QUANTITATIVE APTITUDE

1. (2) Given,

$k + \dfrac{1}{k} = -2$

So, $k = -1$

Now, $\dfrac{k^2 + 4k - 2}{k^2 - k - 5}$

$k + \dfrac{1}{k} = -2 =$

$\dfrac{(-1)^2 + 4 \times (-1) - 2}{(-1)^2 + (-1) - 5}$

$= \dfrac{1 - 4 - 2}{1 - 1 - 5} = -5/-5 = 1$

2. (4) Given,

$x + \dfrac{1}{x} = 5\sqrt{2}$

$\begin{cases} If \ x + \dfrac{1}{x} = v \\ then, \ x^2 + \dfrac{1}{x^2} = v^2 - 2 \end{cases}$

$\therefore x^2 + \dfrac{1}{x^2} = \left(5\sqrt{2}\right)^2 - 2$

$\Rightarrow x^2 + \dfrac{1}{x^2} = 48$

Now, $x^4 + \dfrac{1}{x^4} = 48^2 - 2 = 2302$

3. (2) Let the speed of man = x km/hr and, speed of boat = y km/hr
Total distance = 90 km
A.T.Q,

$x - y = \dfrac{90}{9} = 10$ km/hr

$x + y = \dfrac{90}{18} = 5$ km/h

Now,

$x + y = 10$
$\underline{x - y = 5}$
$2x = 15$
$x = 7.5$

$\therefore$ Required time is

$\dfrac{90 \times \dfrac{3}{5}}{7.5} = \dfrac{90}{75} \times 10 \times \dfrac{3}{5} = 7.2$

4. (4) Total Production of steel
= 240+180+160+200+220 = 1000
Required angle of Kerala =

$\dfrac{360}{1000} \times 200 = 72°$

5. (2) Successive discount = $x + y - xy/100$

$= 10 + 20 - \dfrac{10 \times 20}{100} = 28\%$

ATQ,

$= \dfrac{MP}{CP} = \dfrac{100+P}{100-D}$

$= \dfrac{MP}{CP} = \dfrac{144}{72} = \dfrac{2}{1} \times \dfrac{100}{100}$

MP – 200
CP – 100
Selling pries of the article

$= 200 \times \dfrac{85}{100} = 170$

$\therefore$ Required profit

$= \dfrac{170 - 100}{100} \times 100 = 70\%$

6. (3) Given,

$\dfrac{\sin 30° \sin 40° \sin 50° \sin 60°}{\cos 30° \cos 40° \cos 50° \cos 60°}$

$\begin{cases} \sin(90° - θ) = \cos θ \\ \cos(90° - θ) = \sin θ \end{cases}$

$= \dfrac{\sin 30° \times \sin(90° - 50°) \times \sin(90° - 40°) \times \sin 60°}{\cos(90° - 60°) \cos 40° \cos 50° \cos(90° - 30°)}$

$= \dfrac{\sin 30° \times \cos 50° \times \cos 40° \times \sin 60°}{\sin 60° \times \cos 40° \times \cos 50° \times \sin 30°} = 1$

7. (2) Let H.C.F. = A
$\therefore$ Numbers = Ax and Ay
We know that,
$Ax \times Ay = 48 \times A$

$\Rightarrow A = \dfrac{384}{48} = 8$

$\therefore$ Ratio of HCF : LCM = 8 : 48
= 1 : 6

8. (1) Successively increasing
$= x + y + xy/100$

$= 10 + 5 + \dfrac{10 \times 5}{100}$
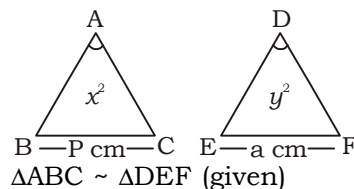
$= 15 + 0.5 = 15.5\%$

Next successive increase

$= 15.5 + 15 + \dfrac{15 \times 15.5}{100}$

$= 30.5 + 2.325$
$= 32.825$

$= 32 + \dfrac{825}{1000} = 32\dfrac{33}{40}\%$

9. (3) A.T.Q,

ΔABC ~ ΔDEF (given)

$\therefore \left(\dfrac{P}{a}\right)^2 = \dfrac{x^2}{y^2}$

$\Rightarrow \dfrac{P}{a} = \dfrac{x}{y} \Rightarrow P = \dfrac{xa}{y}$

$\therefore$ Length of BC = $\dfrac{xa}{y}$ cm

10. (3) Number students 25 Average Marks 19
Taken as 18 and 19 respectively instead of 14 and 15
18+19 = 37 (wrong)
14+15 = 29 (right)
Diff. 37–29 = 8

