QUANTITATIVE APTITUDE

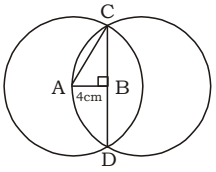
1. (1) $16\cos^3\pi/6 - 12\cos\pi/6$

$= 16\times\left(\frac{\sqrt{3}}{2}\right)^3 - 12\times\frac{\sqrt{3}}{2}$

$= 16\times\frac{3\sqrt{3}}{8} - 6\sqrt{3}$

$= 6\sqrt{3} - 6\sqrt{3} = 0$

2. (1) According to the question

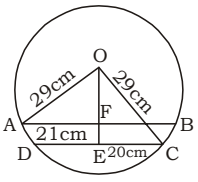


In triangle ABC,
$\Rightarrow BC^2 = AC^2 - AB^2$
$\Rightarrow BC^2 = 8^2 - 4^2$
$\Rightarrow BC^2 = 64 - 16 = 48$
$\Rightarrow BC = 4\sqrt{3}$ and, $2BC = CD$
$\therefore CD = 2\times 4\sqrt{3} = 8\sqrt{3}$ cm

3. (4) Required ratio

B	:	D
90	:	165
6	:	11

4. (2) A.T.Q,



ΔAOF,
$OF^2 = AO^2 - AF^2$
$\Rightarrow OF^2 = 29^2 - 21^2$
$\Rightarrow OF^2 = 841 - 441 = 400$
$\Rightarrow OF = 20$ cm
ΔOEC,
$OE^2 = OC^2 - EC^2$
$\Rightarrow OE^2 = 29^2 - 20^2$
$\Rightarrow OE^2 = 841 - 400 = 441$
$\Rightarrow OE = 21$ cm
OE – OF = EF (Minimum distance)
$\Rightarrow 21 - 20 = EF = 1$
The minimum distance between two chords = 1cm

5. (3) According to the question
$(6m+8w)\times 10 = (26m+48w)\times 2$
$\Rightarrow$ 30m+40w = 26m+48w
$\Rightarrow$ 30m–26m = 48w–40w
$\Rightarrow$ 4m = 8w
$\Rightarrow \frac{m}{w} = \frac{2}{1}$

Now,
$(6\times 2+8\times 1)\times 10 = (15\times 2+20\times 1)\times x$
$\Rightarrow (12+8)\times 10 = (30+20)\times x$
$\Rightarrow 20\times 10 = 50\times x \;\; = x = 4$
Required number of days = 4

6. (1) Difference in the subscription of scheme between December and February = 40 - 30 = 10 Crores

7. (1)

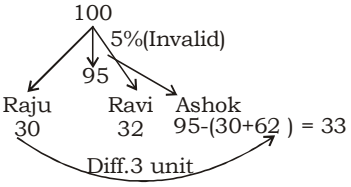
$$\frac{428\times 428\times 428 + 348\times 348\times 348}{428\times 428 - 428\times 348 + 348\times 348}$$

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

= 428+348 = 776

8. (1) Divisibility rule for 3 = Sum of digits must be divisible by 3.
Divisibility rule for 11 = The difference between the sum of the digit in the odd places and the sum of the digits in the even places must be zero or multiple of 11.
According to the question,
7 5 O P Q, P+Q = Multiple of 3.
(7+O+Q)-(5+P) = 0
P–Q = 2 ...(i)
P + Q can not be less than 12.
P+Q = 12 ...(ii)
On solving equations (i) and (ii)
$\Rightarrow$P = 7
$\Rightarrow$Q = 5
$\therefore$ Value of P+2Q = 7+2×5 = 17

9. (1) Let total votes



ATQ,
3 units $\rightarrow$ 5156
$\therefore$ 95 units = $\frac{5156}{3}\times 95$
= 171200
$\therefore$ The total number of valid votes = 171200

10. (2) According to question.

