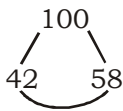## QUANTITATIVE APTITUDE

1. (4) Let Valid Vote =100

100
42   58
16 units = 768400

$$100 \text{ units} = \frac{768400}{16} \times 100$$

= 4802500

80% of Vote = 4802500 + 82560 = 4885060

∴ 20% of Vote = $\frac{4885060}{80} \times 20$

= 1221265

∴ Required percentage

= $\frac{82560}{1221265} \times 100 = 6.8\%$

2. (4) Area of equilateral triangle

= $\frac{\sqrt{3}}{4} a^2 = \frac{\sqrt{3}}{4} \times (24)^2$

= $144\sqrt{3}$ cm^2

3. (4) Quantity of P_1 = 5 + 3 + 4+ 6 = 18,
   Quantity of P_2 = 4+5+3+3 = 15
   Quantity of P_3 = 4+5+3+4 = 16
   So, P_1 substance is most used in terms of quantity in all drugs.

4. (3) The first 'n' natural numbers are 1,2,3, ...n and their corresponding weights are 1, 2, 3, ...n

∴ Weighted mean

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

= $\frac{1^2 + 2^2 + 3^2 + ... + n^2}{1 + 2 + 3 + ... + n}$

∴ Mean = $\dfrac{\frac{1}{6}n(n+1)(2n+1)}{\frac{1}{2}n(n+1)}$

= $\frac{(2n+1)}{3}$

5. (2) Number of inhabitants at the end of three years =

= $10,24,000 \times \left(\frac{102.5}{100}\right)^3$

= 1,102,736.

6. (4) A.T.Q,

	A : B : C
Time	- 6 : 3 : 2
Efficiency	- 1 : 2 : 3

Time taken by A

= $\frac{8 \times (3 + 2 + 1)}{1}$ = 48 days

Time taken by B = $\frac{48}{2}$ = 24 days

Time taken by C = $\frac{48}{3}$ = 16 days

7. (4) ATQ,

$x + \frac{y^2}{x} = 5$

Put $y = 2$ and $x = 1$

$x + \frac{y^2}{x} = 1 + \frac{4}{1} = 5$

∴ $\frac{x^2 + 2x + y^2}{x^3 - 5x^2} = \frac{1 + 2(1) + (2)^2}{(1)^3 - 5(1)^2}$

= $\frac{7}{-4}$ From option $-\frac{7}{4} = -\frac{7}{y^2}$

8. (1) Volume of hemisphere =

$\frac{2}{3} \pi r^3 = \frac{2}{3} \times \pi \times (14)^3$

= $\frac{2}{3} \times \frac{22}{7} \times 14 \times 14 \times 14$

= 5749.33 cm^3

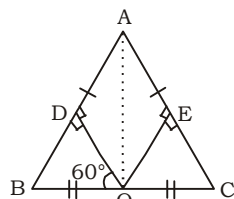9. (1) A.T.Q,
   a+b=5,
   Squaring both side,
   $(a+b)^2 = 5^2$
   ⇒ $a^2 + b^2 + 2ab = 25$
   ⇒ $a^2 + b^2 + 12 = 25$
   ⇒ $a^2 + b^2 = 13$
   ⇒ $3(a^2+b^2) = 13 \times 3 = 39$

10. (3) A.T.Q,

∠BDO=90°
∠OBD = 90°– 60° = 30°
∠B=∠C = 30°
∴∠EOC=60°
AO is bisector of BC.
∴∠DOE = 60°, ∴∠AOE =∠AOD = 30°

11. (4) A.T.Q,

	Initial	Now
Price	5	4
Quantity	4	5

Original price of rice =

$\frac{450}{50} \times \frac{1}{4}$ = 2.25 Rs/kg

12. (1) Surface area of cube = 6a^2= 864
   ⇒ a^2=144
   ⇒ a=12cm
   Volume of the cube=(12)^3
   =1728 cm^3

13. (2) The first student has 2 toffees.
   The second student has 4 toffees.
   The third student has 6 toffees. So, on
   So, Total number of toffees
   = 2+4+6+.......50

   = $\frac{25}{2}$ (50 + 20) = 650

   ∴So, 650 is divisible by 13 and 5 both.

