4 \times 4 - 4 = 12$
 $6 - 6 \Rightarrow 6 \times 6 - 6 = 30$
 $2 - 2 \Rightarrow 2 \times 2 - 2 = 2$
 Similarly, $8 - 8 \Rightarrow 8 \times 8 - 8 = 56$
 $\therefore ? = 56$

26. D

Sol. ' \leftrightarrow ' \rightarrow brother/sister, '=' \rightarrow couple, ' \downarrow ' \rightarrow son/daughter, ' \square ' \rightarrow male, ' \circ ' \rightarrow female.



Since, there are 3 children out of which two are girls, i.e., G and F, so clearly the third child i.e., C is a boy. So, C is the son of E and A.

27. D

Sol. My father's brother's only sibling is my father. My father's mother is my grand mother.

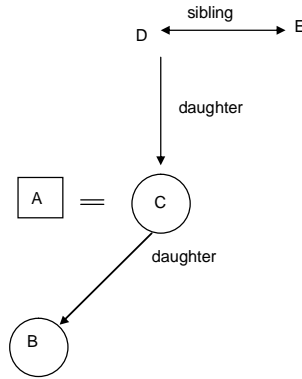
28. B

Sol. Kartik's father's only daughter – in – law is Kartik's wife. Kartik's wife's son is Kartik's son. Kartik's son's wife is Kartik's daughter – in – law.

29. C

Sol. A is B's father and B is C's daughter means A is C's husband and B is their daughter. C is D's only daughter and E is D's only sibling means C is E's only niece. B is the daughter of C (E's niece).

'<->' → brother/sister, '=' → couple, '↓' → son/daughter, '□' → male, 'O' → female.



30. C

Sol. My mother's mother's only son – in – law is my father. My father's sister is my aunt.

31. D

Sol. P – R + Q means P is the sister of R, R is the mother of Q. P is the aunt of Q.

32. B

Sol. T x M + S = N means T is the father of M, M is the mother of S and S is the brother of N. Therefore S is the son of T's daughter.

33. B

Sol. W = A + B – Z means W is the brother of A, A is the mother of B and B is the sister of Z. Therefore, W is maternal uncle of Z.

34. C

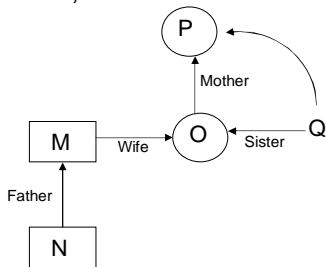
Sol. M x N + O – P ÷ Q means M is the father of N, N is the son of O, O is the daughter of P, P is the mother of Q.

M is the father of N and N is the son of O means M is the husband of O.

O is the daughter of P and P is the mother of Q means O is the sister of Q.

M is the husband of O and O is the sister of Q means M is the brother – in – law of Q

Here, □ indicates that the person is male and O indicates that the person is female.



35. C

Sol.

$$\frac{1}{6 \times \frac{1}{8 \div \frac{1}{1 - \frac{7}{8}}}} + \frac{5}{6} = \frac{1}{6 \times \frac{1}{8 \div \frac{1}{\frac{1}{8}}}} + \frac{5}{6}$$

$$= \frac{1}{6 \times \frac{1}{8 \div 8}} + \frac{5}{6}$$

$$= \frac{1}{6 \times \frac{1}{1}} + \frac{5}{6} = \frac{1}{6} + \frac{5}{6} = 1$$

36. D

Sol. After taking out $\frac{1}{5}$ of its contents, the purse remains with $\frac{4}{5}$ of contents.

Let original content = x

Now, $\frac{1}{12}$ of $\frac{4}{5}x = \text{Rs } 7.40$ or, $\frac{x}{15} = \text{Rs } 7.40 \therefore x = \text{Rs. } 111$

37. C

Sol. Let the train starts with x passengers.

