

1. The given table represents the number of engineers' recruited by four companies A, B, C and D, over the years. Study the table carefully and answer the questions that follows.

Year / company	A	B	C	D
2014	120	9	85	105
2015	132	118	93	97
2016	128	98	94	100
2017	140	106	98	116
2018	148	112	105	125
2019	150	118	110	122

The total number of engineers recruited by company A in 2014 to 2017 is what percentage more than the total number of engineers recruited by all four companies in 2019?

- a) 3.5 b) 2.5 c) 3 d) 4
2. A dealer marks an article 40% above the cost price and sells it to a customer, allowing two successive discounts of 20% and 25% on the mark price. If he suffers a loss of 140 rupees. Then, the cost price (in rupees) of the article is:-
- a) 840 b) 872 c) 900 d) 875
3. The value of the expression $\operatorname{cosec} (85^\circ + \theta) - \sec (5^\circ + \theta) - \tan (55^\circ + \theta) + \cot (35^\circ - \theta)$ is:-
- a) 1 b) 3/2 c) -1 d) 0
4. Quadrilateral ABCD circumscribes a circle. If AB = 8 cm, BC = 7 cm and CD = 6 cm, then the length of AD is?
- a) 7.5 cm b) 7 cm c) 6 cm d) 6.8 cm
5. The compound interest on a certain sum at 10 % p a for $2\frac{1}{3}$ years is 1201.60 interest compound yearly. The sum is ;
- a) 5400 b) 4200 c) 4800 d) 4500

6. In triangle ABC, AB=AC and AL is perpendicular to BC at L. In a triangle DEF, DE= DF and DM is perpendicular to EF at M. If (area of triangle ABC): (area of triangle DEF) = 9:25, then $(DM+AL)/(DM-AL)$ is equal to :

- a) 6 b) 4 c) 3 d) 5

7. PQRS is a cyclic quadrilateral in which PQ = x cm, QR = 16.8CM, RS = 14 cm, PS = 25.2 cm, and PR bisect QS. What is the value of x?

- a) 24 b) 21 c) 18 d) 28

8. The value of $(18 \div 2 \text{ of } \frac{1}{4}) \times (\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}) \div (\frac{2}{3} \div \frac{3}{4} \text{ of } \frac{3}{4})$ is :-

- a) $8\frac{5}{8}$ b) $16\frac{7}{8}$ c) $2\frac{7}{64}$ d) $10\frac{2}{3}$

9. A and B start moving towards each other from places X and Y, respectively, at the same time. The speed of A is 20% more than that of B. after meeting on the way, A and B take $2\frac{1}{2}$ hours and X hours, now to reach Y and X respectively .What is the value of X ?

- a) $3\frac{1}{2}$ b) $3\frac{2}{3}$ c) $3\frac{2}{5}$ d) $3\frac{3}{5}$

10. The expression $(a + b - c)^3 + (a - b + c)^3 - 8a^3$ is equal to: -

- a) $6a(a+b-c)(a-b+c)$ b) $6a(a-b+c)(c-a-b)$ c) $3a(a+b-c)(a-b+c)$ d) $3a(a-b+c)(c-a-b)$

11. If $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta} = \frac{3}{5}$, then the value of $\frac{\operatorname{cosec}\theta + \cot\theta}{\operatorname{cosec}\theta - \cot\theta}$ is :-

- a) $31+8\sqrt{15}$ b) $33+4\sqrt{15}$ c) $27+\sqrt{15}$ d) $24+\sqrt{15}$

12. If $2 \sin \theta + 15 \cos^2\theta = 7$, $0^\circ < \theta < 90^\circ$, then $\tan\theta + \cos\theta + \sec\theta = ?$

- a) $3\frac{4}{5}$ b) 3 c) $3\frac{3}{5}$ d) 4

13. If x is the mean proportional between 12.8 and 64.8 and y is the third proportional to 38.4 and 57.6, then $2x : y$ is equal to:-

- a) 2:3 b) 1:2 c) 3:4 d) 4:5

14. A race track is in the shape of a ring whose inner and outer circumference are 440 m and 506 m, respectively. What is the cost of leveling the track at 6/sq.m? ($\pi = 22/7$)

- a) 29,799 b) 24,832 c) 19,866 d) 18,966

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The total number of engineers recruited by company B in 2014 and 2017 is what percentage of the total number of engineers recruited by C during 2015 to 2019?

- a) 38.2 b) 38.4 c) 39.2 d) 37.8

16. A can complete a certain piece of work in 40 days. B is 25% more efficient than A and C is 28% more efficient than B. they work together for 5 days. The remaining work will be completed by B alone, in:-

- a) $16\frac{3}{5}$ days b) $20\frac{1}{2}$ days c) $20\frac{3}{4}$ days d) $16\frac{1}{5}$ days

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The number of the years in which the number of engineers recruited by company D is less than the average number of engineers recruited by B in the given six years, is:-

- a) 1 b) 3 c) 4 d) 2

18. The given table represents the number of engineers' recruited by four companies A, B, C and D, over the years. Study the table carefully and answer the questions that follows.

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2015	132	118	93
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The ratio of the total number of engineers recruited by complete A and B in 2015 and 2018 to the total number of engineers recruited by C and D in 2014 and 2018 is:-

- a) 17: 14 b) 13: 21 c) 28: 19 d) 9: 14

19. A triangle ABC is and $AD \perp BC$, where D lies on BC. If $AD = 4\sqrt{3}$ cm, then what is the perimeter of a triangle of ABC?

- a) 24 b) 30 c) 21 d) 27

20. Anu fixes the selling price of an article at 25% above its cost of production. If the cost of production goes up by 20%, and she raises the selling price by 10%, then her percentage profit is (correct to one decimal place)

- a) 13.8% b) 15.2% c) 14.6% d) 16.4%

21. The average of the first four numbers is three times the fifth number. If the average of all the five numbers is 85.8, then the fifth number is?

- a) 33 b) 29 c) 39 d) 34

22. Two bottles of the same capacity are 35% and $33\frac{1}{2}\%$ full of orange juice, respectively. They are filled up completely with apple juice and then the contents of both bottles are emptied into another vessel. The percentage of apple juice in the mixture is:-

- a) $60\frac{2}{3}$ b) $64\frac{1}{3}$ c) $65\frac{5}{6}$ d) $34\frac{1}{6}$

23. If $X^4 + X^2Y^2 + Y^4 = 21$ and $X^2 + XY + Y^2 = 7$, then the value of $\frac{1}{X^2} + \frac{1}{Y^2}$ is :

- a) **5/4** b) 7/4 c) d) 5/2

24. When 200 is divided by a positive integer X , the remainder is 8. How many values of X are there?

- a) 6 b) 7 c) **8** d) 5

25. If $x^2 + 3x + 1 = 0$, then what is the value of $x^6 + 1/x^6$

- a) 324 b) 327 c) **322** d) 318

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