

QUANTITATIVE APTITUDE

1. (1) $\cos^3 60^\circ - \cos^3 240 - \cos^3 360^\circ$
 $= \cos^3 60^\circ - \cos^3 (180+60) - \cos^3 (360+0) =$

$$\left(\frac{1}{2}\right)^3 + [\cos^3 60^\circ - \cos^3 0]$$

$$= \frac{1}{8} + \frac{1}{8} - 1 = \frac{-3}{4}$$

2. (1) $x + y + z = 0$
 $[\because a+b+c = 0, a^3+b^3+c^3 = 3abc]$

$$\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = \frac{x^3 + y^3 + z^3}{xyz}$$

$$= \frac{3xyz}{xyz} = 3$$

3. (1) $15\% = \frac{3}{20}, 35\% = \frac{7}{20}$

$$P : Q = 27 : 20$$

$$Q : R = 20 : 23$$

$$P : Q : R = 27 : 20 : 23$$

4 units

$$4 \text{ units} = 2412$$

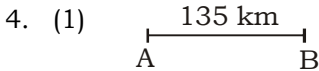
$$1 \text{ units} = 603$$

$$70 \text{ units} = 42210$$

$$\text{Now, } 90\% = 42210$$

$$100\% = 46900$$

Number of voters in the voting list is 46,900.



Distance covered by A in 1 hour = $1 \times 25 = 25 \text{ km}$

Remaining distance = $135 - 25 = 110 \text{ km}$

Both start traveling at 9 O' clock in opposite direction.

$$\text{So, required time} = \frac{110}{55} = 2 \text{ hrs.}$$

\therefore Meeting time = 11 : 00 am

5. (1) ATQ,

$$10\% = \frac{1}{10}$$

$$10 : 9$$

$$10 : 9$$

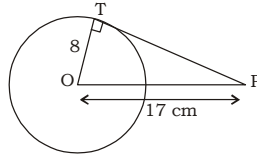
$$10 : 9$$

$$1000 : 729$$

$$\text{Exemption} = \frac{271}{1000} \times 100\%$$

$$= 27.1\%$$

6. (4)



ATQ,
 $PT^2 = 17^2 - 8^2$

$$PT = \sqrt{225} = 15 \text{ cm}$$

\therefore Length of the tangent segment PT is 15 cm.

7. (1)

2	96,	136,	504
2	48,	68,	252
2	24	34,	126
3	12	17,	63
3	4	17,	21
4	17,	7	

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 4 \times 17 \times 7 = 34272$$

8. (3) Gives 800 grams in place of 1 kg.

$$20\% = \frac{1}{5}$$

$$\text{CP} : \text{SP}$$

$$5 : 6$$

$$800 : 1000$$

$$4000 : 6000$$

$$2 : 3$$

\therefore His real gain percentage

$$= \frac{1}{2} \times 100 = 50\%$$

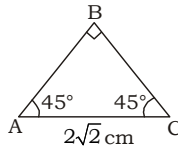
9. (4) ATQ,
 $2\pi (R_2 - R_1) = 396 - 264$

$$\Rightarrow 2 \times \frac{22}{7} (R_2 - R_1) = 132$$

$$\Rightarrow R_2 - R_1 = 3 \times 7$$

$$\Rightarrow R_2 - R_1 = 21 \text{ cm}$$

10. (2)



In right angle triangle ABC

$$\sin 45^\circ = \frac{BC}{AC}$$

$$\frac{1}{\sqrt{2}} = \frac{BC}{2\sqrt{2}}$$

$$\Rightarrow BC = 2 \text{ cm}$$

So, the length of BC is 2 cm.

11. (4) ATQ,

$$8925 = \frac{10200 \times 12.5 \times T}{100}$$

$$T = \frac{8925 \times 10}{125 \times 102} = 7$$

So, the required time is 7 years.

12. (1) Difference between import and export from 2016 to 2017 = $1200 - 1014 = 186$.

Difference between import and export from 2017 to 2018 = $1600 - 1240 = 360$

Difference between import and export from 2018 to 2019 = $1537 - 1522 = 15$

The least difference is in the year 2018 to 2019.