14. (2) Market price of the laptop =

   $65,520 \times \frac{100}{75}$ = 87,360

15. (1) 15 → 3 × 5
   18 → 2 × 3^2
   25 → 3 × 5^2
   32 → 2^5
   LCM = 2^5 × 3^2 × 5^2 = 7200
   Required number = 7200÷2
   = 3600

16. (4) Speed of a Train = $\frac{125y^3 - 1}{5y - 1}$

   = $\frac{(5y - 1)(25y^2 + 5y + 1)}{(5y - 1)}$

   = (25y^2+5y+1) km/h

17. (2) Let, the sides be a=4x, b=6x, c=8x
   (c)^2=(8x)^2=64x^2
   a^2+b^2= (4x)^2+(6x)^2
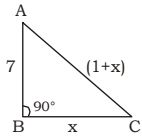   = 16x^2+36x^2 = 52x^2
   a^2+b^2 <c^2
   So, the triangle is obtuse-angled

18. (2) Marks are obtained by A in subject P

   = $\frac{150}{900} \times 100\%$ =16.67%

19. (4) Let side BC = x

AC−BC=1

$\Rightarrow$ AC = (1+ x)

Now,

$(1+ x)^2 = 7^2 + x^2$

$\Rightarrow 1+ 2x + x^2 = 7^2 + x^2$

$\Rightarrow 1+ 2x = 49$

$\Rightarrow 2x = 48$

$\Rightarrow x = 24$

$\therefore \sin C = \dfrac{7}{1+24} = \dfrac{7}{25}$

20. (1) Time taken by A$= \dfrac{400}{16} = 25$ sec.

Total Distance covered by B is 385 m.

Time taken by B=25+10=35 sec

$\therefore$ Speed of B$= \dfrac{385}{35}$ m/s =11m/s

21. (2) $\sin\theta+\cos\theta = \sqrt{5}\, \sin\theta(90°-\theta)$

$\Rightarrow \sin\theta+\cos\theta = \sqrt{5}\cos\theta$

$\Rightarrow \sin\theta = \left(\sqrt{5}-1\right)\cos\theta$

$\Rightarrow \dfrac{\cos\theta}{\sin\theta} = \dfrac{1}{\sqrt{5}-1}$

$\Rightarrow \cot\theta = \dfrac{\sqrt{5}+1}{\sqrt{5}-1} = \dfrac{\sqrt{5}+1}{4}$

22. (2) The total production of company A in 2016 and 2019 together =100

The total production of company C in 2017 and 2018 together =120.

So, the percentage $= \dfrac{100}{120} \times 100$

= 83.33%

23. (4) Total number of workers working in all factories=25+30+70+80+15=220

24. (2)

A	:	B	:	C	:	D
1	:	2	:	2	:	2
3	:	3	:	4	:	4
5	:	5	:	5	:	6
15	:	30	:	40	:	48

Share of C$= \dfrac{40}{133} \times 93100$

=28000

25. (1) A.T.Q,

$\cosec A-\cot A = \dfrac{1}{4}$

$\underline{\cosec A - \cot A = \dfrac{1}{4}}$

So, $\cosec A+\cot A=4$

$2\cosec A = 4 + \dfrac{1}{4} = \dfrac{17}{4}$

$\Rightarrow \cosec A = \dfrac{17}{8}$

$\therefore$
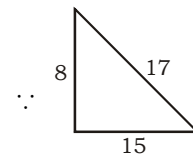
then, $\tan\theta = \dfrac{8}{15}$

1. (4) 2. (4) 3. (4) 4. (3) 5. (2)
6. (4) 7. (4) 8. (1) 9. (1) 10.(3)
11.(4) 12.(1) 13.(2) 14.(2) 15.(1)
16.(4) 17.(2) 18.(2) 19.(4) 20.(1)
21.(2) 22.(2) 23.(4) 24.(2) 25.(1)

GENERAL AWARENESS

1. **(2)** Chhau - Upendra Biswal, Banabali Das and Rajendra Patanayak

   Kathakali - Kalamandalam Gopi, Krishna Prasad, Kottakal Sivaraman etc.

   Odissi - Sanjukta Panigrahi, Sonal Man Singh.

   Manipuri - Elam Endira Devi, Bipin Singh

2. **(3)** It is the duty of every citizen to uphold and protect the 'Sovereignty', 'Unity' and Integrity of India is one of fundamental duties under Article 51(A) (c) of the Indian Constitution.

