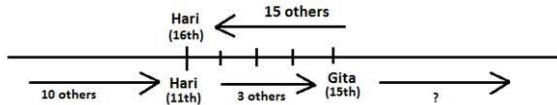


6543, SOLUTION, SSC SGL

Ques 1. ANS (A) Solution:

Persons sitting to the right of Gita are 11. Hence, 'a' is the correct option.

Using the given information we can create the following figure -



Here, we see that number of persons sitting to the right of Gita are = $15 - 4 = 11$.

Ques 2. ANS (A) Solution:

A (1)	B (2)	C (3)	D (4)	E (5)	F (6)	G (7)	H (8)	I (9)	J (10)	K (11)	L (12)	M (13)
Z (26)	Y (25)	X (24)	W (23)	V (22)	U (21)	T (20)	S (19)	R (18)	Q (17)	P (16)	O (15)	N (14)

Here, the pattern is:

'WHITE' is coded as '260' -

W (23), H (8), I (9), T (20), E (5)

$23 + 8 + 9 + 20 + 5 = 65 \times 4 = 260$

'BROWN' is coded as '288' -

B (2), R (18), O (15), W (23), N (14)

$2 + 18 + 15 + 23 + 14 = 72 \times 4 = 288$

Similarly,

'OLIVE' will be written as -

O (15), L (12), I (9), V (22), E (5)

$15 + 12 + 9 + 22 + 5 = 63 \times 4 = 252$

Ques 3. ANS (D) Solution:

Here, the pattern is:

Option (a) 22, 11, 121

$22/2 = 11$ and $11 \times 11 = 121$.

Option (b) 32, 16, 256

$32/2 = 16$ and $16 \times 16 = 256$.

Option (c) 24, 12, 144

$24/2 = 12$ and $12 \times 12 = 144$.

Option (d) 6, 3, 27

$6/2 = 3$ and $3 \times 9 = 27$. Thus, 6, 3, 27 is different.

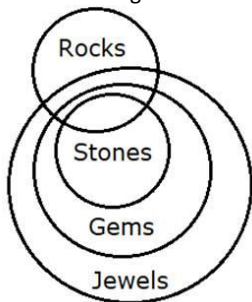
Ques 4. ANS (A) Solution:

Statements:

All gems are jewels.

Some rocks are stones

All stones are gems



Some jewels are stones: All gems are jewels. Some rocks are stones. All stones are gems. Thus, some jewels are stones. So, conclusion I is true.

Some rocks are gems: Some rocks are stones. All stones are gems. Thus, some rocks are gems. So, conclusion II is true.

All jewels are stones: All gems are jewels. All stones are gems. Thus, all jewels cannot be stones. So, conclusion III is false.

Hence, only conclusions I and II follow.

Ques 5. ANS (C) Solution:

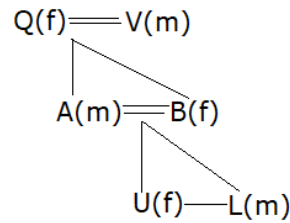
Q @ A & V * B @ U # L & A

Q @ A means 'Q is the mother of A'.

A & V means 'A is the son of V'.

V * B means 'V is the father-in-law of B'.

B @ U means 'B is the mother of U'.



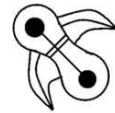
U is the granddaughter of Q.

Ques 6. ANS (B) Solution:

When figure I is rotated 225° anticlockwise, the figure will be:



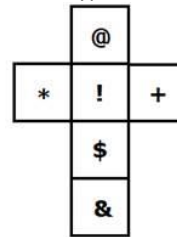
and then 90° clockwise, the figure will be:



Common Mistake: In question it is asked to move the figure from the option not to move the figure of question.

Ques 7. ANS (C) Solution:

In this type of format,



@ lies opposite \$; * lies opposite to + and ! lies opposite to &.

Figure I: 02 lies opposite 20; 11 lies opposite to 7 and 6 lies opposite to 12.

Thus, 02 is not adjacent to 20, 11 is not adjacent to 7 and 6 is not adjacent to 12.

So, figure I is incorrect.

Figure II: 6 lies opposite 12; 20 lies opposite to 02 and 11 lies opposite to 7.

Thus, 6 is not adjacent to 12, 20 is not adjacent to 02 and 11 is not adjacent to 7.

So, figure II is incorrect.

Figure III: 20 lies opposite 11; 6 lies opposite to 02 and 7 lies opposite to 12.

Thus, 20 is not adjacent to 11, 6 is not adjacent to 02 and 7 is not adjacent to 12.

So, figure III is correct.

Figure IV: 7 lies opposite 11; 6 lies opposite to 20 and 02 lies opposite to 12.

Thus, 7 is not adjacent to 11, 6 is not adjacent to 20 and 02 is not adjacent to 12.

So, figure IV is incorrect.

Ques 8. ANS (C) Solution:

$33 \times 32 = 1056$

Similarly, $45 \times 44 = 1980$

Ques 9. ANS (B) Solution:

Here, option (b) is odd.

a) EDI -- DE and E (FGH) I

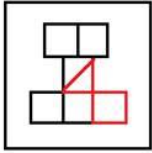
b) POU -- OP and P (QRST) U

c) VUZ -- UV and V (WXY) Z

d) JIN -- IJ and J (KLM) N

Ques 10. ANS (B) Solution:

The given figure is embedded in option figure II.



