

**QUANTITATIVE APTITUDE**

1. (2)  $72 = 2^3 \times 3^2$   
 $108 = 2^2 \times 3^3$   
 $2010 = 2 \times 3 \times 5 \times 67$   
 $\therefore \text{HCF} = 2 \times 3 = 6$

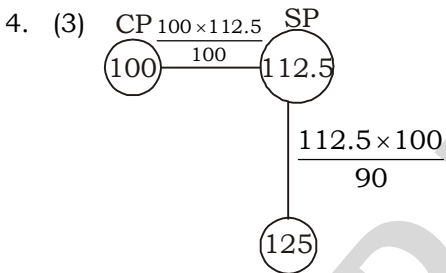
2. (1)  $\sec\theta + \frac{1}{\cos\theta} = 2$   
 putting  $\theta = 90^\circ$

$\sec 90^\circ + \frac{1}{\cos 90^\circ} = 1 + 1 = 2$   
 (satisfy)

$\therefore \sec^{55}\theta + \frac{1}{\cos^{55}\theta} = 1 + 1 = 2$

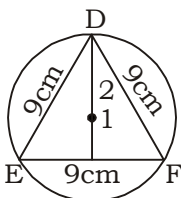
3. (4) The average export of P  
 $\frac{300 + 650 + 1300 + 1200 + 800 + 1400 + 1250}{7}$   
 $= 985.714$

In 2014, 2015 and 2018 export of P is less than average export of P in all years.



Now, 100 units = 800  
 and, 125 units =  $\frac{800}{100} \times 125 = 1000$   
 $\therefore$  The marked price of the article = Rs. 1000

5. (4) ATQ,



Length of radius of circle  
 $= \frac{2}{3} \times \frac{\sqrt{3}}{2} \times 9 = 3\sqrt{3} \text{ cm}$

6. (4) Income that Shiva doubted  
 $= 1000 (75 - 12 - 14 - 15 - 10 - 21) = 3000$   
 $\therefore$  Required percentage  
 $= \frac{3000}{75000} \times 100 = 4\%$

7. (1) In years 2011, 2013, 2014 and 2015 the export of the company is more than import.

8. (3)  $\frac{\tan 320^\circ - \tan 310^\circ}{1 + \tan 320^\circ \tan 310^\circ}$   
 $= \frac{\tan(90^\circ \times 4 - 40^\circ) - \tan(90^\circ \times 3 + 40^\circ)}{1 + \tan(90^\circ \times 4 - 40^\circ) \tan(90^\circ \times 3 + 40^\circ)}$   
 $= \frac{-\cot 40^\circ + \cot 40^\circ}{1 + \cot 40^\circ \cot 40^\circ} = \frac{\alpha + \frac{1}{\alpha}}{1 + \alpha \frac{1}{\alpha}}$

$= \frac{\alpha^2 + 1}{2\alpha} = \frac{1 - \alpha^2}{2\alpha}$

9. (1) Total foreign trade by M in all years  
 $= 125 + 185 + 275 + 255 + 170 = 1010$

10. (1) Distance travelled in 5 min by train  
 $= \frac{18 \times 18}{5} \times \frac{5}{60} = \frac{27}{5} = 5.4 \text{ km}$   
 $\therefore$  Average speed of train  
 $= \frac{5.4 + 7.5 + 12}{25/60} = 59.8 \text{ km/hr}$

11. (4) We know that, when

$x + \frac{1}{x} = 1$

then  $x^3 = -1$

ATQ,

$\left(\frac{r}{13}\right)^3 = -1$

$\Rightarrow r^3 = -2197$

12. (1) We know that, when

$x + \frac{1}{x} = -1$

then  $x^3 = 1$

$\frac{a}{b} + \frac{b}{a} = -1$

$\Rightarrow \left(\frac{b}{a}\right)^3 = 1$

$\Rightarrow a^3 = b^3 \Rightarrow a^3 - b^3 = 0$

13. (1) Simple interest on the sum

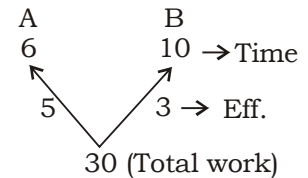
$= \frac{2000 \times 3 \times 5}{100} = 300$

