



SIMPLIFICATION HARD LEVEL

Direction (1-10): What should come in place of the question mark (?) in the following questions?

1. $\frac{3}{7}$ of 329 + $\frac{4}{11}$ of 2530 = $\sqrt{?}$ + 894

- a. 28899
- b. 29899
- c. 27789
- d. 27889
- e. None of these

2. $\sqrt{?} + 14 = \sqrt{2601}$

- a. 1521
- b. 1369
- c. 1225
- d. 961
- e. 1296

3. 85% of 420 + ?% of 1080 = 735

- a. 25
- b. 30
- c. 35
- d. 40
- e. 45

4. 30% of 1225 – 64% of 555 = ?

- a. 10.7
- b. 12.3

c. 13.4

d. 17.5

e. None of these

5. 156% of 780 - $\frac{2}{5}$ of 480 + 85% of 540 = ?

- a. 1388.5
- b. 1483.8
- c. 1488.8
- d. 1538.8

e. None of these

6. $(12)^{3/2} \times (36)^{5/2} \times (144)^{3/2} \div (12)^? = 1728$

- a. $\frac{7}{2}$
- b. $\frac{5}{2}$
- c. 6
- d. 5
- e. 4

7. 16% of 80 + ?% of 44 = 34.8

- a. 55
- b. 50
- c. 60
- d. 40
- e. 70

8. 85% of 95% of $\frac{4}{5}$ of 2240 = ?

- a. 1447.04



b. 1457.04

c. 1449.07

d. 1449.05

e. 1447.004

9. (19% of 361) ÷ 1.9 = ?

a. 391

b. 361

c. 36.1

d. 39.1

e. 3.61

10. $(\sqrt[3]{12167}) \times (\sqrt[3]{274625}) \times (\sqrt[3]{250047}) = ?$

a. 98956

b. 78695

c. 87695

d. 94185

e. 94565

Direction (11-20): What should come in place of the question mark (?) in the following questions?

11. 22% of 44% of 66% of 275000 = ?

a. 14968.2

b. 16669.2

c. 17869.2

d. 17569.2

e. 15869.2

12. 5.2% of 3900 - 4.8% of 3400 = ?

a. 39.6

b. 45.4

c. 35.2

d. 42.4

e. 36.6

13. 45% of 600 + ?% of 480 = 390

a. 20

b. 25

c. 30

d. 40

e. None of these

14. 65% of 240 + ?% of 150 = 210

a. 45

b. 46

c. 32

d. 36

e. None of these

15. $\sqrt[3]{9261} \times \sqrt[3]{62742241} = ? + 89$

a. 166254

b. 166259

c. 166253

d. 166252

e. None of these

16. $(1089)^{1/2} \times 1331 = 121 \times ?$

a. 443

b. 673

c. 363

d. 303

e. None of these

17.

$(854 \times 854 \times 854 - 276 \times 276 \times 276) / (854 \times 854 + 854 \times 276 + 276 \times 276) = ?$



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- a. 1130
- b. 578
- c. 565
- d. 1156
- e. None of these

18. 56% of 225 + 20% of 150 = ? - 109

- a. 49
- b. 103
- c. 53
- d. 47
- e. None of these

19. $\sqrt{75 + \sqrt{31 + \sqrt{16 + \sqrt{81}}}} \times \sqrt{729} = \sqrt{?} \times 18$

- a. 27^2
- b. 13.5
- c. 14^2
- d. 182.25
- e. $(19.6)^2$

20. $\frac{27^{2.3} \times 81^{2.6} \times 27^{46.3}}{27^{5.3}} = 27^{0.1} \times 3^?$

- a. 0.3
- b. 2.3
- c. 140
- d. 140.3
- e. None of these

Direction (21-25): What should come in place of the question mark (?) in the following questions?

