SYMBIOSIS NATIONAL APTITUDE TEST (SNAP)

SOLVED PAPER - 2023

Held On : 10 December 2023 **Memory Based**

GENERAL ENGLISH: READING COMPREHENSION, VERBAL ABILITY

1. The proverb "A rolling stone gathers no moss" emphasizes that:

(a) One should be content with what they have and avoid change.

(b) Patience and perseverance are key to achieving success.

(c) Frequent movement leads to a lack of progress.

(d) New experiences bring valuable knowledge and growth.

2. In the following question, a sentence is given with a phrasal verb in bold. Read each sentence carefully to find out whether there is any error in the phrasal verb, if there is any error, choose the correct phrasal verb from given options. If the phrasal verb given in bold is correct, mark (d) as your answer.

She **narrowed** the exam **down** in the first attempt.

(a) opted for (b) nailed down

(c) passed out (d) No Error

3. The question below consist of a set of labelled sentences. Out of the four options given, select the most logical order of the sentences to form a coherent paragraph.

P: When the game of life is finally over there is no second chance to correct our errors.

Q: Time is the greater equalizer of all mankind.

R: Time offers opportunity but demands a sense of regard.

S: It has taken away the best and the worst of us without regard of either.

(a) QSRP (b) RSQP

(c) QRSP (d) RSPQ

4. In the following question, the sentences have been given in Active / Passive Voice. From the given alternatives, choose the one which best expresses the given sentence in Passive / Active Voice as your answer.

You can play with these kittens quite safely.

(a) These kittens can played with quite safely.

(b) These kittens can play with you quite safely.

(c) These kittens can be played with you quite safely.

(d) These kittens can be played with quite safely.

5. The speaker describes their overwhelming workload as a _____ drowning them in tasks.

(a) Rushing river

(b) Sparkling fountain

(c) Gentle breeze

(d) Heavy stone

6. In the following questions, find out which part of the sentence has an error. The letter corresponding to that part is your answer. If there is no mistake, the answer is (d)'No error.'

If I was you,(a)/ I would not allow them (b)/ such leverage in the business.(c)/ No error(d)

7. In the following questions, choose the word opposite in meaning of the highlighted word given in the sentence.

The journey was becoming **treacherous,** but they continued on.

(a) perilous (b) mutinous

(c) seditious (d) secure

8. In the following question, out of the four alternatives, choose the one which best expresses the meaning of the highlighted word given in the sentence.

The soldier showed an exemplary courage.

(a) flawed (b) faulty

(c) ideal (d) boisterous

9. Fill in the blank with an appropriate preposition-

We must mail the letter _____ Friday.

(a) by (b) since

(c) until (d) for

10. Choose the correct question tag to complete each sentence.

I guess he is in a hurry, _____?

(a) doesn't he (b) is he

(c) isn't he (d) does he

11. The librarian asked everyone to be more _ _ _ as she needed silence to concentrate on filing the new books.

(a) respectful (b) enthusiastic

(c) confused (d) talkative

12. Having _ _ _ the report all night, Sarah was exhausted but satisfied with the final product.

(a) written

(b) write

(c) to write

(d) writes

13. Choose the correct spelling of the word given in bold.

The rich youth cynically declared that the **penacea** for all speeding tickets was a big enough bribe.

(a) panacea (b) penecea
(c) panacia (d) panacya

14. *Choose the correct conjuction for each sentence.*

_____ my best friend Hasan is five years older than me, he looks very young.

(a) Until (b) When
(c) Although (d) Because

15. In the question below has two blanks, each blank indicating that something has been omitted. Choose the set of words for each blank that best fits the meaning of the sentence as a whole.

After a _____ three months of stock market activity, the price of bonds _____ last week.

(a) tumultuous, stabilised
(b) hectic, fell
(c) variety, surged
(d) continuous, soared

QUANTITATIVE, DATA INTERPRETATION AND DATA SUFFICIENCY

16. Roy bought articles at Rs 20 per item. He sells them for Rs 2, Rs 4 and Rs 6 and so on. He intends to make at least a profit of 40%. What will be the minimum number of articles he should sell?

(a) 25 (b) 27
(c) 28 (d) None of these

17. A and B have bags full of one rupee coins. Total value of the amount with them is Rs 45. There was a hole in both the bags due to which 5 one rupee coins were dropped from each bag. Product of the remaining number of coins in the bags is now 124. Find the product of the number of coins in the bags initially.

(a) 350
(b) 324
(c) 200
(d) None of these

18. Imran sold a mobile phone for Rs. 17600 after giving 12% discount on its marked price. He earned a profit of 10%. Find the profit percentage earned by him when no discount is given?

(a) 12% (b) 22%
(c) 25% (d) None of these

19. During an event, 160 persons participated. The participants were grouped into male and female. There were 1240 apples to be distributed among them. If each male gets 7 apples and each female gets 12 apples. Find the number of females present at the event.