13. (3) $5\sin^2 A + 3\cos^2 A = 4$,

Putting , $A = 45^\circ$

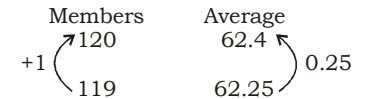
$$5\sin^2 45^\circ + 3\cos^2$$

$$= 5\left(\frac{1}{\sqrt{2}}\right)^2 + 3\left(\frac{1}{\sqrt{2}}\right)^2 = \frac{5+3}{2} = 4$$

(Satisfy)

then, $\tan 45^\circ = 1$

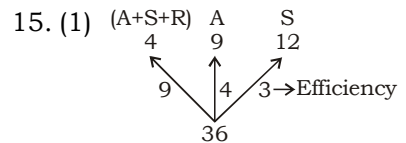
14. (4) ATQ,



The weight of the staff member who lift the hotel

$$= 62.25 + \frac{120 \times 25}{100}$$

$$= 92.25 \text{ kg}$$



$$\therefore \text{Efficiency of Rajani} = 9 - 7 = 2$$

\therefore Rajani can do the work alone in

$$= \frac{36}{2} \Rightarrow 18 \text{ days}$$

16. (3) $\frac{(p-q)^3 + (q-r)^3 + (r-p)^3}{12(p-q)(q-r)(r-p)}$

$$A^3 + B^3 + C^3 = 3ABC$$

We know that,

$$\text{If } A+B+C = 0$$

$$(p-q)^3 + (q-r)^3 + (r-p)^3 = 3(p-q)(q-r)(r-p)$$

$$= \frac{3(p-q)(q-r)(r-p)}{12(p-q)(q-r)(r-p)} = \frac{1}{4}$$

17. (2)

Marks	mean value	Frequency
0 - 10	5	2
10 - 20	15	4
20 - 30	25	12
30 - 40	35	21
40 - 50	45	6
50 - 60	55	3
60 - 70	65	2

Total = 50

Required mean value =

$$35 + \left[\frac{-30 \times 2 - 20 \times 4 + (-10 \times 12) + 10 \times 6 + 20 \times 3 + 30 \times 2}{50} \right]$$

$$= 35 + \left[\frac{-60 - 80 - 120 + 60 + 60 + 60}{50} \right]$$

$$= 35 - 1.6 = 33.4$$

18. (3) ATQ,

Number of books sold by A and B

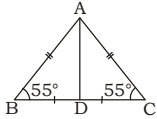
$$= 34 + 48 = 82$$

Number of books sold by E and F

$$= 64 + 110 = 174$$

$$\therefore \text{Required diff.} = 174 - 82 = 92$$

19. (3) $\triangle ABC$ is isosceles triangle.



So, AD vertex on BC

$$\angle BAD = 180 - (90 + 55) = 35^\circ$$

20. (2) $(a+b)^3 - a^3 + b^3$

$$= a^3 + b^3 + 3ab(a+b) - a^3 + b^3$$

$$= 2b^3 + 3ab(a+b)$$

21. (2) $\sin 28^\circ \sin 35^\circ \sin 45^\circ \sec 62^\circ \sec 55^\circ$

$$= \sin(90^\circ - 62^\circ) \sin(90^\circ - 55^\circ)$$

$$= \sin 45^\circ \sec 62^\circ \sec 55^\circ$$

$$\cos 62^\circ \cos 55^\circ \times \frac{1}{\sqrt{2}} \times \frac{1}{\cos 62^\circ}$$

$$\times \frac{1}{\cos 55^\circ} = \frac{1}{\sqrt{2}}$$

22. (4) Let the third proportion = x

$$\text{ATQ, } x = \frac{b^4}{4a} \times \frac{b^4}{4a} = \frac{b^8}{16a^3}$$

$$a \times x = \frac{b^8}{16a^3}$$

23. (3) Volume of sphere : Volume of cone

$$= \frac{4}{3} \pi \times 24 \times 24 \times 24 : \frac{\pi}{3} \times 21 \times$$

$$21 \times 42$$

$$= 4 \times 24 \times 24 \times 24 : 21 \times 21 \times 42$$

$$= 1024 : 343$$

Volume of waste wood

$$= 1024 - 343 = 681$$

Required percentage

$$= \frac{681}{1024} \times 100\% \Rightarrow 66.50\%$$

24. (1) $88 \overline{)99999} (1136$

$$\begin{array}{r} 88 \\ 119 \\ \underline{88} \\ 319 \\ \underline{264} \\ 559 \\ \underline{528} \\ 31 \end{array}$$

$$= 99999 - 31 = 99968$$

The largest 5-digit number that is exactly divisible by 88 is 99968.

