QUANTITATIVE APTITUDE
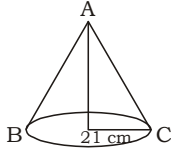
1. (3) ATQ,
   Principal = 100
   16% = 480
   1% = 30
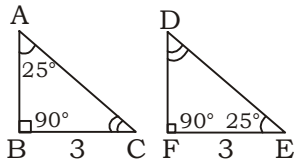   100% = 3000

2. (3)

   r = 21 cm
   Curved surface area = $\pi r l$

   $$\frac{22}{7} \times 21 \times l = 594$$

   $$l = \frac{594}{66} = 9$$

3. (3)

   Given $\angle A = 25$
   $\angle E = 25$
   $\angle B = \angle F = 90°$
   AC = ED
   $\triangle ACB \cong \triangle EDF$ = (ASA)
   or $\triangle ABC \cong \triangle EFD$

4. (2) HCF of $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$

   HCF

   $$= \frac{\text{HCF of numenator}}{\text{LCF of dinomenator}}$$

   $$= \frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8} \quad \text{HCF} = \frac{1}{24}$$

5. (2) The ratio of the number of donors of blood group 'O' to the average of the number of donors of blood group 'A' and 'AB' 80 : $\frac{90+70}{2}$ 1 : 1

6. (2) ATQ,

   Total work = (Abha+Anju)× $\frac{40}{9}$

   $= \left(\text{Abha}×2 + \frac{\text{Anju}}{3}\right) \times \frac{60}{17}$

   $= (\text{Abha+Anju})\frac{2}{9}$

   $= \frac{(6\,\text{Abha+Anju})}{3} \times \frac{3}{17}$

   = 34 Abha + 34 Anju = 54 Abha + 9 Anju
   = 25 Anju = 20 Abha

   $= \frac{\text{Anaj}}{\text{Abha}} = \frac{4}{5}$

   Total work = $(4+5) \times \frac{40}{9} = 40$

   Time taken by Abha = $\frac{40}{5}$
   = 8 days

7. (3) $P - \frac{1}{P} = 6$
   squaring both side

   $P^2 + \frac{1}{P^2} = 36+2$

   $P^2 + \frac{1}{P^2} = 38$

   Again, squaring both side

   $P^4 + \frac{1}{P^4} + 2 = 38^2$

   $P^4 + \frac{1}{P^2} = 1442$

8. (4) Number of seven digits
   89476*2
   ATQ,
   Go through option = 1, 2, 3, 4,
   $8\,\overline{)\,6*2\,(}$
   put the value of * = 3

9. (1) $\frac{CP}{MP} = \frac{100-D\%}{100+P\%} = \frac{100-20}{100+25}$

   $\frac{CP}{MP} = \frac{80}{125} = \frac{16}{25}$
   25 units = 400
   CP = 16 units = 256
   Alternatively:-

   Discount - 20% = $\frac{1}{5}$, 25% = $\frac{1}{4}$

   MP : SP = 5 : 4
   SP : CP = 5 : 4
   MP : CP = 25 : 15
   25 units = 400
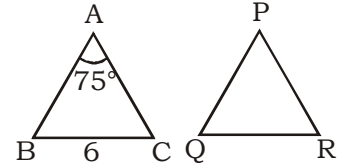   1 unit = 16
   16 units = 256

10. (4) $x^4 - 15x^3 + 15x^2 - 15x + 40, x = 14$
    $x^3(14-15) + 15x^2 - 15x + 40$
    $-x^3 + 15x^2 - 15x + 40$
    $x^2(-x + 15) - 15x + 40$

    $x^2(-14+15) - 15x + 40$
    $x(x-15) + 40$
    $14(14-15) + 40$
    $= -14 + 40 = 26$

11. (3) $\triangle ABC \cong \triangle PQR$, BC = 6 cm,

    $\angle A = 75°$
    From similarity
    BC = QR = 6 cm, $\angle A = 75 = \angle P = 75°$

12. (2)

    The police caught the thief in 3 minutes.

