Q.1

$$\frac{5\frac{1}{2} \div 3\frac{2}{3} \, of \, \frac{1}{4} + \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{9}{11}}{5 \div 5 \, of \, \frac{1}{10} - 10 \times 10 \div 20}$$ का मान बताएँ।

Ans

✗ 1. $1\frac{4}{5}$

✗ 2. $3\frac{4}{5}$

✔ 3. $1\frac{9}{10}$

✗ 4. $9\frac{1}{2}$

Q.2 If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

Ans

✗ 1. 10

✗ 2. 12

✔ 3. 14

✗ 4. 13

Q.3 In ΔPQR, $\angle Q = 85°$ and $\angle R = 65°$. Points S and T are on the sides PQ and PR, respectively such that $\angle STR = 95°$, and the ratio of the QR and ST is 9 : 5. If PQ = 21.6 cm, then the length of PT is:

Ans

✗ 1. 9.6 cm

✗ 2. 10.5 cm

✗ 3. 9 cm

✔ 4. 12 cm

Q.4 A and B, working together, can complete a work in d days. Working alone, A takes (8 + d) days and B takes (18 + d) days to complete the same work. A works for 4 days. The remaining work will be completed by B alone, in:

Ans

✗ 1. 18 days

✗ 2. 16 days

✗ 3. 20 days

✔ 4. 24 days

Q.5 In $\triangle ABC$, D and E are the points on sides AC and BC, respectively such that DE ∥ AB. F is a point on CE such that DF ∥ AE. If CE = 6 cm, and CF = 2.5 cm, then BC is equal to:

Ans ✔️ 1. 14.4 cm

❌ 2. 14 cm

❌ 3. 12 cm

❌ 4. 15.6 cm

Q.6 The given table represents the revenue (in ₹ crores) of a company from the sale of four products A, B, C and D in 6 years. Study the table carefully and answer the question that follows.

Years → Product ↓	2012	2013	2014	2015	2016	2017
A	98	94	80	95	110	115
B	74	96	92	84	98	86
C	82	98	96	88	93	103
D	74	102	92	93	97	102

The number of years in which the revenue of the company from the sale of product D is more than the average revenue from the sale of product A over six years, is:

Ans ✔️ 1. 2

❌ 2. 4

❌ 3. 1

❌ 4. 3

Q.7 Two chords AB and CD of a circle are produced to intersect each other at a point P outside the circle. If AB = 7 cm, BP = 4.2 cm and PD = 2.8 cm, then the length of CD is:

Ans ❌ 1. 12 cm

✔️ 2. 14 cm

❌ 3. 14.6 cm

❌ 4. 15.8 cm

Q.8 The value of $\dfrac{\tan^2\theta - \sin^2\theta}{2 + \tan^2\theta + \cot^2\theta}$ is:

Ans   ✗ 1. $sec^4\theta$

      ✔ 2. $sin^6\theta$

      ✗ 3. $cos^4\theta$

      ✗ 4. $cosec^6\theta$

Q.9 The given table represents the revenue (in ₹ crores) of a company from the sale of four products A, B, C and D in 6 years. Study the table carefully and answer the question that follows.

Years → Product ↓	2012	2013	2014	2015	2016	2017
A	98	94	80	95	110	115
B	74	96	92	84	98	86
C	82	98	96	88	93	103
D	74	102	92	93	97	102

By what percentage is the total revenue of the company from the sale of products A, B and D in 2012 and 2013 more than the total revenue from the sale of product B in 2013 to 2016?(Correct to one decimal place)

Ans   ✔ 1. 45.4

      ✗ 2. 43.6

      ✗ 3. 44.5

      ✗ 4. 31.2

Q.10 One-third of goods are sold at a 15% profit, 25% of the goods are sold at a 20% profit and the rest at a 20% loss. If the total profit of ₹138.50 is earned on the whole transaction, then the value (in ₹) of the goods is:

Ans   ✗ 1. ₹8,587

      ✔ 2. ₹8,310

      ✗ 3. ₹8,030

      ✗ 4. ₹7,756

Q.11 If $P = \dfrac{x^4 - 8x}{x^3 - x^2 - 2x}$, $Q = \dfrac{x^2 + 2x + 1}{x^2 - 4x - 5}$ and $R = \dfrac{2x^2 + 4x + 8}{x - 5}$, then $(P \times Q) \div R$ is equal to:

Ans

✓ 1. $\dfrac{1}{2}$

✗ 2. 1

✗ 3. 2

✗ 4. 4

Q.12 The given table represents the revenue (in ₹ crores) of a company from the sale of four products A, B, C and D in 6 years. Study the table carefully and answer the question that follows.

Years → / Product ↓	2012	2013	2014	2015	2016	2017
A	98	94	80	95	110	115
B	74	96	92	84	98	86
C	82	98	96	88	93	103
D	74	102	92	93	97	102

What is the ratio of the total revenue of the company in 2014 from the sale of all the four products to the total revenue from the sale of product C in 2014 to 2017?