21. $\frac{3}{8}$ of $\frac{4}{9}$ of 1575 + $(\sqrt{?}) - 32\%$ of 786 = 66.98

- a. $\sqrt{56}$
- b. 56
- c. $(56)^2$
- d. 36
- e. None of these

22. $(2^3)^3 \times (2^2)^2 \times (8^2)^{3/2} / (2^2)^6 = (4)^?$

- a. 8
- b. 10
- c. 2.5
- d. 6
- e. 5

23. $(4 \times 18)^{3.35} \times (8)^{5.2} \times (64)^{7.3} \times (27 \times 3)^{9.9} = (72)^?$

- a. 23.15
- b. 24.15
- c. 3.35
- d. 7.3
- e. 20.75

24. $8\sqrt{8} \times 8^3 \div 8^{5/2} = 2^?$

- a. 24
- b. 12
- c. 18
- d. 21
- e. None of these

25. 30% of $(\frac{2}{7})$ of $(\frac{2}{9})$ of $(\frac{2}{5})$ of $(\frac{2}{3})$ of 9450 = ?

- a. 32
- b. 36



- c. 42
- d. 48
- e. 52

Directions (26-35): What approximate value should come in place of question mark (?) in each of the following questions? (Note: You are not expected to calculate the exact value).

26. $6575 \div 74.95 + \sqrt{630} \times 14.83 = ?$

- a. 550
- b. 463
- c. 320
- d. 256
- e. 680

27. $198.05 \times 126.05 \div 76.87 + 178.44 - 294.77 = ?$

- a. 324
- b. 315
- c. 295
- d. 154
- e. 207

28. $0.5\% \text{ of } 4789.823 + 0.7\% \text{ of } 330.732 = ?$

- a. 42
- b. 26
- c. 35
- d. 20
- e. 17

29. $8.99 \times 8.99 \times 8.99 \div 2.99 = 3^?$

- a. 7
- b. 9

- c. 3
- d. 2
- e. 5

30. $14.982^2 \div 5.001^2 \times 4.990 \times 5^{-1} = ?$

- a. 45
- b. 75
- c. 225
- d. 9
- e. 25

31. $2831.994 \div 23.998 + 11.99^2 \div 5.991 = ?^2$

- a. 144
- b. 12
- c. 196
- d. 14
- e. 17

32. $(22.99 + 17.01) \div 1.998 \times 3.997 - 41.998 + 644.199 = ?$

- a. 798
- b. 542
- c. 682
- d. 745
- e. 762

33. $50.01^2 + 19.999^2 + ? = 50.998^2$

- a. -363
- b. -299
- c. 63
- d. 299

34. $(4721+3271+5324) \div (491+769+132) = ?$

34. $(4721+3271+5324) \div (491+769+132) = ?$



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- a. 40
- b. 20
- c. 25
- d. 10
- e. 15

35. 205% of 3850 – 105% of 2640 = ?

- a. 4218.5
- b. 5120.5
- c. 5448.5
- d. 4628.5
- e. 5035.5

Direction (36-50): What should come in place of the question mark (?) in the following questions?