$$\frac{60,000}{100+20} = \frac{x}{100+30}$$

$$\Rightarrow \frac{60000}{120} = \frac{x}{130}$$

$\Rightarrow 500\times 130 = x$
$\Rightarrow x = 65000$

11. (1) A.T.Q,

$$\frac{a^2+b^2+c^2-1024}{ab-bc-ca} = -2$$

$\Rightarrow a^2+b^2+c^2-1024 = 2ab+2bc+2ca$
$\Rightarrow (a^2+b^2+2ab)+c^2-1024 = 2c(a+b)$
$\Rightarrow (a+b)^2+c^2-1024 = 2c(a+b)$
$\Rightarrow 25c^2+c^2-1024 = 2c\times 5c$
$\Rightarrow 16C^2 = 1024$
$\Rightarrow C = \sqrt{64} \Rightarrow C = 8$

12. (4) Average production of A, C, D, and F

$= \frac{37+20+4+10}{4} = \frac{71}{4} = P_1$

The difference between the production of B and E = 16–13 = 3 = P_2
Now,

$P_1 + P_2 = \frac{71}{4} + 3 = \frac{83}{4}$

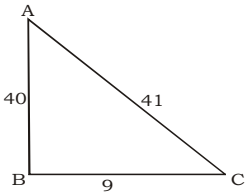
Required value of $P_1 + P_2$

$= \frac{22000\times 83}{4\times 100} = 4565$

13. (3) A.T.Q,
p+q = 6
cubing on both side
$(p+q)^3 = 6^3$
$\Rightarrow p^3+q^3+3pq(p+q) = 216$
$\Rightarrow p^3+q^3+3\times 4(6) = 216$
$\Rightarrow p^3+q^3 = 216-72$
$\Rightarrow p^3+q^3 = 144$

14. (1) Required LCM = 4 × 5 × 4 = 80

15. (1) A.T.Q,



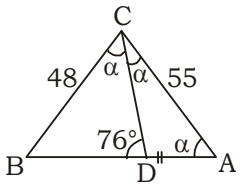
In ABC,
$41^2 = 9^2 + x^2$
$\Rightarrow x^2 = 1681 - 81$
$\Rightarrow x = \sqrt{1600} = 40$

$\text{Cot}A = \frac{9}{40}$

16. (3) A.T.Q,
A truck can run in 36 L Diesel = 492 km
$\therefore$ The truck can run in 33 L

$= \frac{492\times 33}{36} = 451$ km

17. (4) A.T.Q,



$\alpha + \alpha = 76°$

$\alpha = 38°$

In, ΔCBD,

$\angle CBD + 76° + 38° = 180°$

$\Rightarrow \angle CBD = 180° - 114°$

$\Rightarrow \angle CBD = 66°$

18. (4) Price for dealer

$= 650 \times \frac{80}{100} \times \frac{90}{100}$

$\Rightarrow 13 \times 4 \times 9 = 468$

Total CP of dealer = 468+38 = 506

Selling price of dealer =

$\frac{506 \times 120}{100} = ₹607.2$

19. (4) Required percentage =

$$\frac{1}{2}\left[\frac{(73+13)-(17+53)}{\frac{53+17}{2}}\right] \times 100$$

$\frac{16}{70} \times 100 = 22.86$

20. (4) Let the edge of the cube = x

A.T.Q,

$6^3+8^3+10^3 = x^3$

$\Rightarrow x^3 = 1728$

$A \Rightarrow x = 12$ cm

21. (4) Distance = Constant

$\text{speed} \times \frac{1}{\text{time}} = 60\% = \frac{3}{5}$

	Initial	Now
Speed	5	3
Time	3	5

2 units

2 units = 36 min

3 units = $\frac{36}{2} \times 3 = 54$ min

$\therefore$ Required time = 54 min.

22. (3) A.T.Q,

$\tan^2\theta = 1 - a^2$ and

$\sec\theta + \tan^2\theta . \frac{\sin\theta}{\cos\theta} \cdot \frac{1}{\sin\theta}$

$= \sec\theta + \tan^2\theta . \sec\theta$

$= \sec\theta\left(1 + \tan^2\theta\right)$

$= \sqrt{1+\tan^2\theta} \,.(1+\tan^2\theta)$

$= \left(1+\tan^2\theta\right)^{\frac{3}{2}} = \left(2-a^2\right)^{\frac{3}{2}}$

23. (4) A.T.Q,

$$= \frac{D}{\frac{2D}{3\times45} + \frac{D}{4\times60} + \frac{D}{12\times75}}$$

$$= \frac{1}{\frac{2}{135} + \frac{1}{240} + \frac{1}{900}}$$

$$= \frac{1}{\frac{160+45+12}{}} = \frac{108000}{217}$$

$= 49.76$ km/hr

24. (1) 10, 24, 26 are the sides of a right angle triangle.

