

General Instructions

- (i) This question paper contains 50 questions. All questions are compulsory.
- (ii) It comprises 50 single-correct multiple-choice questions.
- (iii) Attempt every question; detailed solutions are provided in the companion solutions booklet.

1. If $\frac{a}{b} = \frac{1}{3}$, $\frac{b}{c} = \frac{2}{2}$, $\frac{c}{d} = \frac{1}{2}$, $\frac{d}{e} = \frac{3}{3}$ and $\frac{e}{f} = \frac{1}{4}$, then what is the value of $\frac{abc}{def}$?

- (A) $3/8$
- (B) $27/8$
- (C) $3/4$
- (D) $27/4$

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2. If $x = -0.5$, then which of the following has the smallest value?

- (A) 2^x
- (B) $1/x$
- (C) $1/x^2$
- (D) $2x^x$

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3. Which among $2^{1/2}$, $3^{1/3}$, $4^{1/4}$, $6^{1/6}$ and $12^{1/12}$ is the largest?

- (A) $2^{1/2}$
- (B) $3^{1/3}$
- (C) $4^{1/4}$
- (D) $6^{1/6}$

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4. Consider a sequence where the n th term, $t_n = \frac{n}{n+2}$, $n = 1, 2, \dots$. The value of $t_3 \times t_4 \times t_5 \times \dots \times t_{53}$ equals:

- (A) $2/495$
- (B) $2/477$
- (C) $12/55$
- (D) $1/1485$

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5. When you reverse the digits of the number 13, the number increases by 18. How many other two-digit numbers increase by 18 when their digits are reversed?

- (A) 5
- (B) 6
- (C) 7
- (D) 8

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6.

Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

- (A) 20
- (B) 25
- (C) 30
- (D) 40

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7. The ratio of two numbers is 3 : 5. If 39 is added to the first, and 14 is added to the second, then the ratio becomes 6 : 7. What will be the ratio if 11 is added to the first number and 6 is added to the second number?

- (A) 7 : 9
- (B) 5 : 9
- (C) 5 : 7
- (D) 2 : 3

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8. In an election between two candidates, the winner got 56% of the total valid votes and won by 4,800 votes. If all votes were valid, how many people voted?

- (A) 36,000
- (B) 40,000
- (C) 42,000
- (D) 48,000

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9. The price of sugar rises by 25%. By what percentage must a family reduce its consumption so that the total expenditure on sugar stays the same?

- (A) 20%
- (B) 25%
- (C) 16.67%
- (D) 22%

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10. A number is first increased by 20% and the result is then decreased by 20%. The final value is what percent of the original?

- (A) 100%
- (B) 96%
- (C) 98%
- (D) 104%

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11. Two numbers are in the ratio 5 : 8. If 9 is added to each, the ratio becomes 8 : 11. Find the larger number.

- (A) 15
- (B) 24
- (C) 40
- (D) 30

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12. If $A : B = 3 : 4$ and $B : C = 6 : 5$, then $A : B : C$ equals:

- (A) 9 : 12 : 10
- (B) 3 : 4 : 5
- (C) 9 : 24 : 20
- (D) 6 : 8 : 5

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13. An amount of Rs. 7,800 is divided among A, B and C in the ratio 2 : 3 : 8. How much does C receive?

- (A) Rs. 1,200
- (B) Rs. 1,800
- (C) Rs. 4,800
- (D) Rs. 3,600

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14. The ratio of milk to water in a 60-litre mixture is 7 : 3. How much water must be added to make the ratio 7 : 4?

- (A) 6 litres
- (B) 10 litres
- (C) 4 litres
- (D) 8 litres

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15. A shopkeeper buys an article for Rs. 480 and sells it for Rs. 600. What is his profit percentage?

- (A) 20%
- (B) 25%
- (C) 30%
- (D) 24%

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16. By selling an article for Rs. 720, a man loses 10%. At what price should he sell it to gain 20%?

- (A) Rs. 960
- (B) Rs. 864
- (C) Rs. 900
- (D) Rs. 800

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17. A trader marks his goods 40% above cost and allows a discount of 25% on the marked price. His profit percentage is:

- (A) 5%
- (B) 10%
- (C) 15%
- (D) 12%

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18. A man sells two articles at Rs. 990 each. On one he gains 10% and on the other he loses 10%. His overall result is:

- (A) Loss of 1%
- (B) No profit no loss
- (C) Gain of 1%
- (D) Loss of 2%

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19. The average of 11 numbers is 50. If one number 65 is removed, the average of the remaining 10 numbers is:

- (A) 48.5
- (B) 50
- (C) 46
- (D) 55

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20. The average age of 30 students is 12 years. If the teacher's age is included, the average rises by 1 year. The teacher's age is:

- (A) 43 years
- (B) 42 years
- (C) 40 years
- (D) 31 years

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21. In what ratio must rice at Rs. 30/kg be mixed with rice at Rs. 45/kg to get a mixture worth Rs. 35/kg?

- (A) 2 : 1
- (B) 1 : 2
- (C) 3 : 2
- (D) 1 : 1

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22. A car covers 240 km in 4 hours. Travelling at the same speed, how far will it go in 7 hours?