Ques 11. ANS (A) Solution:

From a:

$$2 - 13 + 45 \div 9 \times 6 = 19$$

$$2 - 13 + 30 = 19$$

$$19 = 19$$

LHS = RHS

From b:

$$2 \times 13 - 45 \div 9 + 6 = 19$$

$$26 - 5 + 6 = 19$$

$$27 = 19$$

So, LHS is not equal to RHS

From c:

$$2 \div 13 + 45 \times 9 - 6 = 19$$

$$399(2/13) = 19$$

So, LHS is not equal to RHS

From d:

$$2 \times 13 + 45 - 9 \div 6 = 19$$

$$26 + 45 - 2 \div 3 = 19$$

$$70(1/3) = 19$$

So, LHS is not equal to RHS

Ques 12. ANS (D) Solution:

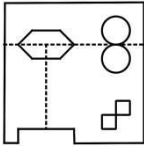
Cluster of alphabets is called as words. Cluster of words is called as sentence. Cluster of sentences is called as paragraph and chapter is made up of cluster of paragraphs.

Ques 13. ANS (B) Solution:

H (IJ) K (LMN) O (PQRS) T (UV) W (XYZ) A (BCDE) F

Ques 14. ANS (B) Solution:

Option figure II is the correct unfolded figure.



Ques 15. ANS (A) Solution:

The pattern is:

$$V+3= Y; Y+3=B; B+3= E. \text{ So, } S+3= V$$

$$L+4= P; P+4= T; T+4= X. \text{ So, } H+4= L$$

$$F+5= K; K+5= P; P+5= U. \text{ So, } A+5= F$$

$$S+6= Y; Y+6= E; E+6= K. \text{ So, } M+6= S$$

Ques 16. ANS (B) Solution:

Let price of article A = Rs. A

And price of article B = Rs. B

According to the question,

$$A/5 = (2B/5) + 30$$

$$A - 2B = 150.. (1)$$

And,

$$5A + 2B = 180.. (2)$$

After solving equation (1) and (2),

We get A = 55

Price of article A = Rs.55

Ques 17. ANS (C) Solution:

The pattern is:

$$-17*-12 = 204$$

$$23*-12 = -276$$

$$21*-12 = -252$$

Ques 18. ANS (A) Solution:

The pattern is:

$$18*2 = 36 \text{ and } 36*2 = 72.$$

$$48 * 4 = 192 \text{ and } 192*4 = 768.$$

Ques 19. ANS (D) Solution:

It is given that, '@' means 'addition', '%' means 'multiplication', '\$' means 'division' and '#' means 'subtraction'

After decoding, the expression will be: $56 \times 2 + 183 \div 3 - 120$

$$=112 + 61 - 120$$

$$=173 - 120$$

$$= 53$$

Ques 20. ANS (B) Solution:

In the word, SITUATED, first all vowels are arranged in the ascending order which are followed by all consonants that are arranged in the ascending order.

So, in ESTABLISHED, vowels are AEEI (in ascending order) which are followed by consonants, BDHLLSST (in ascending order).

Ques 21. ANS (B) Solution:

Adult is the grown form of a toddler similarly butterfly is the grown form of a larva.

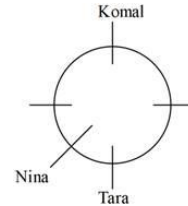
Ques 22. ANS (C) Solution:

In each step the arrow is rotating in a clockwise manner and the shaded region is shifting downwards. Hence, figure (III) will come next in the given series.

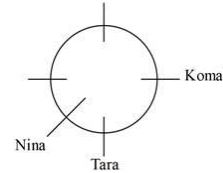
Ques 23. ANS (B) Solution:

Nina is seated to the immediate left of Tara. Only one person is seated between Komal and Nina.

Case 1:

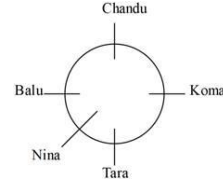


Case 2:



Chandu is seated to the immediate left of Balu.

So case 1 is invalid.



So Komal is seated third to the right of Balu.

Ques 24. ANS (D) Solution:

If a month starts on a Friday, then the 27th of the same month will be the 26th day after Friday. Each day of the week is repeated after 7 days. So on the 26th day (3 weeks and 5 days) it will be a Wednesday.

Ques 25. ANS (A) Solution:

$$N - 3 = K$$

$$O - 3 = L, O + 3 = R$$

$$T + 3 = W$$

$$W - 3 = T$$

$$I - 3 = F, I + 3 = L$$

$$N + 3 = Q$$

$$G - 3 = D$$

$$U - 3 = R, U + 3 = X$$

$$M + 3 = P$$

Ques 26. ANS (D) Solution:

The Chenab is formed by the confluence of two streams, Chandra and Bhaga, in the western (Punjab) Himalayas in India's Himachal Pradesh state. It flows west through Jammu and Kashmir state between the steep cliffs of the Siwalik Range (south) and the Lesser Himalayas (north). After receiving the Jhelum River near Trimmu, the Chenab empties into the Sutlej River, a tributary of the Indus River. Its total length is about 605 miles (974 km), and it feeds several irrigation canals.

Ques 27. ANS (C) Solution:

List I (Vitamin)	List II (Source)
Vitamin E	Lettuce
Vitamin B1	Peas
Vitamin A	Pumpkin
Vitamin D	Fish Liver Oil

Ques 28. ANS (A) Solution:

The correct pairs of Physical quantities and their respective SI units are:

Physical Quantities	SI Unit
Force	Newton
Temperature	Kelvin
Electric Charge	Coulomb
Power	Watt
Current	Ampere
Heat	Joule
Pressure	Pascal

Ques 29. ANS (A) Solution:

माउंट एवरेस्ट पर दुनिया के सबसे ऊँचे मौसम स्टेशन का पुनर्निर्माण किया गया। माउंट एवरेस्ट पर तूफान-हवाओं के कारण दुनिया का सबसे ऊँचा मौसम स्टेशन नष्ट हो गया था। पर्वतारोहियों और वैज्ञानिकों की एक टीम ने एवरेस्ट के शिखर से सिर्फ 39 मीटर (128 फीट) नीचे 8,810 मीटर पर एक नया मौसम केंद्र स्थापित किया है।

The world's highest weather station on Mount Everest was reconstructed. The world's highest weather station on Mount Everest was destroyed due to storm-winds. A team of climbers and scientists has set up a new weather station at 8,810 metres, just 39 meters (128 feet) below Everest's summit.