ATQ,

$\text{Area} = \frac{1}{2} \times 10x \times 24x = 480$

$\Rightarrow 120x^2 = 480 \Rightarrow x = 2$cm

Perimeter of triangle = $60x$

$= 60 \times 2 = 120$ cm

25. (1) Amount to be paid by Damini = SI on 7500 - 3500

$= \frac{4000 \times 4 \times 9}{100 \times 12} = 40 \times 3 = ₹120$

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

GENERAL AWARENESS

1. (2) Asian Games were regulated by Asian Games Federation from first games in New Delhi (1950) until the 1978 Games. Since 1982, they have been organised by Olympic Council of Asia.
Motto - Energy of Asia.
In 2022, Hosted by Hanghou, China
Motto - Heart to Heart
2. (4) Raksha Bandhan, Krishna Janmashtami, Naga Panchami, Pola and Teej are celebrated in Saraavana Month (fifth months) of Hindu Calendar.
3. (1) Article 23 - Prohibition of traffic in human beings and forced labour.
Article 24 - Prohibition of employment of children in factories.
4. (1) Oxalic acid is present in Tomato.
5. (2) About 71 percentage of the Earth's surface is water-covered and the oceans hold about 97.2 percentage of all Earth's water.
6. (3) Decadal growth rate gives an overview of the total population growth in a particular Decade.
The percentage decadal growth rates of the six most populous states have decline during 2001-2011 compared to 1991-2001
Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Andhra Pradesh, Madhya Pradesh.
7. (3) The Paramhans Mandali was founded in 1849, in Bombay by Durgaram Mehtaji and Dodoba Panduranga. It is closely related to Manav Dharma Sabha, which was founded in 1844.
(1840 was the founding year given by SSC which is wrong)
8. (2) The policy of annexation, the Doctrine of Lapse, discrimination against Indian and the social and economic policies of British were causes of 1857 revolt.
Indian Rebellion of 1857 (10^{th} May 1857 - 1 November 1858) resulted in the end of Mughal empire, and company rule in India and Transfer of rule to the British Crown. Bakht Khan was the Commander-in-Chief of Indian forces. Kanwar Singh was the military commander. Canning was the governor General.
9. (4) The motion of freely falling body is an example of uniformly accelerated motion

$$\boxed{\Delta a = \frac{dv}{dt}}$$

10. (4) The gross fiscal deficit (GFD) is the excess of total expenditure including loans net of recovery over revenue receipts (including external grants) and non-debt capital receipts.
11. (1) Laho dance belong to the state of Meghalaya
12. (1) Asian Games, 2023 will be held in Aichi and Nagoya, Japan
Motto-Imagine One Asia.
13. (3) The Revolutionary Socialist Party was founded 19 March, 1940 by Tridib Chaudhury.

14. (3) Kalaimamani is the highest civilian award in Tamil Nadu. It was first awarded in 1954.
Some Awards in 2021-
Directors - Gautham Nenon, Manoj Kumar, Ravi Mariya.
Music Directors - Imman & Dhina
Choreographers - Shiva Saukar and Sridhar.

15. (2) Francium is the most reactive element.

16. (4) The Bill amends the New Delhi International Arbitration Centre Act, 2019.

17. (2)

Debasish Panda -	Chairperson of IRDA
T. Raja Kumar -	President of FATF
Ashwani Bhatia -	Whole time member of SEB

18. (1)

State	Chief Minister	Governor
Himachal Pradesh	Sukhwinder Singh	R.V. Arlekar
Arunachal Pradesh	Pema Khandu	B.D. Mishra
Madhya Pradesh	Shivaraj Singh Chauhan	Raj Bhavan

Lok Sabha Seats in M.P. - 29
Rajya Sabha Seats in M.P. - 11

19. (2) Sangeet Natak Akadami was founded in 1953, by Ministry of Culture. Its Vice Chaiman is Aruma Sairam.
2019 Awardees:-
Siba Prasad Das (Chhan), Anant Mahapatra (Theatre) Ananda Bag (Brahma Veena) and Gobinda Chandra Pal (Odissi dance Gotipua).
Anuradha Roy won 'Sahitya Akadami' Award 2022 in English language for her novel 'All The Lives We never Lives'.