(a) 24 (b) 26
(c) 28 (d) 30

20. A container has a mixture containing three fourth of milk and remaining is water. After diluting the mixture with water, final mixture contains half milk and half water. How much of the liquid will be extracted and replaced with water?

(a) 1/2 (b) 1/4
(c) 1/3 (d) None of these

21. Shopkeeper mixes two types of sugar. If the mixes them in the ratio 3 : 2, his profit is 10% and if he mixes them in the ratio 2 : 3, his profit is 5%. If the selling price of the mixture is Rs 40, then find the ratio of cost prices of both types of sugar.

(a) 2 : 3 (b) 19 : 24
(c) 17 : 20 (d) None of these

22. 4 different positive numbers are written in ascending order. $1/4^{th}$ of the average of all the 4 numbers is 24 less than the greatest of these numbers. If the average of the first 3 numbers is 32, the greatest number among the given number is:

(a) 32 (b) 34
(c) 36 (d) None of these

23. A and B complete a certain work together in 2 days working 5 hours a day. B and C complete the same work in 4 days working 6 hours a day. C and A complete the same in 2 days working 6 hours a day. In how many days can A finish the work alone if he works for 5 hours a day?

(a) 3 (b) 5
(c) 12 (d) 15

24. Three friends Sonu, Monu and Romu play cricket. They scored 342 runs in total. If the ratio of runs scored by Sonu and Monu is 3 : 2 and the ratio of runs scored by Monu and Romu is also 3 : 2, then find the number of runs scored by Romu?

(a) 96 (b) 64
(c) 72 (d) None of these

25. Letters of the word MINUTE be arranged such that the vowels occupy only odd positions.

(a) 32 (b) 36
(c) 48 (d) None of these

26. In how many ways 7 different chocolates can be distributed to A, B and C such that at least one of them gets exactly one chocolate?

(a) 1050 (b) 1176
(c) 1218 (d) None of these

27. To select a group out of three, an unblased die is rolled. If the dice shows 1, then group X is chosen. If it shows 2 or 3, then group Y is chosen and if it shows 4, 5 or 6, then group Z is chosen. Group X has 3 girls, 2 boys. Group Y has 3 girls and 4 boys. Group Z has 4 girls and 5 boys. The dice is rolled and the group is chosen, if it is known that girl is chosen, then find probability that she is chosen from group Y?

(a) 7/90 (b) 63/293
(c) 90/293 (d) None of these

28. Mohini and Rohini are classmates. Mohini speaks truth 6 out of 9 times and Rohini speaks truth 3 out of 6 times. Find the probability that they contradict each other on certain fact?

(a) 1/2 (b) 2/3
(c) 4/5 (d) None of these

29. x, y and z are three consecutive numbers and it is given that $\log(1 + xz) = 2A$, then find A.

(a) log x
(b) log y
(c) log z
(d) None of these

30. If in a decreasing AP, sum of all the terms except the first term is –75 while the sum of all the terms is 0. If the difference between the 9^{th} term and the 13^{th} term is 20, the find the first term of the AP?

(a) 25 (b) 30
(c) 35 (d) None of these

31. From each vertex of an equilateral triangle with area of 240 square units, corners are cut to form a regular hexagon. Area of hexagon will be:

(a) 120 (b) 160
(c) 180 (d) None of these

32. A flower bed has an area of 125, 375 and 250 squre meters. What is the maximum rows of flowers a farmer can grow if the width of a row is 3 square meters.

(a) 249 (b) 246
(c) 250 (d) None of these

33. A person observes the top of a building from a point, the angle of elevation is 30 degrees. He moves 500 m towards the building and angle of elevation of the top of the building changes to 75 degrees. Find the height of the building.

(a) $125(\sqrt{3}+1)$

(b) $250(\sqrt{3}+1)$

(c) $500(\sqrt{3}+1)$

(d) None of these

State	% population below Education index	Proportion of Males and Females	
		Below Education Index	Above Education Index
Gujarat	15	3:2	2:1
Delhi	20	1:3	3:1
Rajasthan	18	3:4	1:4
MP	12	2:5	2:3
Punjab	11	3:5	4:5
UP	16	2:3	5:1
Kerala	10	1:5	3:2

34. If male population above Education Index for UP is 1.6 lakhs, then find the total population of UP in lakhs (approximately)?

(a) 2.28
(b) 2.96
(c) 3.67
(d) 3.69

35. $3+2=7, 51+?=76, 32-8=-32, 12+3=21$
Find the value of ?

(a) 7 (b) 25
(c) 5 (d) None of these

ANALYTICAL & LOGICAL REASONING

36. Find the next term of the series:
1, 3, 7, 13, 21, 31, _____

(a) 67 (b) 43
(c) 31 (d) 52

37. Choose the correct option Tue, Wed, Fri, Mon, ?, Wed

(a) Wed (b) Fri
(c) Thu (d) Sat

38. If 8055 & 238945 are spelled as BOSS and ZEBRAS then how LEETS is spellel ?

(a) 23375 (b) 13357
(c) 13572 (d) None of these

39. Suresh bhai who is father in law of wife of Mahesh Bhai has only one son. The only Brother in law of Mahesh is Paresh & Suresh is Ramesh's Grandfather. If Mahesh has no Sister in law, what is Paresh to Ramesh?