$\therefore$  Amount (P) = 2000 + 300 = 2300  
 Amount of each installment

$= \frac{100P}{100T + \frac{T(T-1)r}{2}} = \frac{2300 \times 100}{100 \times 3 + \frac{3 \times 2 \times 5}{2}}$

$= \frac{230000}{315} = \text{Rs. } 730 \frac{11}{63}$

14. (2) ATQ,



Work done in 6 hours =  $3 \times 8 = 24$  units

Work done by A in 7 hours = 5 units.

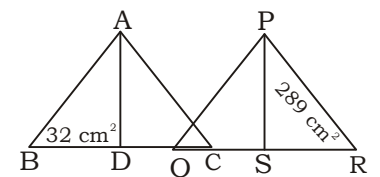
$\therefore$  1 unit work done by B

$= \frac{1}{3} \text{ hrs.}$

$\therefore$  Total time taken

$= 7 \frac{1}{3} \text{ hrs.}$

15. (4)



$$\left(\frac{AD}{PS}\right)^2 = \frac{324}{289} \Rightarrow \frac{AD}{PS} = \frac{18}{17}$$

16. (2) Required answer = 160-135 = 25

17. (2) Let the length of first train = x m

and speed of second train = y km/h.

ATQ,

$$\frac{5}{18}(81-y) = \frac{600+x}{72} \quad \dots(I)$$

$$\frac{5}{18}(81+y) = \frac{600+x}{36} \quad \dots(II)$$

On solving equations (I) and (II)

$$\frac{81-y}{81+y} = \frac{1}{2}$$

$$\Rightarrow 162-2y = 81+y$$

$$\Rightarrow y = 27$$

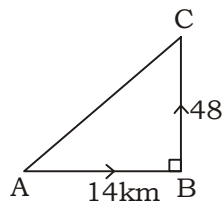
$$\text{Now, } \frac{5(81-27)}{18} = \frac{600+x}{72}$$

$$\Rightarrow 1080 = 600+x$$

$$\Rightarrow x = 480$$

\(\therefore\) Length of first train = 480 m

18. (3)



(Starting point) In \(\Delta ABC\)

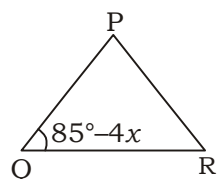
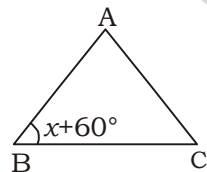
$$\Rightarrow AC^2 = AB^2 + BC^2$$

$$\Rightarrow AC^2 = 48^2 + 14^2$$

$$= 2304 + 196$$

$$\Rightarrow AC = 50 \text{ km}$$

19. (4)



\(\Delta ABC \cong \Delta PQR\),

\(\therefore \angle B = \angle Q, \angle A = \angle P\) and  $\angle C = \angle R$  ATQ,  $x+60^\circ = 85^\circ - 4x$

$$\Rightarrow 5x = 25^\circ$$

$$\Rightarrow x = 5^\circ$$

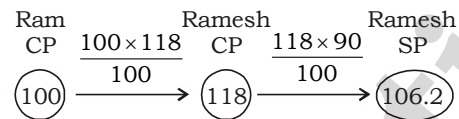
$$\therefore \angle ABC = 60^\circ + 5^\circ = 65^\circ$$

20. (4)  $\overbrace{6788934a4}$  is divisible by 11, when  $(6+8+9+4+4) - (7+8+3+a)$  is divisible by 11.

$$\therefore \frac{31-18-a}{11} = \frac{13-a}{11}$$

So, the minimum value of a is 2.