    $\frac{5}{18} \times (10-x) \times 180 = 100$
    (10–x) = 2
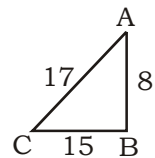   x = 8 km/h

13. (1) Average speed = $\frac{2xy}{x+y}$

    $= \frac{2 \times 45 \times 80}{45+80}$

    $= \frac{90 \times 80}{125} = 57.6$ km/h

14. (2) ATQ,
    The total price of fruit A = 75+120+50+70+95 = 410
    The total price of fruit B = 140+90+35+85+96 $\Rightarrow$ 446
    Diff. between A and B = 410 ~ 446 = 36
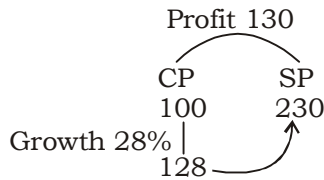
15. (3) $\sin\theta = \frac{8}{17}$

    Pythagoras theorem
    $ABC^2 = \sqrt{289-64} = \sqrt{225} = 15$

    $\tan\theta + \cot\theta = \frac{8}{15} + \frac{15}{8}$

    $= \frac{64+225}{120} = \frac{289}{120}$

16. (4) Let, CP = 100

Profit 130

```
        CP     SP
        100    230
Growth 28% |
        128 ──┘
```

Profit = $\frac{102}{128} \times 100$

= 79.6875

= 80%

17. (3) (A+C) : (E+F)

(80+120) : (40+80)

200 : 120 = 5 : 3

18. (3) $\sin^2\theta \cos^2\theta = \frac{2}{9}$

ATQ,

$\sec^2\theta + \csc^2\theta = \frac{1}{\cos^2\theta} + \frac{1}{\sin^2\theta}$

$\frac{\sin^2\theta + \cos^2\theta}{\sin^2\theta\cos^2\theta} \Rightarrow \frac{1}{\frac{2}{9}} = \frac{9}{2}$

19. (3) a = 36 cm

$R = \frac{a}{\sqrt{3}} \Rightarrow \frac{36}{\sqrt{3}}$

$R = 12\sqrt{3}$ cm

20. (2) $\frac{146 \times 146 \times 146 - 143 \times 143 \times 143}{146 \times 146 + 143 \times 143 + 146 \times 143}$

Let, a = 146, b = 143

$\left[\frac{a^3 - b^3}{a^2 + b^2 + ab}\right] = a - b$

$\Rightarrow 146 - 143 = 3$

21. (3) $\frac{\cos^2 x - \sec^2 x}{\tan^2 x} = a + b\cos 2x$

$\frac{\cos^4 x - 1}{\cos^2 x \frac{\sin^2 x}{\cos^2 x}} = a + b(2\cos^2 x - 1)$

$\cos^4 x - 1 = a(1 - \cos^2 x) + b[2\cos^2 x 1 - 2\cos^4 x + \cos^2 x]$

$2\cos^4 x - 2 = (a - b) - \cos^2 x(a - 3b)$ 2b $\cos^4 x$

Comparing both sides

$-2b = 2$ $a - b = -2$

$b = -1$ $a + b = -2$

             $a = -3$

22. (3) (I) $\left(\frac{P+Q}{2}\right) : \left(\frac{T+U}{2}\right)$

$\frac{9° + 36°}{2} : \frac{(15° + 35°)}{2}$

9 : 10

(II) (R+S) − V

140+50−75 = 115°

360° = 3600

1° = 60

115° = 1150

Only (I)

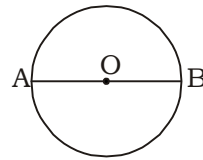**23. (4)** Let number 4x, 5x and 7x

ATQ, $16x^2 + 25x^2 + 49x^2$

=15210

$90x^2 = 15210$

$x^2 = 169$

$x = 13$

16x = 16×13 = 208

24. (2) Perpendicular distance between cord (diameter) and centre of a circle = 0

Let, the strength of the school of teh first year = x

25. (2) $x \times \frac{112}{100} \times \frac{88}{100} \times \frac{110}{100} = 10842$

$x = 10842 \times \frac{50}{56} \times \frac{50}{44} \times \frac{10}{11}$

$x = 10000.36$

$x = 10000$

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

GENERAL AWARENESS

1. (3) Lok Sabha (House of people) is the lower house of India's Parliament. The speaker of Lok Sabha is Om Birla. The maximum membership of the house allotted is 552. 2 seats for additional members of Anglo-Indian community (1952-2020) was abolished in Jan 2020 by the 104th Amendment Act, 2019. A total of 131 seats (24.03%) are reserved for SCs (84) and STs (47).

2. (4) AEB-de-Chancourtois was the first to arrange the chemical elements in order of atomic weight.

Lothar Meyer developed the earliest versions of periodic table.

Dimitri Mendeleev is known for formulating and creating a version of periodic table.

3. (3) Rangarajan Committee - Measure-ment of poverty

Basel Committee - Banking supervision.

Narsimham Committee - To analyse india's banking sector and recommend reforms.

4. (4) Under technology transfer scheme, a maximum of Rs.10 lakhs will be reimbursed to startups purchasing or sourcing technologies to the goverment research institutes and working on them to develop products that can be commercialized.