3. **(4)** Article 66 - Election of Vice-President

   Article 67 - Term of office of Vice President

   Article 67 (b) - The resolution for removing the Vice President of India passed only by Rajya Sabha, passed and agreed to by the Lok Sabha with Simple majority.

4. **(3)** Kajri is a folk song of Bihar and Uttar Pradesh

   Chaiti song is for celebrating the first month of Hindu Calendar in North India.

5. **(3)** In 2005-06, - Ministry of Finance issued first note on Gender budgeting under the annual budget circular.

6. **(4)** Minister of State for Health - Dr. Bharati Pawar.

   Union Health Minister - Mansukh Mandaviya.

7. **(4)** Ishwar Chandra Vidhya Sagar was known as 'Father of Bengali Prose'. Sanskriti College, Calcutta gave him the title 'Vidhya Sagar'. Dalhousie finalised and passed Hindu Widows Remarriage Act, 1856.

8. **(1)** The Rowlatt Committee was appointed in 1918, during the reign of Viceroy Chelmsford. The Rowlatt Act 1919 (Black Act) called for "No Appeal, No Vakil, No Dalil". It gave unperilled powers to government to arrest and imprison suspects without trial.

   Gandhiji gave a call for Satyagraha on April, 1919. He was arrested on 8th of April 1919.

9. **(3)** Kaal Baisakhi - Heavy rains (carried by hail storm), with heavy winds.

   Trade winds - winds blow from east to west just North and South of Equator.

10. **(2)** The Sikkim government Scheme "Bahini" is to provide sanitary pads, safe & healthy environment for girls studying in class 9 to 12 in different school.

State	Chief Minister	Governor
Sikkim	Prem Singh Tamang	Ganga Prasad
Assam	Hemant Bisva	Jagdish Mukhi

11. **(3)** The Competition (Amendment) Bill, 2022, seeks to amend the Competition Act, 2002, to regulate mergers and acquisitions based on the value of transactions. Deals with transaction value more than ₹ 2000 require CI's approval.

12. (2) Grand Trunk Road was built by Sher Shah Suri.
Kashmir to Kanyakumari - NH-44
Agra to Kolkata - NH-19

13. (4) A cricket ball is hard and weighs between 5.5 and 5.75 ounces (137.5 and 143.8)g. Length of Cricket Stumps shall be 28 inches. Weight of Cricket bat is between 2.5 lbs - 3 lbs (1.34kg-1.36kg)

14. (1) Hampi festival celebrates the existence of the Vijaynagar Empire founded by Harihara & his brother Bukka in 1336.
Pukar Mela is a five days Camel and livestock fair held between October and November in Pushkar (Rajasthan).
Konark Dance festival is a five-day festival (1-5 Dec) at Sun temple in Konark.

15. (4)

16. (3) Fit India Movement was launched by Narendra Modi on 29th August 2019. Fit India was founded by Shri Suparno Satpathy in 1993.
National Sports Day - 29th August.

17. (2) Milad-Un-Nabi :- to commemorate the birth anniversary of Prophet Muhammad.
Idu'l Zuha - to commemorate the obedience, willingness and devotion of Prophet Ibrahim towards the God.
Idu'l Fitr - Holiday of Breaking fast.
Muharram is the first month of Islamic calendar. It is the second Holiest month after Ramdan. The tenthe day of the Muharram is known as Ashura.

18. (4) On 17th May 1782, the Treaty of Salbai was signed between the British East India Company and the Marathas. It was the end of First Anglo-Maratha War (1775-1782). The war began with treaty of Surat.

19. (4) Calcium Carbonate - $(CaCO_3)$
Calcium Oxide (quick lime) - CaO
Calcium Hydroxide $(Ca(OH)_2)$ - Slaked lime
Calcium Phosphate is found in bone mineral and tooth enamel.

20. (3) Banabhatta was the court poet of Harshavardana. He wrote Suryastakm. Hrishena was the court poet of Samundra gupta. He composed the epic 'Devi Chandra Guptam'

21. (1)   22. (4)

23. (1) Hydrochloric acid crpaties an acidic medium which facilitates the action of enzyme pepsin. It makes the gastric juice acidic so, pepsin enzyme can digest the proteins in the food particles. It helps kill the harmful bacteria in present in the food.