After dropping one third and taking in 96 passengers, the train has

$$x - \frac{x}{3} + 96 = \frac{2x}{3} + 96 \text{ passengers} = \frac{2x + 288}{3} \text{ passengers}$$

At the second station, the number of passengers = $\frac{2x + 288}{6} + 12$

Now, $\frac{2x + 288}{6} + 12 = 248$

Or, $2x + 288 = 1416$

$\therefore x = 564$

38. B

Sol. $0.00625 = \frac{625}{100000} = \frac{1}{160}$

39. A

Sol. $2.\overline{432} = 2 \frac{432 - 4}{990} = 2 \frac{428}{990} = 2 \frac{214}{495}$

40. D

Sol. $10.\overline{036} = 10 \frac{36 - 3}{900} = 10 \frac{33}{900} = 10 \frac{11}{300}$

41. B

Sol. In order to write first 300 numbers, he has to write: 9 one digit numbers, 90 two digit numbers and the remaining 201 numbers of three digits.

To write one digit number, he has to press the key once only.

To write two digit number; he has to press the key twice and to write three digit number, he has to press the key thrice.

\therefore Number of times he has to press the keys to write numbers from 1 to 300 =
 $= 9 \times 1 + 90 \times 2 + 201 \times 3$

$$= 9 + 180 + 603$$

$$= 792$$

42. C

Sol. Let the quotient be Q and the remainder is R

$$\Rightarrow \text{Divisor} = 12 \text{ Q} = 5R$$

$$\therefore Q = \frac{5 \times 48}{12} = 20$$

$$\text{Divisor} = 12 \times 20 = 240$$

$$\therefore \text{Dividend} = 20 \times 240 + 48 = 4848$$

43. D

Sol. $x + y = 27$ and $x^2 - y^2 = 351$

$$\therefore x - y = 351 \div 27 = 13$$

Now, $x + y = 27$ and $x - y = 13$

$$\Rightarrow 2x = 40 \text{ or } x = 20 \text{ so, } y \text{ is } 7$$

Greater number is 20

44. B

Sol. Divide 305 by 4, the remainder is 1.

$$\Rightarrow (347)^{305} \text{ or } (347)^1 \text{ contains 7 in the unit place.}$$

45. A

Sol. Divide 94 by 4, the remainder is 2.

$$\therefore (788)^{94} \text{ or } (788)^2 \text{ contains 4 in the unit place.}$$

46. C

Sol. There are 365 days in a non – leap year. This problem is to add first 365 natural numbers.

\therefore Money Rohit will have by the end of the year

$$= \text{Rs } (1 + 2 + 3 + \dots + 365)$$

$$= \text{Rs } 365 \times \frac{(365 + 1)}{2} = \text{Rs. } 66795$$

47. D

Sol. Let the number be x and y. It is given that

$$2x + 3y = 18 \text{ and } 3x + 2y = 17$$

$$\Rightarrow x = 3 \text{ and } y = 4$$

\therefore Greater number is 4.

48. C

Sol. Difference of sale proceeds in the two cases

$$= \text{Rs } 2.50 + \text{Rs } 5$$

$$= \text{Rs } 7.50$$

Difference of amount by selling 20 oranges

$$= \text{Rs } 1.50 - \text{Rs } 1.25 = 25 \text{ P}$$

Now if difference is 0.25 paise, the number of oranges = 20

But difference is Rs 7.50, the number of oranges
 $= \frac{20}{0.25} \times 7.50 = 600$