5. (1) Danti durga was the founder of Rashtrakuta Empire. His capital was based in Gulbarga. Govinda-I (809-836 CE) was ruler of Shakambhari dynasty.

Dhruva Dharavarsha was a ruler of Rashtrakuta Empire. Krishna I (Rashtrakuta) built the rock temple of kailasa at Ellora.

6. (2) Indian council Act, 1861 transformed India's executive council to function as a cabinet run on the portfolio system.

The regulating Act of 1773 was passed by the British Parliament to control the territories of the East India Company majorly in Bengal. This act was passed due to the misgovernance by the British East India government that led to a situation of bankruptcy and the government had to interfere with the affairs of the Company.

Charter Act of 1853 renewed the power of company and allowed it to retain territories and revenues. Dalhousie was then Governor-General of India.

7. (2)

8. (1) A six member, Jayant Kumar Bhantia Commission set up

by Maharashtra government in March 2022.

9. (4)
10. (3) Right to Equality (14-18)
   (i) Article 14 - Equality before Law
   (ii) Article 15 - Prohibits discrimination on grounds of religion, race, caste, sex, or place of birth.
   (iii) Article 16 - Equal opportunity in matters of public employment.
   (iv) Article 17 - Abolition of untouch-ability.
   (v) Article 18 - Abolition of titles.
11. (2) Saccharin - $C_7H_5NO_3S$
   Sucralose - $C_{12}H_{19}Cl_3O_8$
   Neotame - $C_{20}H_{30}N_2O_5$
12. (1) China is the largest milk producer in the world. India and Uzbekistan are at 2nd and 3rd position respectively.
13. (3) The first edition of Common Wealth Youth Games was held in Edinburgh, Scotland in 2000. The age limitation of the athletes is from 14 to 18.
   In 2017, it was held in Nassau, The Bahamas.
   In 2023, it will be held in Port of Spain, Trinidad and Tobago.
14. (1) The Republic Day Parade starts from Rashtrapati Bhavan and end at the India Gate. The first parade was held in 1950. The celebration starts on 23rd Jan. The Birth anniversary of (Subhas Chandra Bose) and ends on 30th Jan. (Martyr's Day).
15. (3) FIVB Volleyball Men's World Cup was founded in 1949. Its CEO is Ary Graca. The first edition was held in Prague in 1949. Italy won their fourth title in 2022, beating Poland in the final.
16. (2) Seasonal winds - Monsoon Local winds around the World :-
   Chinook, Foehn, Kamsin, Sirocco, Nor'wester, etc.
17. (4) Ravi Mittal - Chairperson of IBBI

Suchitra K Ella - Chairperson of CII southern region.
Ajay Bhushan Pandey - CEO of (UIDAI).

18. (4) The bacterial flagellum is a motile organelle composed of thousands of protein subunits. The filamentous part that extends from the cell membrane is called the axial structure and consists of three major parts, the filament, hook, and rod, and other minor components.
19. (3) Manipuri dance is also known as Jagoi.
   Dadra is a musical composition in Kathak dance.
   The theoretical structure of Bharatanatyam is known as Sadir.
20. (2) Somatic cells are cells in the body other than sperm and egg cells.
21. (3) Karnataka - Ullsor, Hebbal, Karanji, Ayyanakere, Unkal, Krishana Sagar, Manipal, Mattur, etc.
   Kerla - Vebanand, Ashtamudi, Paravur, Aakulan, Devi Kulan etc.
   Andhra Pradesh- Kolleru, Pulicat, Venkanna etc.
22. (1) The largest coal Mine in India - Jharia
   The oldest coal Mine in India - Raniganj
   Deepest coal Mine in India - Chinakuri pit.
   India is the second largest producer of coal after China.
23. (2)
24. (2) Sopana sangeetham tradition is followed in Kathakali.
25. (2)

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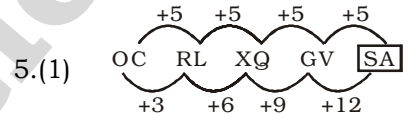21.(3) 22.(1) 23.(2) 24.(2) 25.(2)

GENERAL INTELLIGENCE & REASONING

1.(3) $7^3-13 = 330$
   $6^3-13 = 203$
   $9^3-13 = 716$
2.(3) P – Q % R & S + T P related to T
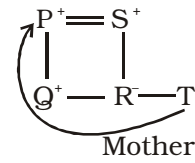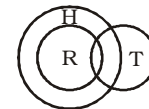