(a) 21534 (b) 21354
(c) 21543 (d) None of these

40. Find logically correct sequence.

1. Pune
2. Aga Khan Palace
3. World
4. India
5. Maharashtra

(a) 21534 (b) 21354
(c) 21543 (d) 15425

41. In a 24 hours time clock, if angle (measured in clockwise directions) between long hand & short hand of a clock is represented by some variable P, then find [(value of P at 6:00) + (value of P at 18:00)] / (Value of P at 12:00) = ?

(a) 3
(b) 2
(c) 4
(d) None of these

42. Mohini and Rohini are classmates. Mohini speaks truth 6 out of 9 and Rohini speaks truth 3 out of 6. Probability that they contradict each other on certain fact?

(a) 1/2 (b) 4/5
(c) 2/3 (d) None

43. Fine the number that will complete the given series:
15, 21, 27, 33, 35, 39, _, 51, 55

(a) 47
(b) 49
(c) 45
(d) 50

44. Arange from bottom to top

1. Knees
2. Elbow
3. Head
4. Toungue
5. Neck
6. Foot

(a) 345216 (b) 345261
(c) 345621 (d) None of these

45. Find the correct Calendar Repeation of 2003

(a) 2032 (b) 2034 (c) 2025 (d) 2028

DIRECTIONS (Qs. 46-47) : *In each of the questions below are given some statements followed by two conclusions. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known fact.*

(a) If only conclusion I follows.
(b) If only conclusion II follows.
(c) If either conclusion I or II follows.
(d) If neither conclusion I nor II follows.

46. **Statements :**

Only a few Chocolate are Table
Only a few Tables are Plants
Only a few Plants are Fan

Conclusions :

I. Some fan is Chocolate is a possibility
II. All fan are Tables

47. **Statements :**

Only a few Ant are Cow
No cow is Joker
Only a few Joker are Deer

Conclusions :

I. Some Deer are Ant
II. Some Ant are Joker.

48. Give a statement followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is/are implicit in the statement.

Statement :

All the species of plants and animals are part of biodiversity and ecosystems and play major role in the overall bealth of the environment.

Assumptions :

I. Preserve or create a backyard habitat. Save as many native plants as you can when building or landscaping.
II. One of the major goals of sustainability is to preserve biodiversity. All life on Earth is connected through the flow of energy (planetary food web), and each time a species becomes endangered or lost to extinction, one more part of that energy flow is lost.

(a) Neither assumption I nor II is implicit.
(b) Both assumption I and II are implicit.
(c) Only assumption I is implicit/
(d) Only assumption II is implicit/

49. **Statement :** The Indian Council of Medical Research issued a warning two years ago, based on studies conducted in hospitals that resistance to antibiotics was found in 50% of patients. A large number of infants were dying due to infections that did not respond to treatment.

Courses of Action :

I. The revision of antibiotics classes by the World Health Organisation in its list of essential medicines is a welcome step in the global initiative to push back against antimicrobial resistance, the phenomenon of bacteria becoming resistant even to the most potent drugs.
II. Close scrutiny of these by national stewardship programmes such as those initiated by the ICMR is needed.

Which of the following will be the course of action?

(a) Only I (b) Both I and II
(c) Either I or II (d) Only II

DIRECTIONS (Qs. 50-51) : *Read the following information carefully and mark the correct answer to the questions given below.*

Sampada Apartment is a housing society formed by a group of professors of a University. It has six flats on a floor in two rows facing North and South which are allotted to Prof. Purohit, Prof. Qureshi, Prof. Rathor, Prof. Sawant, Prof. Tripathy and Prof. Usman. Prof. Qureshi gets a North facing flat and it is not next to Prof. Sawant's flat. Prof. Sawant and Prof. Usman get their flats which are diagonally opposite to each other. Prof. Rathor gets a south facing flat which is next to Prof. Usman's flat. Prof. Tripathy's flat is North facing.

50. Which of the following professors get South facing flats?

(a) Prof. Qureshi, Prof. Tripathy and Prof. Sawant
(b) Prof. Usman, Prof. Tripathy and Prof. Purohit
(c) Prof. Usman, Prof. Rathor and Prof. Purohit
(d) None of the above

51. If the flats of Prof. Tripathy and Prof. Purohit are interchanged, whose flat will be next to that of Prof. Usman?

(a) Prof. Rathor (b) Prof. Tripathy
(c) Prof. Usman (d) None of the above

52. There has been a considerable drop in sales of four wheelers during the past six months when compared to the number of four wheelers sold during this period last year.