49. A

Sol. Let the book contain x pages, so that

$$\left(x - \frac{3}{8}x\right) \times \left(1 - \frac{4}{5}\right) = 30$$

$$\frac{5x}{8} \times \frac{1}{5} = 30$$

$$x = 240$$

50. B

Sol. Let x be the sum

The boy was supposed to find $\frac{7}{12}x$, but he did $x \div \frac{7}{12}$

i.e., $\frac{12x}{7}$

Therefore, $\frac{12x}{7} - \frac{7x}{12} = 95$

or $x\left(\frac{12}{7} - \frac{7}{12}\right) = 95$

or $x\left(\frac{144 - 49}{84}\right) = 95$

or $\frac{95x}{84} = 95$ or $x = 84$

\therefore Correct answer = Rs. $\frac{7}{12} \times 84 =$ Rs. 49

FIITJEE**TARGET NTSE-2017-18****ANSWERS****PART TEST – 1****ENGLISH LANGUAGE TEST****(Paper – 2)****CODE : 1002****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.	C
2.	D	31.	B
3.	B	32.	D
4.	D	33.	C
5.	D	34.	D
6.	B	35.	C
7.	C	36.	C
8.	D	37.	D
9.	B	38.	A
10.	A	39.	B
11.	A	40.	C
12.	D	41.	B
13.	B	42.	A
14.	D	43.	D
15.	A	44.	A
16.	D	45.	D
17.	C	46.	B
18.	C	47.	A
19.	B	48.	B
20.	B	49.	B
21.	A	50.	B
22.	B		
23.	D		
24.	A		
25.	A		
26.	A		
27.	C		
28.	B		
29.	B		

FIITJEE**TARGET NTSE-2017-18**

ANSWERS, HINTS & SOLUTIONS
PART TEST – 1
SAT
(Paper – 3)
CODE : 1003

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.	B	31.	C	61.	A	91.	D
2.	D	32.	A	62.	A	92.	D
3.	A	33.	C	63.	D	93.	C
4.	B	34.	B	64.	A	94.	B
5.	B	35.	B	65.	B	95.	B
6.	C	36.	C	66.	C	96.	D
7.	A	37.	C	67.	A	97.	C
8.	D	38.	D	68.	B	98.	A
9.	B	39.	C	69.	C	99.	A
10.	C	40.	A	70.	D	100.	C
11.	D	41.	A	71.	D		
12.	B	42.	A	72.	C		
13.	A	43.	C	73.	C		
14.	C	44.	D	74.	A		
15.	D	45.	D	75.	C		
16.	D	46.	C	76.	C		
17.	C	47.	B	77.	B		
18.	D	48.	B	78.	A		
19.	D	49.	B	79.	D		
20.	C	50.	C	80.	A		
21.	D	51.	B	81.	D		
22.	A	52.	D	82.	D		
23.	C	53.	A	83.	B		
24.	A	54.	D	84.	D		
25.	D	55.	A	85.	A		
26.	A	56.	D	86.	B		
27.	B	57.	B	87.	D		
28.	D	58.	A	88.	D		
29.	A	59.	C	89.	C		
30.	A	60.	D	90.	D		

HINTS & SOLUTIONS

1. B

$$\text{Sol. } \left(\frac{19v}{20}\right)^2 = v^2 - 2as \quad \dots(i)$$

$$v^2 = 2a(ns) \quad \dots(ii)$$

from (i) & (ii), we set $n = 11$

2. D

$$\text{Sol. } i = \frac{q}{t} = \frac{1.6 \times 10^{-19}}{1.5 \times 10^{-16}} = 1.07 \times 10^{-3} \text{ A}$$

3. A

Sol. Overloading of an electric circuit implies drawing of large current.

4. B

$$\text{Sol. } R = \frac{\rho L}{\pi \frac{D^2}{4}} \quad ; \quad R_1 = \frac{\rho 4L}{\pi D^2} \Rightarrow R_1 = R$$

5. B

$$\text{Sol. } R = \frac{3 \times 1}{3+1} = \frac{3}{4} \Omega$$

6. C

$$\text{Sol. } a_1 t_1 = a_2 t_2 \Rightarrow a \times 2 = 4 \times 3 \Rightarrow a = 6 \text{ m/s}^2$$

7. A

$$\text{Sol. } i = \frac{2 \times 10000 \times 1.6 \times 10^{-19}}{60} = 0.5 \times 10^{-16} \text{ A}$$

8. D

$$\text{Sol. } \frac{R_1 R_2}{R_1 + R_2} = \frac{6}{5}; \text{ Given } R_1 = 2; R_2 = 3 \Omega$$