36. $[5438 - 2784 - 659] \div [820 - 56 - 41] = ?$

- a. 6
- b. 9
- c. 27
- d. 3
- e. 12

37. $6 \frac{2}{3} + 19.28 + 5 \frac{1}{4} + 7 \frac{1}{6} - 7.592 = ?$

- a. 30
- b. 36
- c. 40
- d. 38
- e. 42

38. $6. (37.99)^2 - (11.081)^2 + (6.89)^3 + (4)^2 = (?)^2$

- a. 41
- b. 39

- c. 43
- d. 36
- e. 37

39. $14.891 \div 9 \times 1638 \times 18.8801 \div 7 \times (3)^3 \div 13 = ?$

- a. 15,000
- b. 14,900
- c. 16,500
- d. 15,390
- e. 15,600

40. $(7.9899 \times 7.002) + \sqrt{1024.78} + (1.99086)^3 = ? \div 1/5.7865$

- a. 576
- b. 480
- c. 16
- d. 18
- e. 516

41. $5.5\% \text{ of } 225 + 7.5\% \text{ of } 625 - 18.6\% \text{ of } 182 = ?$

- a. 16
- b. 14
- c. 19
- d. 25
- e. 18

42. $(5.96)^2 + (7.89)^2 + (2.9)^2 + (3.1)^2 = (2.42)^2 + (2.68)^2 + ?$

- a. 105
- b. 108
- c. 107
- d. 106
- e. 110

43. $\sqrt[3]{250047.99} \times 240\% \text{ of } 629.49 = ?$



- a. 83249
b. 114898
c. 78632
d. 104863
e. 95256
- 44. $2377.632 \div 18.05 - 4.56 \times 8.001 = ?$**
- a. 110
b. 106
c. 88
d. 92
e. 96
- 45. $8.23^3 + 8^3 + 8.91^2 + (64.021)^{1/2} = ?$**
- a. 1095
b. 1113
c. 5184
d. 1200
e. None of these
- 46. $\sqrt{527.995 + (9.9161)^2 + (11.296)^2} = ? \div 0.008 / 2$**
- a. 4
b. 8
c. 1
d. 5
e. 2
- 47. $0.85\% \text{ of } 805 + 2.25\% \text{ of } 225 + 2.03\% \text{ of } 203 = ?$**
- a. 14
b. 11
c. 18
d. 16
e. 12
- 48. $1584 \div 24.89\% \text{ of } 352.02 = ?$**
- a. 24
b. 18
c. 12
d. 28
e. 8
- 49. $18\% \text{ of } 256 + 35\% \text{ of } 290 - 15\% \text{ of } 385 = ?$**
- a. 83
b. 80
c. 90
d. 70
e. 85
- 50. $63.9\% \text{ of } 8920.2 + ?\% \text{ of } 5320.3 = 6830.162$**
- a. 36
b. 21
c. 17
d. 31
e. 9



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Answer with Solution

Solution (1-10)

1. D

$$141 + 920 = \sqrt{?} + 894$$

$$\sqrt{?} = 167$$

$$? = 27889$$

2. B

$$\sqrt{?} = \sqrt{2601} - 14 = 51 - 14 = 37$$

$$? = 1369$$

3. C

$$85/100 \times 420 + x/100 \times 1080 = 735$$

$$\Rightarrow x = 35$$

4. B

$$? = 367.5 - 355.2$$

$$= 12.3$$

5. B

$$? = 156 \times 7.80 - (2/5) \times 480 + 85 \times 5.40$$

$$= 1216.8 - 192 + 459$$

$$= 1675.8 - 192 = 1483.8$$

6. E

$$(64 \times 27) \times 4 \times 3 \times 4^3 \times 3^3 / 1728 = 12^?$$

$$4^4 \times 3^4 = 12^?$$

$$(12)^4 = 12^?$$

$$? = 4$$

7. B

$$(16 \times 80) / 100 + (? \times 44) / 100 = 34.8$$

$$? \times 44 / 100 = 34.8 - 12.8 = 22$$

$$? = (22 \times 100) / 44 = 50$$

8. A

$$? = (85/100) \times (95/100) \times (4/5) \times 2240$$

$$= (17 \times 19 \times 4 \times 112) / 100$$

$$= 144704 / 100 = 1447.04$$

9. C

$$? = (19 \times 361 \times 10) / (100 \times 19)$$

$$= (19 \times 19) / 10 = 36.1$$

10. D

$$? = (\sqrt[3]{12167}) \times (\sqrt[3]{274625}) \times (\sqrt[3]{250047})$$

$$= 23 \times 65 \times 63 = 94185$$

Solution (11-20)