Which of the following can the probable cause of the above phenomenon?

(A) The govt. has imposed higher excise duty on four wheelers at the beginning of this year.

(B) The petrol prices have risen considerably during the past eight months.

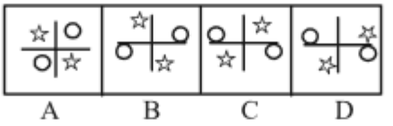
(C) The rate of interest on home and car loans have been rising for the past seven months.

(a) All (A), (B) and (C) (b) (A) and (C) Only

(c) (B) and (C) Only (d) (B) Only

53. 

The water image of the above figure is?



(a) D (b) C (c) A (d) B

54. **Statement :** The Government has decided to construct an eight-lane super highway across the state to facilitate fast movement of vehicles.

Which of the following can be an **assumption** which is implicit in the above statement.

(a) The Government has adequate resources to construct the proposed super highway

(b) The people of the state may protest against the Government's decision as their farm land will be taken over the Government for constructing the highway.

(c) The Government may find it difficult to enrol a suitable contractor for constructing the highway.

(d) There is no other highway which can be used for transportation of goods across the state

55. **Statement :** Thousands of farmers in drought-hit western Madhya Pradesh have been protesting for over a week demanding that authorities increase the minimum price for their crops and waive their bank loans. Madhya Pradesh is one of several states that have suffered droughts and crop failures in recent years. Which of the following courses of action will help to improve the current scenario?

(i) Government should punish those involved in the protests.

(ii) Cloud seeding should be used in such situations.

(iii) Government should constitute a team to assess the severity of drought and convince that appropriate compensation will be paid.

(a) Only (i)

(b) Both (i) and (ii)

(c) Only (iii)

(d) Both (ii) and (iii)

DIRECTIONS (Qs. 56-57) : *Based on the information, answer the questions which follow:*

In a department of a hospital, Amir, Sahil, Vaibhav and Gaurav are doctors and each of them has a duty from 9 am of Day 1 to 9 am of Day 2 for 24 hours in the same order one after the other. After each duty, the doctor gets an off for 3 days, including the day he is relieved from duty. For example, if Amir has a duty on Monday, his next duty will now fall on Friday and this rotation goes on.

56. If 10th July 2020, Gaurav was on duty, who will be on duty on 26th September 2020?

1. Amir 2. Sahil
3. Vaibhav 4. Gaurav

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

57. If on 14th February 2020, Sahil was on duty, then who did the maximum number of duties in that month?

1. Amir 2. Sahil
3. Vaibhav 4. Gaurav

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

58. **Effect:** The temple at the religious site wears a deserted look with the number of devotees trickling down.

Which of the following can be a possible causes of the above effect?

(a) A structural engineer had visited the temple a month back and had declared the structure unsafe.

(b) The temple is facing drastic depletion of its funds which had accumulated over the years due to offerings made by devotees.

(c) The local corporation decided to donate a huge amount of money to the temple for its renovation.

(d) The village housing the religious site has qualified priests to perform religious ceremonies.

DIRECTIONS (Qs. 59-60) : *Answer the question with the help of the information given below:*

One word can be formed with the letters of the English alphabet in order with position numbered 5th , 24th and 16th and AND as a suffix.

59. Find the suffix of the word whose first three alphabets are 19th, 8th and 18th position in the English alphabet and have opposite meanings of the word formed earlier.

(a) ACT (b) AND (c) INK (d) NAL

60. Find the suffix of the word which can be formed using the alphabets in order with position numbered 3rd, 15th , 14th, 20th and 18th and have the same meaning as the word formed in the above question.

(a) ACT (b) AND (c) INK (d) NAL

ANSWERS WITH EXPLANATIONS

1. (c) The word 'moss' symbolizes inactivity and lack of progress. A rolling stone keeps moving, avoiding such stagnation.

2. (b) The phrasal verb 'narrowed down' means 'remove less important options to make it easier to choose. 'Opted for' means 'to choose'; 'nailed down' means 'succeed or achieve something'; 'passed out' means 'distribute' and 'passed away' means 'die. Hence, option (b) is the correct answer.

3. (a) Q will be the first sentence as it gives an introduction to the paragraph that talks about 'Time'. Only option (a) starts with Q; so, it will be the answer.

4. (d) In passive voice the focus shifts to object being acted upon. The construction of the sentence imphasizes the safety aspect and removes the agent (year) performing the action.

5. (a) 'Rushing river' completes the metaphor. It creates a vivid image of being overwhelmed by a constant flow of work, similar to being swept away by a strong current

6. (a) "If I were you" is the correct formation as per the conditional rules.

7. (d) The word **treacherous** means 'presenting hidden or unpredictable dangers'. **Perilous** means 'full of danger or risk'; **mutinous** means 'wilful or disobedient'; **seditious** means 'inciting or causing people to rebel against the authority of a state or monarch' and **secure** means 'certain to remain safe and unthreatened'. Thus, **secure** is the antonym of **treacherous**.