25. (3) Total marks in English

$$= 88 + 77 + 92 = 257$$

Total marks in Hindi

$$= 78 + 78 + 77 = 233$$

Total marks in IT = 77 + 70 + 71

$$= 218$$

Total marks in Science

$$= 81 + 84 + 82 = 247$$

Best performance in English = 257 marks.

1. (1) 2. (1) 3. (1) 4. (1) 5. (1)

6. (4) 7. (1) 8. (3) 9. (4) 10. (2)

11. (4) 12. (1) 13. (3) 14. (4) 15. (1)

16. (3) 17. (2) 18. (3) 19. (3) 20. (2)

21. (2) 22. (4) 23. (3) 24. (1) 25. (3)

GENERAL AWARENESS

1. (4) Auxiliaries to trade refers to the factors that are essential for bringing the goods from the place of their production to the place of their consumption. Examples- Warehousing, Transportation, Communication, Insurance, etc.

2. (1) Nritya Bharti Kathak Dance Academy in Pune was established by Rohini Bhate in 1947.

Roshan Kumari, Kumidini Lakhia and Sitara Devi are also Kathak Dancers

3. (3) The Government of Tripura has launched Mukhyamantri Chaa Srami Kalyan Prakalpa Scheme in order to provide social security to 7000 garden workers. About 75% of them are women and they produce nearly 90 lakh kilograms of tea through 54 tea estates and 21 factories.

4. (1) Nile river flows into Mediterranean sea. Nile is the longest river in the world.

Mississippi river - North America

Amazon river - South America

5. (2) Yoga Day - 21 June
Theme 2022 - Yoga for Humanity

6. (4)

7. (3) Gulabo Sapera was awarded Padama Shri in 2016.

8. (4) Basin of Ganga Brahmaputra lies Between 10°N to 30°N latitude to The vast delta of Sunderbans and the vast Gangetic plain are found there.

Sunderbans is famous for 'Mangrove forest'.

Gokhar Lake or Oxbow lake is a common feature in the plains.

9. (3) On International Women's Day (8th March) Haryana government announced Matrashakti Udaymita Scheme. Under the scheme the women whose family annual income is less than 5 lakh rupees based on (Parivar Pehchan Patra) verified data will be provided loan of 3 lakh rupees. The interest is rate 7% for three years.

10. (1) The birth place of Bhagat Singh is Jaranwala (Punjab, Pakistan in present days). He studied at National College, Lahore. In jail Bhagat Singh wrote 'Why I am An Atheist'. He killed John P Saunders instead of James A. Scott by mistaken identity. He published a series of articles on anarchism called 'Kirti'. On 15 Aug, 2008. A bronze statue of him was installed in parliament.

Surya Sen was leader of Chittagong armoury raid, attempted on 18 April, 1930. S. Nath Sanyol was co-founder of Hindustan Republican Army HRA (1925).

11. (1) The Abinav Bharat Society was founded by Vinayak Damodar Savarkar and his brother Ganesh Damodar Savarkar in 1904, in Bombay.

12. (4) Thermal Ionisation equation given by Meghnad N Saha.

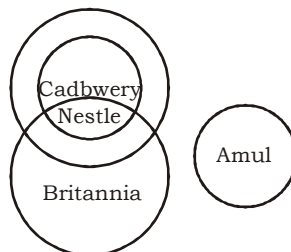
- Cosmic rays were discovered by Victor Hess. Rutherford's atomic model is known as nuclear atomic model.
13. (2) Tagore Ratna awards (established in 2011) were given by Sangeet Natak Akadami in Kolkata and Chennai. Krishna Ganga Sabha Chennai confers Nritya Choodamani Award 2018 to Kuchipudi exponent Vjayanthi Kashi. Kalidas samman is an art award given by the Madhya Pradesh government in four fields.
14. (1) Article 32 - Power of writ to the Supreme Court. Article 226 - Power of writ to the high courts. Herpus Carpus - Protects against unlawful and indefinite imprisonment. Mandamus - Order the public official who has failed to perform his duty to resume his work. Prohibition - Directing a subordinate to stop doing something the law prohibits, Certiorari - A process to seek Judicial review of decision of a lower court. Quo warranto - to challenge a person's right to hold a public office.
15. (2)
16. (4)
17. (4) Himachal Pradesh is the first 'smoke-free state' in India and this milestone has been achieved due to the effective implementation of Central Governments' Pradhan Mantri 'Ujjwala Yojana' (PMUY) and 'Himachal Grihini Suvidha Scheme' of the Himachal Pradesh government. Now, 100% of households in Himachal Pradesh have LPG connections in their houses.
18. (3) Length (touch line) - Min.- 90m, Maximum - 120 m Width (goal line) - Min. 45, Maximum - 90 m. The standard dimension is 105 m long and 68 m wide.