Right average = $19 - \dfrac{8}{25} = 18.68$

OR

Required Average

$= \dfrac{25 \times 19 + 15 + 14 - 18 - 19}{25}$

$= \dfrac{19 \times 25}{25} - \dfrac{8}{25} = 18.68$

11. (1) A.T.Q,
$= x^9 \times x^5 \times x^{-4} \times x^0 \times x^{-6}$

$= x^9 \times x^5 \times \dfrac{1}{x^4} \times x^0 \times x^{-6}$

$= x^9 \times x \times 1 \times \dfrac{1}{x^6} = \dfrac{x^{10}}{x^6} = x^4$

12. (2) $\sin 30° \cos 60° - \cos 30° \sin 60°$

$= \dfrac{1}{2} \times \dfrac{1}{2} - \dfrac{\sqrt{3}}{2} \times \dfrac{\sqrt{3}}{2}$

$= \dfrac{1}{4} - \dfrac{3}{4} = \dfrac{-2}{4} = \dfrac{-1}{2}$
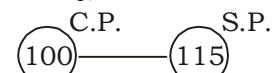
Option (2) is the correct answer

$-\dfrac{1}{2} = -\sin 30°$

13. (3) Mean proportion : third proportion

$= \sqrt{1.6 \times 3.6} : \dfrac{8 \times 8}{5}$

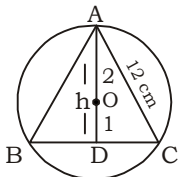$= \dfrac{4 \times 6}{10} : \dfrac{8 \times 8}{5} = 3 : 16$

14. (2) A.T.Q,

Profit = 15 unit
Selling price of shoes

$= \dfrac{1200}{15} \times 115 = ₹9200$

15. (3)

Let Principal - 100
Rate = 25%
Time = 6 years — diff.=50 units
Interest - 25 × 65 = 150

A.T.Q,
50 units = 360
100 units = 720
∴ Required Amount = ₹720

16. (2) A.T.Q,

We know that,

$$h = \frac{\sqrt{3}}{2}a \quad \Rightarrow \quad h = \frac{\sqrt{3}}{2} \times 12$$

$$\Rightarrow h = 6\sqrt{3}$$

$$\therefore OA = 6\sqrt{3} \times \frac{2}{3} = 4\sqrt{3} \text{ cm}$$

17. (1) Total revenue from A.C from Shop E

$$= \frac{4000}{10} \times 5 \times 265000 = ₹53000000$$

Total revenue from Cooler from

Shop E = $\frac{4000}{10} \times 1 \times 8000$

= ₹3200000

Total revenue from fan from

Shop E = $\frac{4000}{100} \times 4 \times 12200$

= ₹19520000

Required percentage =

$$\frac{\text{Total revenue cooler}}{\text{Total revenue from (cooler+AC+Fan)}} \times 100$$

$$= \frac{3200000}{75720000} \times 100 = 4.226\%$$

18. (1) Maximum marks – 400 (SST + Physics + Chemistry + Math)
Total marks of students A = 92+90+90+80 = 352
Total marks of student B = 90+80+85+85 = 340
Total marks of student C = 80+80+65+70 = 295
Total marks of student D = 85+80+82+75 = 322
Total marks of student E = 80+75+75+85 = 315
Total marks of student F = 90+90+90+85 = 355
Maximum marks for 80% =

$$\frac{400}{100} \times 80 = 320$$

∴ Required students are A, B, D and F.

19. (4) Ratio of S_3 and S_4
= 400 : 500 = 4 : 5

20. (2) According to the question.

$$8\overline{)8127}(1015$$
$$\underline{8}$$
$$\times 12$$
$$\underline{8}$$
$$47$$
$$\underline{40}$$
$$7 \rightarrow \text{Remainder}$$