20. (3) Arachnids - Class of joint legged invertebrate animals.
Examples:- spiders, scorpions
Echinoderms - strafish, brittle stars, sea urchins, sand dollers and crinoids.
Platyhelminthes - flat worms, taenia, fasciola, opistorclis.
Arthropods - lobsters, crabs, insects, centipedes, willipedas.

21. (4) Karaikal (Puducherry) was sold to the French in 1739. Veerampattinam is the largest costal village. French colony for nearly 200 years.

State	Chief Minister	Governor
Puducherry	N Rangaswamy	Tamilisai Soundarajan

22. (4) KOH + CaO - Potash
Soda lime is mixture of - NaOH (95%) + CaO(8%)

23. (4) **Criminal Procedure (Identification) Bill 2022:**
It seeks to repeal the Identification of prisoners Act 1920, and allows the collection, storage and analysis of physical and biological samples including retina and iris scan of the convicted, arrested and detained persons.

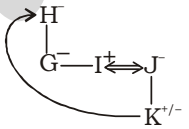
24. (3) The first Jute Mill the Acland Mill was first established in India in 1855 by George Acland and Bengali financier Babu Bysumber Sen in Rishra, Bengal Presidency British India (Now in W.B. in India).

25. (2) 'Krdumbashree' was started in 1988. It was a three-tier structure.

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

GENERAL INTELLIGENCE & REASONING

1. (4) G # M & 1 @ J & K



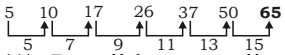
H is mother-in-law of J.

2. (2) Right answer is option (2)

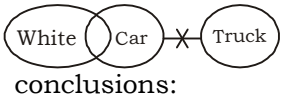
3. (1) Given (40 ,120, 400) (18, 20, 78)
The pattern is
40 + 120 × 3 = 400
18 + 20 × 3 = 78
29 + 23 × 3 = 98

4. (2) Right answer is option (2)

5. (2) The pattern is



6. (1) Possible venn diagram

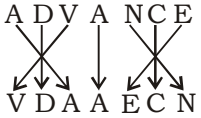


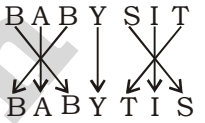
conclusions:
i All truck are white. ✗
ii Some car are white. ✓

7. (3) Given
24 : 840 :: 27 : ? :: 33 : 452
The pattern is
$24^2 + 24 \times 11 = 840$
$27^2 + 27 \times 11 = 1026$
$33^2 + 33 \times 11 = 1452$

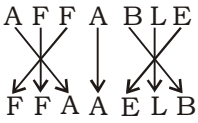
8. (4) The pattern is
MPT $\xrightarrow{+3}$ M $\xrightarrow{+4}$ P T
FIM $\xrightarrow{+3}$ F $\xrightarrow{+4}$ I M
GJN $\xrightarrow{+3}$ G $\xrightarrow{+4}$ J N
DGI $\xrightarrow{+3}$ D $\xrightarrow{+2}$ G I — odd

9. (2) The logic is



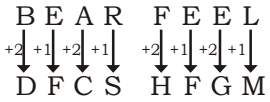


Similarly,

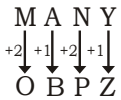


10. (3)

11. (3)



Similarly,



12. (3) The order in a dictionary is
3. Individual 1. Inudate
5. Invective 4. Inveterate
2. Invidious 6. Invincible
7. Inviolable
Correct order - 3,1,5,4,2,6,7

13. (4) By hit and trial method
P × Q + R, $P^{-}—Q^{+}—R$

14. (3) The pattern is
NAME NEME **NIME** NOME NUME
AEIOU — Vovel

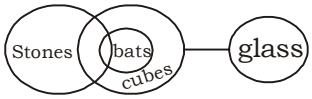
15. (1) the right answer is 1

16. (1) By hit and trial method
35 * 5 * 7 * 2 * 19 = 42
Putting ×, ÷, –, +
35 × 5 ÷ 7 – 2 + 19 = 42
25 – 2 + 19 = 42, ⇒ 42 = 42