Ques 30. ANS (B) Solution:

The central government on 24 February approved the renaming of two Maharashtra cities - Aurangabad and Osmanabad.

Aurangabad will now be renamed as 'Chhatrapati Sambhajnagar' while Osmanabad will be called 'Dharashiv'.

The Ministry of Home Affairs (MHA) said that central government had "no objection" to changing the names of both districts of Maharashtra.

Chhatrapati Sambhaji who was the eldest son of warrior king Chhatrapati Shivaji Maharaj, was the second ruler of the Maratha state founded by his father. Sambhaji Maharaj was executed on Aurangzeb's orders in 1689. Dharashiv, the name of a cave complex near Osmanabad, dates back to the 8th century as per some scholars.

Ques 31. ANS (B) Solution:

Apart from wives, numerous male and female slaves populated the Mughal household. Khwajasara is used for 'Slave eunuchs' in Mughal household. They moved between the external and internal life of the household as guards, servants, and also as agents for women engaged in commerce.

The tasks they performed varied from the most mundane to those requiring skill, tact and intelligence.

Source- Medieval India- NCERT

Ques 32. ANS (C) Solution:

Atmosphere is divided into five layers starting from the earth's surface:

Troposphere → Stratosphere → Mesosphere → Thermosphere → Exosphere

The thermosphere is the fourth layer, and it absorbs the sun's radiation, making it very hot. The thermosphere puts on a dazzling light show (the auroras) caused by colliding particles, and the thermosphere is also where satellites orbit the Earth.

Thermosphere

Temperature rises very rapidly with increasing height in this layer.

Ionosphere is a part of this layer.

It extends between 80-400 km.

This layer helps in radio transmission.

Ques 33. ANS (D) Solution:

Tooth decay starts when the pH of the mouth is lower than 5.5.

Tooth enamel, made up of calcium hydroxyapatite (a crystalline form of calcium phosphate) is the hardest substance in the body. It does not dissolve in water, but is corroded when the pH in the mouth is below 5.5.

Ques 34. ANS (A) Solution:

An atom is the smallest particle of the element that cannot usually exist independently and retain all its chemical properties.

A molecule is the smallest particle of an element or a compound capable of independent existence under ordinary conditions. It shows all the properties of the substance.

Compounds composed of metals and nonmetals contain charged species. The charged species are known as ions.

Ques 35. ANS (A) Solution:

Constitutions limit the power of government in many ways. The most common way of limiting the power of government is to specify certain fundamental rights that all of us possess as citizens and which no government can ever be allowed to violate. The exact content and interpretation of these rights varies from constitution to constitution. But most constitutions will protect a basic cluster of rights. Citizens will be protected from being arrested arbitrarily and for no reason. This is one basic limitation upon the power of government.

Source: NCERT.

Ques 36. ANS (A) Solution:

Qutub Festival of Classical Music and Dance: The festival is staged around Sharad Pournima in the month of October at the Qutab Minar complex in Delhi.

The Delhi tourism department organises the Qutub Festival annually between October and November. Cultural, dance and musical events are held during the three-day festival.

Ques 37. ANS (C) Solution:

Known as one of India's most inventive classical dancers and pioneering dance educationists, Mohiniyattam exponent Kanak Rele, who played a significant role in bringing a systematic structure, academic veracity and much currency to Mohiniyattam, besides propagating female roles in Kathakali, died in Mumbai. She was 85.

Rele, conferred with the Padma Bhushan in 2013, is survived by husband Yatindra Rele, son Rahul, daughter-in-law and Bharatanatyam exponent Uma, and two grandchildren.

She created the Nalanda Dance Research Centre in 1966, and the Nalanda Nritya Kala Mahavidyalay in 1972 in Mumbai.

Ques 38. ANS (A) Solution:

A ribosome is an intracellular structure made of both RNA and protein, and it is the site of protein synthesis in the cell. The ribosome reads the messenger RNA (mRNA) sequence and translates that genetic code into a specified string of amino acids, which grow into long chains that fold to form proteins. A ribosome is the cellular machinery responsible for making proteins.

Ques 39. ANS (C) Solution:

Gopalhari Deshmukh (1823-1892) was a social reformer and rationalist from Maharashtra. He held the post of a judge under British raj, but wrote for a weekly Prabhakar under the pen name of Lokahitawadi on social reform issues. He advocated a reorganisation of Indian society on rational principles and modern, humanistic, secular values. He attacked Hindu orthodoxy and supported social and religious equality. He wrote against the evils of the caste system. He said, "If religion does not sanction social reform, then change religion." He started a weekly, Hitechhu, and also played a leading role in founding the periodicals, Gyan Prakash, Indu Prakash and Lokahitawadi.

Source: Modern India by Rajiv Ahir

Ques 40. ANS (A) Solution:

भारत और सेशेल्स ने समुद्री सुरक्षा सहित प्रमुख क्षेत्रों में और व्हाइट शिपिंग जानकारी साझा करने पर छह समझौतों पर हस्ताक्षर किए, जो कि दोनों देशों को गैर-सैन्य वाणिज्यिक जहाजों की पहचान और आंदोलन के बारे में डेटा का आदान-प्रदान करने में सक्षम बनाएगा।

India and Seychelles signed six agreements in key areas including maritime security and on sharing of white shipping information, which will enable the two countries to exchange data about the identity and movement of non-military commercial vessels.