21. (4) ATQ,



$$100 \text{ units} = 1250$$

$$\therefore 106.2 \text{ units}$$

$$= \frac{1250}{100} \times 106.2$$

$$= \text{Rs. } 1327.5$$

\(\therefore\) SP of Ramesh = Rs. 1327.5

22. (2) Let the present age of father = 7x

and, the present age of son = 2x

ATQ,

$$\frac{7x+10}{2x+10} = \frac{9}{4}$$

$$\Rightarrow 28x+40 = 18x+90$$

$$\Rightarrow 10x = 50$$

$$\Rightarrow x = 5$$

\(\therefore\) Present age of father = 7x5

$$= 35 \text{ years}$$

23. (2)  $\tan^2\theta + \tan^4\theta = 1$

$$\Rightarrow \tan^2\theta (1 + \tan^2\theta) = 1$$

$$\Rightarrow \tan^2\theta \sec^2\theta = 1$$

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

$$\Rightarrow \sin^2\theta = \cos^4\theta$$

$$\Rightarrow \cos^4\theta - 1 + \cos^2\theta = 0$$

$$\Rightarrow \cos^4\theta + \cos^2\theta = 1$$

24. (3) Radius of the hemisphere

$$= 6.3 \text{ cm.}$$

\(\therefore\) Volume of the hemisphere

$$= \frac{2}{3} \times \frac{22}{7} \times (6.3)^3$$

$$= 523.908 \text{ cm}^3$$

25. (4) Case - 1

$$100^2 - 99^2 + 98^2 - 97^2 + 96^2 - \dots - 22^2 - 21^2$$

$$= (100+99)(100-99) + (98+97)(98-97) + \dots + (22+21)(22-21)$$

$$= 199 + 195 + 191 + \dots + 43$$

Number of terms

$$= \frac{199-43}{4} + 1 = 40$$

$$\therefore S_n = \frac{40}{2} [199+43]$$

$$= 20 \times 242$$

$$= 4840 \text{ (satisfied)}$$

Case II.

$$\left(k^2 + \frac{1}{k^2}\right) \left(k - \frac{1}{k}\right) \left(k^4 + \frac{1}{k^4}\right) \left(k + \frac{1}{k}\right) \left(k^4 - \frac{1}{k^4}\right)$$

$$= \left(k^2 - \frac{1}{k^2}\right) \left(k^2 + \frac{1}{k^2}\right) \left(k^8 - \frac{1}{k^8}\right)$$

$$= \left(k^4 - \frac{1}{k^4}\right) \left(k^8 - \frac{1}{k^8}\right) \neq k^{16} - \frac{1}{k^{16}}$$

\(\therefore\) Only statement I is correct.

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

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

11. (4) 12. (1) 13. (1) 14. (2) 15. (4)

16. (2) 17. (2) 18. (3) 19. (4) 20. (4)

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

### GENERAL AWARENESS

1. (2) North America - Tropic of Cancer

Asia - Tropic of Cancer and Equator

Europe lies between the latitudes  $34^\circ$  North and  $81^\circ$  North. It also lies between the longitudes  $31^\circ$  West and  $69^\circ$

2. (3) Article 235 - Reflects that controlling power of subordinate courts lies in the hands of the high court.

Article 226 - Power of High Courts to issue certain writs.

Article 227 - Power of superintendence over all courts by the High Court.

3. (3)

4. (4) Qutud-Din Aibak - 25 June 1206 - 14 November 1210

Aram Shah - December 1210 - June 1211

Iltutmish - June 1211 - 30 April 1236

5. (2)

6. (1) On 12 February 2022 Maharashtra's Health minister Rajesh Tope announced that "Hope express" will be launched in the state to prevent cancer.

7. (2) Raja and Radha Reddy are an Indian kuchipudi dancing couple.

Awards - Padma Shri, Padma Bhushan (2000)

Usha sirivasan is a classical dancer specializing in Kuchipudi.

Deepa Sashindran founded Kuchipudi Parampara Foundation Trust Bangalore.

8. (3) The small intestine has three parts the duodenum, jejunum and ileum. It helps to further digest food coming from the stomach. It absorbs nutrients (Vitamins, minerals, carbohydrates, fats, proteins) and water from food so they can be used by the body.