21. (1) A.T.Q,
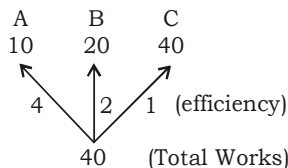
Work done in 3 days = 4+4+4+2+1 = 15 unit
Work done in 8 days = 15 × 2 + 4 + 4 = 38 units
∴ Work will be finished in

$$= 8 + \frac{2}{7} = 8\frac{2}{7}$$

22. (1) This is a formula
Sinα–Sinβ

$$= 2\cos\frac{\alpha+\beta}{2}\sin\frac{\alpha-\beta}{2}$$

23. (3) According to the question
Volume of hemisphere = Volume of cone

$$\frac{2}{3}\pi \times 4 \times 4 \times 4 = \frac{1}{3}\pi \times r^2 \times 72$$

$$\Rightarrow 4 \times 4 = r^2 \times 9$$

$$\Rightarrow r = \frac{4}{3} = 1.33 \text{ cm}$$

24. (3) Sum of three angles of a triangle = 180°
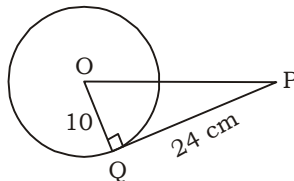According to the question
$(x - 46°) + (x + 96°) + 8x = 180$
$\Rightarrow 10x + 50° = 180°$
$\Rightarrow 10x = 130°$
$\Rightarrow x = 13°$
Value of $2x = 2 \times 13° = 26°$

25. (3) A.T.Q,

ΔOQP is a right angled triangle
∴ OP² = OQ²+PQ²
$\Rightarrow$ OP² = 10²+24²
$\Rightarrow$ OP² = 100+ 576
$\Rightarrow$ OP² = 676
∴ Length of OP = 26 cm

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

GENERAL AWARENESS

1. (3) Cooperative sector-Industries are owned and operated by a group of individuals.

2. (4) To encourage the study of ancient texts and Hindu Laws, Jonathan Duncan established the Banaras Hindu College in 1791.

3. (2) 'Gulam Giri' was written by Jyotiba Phule in Marathi language with an English preface. The text has been translated into English and named it 'Slavery'. She formed the Satya Shodhak Samaj in 1873, to aim for equal rights for people from lower castes.

4. (2) Rabi crops - Wheat, Gram, Peas, Mustard, Barley, Oats, Linseed etc.
Kharif crops - Rice, Maize, Pulses, Millets, Soyabean, Groundnuts, etc.

5. (2) Phytoplankton use sun light, nutrients, CO_2 and water to produce oxygen and nutrients for other organisms. They are responsible for producing 50% of the oxygen we breath.
Ex:-Green algae, Cyanobacteria, Dinoflagellates.
Zooplankton - Jellyfish, Krill, Forans, etc.

6. (3) Military World Games have been held since 1995. Rome. The first winter edition was held in 2010 in Aosta Valley, Itlay.
In 2027, it will be held in Bagota, Colombia.
Cadet Games 2022, was held in St. Petersburg.

7. (4) Kirana Gharana - Bhimsen Joshi, Prabha Atre, Abdul Wahid Khan, Amjad Ali Khan, Roshan Ara Begum, etc.
Jaipur Gharana - Ustad Alladiya Khan, Kishori Amonkar Mallikarjun Mansur, Padma Talwalkar, etc.
Gwalior Gharana - Malini Rajukar, Omkarnath Thaker, Ghulam Hassan, etc.
Delhi Gharana - Ustad Iqbal Ahmed Khan

8. (4) Tejashwi Yadav - Deputy Chief Minister of Bihar.
Phagu Chauhan -Governor of Bihar
Parmod Sawant-Chief Minister of Goa.
Lok Sabha in Bihar - 40
Rajya Sabha Bihar - 16

9. (2) The cell cycle is composed of interphase (G_1, S and G_2 phases), followed by the mitotic phase (Mitosis and cytokinesis) and G_0 phase.

10. (4) Shyamji Krishna Verma also founded 'The Indian Sociologist'. On 4 October 1989. 'The India Post' has issued a postal stamp on Shyamji Krishan Verma.

11. (1) Under this Scheme, age group of 18-60 years living in the local body area will be registered on the basis of Jan Aadhar Card. It ensures 100 days of guaranteed employment in a year. A provision of ₹ 800 Cr. has been made annually for the scheme.

State	Lok Sabha	Rajya Sabha
Himachal Pradesh	4	3
Uttar Pradesh	80	31
Maharashtra	48	19

12. (2) Third Five year Plan (1961-65) focussed on the defence industry and the Indian Army.
First Five year Plan (1951-55) focussed on development of Primary sectors.
Second Five year Plan (1956-60) focussed on development of Public sector and rapid Industrialisation.

13. (3) The Idea of Fundamental duties has been inspired by Russia.These were incorporateds in Part IV-A of the constitution by the 42nd Amendment. Act, 1976 on the recommendations of Sawarn Singh Committee. Originally they were ten. One duty was added through 86th Amend-ment Act, 2002 All duties. are listed in Article 51-A.