Ques 41. ANS (A) Solution:

Wave energy research in India was initiated in 1983 when the Department of Ocean Development of Government of India provided funds to the Indian Institute of Technology, Madras, for carrying out the research. This led to the establishment of a 150 kW Pilot wave energy plant in 1991 at Vizhinjam in Thiruvananthapuram, Kerala.

Ques 42. ANS (D) Solution:

The East India Association was organised by Dadabhai Naoraji in 1866 in London. The association was formed to discuss Indian questions and influence the public in England to promote Indian welfare. The branches of this organisation were formed in major Indian cities later. The Association produced a journal named Journal of the East India Association.

Ques 43. ANS (B) Solution:

The 1813 Act sought to end monopoly of the East India Company over trade in India.

However the Company retained the trade with China and the trade in tea.

The charter act of 1833 ended the Company's monopoly over trade with China and trade in tea.

Source : A brief history of Modern India by Rajiv Ahir.

Ques 44. ANS (B) Solution:

Option 'b' is correct: Vertical distribution of different species occupying different levels is called stratification. For example, trees occupy top vertical strata or layer of a forest, shrubs the second and herbs and grasses occupy the bottom layers.

Compartmentalization: When trees are wounded, many organisms including fungi, infect the wood at different times and in different ways; trees respond to these infections with both chemical and physical changes resulting in discolored and decayed wood. The spread of the disease in trees is limited by compartmentalization of the specific region.

Source: XIIth Biology NCERT

Ques 45. ANS (C) Solution:

Wangala festival is celebrated by tribes of Garo hills in Meghalaya. It is an age-old practice by the 'Songsareks' or non-Christian Garos in all the villages of Garo Hills, celebrated at every harvesting period in late autumn. The first "Hundred Drums Wangala Festival" was organised in the year 1976 to protect the culture of garo tribes.

Ques 46. ANS (C) Solution:

शंघाई सहयोग संगठन (SCO) के आठ सदस्य देशों के विदेश मंत्रियों की बैठक चार और पांच मई को गोवा में आयोजित की गयी. SCO की शीर्ष बैठक जुलाई में नई दिल्ली में आयोजित की जाएगी. पाकिस्तान के विदेश मंत्री बिलावल भुट्टो जरदारी ने भी इस बैठक में भाग लिया.

A meeting of foreign ministers of eight member countries of the Shanghai Cooperation Organization (SCO) was held in Goa on May 4 and 5. The apex meeting of SCO will be held in New Delhi in July. Pakistan's Foreign Minister Bilawal Bhutto Zardari also participated in this meeting.

Ques 47. ANS (C) Solution:

Biogeochemical cycle is any of the natural pathways by which essential elements of living matter are circulated.

The term biogeochemical is a contraction that refers to the consideration of the biological, geological, and chemical aspects of each cycle.

Some of the major biogeochemical cycles are as follows: (1) Water Cycle or Hydrologic Cycle (2) Carbon-Cycle (3) Nitrogen Cycle (4) Oxygen Cycle.

Ques 48. ANS (D) Solution:

Article 15(4) permits the State to make any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes.

Ques 49. ANS (D) Solution:

Bank rate is the rate at which a central bank is ready to buy or rediscount bills of exchange or other commercial papers. It also signals the medium-term stance of monetary policy.

When bank rate is raised, it is expected that all interest rates will move together in the same direction. As a result, the cost of borrowing increases and as a result money supply reduces.

Source: NCERT

Ques 50. ANS (C) Solution:

Amazon Rainforest is the world's largest tropical rainforest occupying the drainage basin of the Amazon River and its tributaries in northern South America and covering an area of 2,300,000 square miles (6,000,000 square km). Comprising about 40 percent of Brazil's total area, it is bounded by the Guiana Highlands to the north, the Andes Mountains to the west, the Brazilian central plateau to the south, and the Atlantic Ocean to the east.

Ques 51. ANS (D) Solution:

breadth of the rectangle = 27 cm

Let length of the rectangle and side of the square are 6x cm and 5x cm, respectively.

The perimeter of a rectangle is 2/3rd of the perimeter of a square

$$\Rightarrow 2(L + B) = \frac{2}{3} * 4 * 5x$$

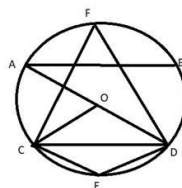
$$\Rightarrow (6x + 27) = \frac{4}{3} * 5x$$

$$\Rightarrow x = \frac{81}{2}$$

$$\text{And area of the rectangle} = \left(\frac{81}{2} * 6\right) * 27 = 6561 \text{ cm}^2$$

Ques 52. ANS (B) Solution:

Connect O to C. And take a point F on the major arc of circle.



Given $AB \parallel CD$.