Mother

3.(3) By hit and trial method
   8×4+6−2÷1 = 6
   2×4+6−8÷1 = 6
   8+6−8 = 6
   6 = 6
4.(3) By hit and trial method
   $18+(12×6)+(63÷7)×4+(27)^{1/3}-11=112$
   $18+(12×4)+(63÷7)×6+(27)^{v3}-11=112$
   66+54−8 = 112
   66+46 = 112
   112 = 112
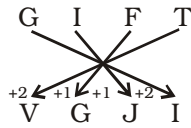
5.(1)

6.(2) The order of words in a dictionary is.
   Order 3, 4, 1, 3, 5
   2. Historian
   4. Historical
   1. History
   3. Hobnail
   5. Hobnob
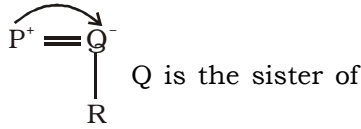7.(4) The right answer is 4
8.(1) The possible venn diagram is

Neither conclusion follows.

9.(2)

10.(3)

Similarly,

G I F T

V G J I

with +2 +1 +1 +2
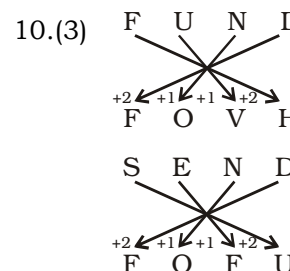
11.(3) By hit and trial method
P×Q÷R

$$P^+ = Q^-$$

Q is the sister of P.

12.(1) The right answer is 1.

13.(2)

14.(2) X Y Z → X$^{\pm1}$ Y $^{\pm1}$ Z
L N M → L$^{\pm1}$N$^{\pm1}$M -odd
A B C → A$^{\pm1}$ B$^{\pm1}$ C
I J K → I$^{\pm1}$ J$^{\pm1}$ K

15.(2) 34×2–12×2 = 56
78×2–27×2 = 102
72×2–34×2 = 76

16.(4) By hit and trial method
9×4+5–8÷2 = 25
5×4+9–8÷2 = 25
20+9–4 = 25
25 = 25

17.(4) The possible venn diagram is
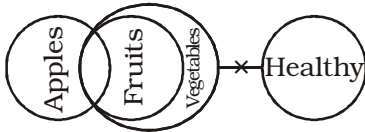
Only conclusions (II) and (III) follow

18.(1)

19.(3) 32–65 → 32×2+1 = 65
12–25 → 12×2+1 = 25
28–56–28×2+0 = 56 –odd
26–53–26×2+1 = 53

20.(4) 27^2–15 = 713
32^2–16 = 1209
35^2–16 = 1008
35^2–16 = 1209

21.(4)

22.(1) From fig (II) to fig (III)

1↔2
3↔4
6↔5
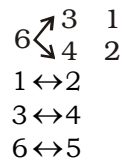
23.(3)

137, 114, **160**, 91, 183

24.(2)

–23 +46 –69 +92
     ×2   ×3   ×4
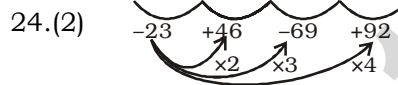
25.(1)

S	M	L
↓+4	↓+8	↓+9
W	U	Z
↓+4	↓+8	↓+9
A	C	I
↓+4	↓+8	↓+9
E	K	R
↓+4	↓+8	↓+9
I	**S**	**A**

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

◗ ENGLISH LANGUAGE AND COMPREHENSION ◖

5. (4) "Quiver" is incorrectly spelt. Meaning -
   i) Noun -a case for carrying or holding arrows. (तरकश)
   ii) Verb- to shake or move with a slight trembling motion. (कांपना)

6. (4) "be up against" is correct phrase.
   It means - likely to have serious problems or difficulties.

12. (3) replace "decently" with "decent". Look is a verb that takes Adjective after it.

20. (2) replace "blind" with "blinded". "blinded by a dust storm" is correct exression. Here Past Participle is needed.

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

Words	Meaning in English	Meaning in Hindi
Agony	Intense pain of mind or body *Syn. Anguish , torment, distress, pang, torture.* *Ant. comfort, relief, composure, enjoyment.*	व्यथा, कष्ट
Comity	friendly social atmosphere, social harmony.	सौहार्द
Feticide	An abortion, the killing of a fetus.	भ्रूणहत्या
Fury	Extreme anger *Syn. furore, indignation, ire, lividness, madness , outrage, rage, wrath.* *Ant. Delight, pleasure, Joy.*	प्रचण्डता, कोप, प्रकोप, तीव्र क्रोध
Irresolute	Showing or feeling hesitance, uncertain. *Ant. decisive.*	दुविधा में होना
Variant	varying usually slightly from a usual or standard form *Syn. alternative, different, distinct.* *Ant. similar , analogous, related, equal.*	भिन्न, असंगति, भिन्नरूप