14. (4) Makar Sankranti-14 January
Uttarayan - 14 January in Kite Festival Gujarat.
Bikaner Festival - 12 or 13 January
Onam is celebrated in Kerala.

15. (4) Manish Sisodia started the Mission Kusal Karmi" to help the construction workers to improve their ability.

16. (2) 2026 Youth Summer Olympic Games will be held in Dakar, Senegal.
2024 Youth Winter Olympic Games will be held in Gagwon, South Korea.

17. (3) Thorny bushes are found in Hot and dry desert region. Climate with seasonal rainfall averaging 250 to 500 milli-metres or less than 50 cm.

18. (3) Bidesiya dance is the most popular folk dance of Bihar.

19. (1) Sonal Mansingh is an Indian classical dancer specialised in Bharatanatyam and Odissi dancing style.
Kumudini Lakhia, Shovana Narayan, Sunayana Hazarilal are Kathak dancers.

20. (4) Rate at which velocity changes with time in term of both speed & direction. Unit of acceleration is metre per second^2

$$S.I. \text{ unit} = \frac{v}{t} = \frac{m/\sec}{\sec} = m/\sec^2$$

21. (4) Sangam poem mention the 'muvendar' a Tamil word meaning three chiefs, used for the heads of three ruling Families, Cholas, Cheras and Pandyas.

22. (2) The Vice President (Jagdeep Dhankar) of India is the ex-officio Chairmen of Rajya Sabha (Article 64). First Vice President of India was Sarvepalli Radha Krishnan
Article 63 - There shall be a Vice President of India.
Article 67 - Term of office of Vice President

23. (4) Peat is the lowest quality of Coal.

24. (4)

25. (1)
Common Name	Chemical Name
Washing Soda	Na_2CO_3
Baking Sosa	$NaHCO_3$
Gypsum	$CaSO_4$

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

GENERAL INTELLIGENCE & REASONING

1. (2) Option 2 is the right answer/विकल्प 2 सही उत्तर है।

2. (1) $[\{(38-23)+(4\times 3)\}\div(6+3)]\times 2$
$[\{15+12\}\div 9]\times 2 = 3\times 2 = 6$

3. (4) The logic is

Similarly,
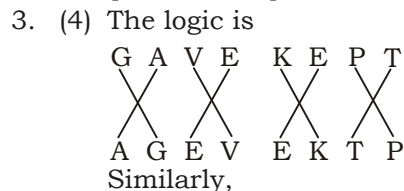
4. (2) opposite the face of '2'

Fig (i)   Fig (ii)   Fig (iii)

$4 \leftrightarrow 2$ (fig (ii) and fig (iii))
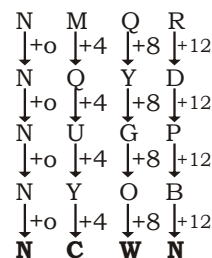$4 \!\!\begin{array}{l} 1-5 \\ 3-6 \end{array}$
4 is the number on the face opposite the face showing '2'.

5. (4) $12:16 \rightarrow \sqrt{16}\times 3=12$
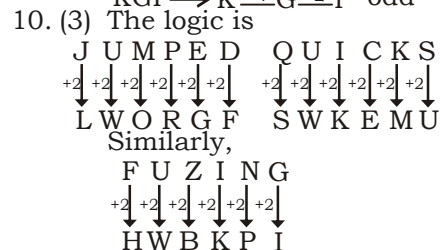$18: \mathbf{36} \rightarrow \sqrt{36}\times 3=18$
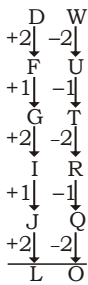$24:64 \rightarrow \sqrt{64}\times 3=24$

6. (3) Big hand rotate 135º clockwise and small hand rotate 90º and 45º alternatively.
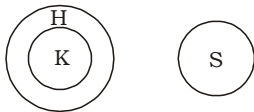
7. (1) The correct answer is 1.