11. D

$$? = (275000 \times 22 \times 44 \times 66) / (100 \times 100 \times 100)$$

$$= (275 \times 22 \times 44 \times 66) / (10 \times 100) = 17569.2$$

12. A

$$? = (5.2\% \text{ of } 3900) - (4.8\% \text{ of } 3400)$$

$$= [(5.2 \times 3900) / 100] - [(4.8 \times 3400) / 100]$$

$$= (5.2 \times 39) - (4.8 \times 34)$$

$$= 202.8 - 163.2 = 39.6$$

13. B

$$45/100 \text{ of } 600 + ?/100 \text{ of } 480 = 390$$

$$\Rightarrow 270 + 4.8 \times ? = 390$$

$$? = 390 - 270 / 4.8$$

$$= 25$$

14. D

$$65/100 \text{ of } 240 + ?/100 \text{ of } 150 = 210$$

$$\Rightarrow 156 + 1.5 \times ? = 210$$

$$\therefore ? = 210 - 156 / 1.5 = 36$$

15. D

$$? = 21 \times 7921 - 89$$

$$= 166252$$

16. C

$$? = 33 \times 1331 / 121$$

$$= 363$$

17. B

$$? = (854^3 - 276^3) / (854^2 + 854 \times 276 + 276^2)$$

By applying $a^3 - b^3 = (a-b) / (a^2 + ab + b^2)$

$$= 854 - 276$$

$$= 578$$

18. E

$$? = 126 + 30 + 109$$

$$= 265$$

19. D

$$\sqrt{75 + \sqrt{31 + \sqrt{16 + \sqrt{81}}}} = 9 \text{ and } \sqrt{729} = 27$$

$$\therefore \frac{9 \times 27}{18} = \sqrt{?}$$

$$\text{Hence, } \sqrt{?} = (13.5)^2$$

$$\therefore ? = 182.25$$

20. C

$$\frac{27^{2.3} \times 81^{2.6} \times 27^{46.3}}{27^{5.3}} = 27^{0.1} \times 3^7$$

$$\frac{(3^3)^{2.3} \times (3^4)^{2.6} \times (3^3)^{46.3}}{(3^3)^{5.3}} = (3^3)^{0.1} \times 3^7$$

$$\frac{3^{156.2}}{3^{15.9}} = (3^3)^{0.1} \times 3^7$$

$$3^{0.3+7} = 3^{140.3}$$

$$\therefore ? = 140.3 - 0.3 = 140$$

Solution (21-25)

21. C

$$3/8 \times 4/9 \times 1575 + (\sqrt{?}) - 32\% \text{ of } 786 = 66.98$$

$$1/2 \times 525 + (\sqrt{?}) - (32/100) \times 786 = 66.98$$

$$262.5 (100) + (\sqrt{?}) (100) - 25152 = 66.98(100)$$

$$26250 - 25152 + (\sqrt{?}) (100) = 6698$$

$$(\sqrt{?}) (100) = 5600$$

$$? = (56)^2$$

22. E

$$(2^3)^3 \times (2^2)^2 \times (8^2)^{3/2} / (2^2)^6 = (4)^?$$

$$(4)^? = 2^9 \times 2^4 \times 8^3 / 2^{12}$$

$$(4)^? = 2^{13-12} \times 8^3$$

$$(4)^? = (4)^5$$

$$? = 5$$

23. A

$$(72)^? = (4 \times 18)^{3.35} \times (8)^{5.2} \times (64)^{7.3} \times (27 \times 3)^{9.9}$$

$$(72)^? = (4 \times 2 \times 9)^{3.35} \times (8)^{5.2} \times (8 \times 8)^{7.3} \times (9 \times 9)^{9.9}$$

$$(72)^? = (8)^{3.35+5.2+7.3+7.3} \times (9)^{3.35+9.9+9.9}$$

$$(72)^? = (72)^{23.15}$$

24. E

$$8\sqrt{8} \times 8^3 \div 8^{5/2} = 2^?$$

$$8^{1+1/2+3-5/2} = 2^?$$

$$8^{(2+1+6-5)/2} = 2^?$$

$$8^{4/2} = 2^?: 8^2 = 2^?$$

$$? = 6$$

25. D

$$? = 30\% \text{ of } 2/7 \text{ of } 2/9 \text{ of } 2/5 \text{ of } 2/3 \text{ of } 9450$$

$$= 30\% \text{ of } [(16/945) \times 9450]$$

$$= 30\% \text{ of } 160 = 48$$

Solution (21-35)