8. (c) Exemplary means commendable, ideal and admirable etc. thus, option (c) i.e. ideal is the correct answer.

9. (a) When we talk about a deadline for a future event, we use 'by'. We use 'until' when we talk about a continuous process that will stop in the future.

10. (c) isn't he

11. (a) 'Respectful' is the most appropriate choice because libraries are places where quiet is expected. It indicates consideration for others.

12. (a) The past participle "written" is needed because the action of writing happened before Sarah's exhaustion and satisfaction.

13. (a) panacea

14. (c) 'Although' is a conjunction used to introduce a contrasting clause.

15. (b) Hectic and fell are the correct options to be filled in here.

16. (b) Let Roy bought N number of articles.

$\therefore$ cost price = 20 N

$$\text{Total S.P. to get 40\% Profit} = 20\,N \times \frac{140}{100} = 28\,N$$

Now, $2 + 4 + 6 +$----- Nth term $= 28N$

here, $N = 2 + (N-1)^2 = 2.N$

$$\therefore \text{Sum of S.P.} = \frac{N}{2}(2+2N) = N(N+1) = 28N$$

$N^2 = 27N = 0$

$\therefore N = 27$

17. (b) Let two bags A and B have x and (45–x) number of coins.

ATQ, $(x-5)(45-x-5) = 124$.

$(x-5)(40-x) = 124 \Rightarrow 45x - x^2 - 200 = 124$

$x^2 - 45x + 324 = 0$

$(x-9)(x-36) = 0$

$\therefore x = 9$ and 36

Product = 9*36 = 324.

Tricky way:

$124 = 2 \times 2 \times 31 = 4 \times 31$

so, number of coins in each buy after 5 coins dropped from each bag = 4 and 31.

$\therefore$ Number of coins in the bag initially

= (4 + 5) and (31 +5) = 9 and 36

Product = $9 \times 36 = 324$

18. (c) Imran's mobile phone selling price = ₹17600

Discount = 12%

$$\therefore \text{Marked price} = 17600\,\frac{100}{(100-12)} = 20000$$

Profit = 12%

$$\therefore \text{Cost price} = 17600 + \frac{100}{(100+10)} = 16000$$

$$\therefore \text{Required profit\%} = \frac{(20000-16000)}{16000} \times 100 = 25\%$$

19. (a) Here, $m + f = 160$ ...(i)

and $7m + 12f = 1240$ ...(ii)

From (i) and (ii), we get that $(12-7)m = 1920 - 1240 = 680$.

$$\therefore m = \frac{680}{5} = 136$$

$\therefore$ Number of female present at the event = 16 – 136 = 24

20. (c) Milk : Water = $\frac{3}{4} : \frac{1}{4}$

When x ml mixture is replaced by x and water then,

Milk water $= \left(\frac{3}{4}-\frac{3x}{4}\right):\left(\frac{1}{4}-\frac{x}{4}+x\right) = 50:50$

$(3-3x):(1+3x) = 1:1$

$\therefore\ 6x = 2$ or $x = \frac{1}{3}$

21. (b) Let cost price of two types of sugar are y and z Rs. /kg.

Here, profit % = 10%

$\therefore\quad (3xy+2x.z)\times\frac{110}{100} = \text{S.P.}$ ...(i)

Similarly, $(2xy+3xz)\times\frac{105}{100} = \text{S.P.}$ ...(ii)

From equation (i) and (ii), we get

$(3y+2z)\times\frac{110x}{100} = (2y+3z)\times\frac{105x}{100}$

$(3y+2z)\times 22 = (2y+3z)\times 21.$

$66y-42y = 63z-44z$

$24y = 19z$

$\therefore\quad \frac{y}{z} = \frac{19}{24}$

22. (a) Average of first 3 number = 32

$\therefore$ Sum of first 3 numbers = $32\times 3 = 96.$

Let 4th number is d.

then, $\left(\frac{96+d}{4}\right)$ gives the average of those 4 numbers.

ATQ, $d-\left(\frac{96+d}{4}\right)\times\frac{1}{4} = 24$

$16d-d = 24+16+96$

$d = 32.$

23. (a) (A + B) total working hours = $2\times 5 = 10$h.

(B + C) total working hours = $4\times 5 = 20$h.

(A + C) total working hours = $2\times 6 = 12$h.

Now, L.C.M. of 10, 20 and 12 = 60

$\therefore$ A+ B efficiency = 6

B + C efficiency = 3

C + A efficiency = 5

From this, A – B = 5–3 = 2

$\therefore$ A = 4

Hence, A will finish work in $\frac{60}{4} = 15$ hours

If he work 5 hours a day, then, will finish

$= \frac{15}{5} = 3$ days.

24. (c)

Sonu	:	Monu	:	Romu	
3	:	2	:		×3
		3	:	2	×2
9	:	6	:	4	

Total run scored = 342.