- (A) 360 km
- (B) 420 km
- (C) 400 km
- (D) 480 km

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23. A train 150 m long is running at 72 km/h. How long does it take to cross a platform 250 m long?

- (A) 20 s
- (B) 18 s
- (C) 25 s
- (D) 22 s

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24. A man covers a distance at 40 km/h and returns along the same road at 60 km/h. His average speed for the whole journey is:

- (A) 48 km/h
- (B) 50 km/h
- (C) 45 km/h
- (D) 52 km/h

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25. A boat goes 30 km downstream in 2 hours and returns the same distance upstream in 3 hours. The speed of the stream is:

- (A) 2.5 km/h
- (B) 5 km/h
- (C) 2 km/h
- (D) 3 km/h

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26. A can do a piece of work in 12 days and B in 18 days. Working together, they finish it in:

- (A) 7.2 days
- (B) 7.5 days
- (C) 6 days
- (D) 8 days

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27. 15 men can build a wall in 8 days. How many days will 10 men take to build the same wall?

- (A) 12 days
- (B) 10 days
- (C) 16 days
- (D) 6 days

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28. A and B together do a work in 12 days; B alone does it in 20 days. In how many days can A alone do it?

- (A) 30 days
- (B) 24 days
- (C) 15 days
- (D) 36 days

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29. Find the simple interest on Rs. 6,000 at 8% per annum for 3 years.

- (A) Rs. 1,440
- (B) Rs. 1,600
- (C) Rs. 1,200
- (D) Rs. 1,800

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30. The compound interest on Rs. 8,000 at 10% per annum for 2 years (compounded annually) is:

- (A) Rs. 1,680
- (B) Rs. 1,600
- (C) Rs. 1,760
- (D) Rs. 800

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31. A sum doubles itself in 8 years at simple interest. The annual rate of interest is:

- (A) 12.5%
- (B) 10%
- (C) 8%
- (D) 15%

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32. The sum of the digits of a two-digit number is 9. When the digits are reversed, the number decreases by 27. Find the original number.

- (A) 63
- (B) 54
- (C) 72
- (D) 36

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33. How many numbers between 1 and 200 are divisible by both 6 and 8?

- (A) 8
- (B) 6
- (C) 12
- (D) 4

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34. The HCF of two numbers is 12 and their LCM is 144. If one number is 36, the other number is:

- (A) 48
- (B) 60
- (C) 24
- (D) 72

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35. What is the remainder when 2^{31} is divided by 7?

- (A) 1
- (B) 2
- (C) 4
- (D) 0

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36. If $x + \frac{1}{x} = 5$, then the value of $x^2 + \frac{1}{x^2}$ is:

- (A) 23
- (B) 25
- (C) 27
- (D) 21

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37. The sum of two numbers is 15 and the sum of their squares is 113.
The product of the two numbers is:

- (A) 56
- (B) 48
- (C) 60
- (D) 52

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38. If $3x - 2y = 5$ and $x + y = 5$, then the value of x is:

- (A) 3
- (B) 2
- (C) 4
- (D) 1

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39. Simplify: $\frac{2}{3}$ of 45 + 25% of 80 – 12.

- (A) 38
- (B) 40
- (C) 30
- (D) 42

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40. Find the sum of the first 20 terms of the arithmetic progression 3, 7, 11, 15, ...

- (A) 820
- (B) 800
- (C) 840
- (D) 780

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41. The third term of a GP is 12 and the sixth term is 96. The first term is:

- (A) 3
- (B) 2
- (C) 4
- (D) 6

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42. What is the value of the sum $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \cdots + \frac{1}{9 \cdot 10}$?

- (A) $9/10$
- (B) $1/10$
- (C) $10/11$
- (D) $8/9$

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43. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}$ (continued infinitely) is:

- (A) 3
- (B) 2
- (C) 6
- (D) 4

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44. If $2^x = 8^{y+1}$ and $9^y = 3^{x-9}$, then the value of x is:

- (A) 21
- (B) 18
- (C) 24
- (D) 15

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45. In how many ways can the letters of the word 'LEADER' be arranged?

- (A) 360
- (B) 720
- (C) 120
- (D) 180

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46. Two dice are thrown together. What is the probability that the sum of the numbers is 8?

- (A) $5/36$
- (B) $1/6$
- (C) $1/9$
- (D) $7/36$

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47. A company sold 1,200, 1,500, 900 and 1,400 units over four quarters. What is the average quarterly sales?

- (A) 1,250
- (B) 1,200
- (C) 1,300
- (D) 1,000

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48. In a survey of 800 people, 45% preferred tea and the rest preferred coffee. How many more people preferred coffee than tea?

- (A) 80
- (B) 120
- (C) 40
- (D) 360

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49. A and B start a business investing Rs. 25,000 and Rs. 35,000 respectively. If the annual profit is Rs. 24,000, B's share is:

- (A) Rs. 14,000
- (B) Rs. 10,000
- (C) Rs. 12,000
- (D) Rs. 16,000

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50. The ratio of the present ages of a father and son is 7 : 2. After 10 years, the ratio becomes 9 : 4. The present age of the father is:

- (A) 35 years
- (B) 42 years
- (C) 28 years
- (D) 40 years