9. B

$$\text{Sol. } \frac{16+0}{2} \times t = 0.4 \Rightarrow t = 0.05$$

10. C

$$\text{Sol. } R = \frac{12 \times 6}{12+6} = 4 \Omega$$

11. D

$$\text{Sol. } R_{\text{eq}} = R + \frac{2R}{3} + R = \frac{8R}{3}$$

12. B
 Sol. $t = \frac{10 \times 10^{-3} \times 10^3 \times 4200 \times 10}{10^3} = 420 \text{ s}$
13. A
 Sol. $p = i^2 R$
14. C
 Sol. Velocity is constant.
15. D
 Sol. Sample contain 12.04×10^{23} MgCO_3 molecule
 Therefore 6.022×10^{23} molecules weigh 84 gms
 $\Rightarrow 12.04 \times 10^{23}$ molecules weigh $84 \times 2 \text{ gm} = 168 \text{ gm} = 0.168 \text{ kg}$
16. D
 Sol. 4 gram ions of SO_4^{2-} are present in 1 gram molecule of $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$.
17. C
 Sol. Removal of CO_2 & H_2O from atmospheric air by using KOH and anhydrous CaCl_2 is an example of chemical and physical changes respectively.
18. D
 Sol. With increase in P of colloisions increase as there is decrease in volume (at constant temperature).
19. D
 Sol. 100 ml of solution contains – 28.6 g of solute
 50 ml of solution contains – 14.3 g of solute
 & 2.4 g solute separates when solution is cooled from 50°C to 40°C
 So, solute left in solution = 11.9 g ($14.3 - 2.4$) m 50 ml
 $\frac{m}{v} \% = \frac{11.9}{50} \times 100 = 23.8\%$
20. C
 Sol. Liquid \rightarrow Definite volume, Gas \rightarrow Highly compressible, Plasma \rightarrow Super energetic, Bose-Einstein condensate \rightarrow Super low density.
21. D
 Sol. Suspension contains the largest particle.
22. A
 Sol. It can be separated into sulphur & iron fillings by physical method is not a characteristic property of the residue.
23. C
 Sol. Tyndall effect & Brownian motion are observed in an emulsion.
24. A

Sol. Number of neutrons in 0.23 g sodium metal is 72.264×10^{21} .

25. D

Sol. Density of air will be highest at -73°C and 2 atm.

26. A

Sol. 16 g of O_2 ; $n = \frac{16}{32} = \frac{1}{2}$; No. of atoms = $2 \times \frac{1}{2} \times N_A = N_A$

27. B

Sol. No. of p + No. of n = 14
 $6 + 8 = 14$

Mass of neutron = $\frac{8}{2} = 4$ units

Mass of p = $6 \times 2 = 12$ units

Now mass no. = $12 + 4 = 16$ units

% change = $\frac{2}{14} \times 100 = 14.28\%$

28. D

Sol. Vitamins synthesized by bacteria inside the gut are B_{12} & K.

29. A

Sol. In mammals, the digestion of starch starts from mouth.

30. A

Sol. RBCs in mammals have no nucleus because it degenerates during development.

31. C

Sol. Lactose is composed of Glucose + Galactose.

32. A

Sol. Anaerobic respiration yields minimum number of ATP.

33. C

Sol. Excretion of urea is called ureotelism.

34. B

Sol. Left ventricle chamber of heart have the thickest muscular wall.

35. B

Sol. Hydrolytic enzymes are present in lysosomes.

36. C

Sol. Pleura are double membrane sac which envelop the lungs.

37. C

Sol. Carbon monoxide, a poisonous gas emitted by automobiles, prevent transport of oxygen into the body tissues by forming a stable compound with haemoglobin.

38. D

Sol. 70s ribosomes break up into 50 S and 30 S.

39. C

Sol. In man, renal vein takes away blood from kidneys.

40. A

Sol. Pace-maker is implanted when SA node is defective.