9. (3)

10. (3) Imperial Records Department was started on March 11, 1891. It was located in Imperial Secretariat Building at Calcutta.

The Imperial Records Department was shifted to New Delhi from Calcutta in 1911.

National Archives of India was constructed in 1926. It was designed by Sir Edwin Lutyens.

11. (3) Personal Disposable Income = Personal Income - Personal taxes - Miscellaneous receipts of government.

Personal Disposable Income = Personal consumption expenditure + Personal savings.

12. (1)

13. (4) Goa - Dhalo, Fugdi, Shigmo, Dekhni, Morulen.

Sikkim - Chu Faat, Sikmari, Singhi Cham, Yak Cham, Denzong Gnenha, Tashi Yangku, Khukuri Naach

14. (3) Willy Willy - Australia  
Hurricane - Japan, China, India, Australia, Mexico and the U.S

Mango showers is a colloquial term to describe the occurrence of pre-monsoon rainfall.

15. (3) Battle of Chausa was fought between Humayun, and Sher Shah Suri. It was fought on 26 June 1539 at Chausa.

Battle of Kannauj was fought between Sher Shah Suri and Humayun on May 17, 1540. This battle is also known as the battle of Bilgram, Humayun was defeated by Sher Shah Suri in the battle.

16. (1) Union Home and Cooperation Minister, Amit Shah has inaugurated the Seema Darshan Project at Nadabet on the Indo-Pak border in Banaskantha District of Gujarat. The project was launched with the aim to provide an opportunity for the citizen to observe the life and work of the BSF personnel on our border. The tourist can see missiles, tanks, aircraft etc which are used by the Indian Army and BSF at Nadabet.

17. (1) Recently the diamond city of India, Surat, has become the first in India to get a road that is made out of steel waste.

18. (4)

19. (1) 7 major and minor plates of lithosphere are:-

African plate, Antarctic plate, Eurasian plate, Indo-Australian Plate, North American plate, Pacific plate and South American plate.

20. (4) Muscle cramp occur when there is an aerobic respiration taking place in our muscles. During anaerobic respiration glucose gets converted into lactic acid which leads to lack of oxygen. A hot water bath or a massage can help in getting relief from the muscle cramps.

21. (3)

Column-A (Element)	Column-B (Group of element in the periodic table)
i. Na	Alkali metal
ii. Cu	Transition metal
iii. Mg	Alkaline earth metal
iv. He	Zero group element

22. (4)

23. (2)

24. (2) Musiri and Tondi were the ports of the Chera dynasty located at the Malabar coast near the city of Kochi and Calicut respectively.

Kayal and Kollam were the Pandyan ports.

25. (1) ICAR-National Dairy Research Institute (NDRI) at Karnal in 1955.

National Research Centre for Banana → Trichi

National Research Centre for Lichi → Muzaffarpur

National Research Centre for Pomegranate → Solapur

National Research Centre for Grapes → Pune

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

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

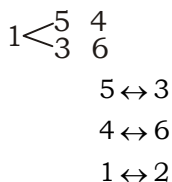
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16. (1) 17. (1) 18. (4) 19. (1) 20. (4)

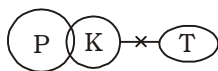
21. (3) 22. (4) 23. (2) 24. (2) 25. (1)

**GENERAL INTELLIGENCE & REASONING**

1. (3) From fig 1 & fig 2



2. (2) The possible venn diagram is



Only conclusion III follows

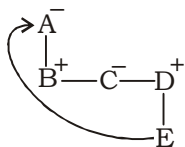
3. (3)

FROST place value adding  $(6+18+15+19+20) \times 2 = 156$   
 CANDLE place value adding  $(3+1+14+4+12+5) \times 2 = 78$   
 Similarly,  
 SCREAM place value adding  $(19+3+18+5+1+13) \times 2 = 118$

4. (1)