SO,

$$\angle DAB = \angle ADC = 40^\circ$$

$$OD = OC$$

$$SO, \angle OCD = \angle ODC = 40^\circ$$

In $\triangle OCD$,

$$\angle COD = 180 - 40 - 40 = 100^\circ$$

We know that angle subtended on circle is double the angle subtended on arc.

$$\text{So, } \angle CFD = \frac{100}{2} = 50^\circ$$

Since CFDE is a cyclic quadrilateral.

$$SO, \angle CED = 180 - 50 = 130^\circ$$

Ques 53. ANS (D) Solution:

$$\text{Total distance covered} = 40 * 3 + 30 * 2 + 80 * 5 = 120 + 60 + 400 = 580 \text{ km}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{580}{10}$$

$$= 58 \text{ km/hr}$$

Ques 54. ANS (D) Solution:

According to the question-

$$20\% \text{ of } 100 + 50\% \text{ of } x = 30\% \text{ of } (100+x)$$

$$2000 + 50x = 3000 + 30x$$

$$20x = 1000$$

$$x = 50 \text{ ml}$$

Ques 55. ANS (B) Solution:

$$\text{Ratio} = \left(\frac{1}{4}\right) : \left(\frac{1}{7}\right) : \left(\frac{1}{5}\right) = 35 : 20 : 28$$

$$\text{Sum of ratio} = 83$$

$$\text{Sum of three numbers} = 166$$

$$83 \text{ units} = 166$$

$$1 \text{ unit} = 2$$

$$35 \text{ units} = 70$$

20 units = 40
 28 units = 56
 LCM of 70, 40 and 56 = 280.

Ques 56. ANS (B) Solution:
 total no. of males = 19000 total no. of females = 15500 diff =
 19000 - 15500 = 3500

Ques 57. ANS (A) Solution:
 Cost price of iphone = $46068 \times \frac{100}{88}$ = Rs. 52350
 Profit% = 18%
 Selling price = $52350 \times \frac{118}{100}$ = Rs. 61773

Ques 58. ANS (A) Solution:
No. of female Canadian tourists in India

$$= 60 \times \frac{15}{100} \times \frac{37}{100}$$

$$= 3.33 \text{ million}$$

Ques 59. ANS (C) Solution:
 Let total number of members = X
 Number of males = $6X/11$
 Number of females = $5X/11$

Number of grade A male members = $(5/6) \times (6X/11) = 5X/11$
 Number of grade B female members = $(3/5) \times (5X/11) = 3X/11$
 Number of grade B male members = $(6X/11) - (5X/11) = X/11$
 Total number of grade B members = $(3X/11) + (X/11) = 4X/11$
 Required fraction = $4/11$

Ques 60. ANS (A) Solution:
 Average listed price of all items in mall X = $(1200 + 1000 + 1400 + 800 + 1400)/5$ = Rs.1160
 Average listed price of all items in mall Y = $(1500 + 750 + 900 + 1000 + 1500)/5$ = Rs.1130
 Required difference = $1160 - 1130$ = Rs.30

Ques 61. ANS (C) Solution:
 $\left[k^2 + \frac{1}{k^2}\right]^2 = (k^2)^2 + \left(\frac{1}{k^2}\right)^2 + 2 \times k^2 \times \frac{1}{k^2}$

$$\left[k^2 + \frac{1}{k^2}\right]^2 = k^4 + \frac{1}{k^4} + 2$$

$$\left[k^2 + \frac{1}{k^2}\right]^2 = 47 + 2 = 49$$

$$k^2 + \frac{1}{k^2} = 7$$

$$\left[k + \frac{1}{k}\right]^2 = k^2 + \frac{1}{k^2} + 2 = 7 + 2 = 9$$

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

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

$$= 3 \times (7-1)$$

$$= 3 \times 6$$

$$= 18$$

Ques 62. ANS (C) Solution:

Given,

$$X = 3Y$$

$$5X = 15Y$$

$$9\left(\frac{t}{2} + 1\right) = 15 \times 5 \times (t+2)$$

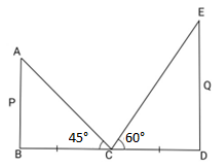
$$3t + 6 = 2 \times 25 \times (t+2)$$

$$3t + 6 = 50t + 100$$

$$-47t = 94$$

$$t = -2$$

Ques 63. ANS (A) Solution:



In $\triangle ABC$,
 $\tan 45^\circ = AB/BC$

$$1 = P/BC$$

$$P = BC$$

In $\triangle CDE$,

$$\tan 60^\circ = DE/CD$$

$$\sqrt{3} = Q/CD$$

$$Q = CD\sqrt{3}$$

Ratio of the heights of P and Q = BC : $CD\sqrt{3} = 1 : \sqrt{3}$

Ques 64. ANS (B) Solution:

$$\text{Let } r = 17p + 7$$

$$\text{and } s = 17q + 13$$

where, p and q are natural numbers.

$$\text{So, } r + s = 17p + 7 + 17q + 13 = 17(p + q) + 17 + 3$$

when (r + s) is divided by 17, we get the remainder 3.

Ques 65. ANS (C) Solution:

$$p = 7 + 4\sqrt{3}$$

$$p^2 = (7 + 4\sqrt{3})^2$$

$$= 49 + 48 + 2 \times 7 \times 4\sqrt{3}$$

$$= 97 + 56\sqrt{3}$$

$$\frac{p^6 + p^4 + p^2 + 1}{p^3} = \frac{p^4(p^2 + 1) + (p^2 + 1)}{p^3}$$

$$= \frac{(p^4 + 1)(p^2 + 1)}{p^2 + p}$$

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

$$= \left[97 + 56\sqrt{3} + \frac{1}{97 + 56\sqrt{3}}\right]\left[7 + 4\sqrt{3} + \frac{1}{7 + 4\sqrt{3}}\right]$$

$$= \left[97 + 56\sqrt{3} + \frac{97 - 56\sqrt{3}}{9409 - 9408}\right]\left[7 + 4\sqrt{3} + \frac{7 - 4\sqrt{3}}{49 - 48}\right]$$

$$= [97 + 56\sqrt{3} + 97 - 56\sqrt{3}][7 + 4\sqrt{3} + 7 - 4\sqrt{3}]$$

$$= [194][14]$$

$$= 2716$$

Ques 66. ANS (D) Solution:

$$\frac{1\frac{1}{2} + 1\frac{3}{7} + \left(1\frac{3}{5} \text{ of } 1\frac{1}{4}\right) \times 2\frac{1}{3}}{2\frac{2}{3} + \frac{4}{9} \times \frac{5}{6} + 14}$$

$$= \frac{\frac{3}{2} + \frac{10}{7} + \left(\frac{8}{5} \text{ of } \frac{5}{4}\right) \times \frac{7}{3}}{\frac{8}{3} + \frac{4}{9} \times \frac{5}{6} + 14}$$

$$= \frac{\frac{3}{2} + \frac{10}{7} + 2 \times \frac{7}{3}}{\frac{8}{3} \times \frac{9}{4} \times \frac{5}{6} + 14}$$

$$= \frac{\frac{3}{2} + \frac{10}{7} \times \frac{1}{2} \times \frac{7}{3}}{19}$$

$$= \frac{\frac{3}{2} + \frac{5}{3}}{19}$$

$$= \frac{19}{6 \times 19}$$

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

Ques 67. ANS (D) Solution:

Let total number of students = X

Increase in marks = $95 - 57 = 38$

Let the original average = Y

Now,

$$X * (Y + 0.95) - XY = 38$$

$$XY + 0.95X - XY = 38$$

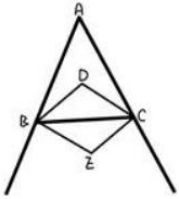
$$0.95X = 38$$

$$X = 38/0.95$$

$$X = 40$$

Ques 68. ANS (A) Solution:

$$\angle A = 60^\circ$$



$$\text{Since } \angle BDC = 90^\circ + \frac{A}{2} = 90^\circ + 30^\circ = 120^\circ$$

$$\angle BEC = 90^\circ - \frac{A}{2} = 90^\circ - 30^\circ = 60^\circ$$

Ques 69. ANS (C) Solution:

Let total number of votes = m

$$76\% \text{ of } m - 24\% \text{ of } m = 1480$$

$$52\% \text{ of } m = 1480$$

$$m = 148000/52$$

$$m = 2846$$

Ques 70. ANS (D) Solution:

Cosec K = 13/5 = hypotenuse/perpendicular = KL/LM

By Pythagoras theorem,

$$\text{Base} = \sqrt{(169 - 25)} = \sqrt{144} = 12 = KM$$

Now,

$$\text{Cos K} = \text{base/hypotenuse} = KM/KL = 12/13$$

$$\text{Sin L} = KM/KL = 12/13$$

Therefore,

$$[1 - (12/13)] / (12/13) = 1/12.$$

Ques 71. ANS (A) Solution:

$$2/3 \text{rd of work} = 10 \text{ days}$$

$$\text{Whole work} = 10 * 3/2 = 15 \text{ days}$$

$$\text{Ratio of efficiency of Baku and Goku} = 1: 4$$

$$\text{Ratio of time taken by Baku and Goku} = 4: 1$$

Therefore,

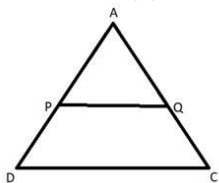
$$1 \text{ unit} = 15 \text{ days}$$

$$4 \text{ units} = 60 \text{ days}$$

$$\text{Total work} = \text{LCM of } 15 \text{ and } 60 = 60 \text{ units}$$

$$\text{Required number of days} = (60 * 3/4) / (4 + 1) = 45/5 = 9.$$

Ques 72. ANS (C) Solution:



$$\text{Let } PD = X \text{ cm}$$

Given, PQ is parallel to DC.

So, $\Delta APQ \sim \Delta ADC$ (by AA rule)

Therefore,

$$AP/AD = PQ/DC$$

$$7 / (7 + X) = 8/12$$

$$21 = 14 + 2X$$

$$2X = 7$$

$$X = 3.5 \text{ cm}$$

Ques 73. ANS (C) Solution:

Volume of solid cylinder = $\pi r^2 h$

$$= (22/7) * 2 * 2 * 7$$

$$= 88 \text{ cm}^3$$

Since, cylinder is completely submerged,

Volume of cylinder = Area of base of container X Rise in water level of the container (let's say h1)

$$4 * 2 * h1 = 88$$

$$h1 = 88/8 = 11 \text{ cm}$$

Ques 74. ANS (C) Solution:

$$6(\sec^2 61^\circ - \cot^2 29^\circ) - \sec 60^\circ + X(\sin^2 48^\circ + \sin^2 42^\circ) = \frac{3X}{4}$$

$$6(\sec^2 61^\circ - \cot^2 (90 - 61)^\circ) - 2 + X(\sin^2 48^\circ + \sin^2 (90 - 48)^\circ) = \frac{3X}{4}$$

$$6(\sec^2 61^\circ - \tan^2 61^\circ) - 2 + X(\sin^2 48^\circ + \cos^2 48) = \frac{3X}{4}$$

$$6 - 2 + X = \frac{3X}{4}$$

$$4 = \frac{3X}{4} - X$$

$$4 = \frac{-X}{4}$$

$$X = -16$$

Ques 75. ANS (B) Solution:



Area of quadrant = one-fourth of area of circle

$$\text{Area of circle} = \pi r^2$$

$$\text{Area of quadrant} = \frac{\pi r^2}{4}$$

$$16\pi = \frac{\pi r^2}{4}$$

$$r = \sqrt{64} = 8 \text{ cm}$$

r = side as well as base of the triangle occupying maximum area

$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 8 \times 8 = \frac{64}{2} = 32 \text{ cm}^2$$

Ques 76. ANS (D) Solution:

After reading all the five parts we observe that E should be placed at the second position after the fixed part as the fixed part ends with a possessive determiner 'his' and E starts with a noun. C should be placed next to E as it describes against whom the war was being fought. D can be placed next to E as it starts with a conjunction 'and' which indicates that more information is on the way. B can be placed at the last as it explains the additional role of Rama in the life of the other person in the sentence. Rearranging the four jumbled parts in the order of ECDB makes a meaningful sentence. Hence, (d) is the correct answer.