24. (1) Arne Tiselius won Nobel prize in chemistry in 1948 for his research on electrophoresis and adsorption analysis.
Henry Taube won Nobel prize in chemistry in 1983 for his work in the mechanisms of electron-transfer rections.
Emil Fischer won Nobel Prize in chemistry in 1902. He discovered Fisher esterification.

25. (2) According to census 2011, the male literacy rate in India is 82.14 percent and for female it is 65.46 percent.
Highest Litracy rate - Kerala (94%)
Lowest Litracy rate - Bihar (61.80%)

1. (2) 2. (3) 3. (4) 4. (3) 5. (3)
6. (4) 7. (4) 8. (1) 9. (3) 10.(2)
11.(3) 12.(2) 13.(4) 14.(1) 15.(4)
16.(3) 17.(2) 18.(4) 19.(4) 20.(3)
21.(1) 22.(4) 23.(1) 24.(1) 25.(2)

GENERAL INTELLIGENCE & REASONING

1. (3) Given
(11,13,143)
(17,11,187)
The logic is
11 × 13 =143
17 × 11 =187
Similarly, 3 × 4 = 12

2. (2) The pattern is
GOLF place value adding (7+15+12+6)+4 = 44
BALL place value adding (2+1+12+12)+4 = 31
Similarly,
PLAY place value adding (16+12+1+25)+4=**58**

3. (4) From fig 1 and fig 3
4 < $\begin{matrix}3 & 2\\6 & 5\end{matrix}$
1 ↔ 4

4. (4)

5. (4) By hit and trial method
I. 4 + 6 × 5 − 7 ÷ 1
Interchanging + and ×, 5 and 4
5 × 6 + 4 − 7 ÷ 1
30 + 4 − 7
27
II. 5 × 3 − 4 + 8 ÷ 2
Interchanging + and ×, 5 and 4
4 + 3 − 5 × 8 ÷ 2
7 − 20
− 13

6. (3) By hit and trial method
99 * 33 * 66 * 22 * 44 * 50
Putting, ÷, +, ÷, +, =
99 ÷ 33 + 66 ÷ 22 + 44 = 50
3 + 3 + 44 = 50
50 = 50

7. (2) EVS → E opposite V −3 S
IRP → I opposite R −2 P — odd
VEB → V opposite E −3 B
GTQ → G opposite T −3 Q

8. (3) The order in a dictionary is
6. Fundament
2. Funerary
4. Funicular
5. Fuscous
7. Fuselage
3. Fusion
1. Fustian
Order- 6,2,4,5,7,3,1

9. (4) A + B & C − D + E

$\begin{array}{c} A^+ \Longleftrightarrow C^- \\ B^+ \!-\! D^+ \\ E \end{array}$
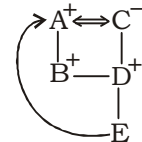
∴ A is E's father's father

10. (3)   11. (2)   12. (4)

13. (4) The logic is

L   A   T
+2↓ +3↓ −2↓
N   D   R
+2↓ +3↓ −2↓
P   G   P
+2↓ +3↓ −2↓
R   J   N
+2↓ +3↓ −2↓
T   M   L

14. (4)

15. (4)
CONTROL   MISTAKE
↓↗↓↓↓↗↓   ↓↗↓↓↓↗↓
NOCTRLO   SIMTAEK
Similarly, JOURNAL
↓↗↓↓↓↗↓
UOJRNLA

16. (2) Given
(15, 9, 4)
(7, 2, 3)
The pattern is
(9 + 4) + 2 = 15
(2 + 3) + 2 = 7
Similarly, (13 + 4)+2 = 19

17. (2)
  6–60–50 → 6×10=60, 6×10–10=50
  7–70–68 → 7×10=70, 7×10–10=60 – odd
  8–80–70 → 8×10=80, 8×10–10=70
  9–90–80 → 9×10=90, 9×10–10=80

18. (1) The possible venn diagram is
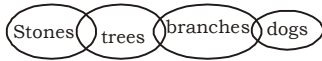
None of the conclusions follow
Conclusions:
i. Some grasses are branches.
ii. Some trees are dogs
iii. Some grasses are dogs
iv. Some branches are grasses

19. (1) By hit and trial method
  $7 × 6 ÷ 3 + 9 – 8 = 17$
  Interchanging × and +, 9 and 6
  $7 + 9 ÷ 3 × 6 – 8 = 17$
  $7 + 18 – 8 = 17$ $17 = 17$