8. (3) The pattern is

9. (4) TVR $\rightarrow$ T $\underline{+2}$ V $\underline{-4}$ R
DFB $\rightarrow$ D $\underline{+2}$ F $\underline{-4}$ B
QSO $\rightarrow$ Q $\underline{+2}$ S $\underline{-4}$ O
KGI $\rightarrow$ K $\underline{+4}$ G $\underline{+2}$ I $-$odd

10. (3) The logic is

Similarly,

11. (2) The pattern is

$$\begin{array}{cc} D & W \\ +2\downarrow & -2\downarrow \\ F & U \\ +1\downarrow & -1\downarrow \\ G & T \\ +2\downarrow & -2\downarrow \\ I & R \\ +1\downarrow & -1\downarrow \\ J & Q \\ +2\downarrow & -2\downarrow \\ L & O \end{array}$$
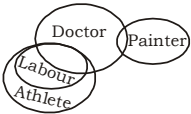
12. (2) The possible venn diagram is

13. (3) $(55 + 65) \times 2 = 240$
$(85 + 75) \times 2 = 320$
Similarly, $(35 + 45) \times 2 = 160$

14. (2) The possible venn diagram is

15. (3) The right answer is '3'

16. (1)

153–151–147 → 153+151+147=451– the prime no.
171–169–167 → 171+169+167=507– divisible by 3
183–181–178 → 183+181+178=542– divisible by 2
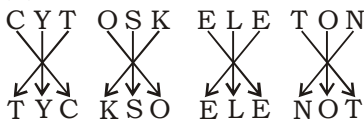201–198–197 → 201+198+178=596– divisible by 2

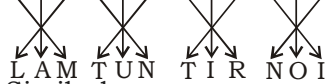**17. (2)** By hit and trial method
Interchanging 9, 2 and ÷, ×
$150 \div 15 + 14 - 2 \times 9$
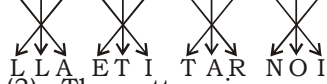$10 + 14 - 18 = 6$

18. (1) The pattern is

19. (3) The pattern is
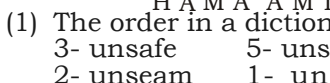
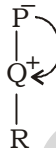**20. (1)** The order in a dictionary is
3- unsafe   5- unsay
2- unseam   1- unseen-
4th position   4- unsound

21. (2) By hit and trial method
$P + Q \times R$

22. (3) By hit and trial method
$30 \div 6 \times 4 + 15 - 35 = 25$
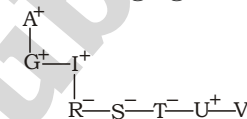Interchanging 25 and 35, × and ÷
$30 \times 6 \div 4 + 15 - 25 = 35$
$45 + 15 - 25 = 35$
$45 - 10 = 35$
$35 = 35$

23. (2) A+G&I+R@S@T#U&V

A is maternal grandfather of T.

24. (3) The pattern is

$$35 : 21 \rightarrow \frac{35}{7} = \mathbf{5}, \frac{21}{7} = \mathbf{3}$$

$$\mathbf{60} : 36 \rightarrow \frac{60}{12} = \mathbf{5}, \frac{36}{12} = \mathbf{3}$$

$$40 : 24 \rightarrow \frac{40}{8} = \mathbf{5}, \frac{24}{8} = \mathbf{3}$$

25. (2) 4, 6, 12, 14, 28, 30, **60**
×2 ×2 ×2

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

ENGLISH LANGUAGE AND COMPREHENSION

2. (4) Replace "it" with "in" as "fate had in store" is the correct expression.

8. (1) "piercing" is incorrectly spelt as "peircing".
Means- to create a hole (छेद करना)

18. (2) Replace 'for which' with 'when'.

20. (2) When 'have' means to 'own' or 'possess', it cannot take 'ing' form. 'Has' should replace 'is having'.

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

Words	Meaning in English	Meaning in Hindi
Announce	To make something known publicly and officially. *Syn. advertise*	घोषणा करना, ऐलाना करना
Competent	having the ability or skill needed for something. *Syn. capable*	सक्षम, योग्य
Complex	Made up of multiple parts; composite; not simple.	जटिल
Denounce	To criticize	भर्त्सना करना, दोषारोपण करना
Gratis	free , without charging any price	नि:शुल्क
Gourmet	a person who enjoys food and knows a lot about it.	भोजनप्रेमी तथा भोजन-विशेषज्ञ
Gracious	(used about a person or his/her behaviour) kind, polite and generous.	(व्यक्ति या उसका आचरण) दयालु, नम्र और उदार
Itch	The feeling on your skin that makes you wantto rub or scratch it.	खाज, खुजली
Pie	type of food consisting of fruit, meat or vegetables inside a pastry case.	फल, मांस या सब्जियों से भरी पेस्ट्री; खिचड़ी
Sporadic	not done or happening regularly, irregular *Syn. Occasional .*	अनियमित रूप से किया गया या होने वाला काम
Sleek	Having an even, smooth surface	चिकना, आकर्षक बनाना
Trivial	of little importance; not worth considering. *Ant. serious.*	महत्वहीन, मामूली; नगण्य, तुच्छ