The correct sentence would be: Rama fought by his side in the war against the giants and was his companion in his adventures.

Note: CONJUNCTIONS

A conjunction (also called a connective) is a word such as and, because, but, for, if, or, when etc. Conjunctions are used to connect phrases, clauses, and sentences.

Possessive Determiners/Adjectives: Words like 'my', 'our', 'your', 'his', 'her', 'its', and 'their' are known as possessive adjectives (or possessive determiners). They come before nouns and indicate ownership of the noun. Example: "The teacher asked the students to open their drawing books."

Ques 77. ANS (B) Solution:

After reading all the sentences, we can say that the passage is about the grocery shop and the mice that lived there. Sentence B comes first as it mentions the grocery shop around which the story revolves. AD forms a mandatory pair as sentence A mentions that there were many mice in the shop, and what menace 'they' (refers to mice in sentence A) caused in the shop is mentioned in sentence D. Sentence C mentions what the grocer did to deal with the mice. Hence, sentence C would follow the pair AD. Therefore, the correct order is BADC. Hence, option (b) is the correct answer.

Ques 78. ANS (C) Solution:

'Jail' means a place where prisoners are kept. Hence, (c) is the correct answer.

'Godown' means a warehouse.

'Tank' means a closed container for liquids and gases.

'Custody' means the legal right to take care of something or somebody.

Ques 79. ANS (A) Solution:

'Tame' means '(of an animal) not dangerous or frightened of people; domesticated.'. Options b) and c) can be rejected as they are unrelated to the word. 'Domestic' means 'Relating to the running of a home or to family relations.'. Hence, option d) can also be rejected as it is the same meaning as the word. 'Immunity' means 'The ability of an organism to resist a particular infection or toxin by the action of specific antibodies or sensitized white blood cells.'. 'Embellish' means 'Make (something) more attractive by the addition of decorative details or features.'. Hence, option a) is the correct answer.

Ques 80. ANS (A) Solution:

The phrases had better, had rather, had sooner, would rather, sooner than, rather than, take the infinitive without 'to'. Option a) fits perfectly in the sentence. The sentence uses two events which are used in a comparative sense. Therefore, 'rather' would be more appropriate in the first blank and 'than' in the second blank after which the capering event follows. Option b) is incorrect because 'want' or 'to' do not grammatically fit in their respective blanks. Option c) is incorrect because 'wanting' is not parallel to 'go-out to'. Option d) is incorrect because the second word 'to' is incorrect. Therefore, the correct answer is option a).

NOTE:

Parallelism: In grammar, parallelism, also known as parallel structure or parallel construction, is a balance within one or more sentences of similar phrases or clauses that have the same grammatical structure. Given below is an example which shows a sentence in two forms (parallel in structure and lacking parallelism): Lacking parallelism: Perna likes cooking, dancing and to sing. Parallel: Perna likes cooking, dancing and singing.

Ques 81. ANS (D) Solution:

Sumptuous - splendid and expensive-looking. Mean - not generous; scant - barely sufficient or adequate; frugal - sparing or economical as regards money or food.; lavish - sumptuously rich, elaborate, or luxurious.

Thus, 'lavish' is the only word that can be a synonym of the word 'sumptuous'. Hence, option (d) is the correct answer.

Ques 82. ANS (B) Solution:

Aficionado means a person who is very knowledgeable and enthusiastic about an activity, subject, or pastime. Hence, (b) is the correct answer.

Ques 83. ANS (C) Solution:

"Belligerent" means "hostile" and aggressive. The opposite of aggressive is being non-aggressive or "peaceable". Hence, option C will be the correct answer. "Devious" means showing a skilful use of underhand tactics to achieve goals. "Supposedly" means according to what is generally assumed or believed (often used to indicate that the speaker doubts the truth of the statement).

Ques 84. ANS (D) Solution:

The sentence contains no error.

When two or more subjects are connected by the correlative conjunctions as given in the list, the verb agrees with the nearest subject.

subject.

Either..or
Neither..nor
Not only..but also
None..but

For example: Not only the players but also the coach was worried of the opponent team.

All the parts of the sentence are grammatically and structurally correct.

Thus, the correct answer is (d) No error.

Ques 85. ANS (B) Solution:

The underlined phrase is incorrect because the modal verb 'can' must be followed by the base form of the verb, which is not the case here. 'Becomes' has an '-s/es' ending. The sentence mentions the positive and negative aspects of 'collaboration'. In the first half of the sentence, the positive aspects are mentioned; according to this, options a) and c) are eliminated because these are contextually incorrect. Option b) is grammatically and meaningfully correct. Hence, b) is the correct answer.

Ques 86. ANS (A) Solution:

The phrase highlighted in the given sentence is incorrect and needs replacement with the correct one. It is to be noted that the helping verb 'have' is always followed by a past participle, so the usage of the base verb 'blanch' is incorrect. (c): The sentence talks about an activity in totality and not in continuation. (b): The preposition 'during' is used to express throughout something which is generally expressed using a noun or gerunds and clearly, 'blanch' is neither a noun nor a gerund.

Hence, option (a) is correct.