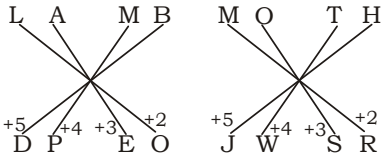
17. (4) The right option is 4

18. (2) Given (16, 7, 37) (28, 9, 55)
The logic is
16 + 7 × 3 = 37
28 + 9 × 3 = 55
Similarly, 13 + 4 × 3 = 25

19. (3) Possible venn diagram is



20. (4) The pattern is



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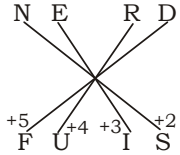


21. (4) The logic is

FUEL = 50 → FUEL Place value adding (6+21+5+12)+6=50

JEEK = 44 → JEER Place value adding (10+5+5+18)+6=44

FARE = **36** → FARE Place value adding (6+1+18+5)+6=36

22. (1) By hit and trail method

729 × 81 ÷ 20 + 16 – 6 = 50

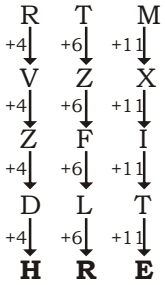
Interchanging 6 and 20, × and ÷

729 ÷ 81 × 6 + 16 – 20 = 50

9 × 6 + 16 – 20 = 50

50 = 50

23. (1)



24. (1) 15 – 220 –215 → 15^2=225, 15^2 – 5 = 220 — odd

10 – 100 –95 → 10^2=100, 10^2 – 5 = 95

20 – 400 –395 → 20^2=400, 20^2 – 5 = 395

25 – 625 –620 → 25^2=625, 25^2 – 5 = 620

25. (2) By hit and trial method

I. 4 + 3 × 8 – 2 ÷ 1 = 3

Interchanging × and –, 8 and 4

8 + 3 – 4 × 2 ÷ 1 = 3

11 – 8 = 3

3 = 3 (correct)

II. 8 × 2 – 4 + 6 ÷ 2 = 11

Interchanging × and –, 8 and 4

4 – 2 × 8 + 6 ÷ 2 = 11

4 – 16 + 3 = 11

– 11 = 11 (in correct)

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

ENGLISH LANGUAGE AND COMPREHENSION

2. (4) "Working" should replace "work". "Working with" is the correct expression

6. (2) 'Close the deal' is correct expression which means- to make an agreement final.

Ex.:- We were about to close/ seal the deal when we realized that there was a mistake in the contract.

8. (2) "It" is third person singular pronoun' hence It takes a singular verb.

So "it doesn't matter to them" is correct expression.

20. (2) "hardly had" is the correct expression. ("Had" is used to show possession.)

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

Words	**Meaning in English**	**Meaning in Hindi**
Bleak	lacking reasons to feel happy or hopeful *Syn. cheerless, gloomy, desolate, miserable, hopeless*	उदास, निराशाजनक
Blessed	having God's help and protection. *Syn. Lucky , fortunate .* *Ant. Cursed*	भाग्यवान *श्रापित होना*
Godliness	The condition and quality of being godly, pious *Syn. Devine, reverent, reverential, dutiful, religious, devout.*	धार्मिकता, धर्मपरायण
Lunatic	a person who behaves in a stupid way doing crazy and often dangerous things *Syn. insane, psycho, mad*	पागल, मूर्खतापूर्ण
Moral	of or relating to principles of right and wrong in behaviour. *Syn. Ethical, righteous.*	उचित-अनुचित से संबंधित; नैतिक
Polyglot	speaking, many languages; multilingual	बहुभाषी
Stoic	Indifferent to pleasure or pain *Syn. emotionless, impassive, apathetic, indifferent*	भावहीन
Symphony	a long piece of music written for a large orchestra, consonance of sounds. *Syn. coherence, concinnity, consonance.*	बड़े वाद्यवृंद के लिए तैयार की गई लंबी संगीत-रचना, स्वरसंगति, तालमेल