41. A

Sol. $x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$

$$= 5 \times (111 - xy) \quad (i)$$

$$(x + y)^2 = x^2 + y^2 + 2xy$$

$$25 = 111 + 2xy$$

$$xy = -43 \quad (ii)$$

$$x^3 y^3 = 5 \times (111 + 43) = 770$$

42. A

Sol. $ab = 1$ $a = \frac{2 - \sqrt{5}}{2 + \sqrt{5}} \times \frac{2 - \sqrt{5}}{2 + \sqrt{5}} \Rightarrow \frac{4 + 5 - 4\sqrt{5}}{-1} = 4\sqrt{5} - 9$

$$b = \frac{2 + \sqrt{5}}{2 - \sqrt{5}} \times \frac{2 + \sqrt{5}}{2 + \sqrt{5}} = \frac{4 + 5 + 4\sqrt{5}}{-1} = -(9 + 4\sqrt{5})$$

$$a^2 + b^2 = (a + b)(a - b) \Rightarrow (-18)(8\sqrt{5}) = -144\sqrt{5}$$

43. C

Sol. $\frac{1}{3 - \sqrt{8}} \times \frac{3 + \sqrt{8}}{3 + \sqrt{8}} = \frac{3 + \sqrt{8}}{9 - 8} = 3 + \sqrt{8}$

$$\frac{1}{\sqrt{8} - \sqrt{7}} = \sqrt{8} + \sqrt{7}, \frac{1}{\sqrt{7} - \sqrt{6}} = \sqrt{7} + \sqrt{6}, \frac{1}{\sqrt{6} - \sqrt{5}} = \sqrt{6} + \sqrt{5}$$

$$3 + \sqrt{8} - \sqrt{8} - \sqrt{7} + \sqrt{7} + \sqrt{6} - \sqrt{6} - \sqrt{5} + \sqrt{5} + 2$$

$$\Rightarrow 3 + 2 = 5$$

44. D

Sol. $x + 2 = 0$, $x = -2$

$$\begin{aligned} \text{Remainder} &= f(-2) = 2(-2)^4 - 6(-2)^3 + 2(-2)^2 - (-2) + 2 \\ &= 32 + 48 + 8 + 2 + 2 \\ &= 92 \end{aligned}$$

45. D

Sol. $\frac{3}{5} = \frac{3}{5} \times \frac{15}{15} = \frac{45}{75}$

$$\frac{2}{3} = \frac{2}{3} \times \frac{25}{25} = \frac{50}{75}$$

46. C

Sol. Let $n = a^2$

$$\begin{aligned} \text{next perfect square} &= (a+1)^2 = a^2 + 2a + 1 \\ &= n + 2\sqrt{n} + 1 \end{aligned}$$

47. B

Sol. $a^{1/3} + b^{1/3} + c^{1/3} = 0$

$$(a^{1/3})^3 + (b^{1/3})^3 + (c^{1/3})^3 = 3(a^{1/3})(b^{1/3})(c^{1/3})$$

$$a + b + c = 3 \times \sqrt[3]{abc}$$

$$(a + b + c)^3 = 27(abc)$$

48. B

Sol. $x = \sqrt[3]{2 + \sqrt{3}}, x^3 = 2 + \sqrt{3}$

$$\frac{1}{x^3} = \frac{1}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}} = \frac{2 - \sqrt{3}}{4 - 3} = 2 - \sqrt{3}$$

$$x^3 + \frac{1}{x^3} = 2 + \sqrt{3} + 2 - \sqrt{3} = 4$$

49. B

Sol. $f(x) = x^3 - ax^2 - 13x + b$

$$f(1) = f(-3) = 0 \text{ (Factor th).}$$

$$f(1) = 1 - a - 13 + b$$

$$= -12 - a + b = 0 \text{ (i)}$$

$$f(-3) = -27 - 9a + 39 + b$$

$$12 - 9a + b = 0 \text{ (ii)}$$

On solving (i) and (ii), $a = 3, b = 15$

50. C

Sol. $(x^{b-c})^{-bc} \times (x^{c-a})^{1/ca} \times (x^{a-b})^{1/ab}$

$$x^{\frac{b-c}{bc}} \times x^{\frac{c-a}{ca}} \times x^{\frac{a-b}{ab}}$$

$$x^{\frac{b}{bc} - \frac{c}{bc}} \times x^{\frac{c}{ca} - \frac{a}{ca}} \times x^{\frac{a}{ab} - \frac{b}{ab}}$$