Ques 87. ANS (D) Solution:

In the given sentence 'while' is used to connect two simultaneous actions. The verb 'was found' is in the simple past tense which conveys that the action is already completed. This is incorrect. The sentence talks about a present situation [as indicated by present verb 'need' and adverb 'now']. So, 'is found' (simple present tense) should replace 'was found' to rectify the given sentence.

Therefore, the error is in the segment in option (d).

Hence, option (d) is the correct answer.

The correct sentence is: We need calmness and unity now to keep governing while a new leader is found.

Ques 88. ANS (D) Solution:

Imperative Sentences are used to demonstrate Request, Order, Command, etc.

Imperative Sentences begin with Principal verbs like Go, Make, etc. As per the meaning of "Said", "Say", etc. the verbs change forms like "begged/beg" etc.

'To' is used before the Principal Verbs in the Indirect Speech.

For example:

John said to his assistant, "Bring a glass of water." (Direct Speech)

John ordered his assistant to bring him a glass of water. (Indirect Speech)

The following things in the sentence should change when changed from Direct speech to Indirect Speech:

- The reporting verb 'said to' is changed into 'ordered'.
- The verb 'wipe' is changed into the infinitive 'to wipe'.

None of the options except (d) follows these changes. Hence, option (d) is correct.

Therefore, the correct answer is: Nick ordered the servant to wipe the floor.

Ques 89. ANS (C) Solution:

The correct meaning of 'devil's advocate' is 'someone who pretends, in an argument or discussion, to be against an idea or plan that a lot of people support, in order to make people discuss and consider it in more detail'. Answer is option (c).

Ques 90. ANS (A) Solution:

The correct spelling and meaning of the correct answer is: Accommodate: to provide with a place to live or to be stored in. Thus, the correct answer is option (a).

Ques 91. ANS (C) Solution:

Juice- the liquid obtained from or present in fruit or vegetables. Essence- an extract or concentrate obtained from a plant or other matter and used for flavouring or scent.

Syrup- a thick, sweet liquid made by dissolving sugar in boiling water, often used for preserving fruit.

Beverage- a drink other than water.

Among the given options, the word that matches the meaning of the given group of words is option (c) 'syrup'.

Hence, the correct answer is option (c).

Ques 92. ANS (C) Solution:

The modal used in indirect speech ('should') cannot be changed when changing into direct speech ('might', 'must', 'can'). Hence, options (a), (b) and (d) are incorrect. The correct sentence in direct speech will be: "We should wait for the assignment", he said. Therefore, option (c) is the correct answer.

Ques 93. ANS (A) Solution:

The sentence with the first blank talks about the discovery of electricity not being a single invention but the beginning of multiple inventions that led to the modern-day use of electricity. Among the given options, 'chain' fits in the blank appropriately as its usage conveys the same. Other words fail to convey this. Hence, (a) is the correct answer.

Ques 94. ANS (B) Solution:

The sentence with the second blank talks about the purest form of electricity. Among the given options, 'lightning' fits in the blank appropriately as its usage conveys that the occurrence of a natural electrical discharge of very short duration and high voltage between a cloud and the ground or within a cloud, accompanied by a bright flash is the most basic form of electricity. Other words fail to convey this. Hence, (b) is the correct answer.

Ques 95. ANS (C) Solution:

The sentence with the third blank talks about how great effort it took to bring this entity into use. Among the given options, 'energy' fits in the blank appropriately as its usage conveys that it required a lot of effort to bring this power into everyday use. Other words fail to convey this. Hence, (c) is the correct answer.

Ques 96. ANS (D) Solution:

The sentence with the fourth blank talks about some of the notable names related to how electricity was harnessed. Among the given options, 'history' fits in the blank appropriately as its usage conveys that the whole series of past events connected with the harnessing of electricity can give some important names. Other words fail to convey this. Hence, (d) is the correct answer.

Ques 97. ANS (A) Solution:

The sentence with the fifth blank talks about Benjamin Franklin being the reason for the discovery of electricity through his experiment of flying a kite during a thunderstorm. Among the given options, 'credited' fits in the blank appropriately as its usage conveys that Benjamin Franklin has been publicly acknowledged for his contribution to the discovery of electricity. Other words fail to convey this. Hence, (a) is the correct answer.

Ques 98. ANS (B) Solution:

'To read between the lines' means to look for or discover a meaning that is implied rather than explicitly stated. Hence, (b) is the correct answer.

The figurative expression for 'to insult or provoke someone of power' is - to twist a lion's tail.

The figurative expression for 'to understand' is - to see the light.

The figurative expression for 'to desert someone who is still in difficulties' is - to leave in the lurch.

Ques 99. ANS (B) Solution:

The subject of the Passive Voice is changed into the object of the Active Voice. Also, the object of the Passive Voice is changed into the subject of the Active Voice.

The removal of the 'to be form of verb' and the preposition 'by' is necessary while changing the voice of the sentence from Passive to Active.

The Passive voice in this question is in Present Continuous. Thus, the Active voice will also be in Present Continuous.

In Passive voice, the format is: Subject (Objective case) + am/is/are + being + V3 + by + Object (Subjective case).

Thus, the format of Active voice is: Subject + am/is/are + Verb (ing) + Object.

For example:

A design is being prepared by the architect. (Passive Voice)

The architect is preparing a design. (Active Voice)

The options except (b) don't follow the correct grammatical format of the Active Voice.

Hence, option (b) is the correct answer.

Ques 100. ANS (D) Solution:

The adverb 'recently' should be used in place of the adjective 'recent', as it is being used to modify the verb 'discovered' in the part given in option D. Hence, option D is the right answer. Print