20. (4) Given
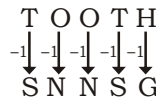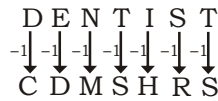 345, 356, 368, 381, 395
  The logic is
  345 356 368 381 395 **410**
    +11 +12 +13 +14 +15

21. (3) The pattern is

22. (4) The pattern is

D E N T I S T
–1 –1 –1 –1 –1 –1
C D M S H R S

T O O T H
–1 –1 –1 –1 –1
S N N S G
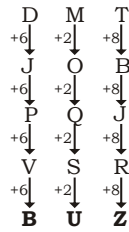
Similarly, H E A L I N G
–1 –1 –1 –1 –1 –1 –1
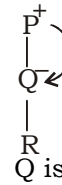G D Z K H M F
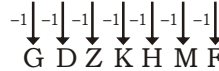
23. (4) The possible venn diagram is
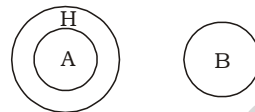
only conclusion I follows

24. (1) By hit and trial method
  P ÷ Q × R,

Q is daughter of P

25. (2)
  1. (3) 2. (2) 3. (4) 4. (4) 5. (4)
  6. (3) 7. (2) 8. (3) 9. (4) 10.(3)
  11.(2) 12.(4) 13.(4) 14.(4) 15.(4)
  16.(2) 17.(2) 18.(1) 19.(1) 20.(4)
  21.(3) 22.(4) 23.(4) 24.(1) 25.(2)

ENGLISH LANGUAGE AND COMPREHENSION

1. (3) "refers to" is correct phrase , means to go through.
13. (1) "Has gone" is correct expression. (Here Present perfect tense should be used).
14. (2) In case of "neither and nor", the verb agrees to the nearest Subject. If the nearest noun is singular , we use singular verb. So " nor the nurse was present " is the correct expression.

1. (3) 2. (3) 3. (2) 4. (4) 5. (4)
6. (3) 7. (1) 8. (2) 9. (3) 10.(2)
11.(3) 12.(1) 13.(1) 14.(2) 15.(4)
16.(3) 17.(4) 18.(4) 19.(1) 20.(3)
21.(4) 22.(2) 23.(2) 24.(3) 25.(3)

Words	Meaning in English	Meaning in Hindi
A far cry	Very different from (something or someone). *Ex:-The movie is a far cry from the book.*	अनुमान से एकदम अलग होना
Besiege	To surround a place with an army	घेराबंदी करना
Cloven hoof	To reveal one's evil or malicious nature/intention. *Ex:- The devil is typically depicted with cloven hooves* *Ex:- I thought I could trust him until he showed the cloven hoof by spreading rumours about me.*	अपना असली रंग/इरादा दिखाना
Deranged	Disturbed or upset, especially mentally.	पागल, मतिभ्रष्ट
Illness	An instance of a disease or poor health. *Ex:- Her grandmother had passed away after a long illness.* *Syn. Sickness, malaise, malady*	रोग, बीमारी, अस्वास्थ्य
Imitate	To copy	नकल करना; अनुकरण करना
Incise	to carve (something, such as an inscription) into a surface. *Syn. Engrave , carve , inscribe.*	नक्काशी करना
Jaundiced eye	To look upon something with prejudice. Usually, in a cynical and negative way. *Ex:- He has a jaundiced eye. He cannot be my lawyer.*	पूर्वाग्रह से ग्रस्त होना
Lacklustre	lacking brilliance, dull, mediocre.	जो रोचक या रोमांचक न हो; शिथिल, भावशून्य, फीका
Mutate	to change, to develop a new form or structure.	परिवर्तित होना, बदल जाना
Nexus	a complicated series of connections between different people or things. *Syn. connection , link, collusion*	विभिन्न व्यक्तियों या वस्तुओं के बीच संबंध
Replicate	to copy something exactly. Unprecedented never happened or existed before. *Syn. new , novel , unfamiliar.*	किसी वस्तु की प्रतिकृति या हूबहू नकल करना बनाना जो पहले कभी घटित नहीं हुआ या जिसका अस्तित्व नहीं रहा; अभूतपूर्व
Tarnished	To bring disgrace on , malign the image of someone *Ex:- The scandal has tarnished his reputation.*	कलंकित करना, मलिन करना
Wry face	A disdainful grimace, A contorted facial expression.	मुँह बिचकाने की मुद्रा