$$x^{1/c-1/b} \times x^{1/a-1/c} \times x^{1/b-1/a}$$

$$x^{1/c-1/b+1/a-1/c+1/b-1/a}$$

$$x^0 = 1$$

51. B

Sol. $x^4 + \frac{1}{x^4} = 194$

$$\left(x^2 + \frac{1}{x^2}\right) - 2 = 194 \quad x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2} - 1\right)$$

$$\left(x^2 + \frac{1}{x^2}\right)^2 = 196 = 4(14-1)$$

$$\left(x + \frac{1}{x}\right)^2 - 2 = 14 = 52$$

$$\left(x + \frac{1}{x}\right)^2 = 16$$

$$x + \frac{1}{x} = 4$$

52. D

Sol. $\frac{16}{225} = \frac{16}{5^2 \times 3^2}, \frac{5}{18} = \frac{5}{2 \times 3^2}, \frac{2}{21} = \frac{2}{7 \times 3}$
 $\frac{7}{250} = \frac{7}{5^3 \times 2}$

denominator contains no quantity other than 2, 5.

53. A

Sol. $7^1 = 7, 7^2 = 49, 7^3 = 343, 7^4 = 2401, 7^5 = 16807$
 Units place repeats after 4 powers.
 $103 = 4 \times 25 + 3$ remainder = 3

54. D

Sol. If HCF = LCM both numbers must be prime.
 So, $n_1 = n_2$.

55. A

Sol. $a + b = 43$
 HCF (a, b) = 1 (both coprime)
 LCM = $a \times b = 450$
 $a = 18, b = 25$

56. D

Sol. $f(x) = ax^2 + bx + c = 0$
 $4x + 5$ is a factor
 $x = \frac{-5}{4}$
 remainder = $f\left(\frac{-5}{4}\right) = 0$. (factor th).
 $\left(\frac{-5}{4}\right)^2 + b\left(\frac{-5}{4}\right) + c = 0$ a
 $25a - 20b + 16c = 0$

57. B

Sol. $a^x = b, b^y = c, c^z = a$
 $a^{xy} = b^y = c$

$$a^{xyz} = b^{yz} = c^z = a$$

$$a^{xyz} = a$$

$$xyz = 1$$

58. A

$$\text{Sol. } \frac{(243)^{0.13} \times (243)^{0.07}}{7^{0.25} \times 49^{0.075} \times 343^{0.2}} = \frac{(243)^{0.2}}{7^{0.25} \times 7^{0.15} \times 7^{0.6}}$$

$$\frac{(3^5)^{0.2}}{7^{0.25+0.15+0.6}} = \frac{3^1}{7^1} = \frac{3}{7}$$

59. C

$$\text{Sol. } a = 2^{1/3} - 2^{-1/3}$$

$$(a + 2^{-1/3}) = (2^{1/3})^3$$

$$(a + 2^{-1/3})^3 + 3 \times a \times 2^{-1/3} (a + 2^{-1/3}) = 2$$

$$a^3 + 2^{-1} + 3 \times a \times 2^{-1/3} \times (2^{1/3}) = 2$$

$$a^3 + \frac{1}{2} + 3a = 2$$

$$a^3 + 3a - \frac{3}{2} = 0$$

$$2a^3 + 6a - 3 = 0$$

60. D

$$\text{Sol. } 7^3 = 343, 8^3 = 512, 9^3 = 729$$

$$8^3 > 399$$

$$\text{least number} = 512 - 399 = 113$$

61. A

Sol. Plantation farming → A single crop is grown in a large area
 Sericulture → Rearing the silkworms for silk production
 Horticulture → Intensive cultivation of fruits and vegetables
 Jhumming → Burning a piece of land for cultivation

62. A

Sol. Father of communism → Marx

Cheka → Russian Secret Police

Leader of the provisional government → Kerenskii

Leader who introduced collectivization programme → Joseph Stalin

63. D

Sol. The causes of the revolutionary disturbances in Russia in 1905 were Russia's defeat in the Russo – Japanese War of 1904 due to the poorly organized Russian army, the prices of essential commodities rose, so that real wages declined by 20 per cent, Workers were dismissed at the Putilov Iron Works.