$(9+6+4)x = 342 \Rightarrow x = \frac{342}{19} = 18.$

$\therefore$ Number of run scored by Romu = $4\times 18 = 72$

25. (b)

V	C	V	C	V	C
1st		3rd		5th	

Vowel → E, I, U

Consonant → M, N, T

Arrangement = Three vowels occupy three odd positions in 3! ways and remaining 3 consonant will occupy three positions in 3! ways.

$\therefore$ Total number of ways = $3!\times 3! = 36$

26. (c) A B C

6 0 1 $\Rightarrow \frac{7!}{6!}\times 3! = 42$

5 1 1 $\Rightarrow \frac{7!}{5!}\times\frac{3!}{2!} = 126$

4 2 1 $\Rightarrow \frac{7!}{2!\times 4!}\times 3! = 630$

3 3 1 $\Rightarrow \frac{7!}{3!\times 3!}\times\frac{3!}{2!} = 420$

$\therefore$ Total number of ways of distribution

$= 42+126+630+420 = 1218.$

27. (c) Probability of choosing a group x = $\frac{1}{6}$

Probability of choosing a group y = $\frac{2}{6} = \frac{1}{3}$

Probability of choosing a group z = $\frac{3}{6} = \frac{1}{2}$

Now, Probability of choosing a girl from group x = $\frac{3}{5}$

Probability of choosing a girl from group y = $\frac{3}{7}$

Probability of choosing a girl from group z = $\frac{4}{9}$

$\therefore$ Probability of choosing a girl

$$P(G) = \frac{3}{5}\times\frac{1}{6}+\frac{3}{7}\times\frac{1}{3}+\frac{4}{9}\times\frac{1}{2}$$

$$=\frac{1}{10}+\frac{1}{27}+\frac{2}{9}=\frac{63+90+140}{630}$$

$$=\frac{293}{630}$$

$\therefore$ Probability that she is choosen from group y

$$P\left(\frac{Y}{G}\right)=\frac{P(Y\cap G)}{P(G)}$$

$$=\frac{\frac{1}{7}}{\frac{293}{630}}=\frac{90}{293}$$

28. (a) Probability for Mohini speaks truth $P(M)=\frac{6}{9}=\frac{2}{3}$

Probability for Rohini speaks truth $P(R)=\frac{3}{6}=\frac{1}{2}$

$\therefore$ Probability that they contradict each other on certain facts = P(M). P(R') + P(M').P(R)

$$=\frac{2}{3}\times\left(1-\frac{1}{2}\right)+\left(1-\frac{2}{3}\right)\times\frac{1}{2}$$

$$=\frac{2}{3}\times\frac{1}{2}+\frac{1}{3}\times\frac{1}{2}=\frac{1}{2}$$

29. (b) $y=(x+1)$ and $z=(x+2)$

$\log(1+xz)=2A.$

$\log(1+x(x+2))=2A$

$\log(1+x^2+2x)=2A$

$\log(1+x)^2=2A$

$2\log(1+x)=2A$

$\therefore A=\log(1+x)=\log(y)$

30. (c) Let first term = a and let term = l

and common difference = d.

Difference between 9th and 13th term = 20

$a+(9-1).d-\{a+(13-1).d\}=20$

$-4d=20\Rightarrow d=-5$

Now for a series of n terms (says)

Now, first term (a) – 75 = Sum (s)

$\Rightarrow \quad s=a-75$

and sum = 0 + last term (l) $\Rightarrow$ sum = l

$\therefore a-75=l=a+(n-1)(-5)$

$\therefore n-1=15\Rightarrow n=16$

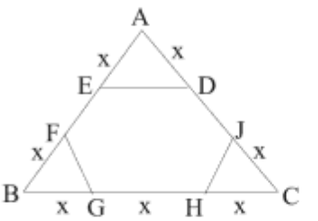
sum of the series except last term = 0

$$\left(\frac{n-1}{2}\right)[2a+(n-1-1)d]=s$$

$$\left(\frac{16-1}{2}\right)[2\times a+(16-2(-5)=0$$

$x=35$

31. (b)



Let the side of the equilateral Δ is 3x units then, Area of

equilateral $\Delta=\frac{\sqrt{3}}{4}\times(\text{side})^2$

$$240=\frac{\sqrt{3}}{4}(\text{side})^2=\frac{\sqrt{3}}{4}(3x)^2$$

Again, when this triangle converted into regular hexagon of each side x unit.

then, In ΔADE, AE = AD = DE = x unit

$\therefore$ By symmetry, $\Delta ADE=\Delta BFG=\Delta CJH$ are equilateral triangle of same area.