19. (3) Mehrgarh was discovered by Jean-Francois Jerrige and his wife, Catherine Jarrige in 1974. It is located in Kacchi plain of Baluchistan in Pakistan.
20. (1) William Ramsay discovered the noble gases and received Nobel Prize in 1904. George de Hevesy made development of radioactive tracers to study chemical processes and received Nobel Prize in 1943. John Dalton - Atomic theory all matters are made up of atoms.
21. (4) Bleaching Powder - $\text{Ca}(\text{OCl}_2)$ Nitrogen is used to make fertilizers, nylon, dyes and explosives. Sulphur is used for making car batteries, oil refining and mineral extraction, etc.
22. (2) Rouf - Jammu and Kashmir Phauga - Jharkhand and Bihar Koli - Maharashtra.
23. (3) Monoecious plant - having both the male and female reproductive organs in the same individual. Monoecious animals - Liver fluke, tapeworm and Earthworm.
24. (2)
25. (3) Gay Lussac's Law discovered in 1808 states that the pressure of a given amount of gas held at constant volume is directly proportional to the absolute temperature of gas.

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

GENERAL INTELLIGENCE & REASONING

1. (1) The possible venn diagram is.



Only conclusions (I) and (II) follow

2. (2)
3. (1)

$$5-23 \rightarrow 5^2+2 = 27 \text{ -odd}$$

$$11-123 \rightarrow 11^2+2 = 123$$

$$9-83 \rightarrow 9^2+2 = 83$$

$$7-51 \rightarrow 7^2+2 = 51$$

4. (4)

Given

$$600, 565, 530, 495, 460, \boxed{425}$$

5. (3)

$$8 : 448 :: 9 : ? :: 11 : 847$$

$$8^2 \times 7 = 448$$

$$9^2 \times 7 = 567$$

$$11^2 \times 7 = 847$$

6. (2)

Bull is male and cow is female, Similarly, gander male is related to goose female.

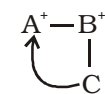
7. (1)

The pattern follow here
 $U^{\pm 1} V^{\pm 4} Z$
 $M^{\pm 1} N^{\pm 2} P$
 $X^{\pm 1} Y^{\pm 2} A$
 $Q^{\pm 1} R^{\pm 2} T$

8. (4)

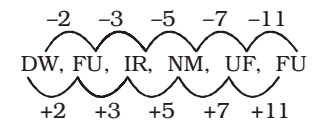
9. (2)

By hit and trial method
 $A-B+C$



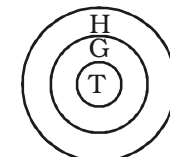
A is the paternal uncle of C.

10. (3)



11. (3)

The possible venn diagram is



12. (1)

Only conclusion I follows.
 By hit and trial method
 $40-220 \div 2 \times 2 + 20 = 200$
 $20+220 \div 2 \times 2 - 40 = 200$
 $20+110 \times 2 - 40 = 200$
 $220-20 = 200$
 $200 = 200$

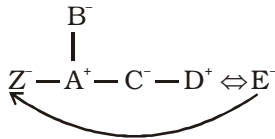
13. (2)

By hit and trial method
 $7 \times 9 + 3 \div 7 - 3 = 25$
 $7 \times 9 \div 3 + 7 - 3 = 25$
 $21 + 4 = 25$
 $25 = 25$

14. (3)

Interchanging \times and $-$ 4 and 2
 (i) $7-5 \times 4 + 8 \div 2$
 $7 \times 5 - 2 + 8 \div 4$
 $35 - 2 + 2 = 35$
 (ii) $7 \times 3 - 8 \div 2 + 4$
 $7 - 3 \times 8 \div 4 + 2$
 $7 - 6 + 2 = 3$