5. (4)  $A - B \% C * D + E$ ,

A related to E



Father's mother

6. (3)  $9 \times 7 + 4 \div 1 - 6 = 38$

interchanging 9 and 6

$6 \times 7 + 4 \div 1 - 9 = 38$

$42 + 4 - 9 = 38$

$46 - 9 = 38$

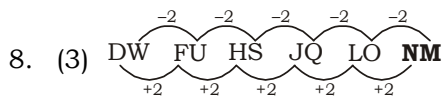
$37 = 38$  (incorrect equation)

7. (1) Count the number of odd days from 2003 to get the sum equal to 0 odd days. The odd days in the different year are calculated as:

2003 → 01, 2004 → 02 (leap year)

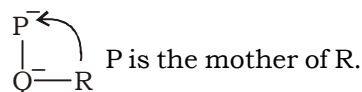
2005 → 01, 2006 → 01, 2007 → 01, 2008 → 02 (leap year), 2009 → 01, 2010 → 01, 2011 → 01, 2012 → 02 (leap year), 2013 → 01,

Total=14 So, no remainder, So, 2014 will be the same as 2003.



8. (3) By hit and trial method

$P - Q + R$



10. (1)

11. (2) Group of birds - flock

Same way, group of swarm - Bees

12. (1)  $8 : 48 :: ? : 143 :: 15 : 195$

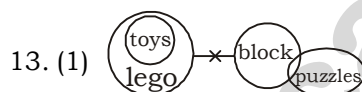
the pattern followed here

$8^2 - 8 \times 2 = 48$

$13^2 - 13 \times 2 = 143$

Similarly,

$15^2 - 15 \times 2 = 195$



13. (1) Only conclusion II follows

14. (4)  $5^2 - 2 = 23$

$6^2 - 2 = 34$

Similarly,

$3^2 - 2 = 7$

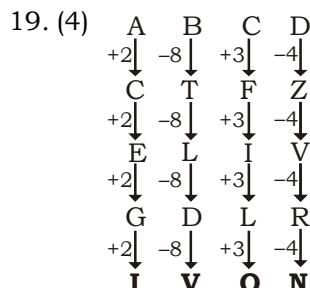
15. (4) Drama is performed on the stage similarly a trial is performed in a court.

16. (4) OQS → O +2 Q +2 S  
 JLN → J +2 L +2 N  
 HJL → H +2 J +2 L  
 MOP → M +2 O +1 P - odd

17. (2)

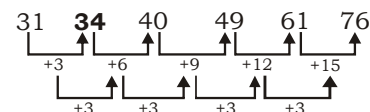
18. (3)

YOU place value adding  $(25+15+21)+10 = 71$   
 TOO place value adding  $(20+15+15)+10 = 60$   
 SIT place value adding  $(19+9+20)+10=58$



20. (2)  $10 - 100 \rightarrow 10^2 = 100$   
 $8 - 62 \rightarrow 8^2 = 64 - \text{odd}$   
 $6 - 36 \rightarrow 6^2 = 36$   
 $4 - 16 \rightarrow 4^2 = 16$

21. (2)



22. (1)

23. (2)

24. (4)  $8 \times 4 + 6 - 2 \div 1 = 6$

interchanging 2 and 8

$2 \times 4 + 6 - 8 \div 1 = 6$

$8 + 6 - 8 = 6$

$6 = 6$

25. (1) By hit and trial method

$95 * 5 + 19 \div 2 - 21 = 36$

Putting ÷ and \*

$95 \div 5 + 19 \times 2 - 21 = 36$

$19 + 38 - 21 = 36$

$57 - 21 = 36$

$36 = 36$

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

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

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16. (4) 17. (2) 18. (3) 19. (4) 20. (2)

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**ENGLISH LANGUAGE AND COMPREHENSION**

1. (3) "young teenagers" is correct substitute.

3. (3) Here "beneath the surface" is correct expression.

10. (2) "fought for the crown" is correct expression.

It means- they fought to get the crown.

20. (1) "continuous" is incorrectly spelt.

Meaning- without a break, nonstop. (निरंतर)

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

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