Area of $\Delta ADE=\frac{\sqrt{3}}{4}(x)^2$.

$$\therefore \quad \text{Area of hexagonal}=\frac{9\sqrt{3}}{4}(x)^2-\frac{3\sqrt{3}}{4}(x)^2$$

$$6\times\frac{\sqrt{3}}{4}(x)^2=\frac{6\times240}{9}=160\text{ unit}$$

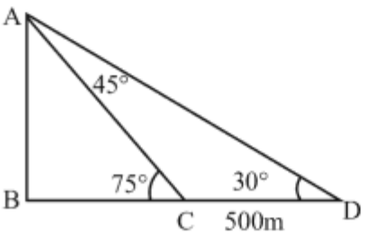
32. (a) Maximum number of flower $=\left[\frac{125}{3}\right]=41$

Maximum number of flower $=\left[\frac{375}{3}\right]=125$

Maximum number of flower $=\left[\frac{250}{3}\right]=83$

$\therefore$ Maximum rows of flower = 41 + 125 + 83 = 249

33. (a) Let height of the building AB = h m and BC = x m.



From ΔACD, $\angle ACB=\angle CDA+\angle CAD$

$75° = (30°) + (\angle CAD)$

$\therefore (\angle CAD) = 75 - 30 = 45°$

From sine rule in ΔACD,

$$\frac{AC}{\sin 30°} = \frac{CD}{\sin 45°} \Rightarrow \frac{AC}{\frac{1}{2}} = \frac{500}{\frac{1}{\sqrt{2}}}$$

$\therefore AC = 250\sqrt{2}$

From ΔABC,

$$\sin 75° = \frac{AB}{AC} = \frac{h}{250\sqrt{2}}$$

$$\sin(45° + 30°) = \frac{h}{250\sqrt{2}}$$

$\sin 45°, \cos 30° + \cos 45°$

$$\sin 30° = \frac{h}{250\sqrt{2}}$$

$$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \cdot \frac{1}{2} = \frac{h}{250\sqrt{2}}$$

$$\frac{\sqrt{3}+1}{2\sqrt{2}} = \frac{h}{250\sqrt{2}}$$

$$\therefore \quad h = 125\left(\sqrt{3}+1\right)$$

34. Let total population of U.P. = N.

then, population above education index $= N \times \left(\frac{100-16}{100}\right)$

$= 0.84N$

Male population above education Index

$$= \frac{5}{6} \times 0.84N = 0.7N$$

$$\therefore N \frac{1.6}{0.7} \approx 2.28 \text{ lakhs}$$

35. (c) Pattern is: $3 + 2$

$= 3 + (2)^2 = 7$

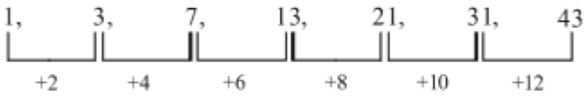
$32 - 8 = 32 - (8)^2 = 32 - 64 = -32.$

$12 + 3 = 12 + (3)^2 = 12 + 9 = 21.$

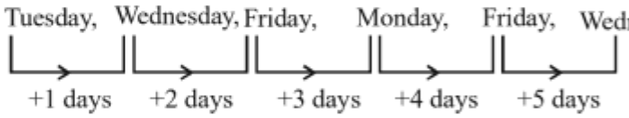
$51 + (?)^2 = 76 \Rightarrow \sqrt{76 - 51} = ?$

$\therefore ? = 5$

36. (b) Series is:



37. (b)



38. (d)

Letter	B	O	S	Z	E	R	A
Code	8	0	5	2	3	9	4

$\therefore$ Code of LEETS = 13375.

39. (c) Suresh Bhai

↓ FIL

Mahesh ⇔ Mahesh wife —Paresh

↓ SON

Ramesh

$\therefore$ Paresh is Ramesh maternal uncle

40. (c) Logical order:

Age khan palace, Pune, Maharashtra, India, World

(2) (1) (5) (4) (3)

41. (b) Value of P at 6:00 = 90°

Value of P at 18:00 = 270°

Value of P at 12:00 = 180°

$$\therefore \frac{90° + 270°}{180°} = \frac{360°}{180°} = 2$$

42. (a) Probability of Mohini speaking truth $P(m) = \frac{6}{9} = \frac{2}{3}$

Probability of Mohini not speaking truth $P(M) = 1 - \frac{2}{3} = \frac{1}{3}$

Probability of rohini speaking truth $P(R) = \frac{3}{6} = \frac{1}{2}$

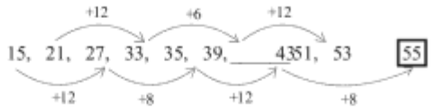
Probability of rohini speaking truth = $= P(R°) = \frac{1}{2}$

Required Probability = P(M) . P(R') + P(R) R'(M)

$$= \frac{2}{3} \times \frac{1}{2} + \frac{1}{3} + \frac{1}{2}$$

$= \frac{1}{3} + \frac{1}{6}$

$= \frac{1}{2}$

43. (a) 

$35 + 12 = 47$

$47 + 8 = 55$

44. Head Tounge, Neck Elbows, Knees, Foot.

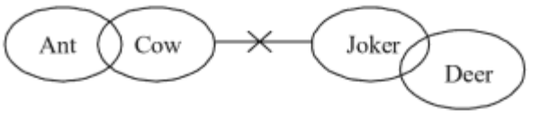
45. (b) 2032, 2028 will be leap years, so the calendar of 2023 won't be same

Also 2023 = 2020 (leap year) + 3

so 2023 would repeat itself in 2034.