Ans

✗ 1. $7 : 10$

✗ 2. $14 : 23$

✓ 3. $18 : 19$

✗ 4. $7 : 9$

Q.13 If $a + b + c = 7$ and $ab + bc + ca = -6$, then the value of $a^3 + b^3 + c^3 - 3abc$ is:

Ans

✓ 1. 469

✗ 2. 463

✗ 3. 472

✗ 4. 479

Q.14 The time taken by a boat to travel 13 km downstream is the same as time taken by it to travel 7 km upstream. If the speed of the stream is 3 km/h, then how much time (in hours) will it take to travel a distance of 44.8 km in still water?

Ans

✗ 1. $5\frac{3}{5}$

✗ 2. $4\frac{13}{25}$

✗ 3. $5\frac{2}{5}$

✔ 4. $4\frac{12}{25}$

Q.15 PRT is a tangent to a circle with centre O, at the point R on it. Diameter SQ of the circle is produced to meet the tangent at P and QR is joined. If $\angle QRP = 28°$, then the measure of $\angle SPR$ is:

Ans

✗ 1. $32°$

✗ 2. $62°$

✗ 3. $29°$

✔ 4. $34°$

Q.16 The ratio of boys and girls in a group is 7 : 6. If 4 more boys join the group and 3 girls leave the group, then the ratio of boys to girls becomes 4 : 3. What is the total number of boys and girls initially in the group?

Ans

✗ 1. 78

✗ 2. 117

✗ 3. 91

✔ 4. 104

Q.17 A cylindrical vessel of radius 30 cm and height 42 cm is full of water. Its contents are emptied into a rectangular tub of length 75 cm and breadth 44 cm. The height (in cm) to which the water rises in the tub is: (Take $\pi = \frac{22}{7}$)

Ans

✗ 1. 30

✗ 2. 40

✔ 3. 36

✗ 4. 45

Q.18 If $30x^2 - 15x + 1 = 0$, then what is the value of $25x^2 + (36x^2)^{-1}$?

Ans

✗ 1. $6\frac{1}{4}$

✗ 2. $\frac{65}{12}$

✗ 3. $\frac{9}{2}$

✔ 4. $\frac{55}{12}$

Q.19 The given table represents the revenue (in ₹ crores) of a company from the sale of four products A, B, C and D in 6 years. Study the table carefully and answer the question that follows.

Years → Product ↓	2012	2013	2014	2015	2016	2017
A	98	94	80	95	110	115
B	74	96	92	84	98	86
C	82	98	96	88	93	103
D	74	102	92	93	97	102

The total revenue of the company from the sale of products B, C and D in 2014 is what percentage of the total revenue from the sale of products C and D in 6 years?

Ans

✗ 1. 28

✔ 2. 25

✗ 3. 18

✗ 4. 20

Q.20 The income of A is 60% less than that of B, and the expenditure of A is equal to 60% of B's expenditure. If A's income is equal to 70% of B's expenditure, then what is the ratio of the savings of A and B?

Ans

✗ 1. $4:7$

✔ 2. $2:15$

✗ 3. $3:8$

✗ 4. $5:9$

Q.21 The expression $3\sec^2\theta\ \tan^2\theta + \tan^6\theta - \sec^6\theta$ is equal to:

Ans
✗ 1. 2
✗ 2. 1
✗ 3. −2
✔ 4. −1

Q.22 The average weight of some students in a class was 58.4 kg. When 5 students having the average weight 62.8 kg joined the class, the average weight of all students in the class increased by 0.55 kg. The number of students initially in the class, were:

Ans
✗ 1. 25
✗ 2. 40
✔ 3. 35
✗ 4. 30

Q.23 The difference in compound interest on a certain sum at 10% p.a. for one year, when the interest is compounded half yearly and yearly, is ₹88.80. What is the simple interest on the same sum for $1\frac{2}{3}$ years at the same rate?

Ans
✗ 1. ₹5,986
✗ 2. ₹5,916
✗ 3. ₹5,980
✔ 4. ₹5,920

Q.24 The marked price of an article is ₹740. After two successive discounts of 15% and x %, it is sold for ₹566.10. What is the value of x ?

Ans
✔ 1. 10
✗ 2. 5
✗ 3. 12
✗ 4. 20

Q.25 If $7sin^2\theta - cos^2\theta + 2sin\theta = 2$, $0° < \theta < 90°$, then the value of $\frac{sec\ 2\theta + cot2\theta}{cosec\ 2\theta + tan\ 2\theta}$ is:

Ans ✗ 1. 1

✗ 2. $\frac{2}{5}(1 + \sqrt{3})$

✔ 3. $\frac{1}{5}(1 + 2\sqrt{3})$

✗ 4. $\frac{2\sqrt{3} + 1}{3}$