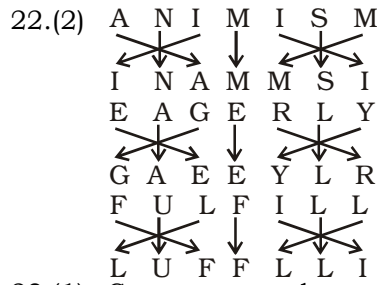
- 15.(1)
 16.(2) Given
 Today — Friday
 After 55 days, then $\frac{55}{7}$
 \Rightarrow Remainder = 6
 Friday + 6 = Thursday
 17.(3) $19+4 = 23$
 $13+14 = 27$
 $25+2 = 27$
 18.(3) $Z * A \$ B - C * D \% E$,
 Z related to E



Husband's Sister

- 19.(3)
 20.(4) $\frac{170}{2} + 97 = 182$
 $\frac{128}{2} + 92 = 156$
 $\frac{130}{2} + 73 = 138$

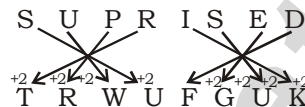
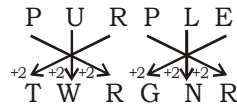
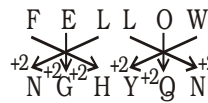
- 21.(2)
- | | | | |
|----------|----------|----------|----------|
| N | T | S | M |
| ↓+3 | ↓-6 | ↓+9 | ↓+14 |
| Q | N | B | A |
| ↓+3 | ↓-6 | ↓+9 | ↓+14 |
| T | H | K | O |
| ↓+3 | ↓-6 | ↓+9 | ↓+14 |
| W | B | T | C |
| ↓+3 | ↓-6 | ↓+9 | ↓+14 |
| Z | V | C | Q |



- 23.(1) Carpenter use hammer.
 Similarly,
 Fisherman use net.

24.(4)

25.(4)



1. (1) 2. (2) 3. (1) 4. (4) 5. (3)
 6. (2) 7. (1) 8. (4) 9. (2) 10. (3)
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 21. (2) 22. (2) 23. (1) 24. (4) 25. (4)

ENGLISH LANGUAGE AND COMPREHENSION

1. (3) "Every nook and corner of the city" means- all over the city.

5. (2) "Caribbean" is wrongly spelt. Meaning -The region consisting of the Caribbean Sea, its islands (including the West Indies), and the surrounding coasts.
 6. (4) Passive construction is possible (It is the case when a verb is followed by an adjective). So, option (2) is correct answer but the commission has given option (4) as the right answer.
 8. (3) "Conscientious" is wrongly spelt. Meaning - Wishing to do one's work or duty well and thoroughly. (ईमानदार)
 14. (4) "talks about" is correct substitute. It shows a habit, so Present Indefinite Tense should be used.
 15. (4) Replace "quiet" with quite. Quiet- (silent) (शांत) Quite- entirely, perfectly, almost. (पूर्णतया, अत्यन्त, पूरी तौर से, काफी हद तक)
 18. (3) Remove article "a". "got permission" is correct substitute.
 1. (3) 2. (4) 3. (4) 4. (4) 5. (2)
 6. (4) 7. (3) 8. (3) 9. (2) 10. (3)
 11. (3) 12. (2) 13. (3) 14. (4) 15. (4)
 16. (2) 17. (4) 18. (3) 19. (3) 20. (2)
 21. (3) 22. (3) 23. (1) 24. (2) 25. (3)

Words

Meaning in English

Blow one's own trumpet to talk about oneself or one's achievements, egotism
 Concealed kept secret.

Syn. disguised, hidden.

Eager Desirous; keen to do or obtain something.

Syn. Exhilarated, avid, intent, fervent, impatient, earnest

Ex:- Raman is very eager to go cycling this weekend.

Have feet of clay To have a bad quality that you keep hidden.

Ineffable too great or extreme to be expressed or described in words.

Ex:- It was ineffable for me to narrate the whole Mahabharata.

Keep the wolf from the door to have or earn enough money to afford things (such as food and clothing) that is needed to live.

Ex:- They make just enough to keep the wolf from the door.

Red-tapism The practice of requiring excessive paperwork and tedious procedures before official action can be considered or completed.

To move heaven or earth to do everything you can to achieve something.

Meaning in Hindi

अपने मुँह मियां मिट्टू
 (खुद की प्रशंसा करना)
 गुप्त

उत्सुक

बुराईयाँ (जो छिपाई जाए)
 अनिर्वचनीय, अकथनीय
 अवर्णनीय

पर्याप्त पैसे कमा लेना

लाल फीताशाही

किसी चीज को पाने के लिए कोई कसर न छोड़ना