Sol. (46-47):

46. (a) 

47. (d) 

48. (d) With reference to the given statement Only assumption II is implicit i.e. One of the major goals of sustainability is to preserve biodiversity. All life on Earth is onnected through the flow of energy(planetry food web), and each time a species becomes endangered or lost to extinction, one more part of that energy flow is lost.

49. (b) Course of action I follows because with a graded approach to the use of antibiotics, under which some medicines are reserved for the most resistant microbes, the WHO list can stop their misuse as broad-spectrum treatments. Course of action II also follows because a close inspection is also needed of the national supervisory programmes to help people to get rid out of it.

Sol. (50-51):

Let the six professors be denoted as P, Q, R, S, T and U.

The first thing we should focus on doing is to identify which professors are in the North facing flats and which professors are in the South facing flats.

From the last two statements, viz: "R gets a south facing flat which is next to U's flat" and "T's flat is North Facing".

At this point we also know that "S and U get flats which are diagonally opposite to each other" and since we know that U faces South, S would naturally face North; and we can also deduce that both S and U must be occupying corner flats.

Further from the statement: "Q gets a North facing flat and it is not next to S's flat" we realise two things:

T, S, Q are in the three North facing flats and since S and Q are not adjacent to each other, they must be both occupying corner flats while T would be occupying the middle flat in the North facing flats.

Consequently P would be in a South facing flat and the three people in South facing flats would be P, R, U. Also since R is next to U and we have alrady deduced that U is in the corner flat, we know that R would be in a middle flat.

The figure changes to the following:

Flat Direction	Corner Flat	Middle Flat	Corner Flat	Professors facing South and North
South Facing Flats				R (corner flat), R (middle falt), U (corner flat)
North Facing Flats				T (in middle flat), S & Q (corner flat)

Consequently we also realise that there are essentially the following 2 ways of arranging the 6 people:

Possibility 1:

Flat Direction	Corner Flat	Middle Flat	Corner Flat	Professors facing South and North
South Facing Flats	P	R	U	R (corner flat), R (middle falt), U (corner flat)
North Facing Flats	S	T	Q	T (in middle flat) S & Q (corner flat)

Possibility 2:

Flat Direction	Corner Flat	Middle Flat	Corner Flat	Professors facing South and North
South Facing Flats	U	R	P	P (corner flat), R (middle falt), U (corner flat)
North Facing Flats	Q	T	S	T (in middle flat) S & Q (corner flat)

Based on these reactions and deductions we can solve the questions.

50. (c) P, R and U get South facing flats as deduced above and hence, option (c) is the correct answer.

51. (a) From the final conclusions above, it is quite clear that there is no change in U's neighbour if P and T interchanged their flats. Option (a) is correct.

52. (a) All the three causes will effect the sales of four wheelers.

53. (d)

54. (a) Government decision to construct super highway shows that Government has sufficient resources to construct it.

55. (c) (i) is not an appropriate course of action as it not known from the statement weather the protest are violent or peaceful. (ii) is preventive measure not a corrective action. As it is mentioned in the statement that the given state has faced several drought like situations over the recent years, so (iii) is an appropriate course of action.

56. (b) Each person get his next duty after the gap of 3 days.

As on 10^{th} July 2020, Gaurav was on duty. So, his next duty was on 14^{th}, 18^{th}, 22^{th} ..... July.

Now, number of days between 10^{th} July to 26^{th} Sept.

$= 21 + 31 + 26 = 78$ days.

$= (4 \times 19 + 2)$ days.

$\therefore$ On 24^{th} September Gaurav was on duty and on 26^{th} September Sahil was on duty.

57. (a) As February 2020 is 29 days (Leap year)

Then, person having duty on 1^{st} February, must have their duty on 29^{th} February 2020.

Now, number of days between 1^{st} and $14^{th} = 13$ days.

$= 4 \times 3 + 1$ odd day.

So, Amir was on duty since on 1^{st} February and 29^{th} February.

Hence, Amir did the maximum number of duties.

58. (a) Clearly option (a) is the cause.

59. (c) As per the question, we can easily from the word

E X P A N D
↓ ↓ ↓
5^{th} 24^{th} 16^{th}

First three letters are – S H R **I N K**

↑ as suffix

Hence, option (c).

60. (a) "SHRINK" is the word the was the answer formed in the previous question.

As per the question,

C O N T R **A C T**
↓ ↓ ↓ ↓ ↓
3^{rd} 15^{th} 14^{th} 20^{th} 18^{th}

Hence option (a).