64. A
Sol. It is a center for mass killing during Nazi Germany.
65. B
Sol. Reign of Terror → Maximilian Robespierre
April Theses → Three demands of Lenin
November Criminals → Supporters of the Weimar Republic
Holocaust → Suffering endured by Jews
66. C
Sol. Justice → On social, economical and political ground
Liberty → Freedom of thought and expression
Equality → No discrimination on status opportunity
Fraternity → Bounding and integrity of Nation
67. A
Sol. Statement A, C and D are correct.
68. B
Sol. Ghettos → Areas of jews
Reichstag → German parliament
Duma → Russian parliament
Sans Culottes → Jacobins
69. C
Sol. Both statement I and II are true and statement I is the correct explanation of statement II.
70. D
Sol. Both statement I and statement II are true and statement II is the correct explanation of statement I.
71. D
Sol. Both statement I and statement II are true but statement II is not the correct explanation of statement I
72. C
Sol. Cardamom Hills are the part of southern western ghats.
73. C
Sol. A is true but R is false.
74. A
Sol. Both A and R are true, and R explain A.
75. C
Sol. Andaman and Nicobar island.
76. C
Sol. Godavari is the longest river of peninsular India.

77. B
Sol. Lakshadweep has the least area.
78. A
Sol. 1 hrs.
79. D
Sol. Mahendragiri, Doda Betta, Namcha Barwa, Kanchenjunga.
80. A
Sol. Four divisions of Himalaya from west to east are Punjab, Kumaon, Nepal, Assam, Purwanchal.
81. D
Sol. Chenab is the tributary of Indus that originate from Himachal Pradesh.
82. D
Sol. Wular lake is located in Jammu and Kashmir.
83. B
Sol. A and C statements are correct.
84. D
Sol. Democracy is better than any other form of rule because it promotes equality among citizens, enhances the dignity of the individual, improves the quality of decision making.
85. A
Sol. Chile → End of military dictatorship
Nepal → King agreed to give up his powers
Poland → End of one party rule
Ghana → Freedom from Britishers
86. B
Sol. The practice of untouchability is an example of social divisions.
87. D
Sol. A is false but R is true.
88. D
Sol. Zimbabwe have initially a Republic with a presidential system of government.
89. C
Sol. In more and more countries, rulers and being elected by the people.
90. D
Sol. In a non – democratic country, dictators do not allow other parties to function, e.g. Chile, freedom of speech and expression is denied e.g., Chile, people cannot choose their leaders or change them e.g. Myanmar.
91. D

- Sol. Democracies are more prosperous than others is a negative argument against democracy.
92. D
Sol. People are free to believe in and practice any religion is not a valid reason.
93. C
Sol. General Musharaff conducted a military coup in October 1999, overthrowing a democratically elected government, In 2002 he held a referendum which, according to Pakistani media, human rights organizations the democracy activists, was based on malpractices and fraud.
94. B
Sol. Kerala has low infant mortality rate.
95. B
Sol. Migration is the movement of people across the regions and territories, migration can be internal as well as external and migration is the important determinant of population change.
96. D
Sol. Area of highest growth rate of population – Nagaland and Area with highest density of population – Delhi.
97. C
Sol. Agriculture is the most labours absorbing sector of economy.
98. A
Sol. 150, 240 and 60 families
99. A
Sol. The total area of irrigated land in Palampur village is 200 hectares.
100. C
Sol. Irrigation is now done through electric – run tubewells, reducing the farmer's dependence on rainfall, also enabling larger areas of land to be irrigated and irrigation improvement allowed farmers to grow three different crops in a year.