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26. B

$$6575 \div 74.95 + \sqrt{630} \times 14.83 = ?$$

$$88 + 25 \times 15 \approx ?$$

$$? = 463$$

27. E

$$? \approx 198 \times 126 \div 77 + 178 - 295$$

$$? = 198 \times 126 \times (1/77) + 178 - 295$$

$$? = 324 + 178 - 295$$

$$? = 207$$

28. B

$$0.5\% \text{ of } 4789.823 + 0.7\% \text{ of } 330.732 = ?$$

$$\text{or, } ? \approx 4790/200 + 331/100 \times (0.7) \approx 24 + 2 = 26$$

29. E

$$8.99 \times 8.99 \times 8.99 \div 2.99 = 3^?$$

$$9 \times 9 \times 9/3 \approx 3^?$$

$$9 \times 9 \times 3 = 3^5 = 3^?$$

30. D

$$14.982^2 \div 5.001^2 \times 4.990 \times 5^{-1} = ?$$

$$15^2/5^2 \times 5 \times 1/5 = ?$$

$$? = 3^2 = 9$$

31. B

$$2831.994 \div 23.998 + 11.99^2 \div 5.991 = ?^2$$

$$2832/24 + 12^2/6 \approx ?^2$$

$$118 + 24 = 144 = ?^2, ? = \pm 12$$

32. C

$$(22.99 + 17.01) \div 1.998 \times 3.997 - 41.998 + 644.199 = ?$$

$$(23 + 17)/2 \times 4 - 42 + 644 \approx ?$$

$$? = 20 \times 4 - 42 + 644$$

$$? = 80 + 644 - 42 = 724 - 42 = 682$$

33. B

$$50.01^2 + 19.999^2 + ? = 50.998^2$$

$$50^2 + 20^2 + ? \approx 51^2$$

$$? = 51^2 - 50^2 - 20^2$$

$$? = 2601 - 2500 - 400 = -299$$

34. D

$$? = (4721 + 3271 + 5324) \div (491 + 769 + 132) = 13316 \div 1392 \approx$$

$$13400 \div 1400 = 9.5 \approx 10$$

35. B

$$\begin{aligned} ? &= \frac{205}{100} \times 3850 - \frac{105}{100} \times 2640 \\ &= 7,892.5 - 2,772 \\ &= 5120.5 \end{aligned}$$

Solution (36-50)

36. D

$$[5438 - 2784 - 659] \div [820 - 56 - 41] = ?$$

$$? = 1995 / 723 = 2.759 \approx 3$$

37. A

$$6 \frac{2}{3} + 19.28 + 5 \frac{1}{4} + 7 \frac{1}{6} - 7.592 = ?$$

$$? = 20/3 + 19.28 + 21/4 + 43/6 - 7.592$$

$$\approx 19 + 19 - 8 = 30$$

38. A

$$(37.99)^2 - (11.081)^2 + (6.89)^3 + (4)^2 = (?)^2$$

$$(?)^2 = (38)^2 - (11)^2 + (7)^3 + (4)^2$$

$$(?)^2 = 1444 - 121 + 343 + 16 = 1682$$

$$? = \sqrt{1682} = \sqrt{1681} = 1681$$

39. D

$$14.891 \div 9 \times 1638 \times 18.8801 \div 7 \times (3)^3 \div 13 = ?$$



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$$= 15/9 \times 1638 \times 19/7 \times 27/13$$

$$= 15,390$$

40. C

$$(7.9899 \times 7.002) + \sqrt{1024.78} + (1.99086)^3 = ? \div 1/5.7865$$

$$(8 \times 7) + 32 + (2)^3 = ? \times 5.7865$$

$$(56 + 32 + 8) / 5.7865 \approx 96/6 = 16$$

41. D

$$? = 5.5\% \text{ of } 225 + 7.5\% \text{ of } 625 - 18.6\% \text{ of } 182$$

$$= 12.375 + 46.875 - 33.852$$

$$\approx 12 + 47 - 34 = 25$$

42. A

$$(2.42)^2 + (2.68)^2 + ? = (5.96)^2 + (7.89)^2 + (2.9)^2 + (3.1)^2 \approx (6)^2 + (8)^2 + (3)^2 + (3)^2$$

$$\approx 36 + 64 + 9 + 9 = 118$$

$$\therefore ? = 118 - \{(2.42)^2 + (2.68)^2\}$$

$$= 118 - (5.86 + 7.18) \approx 118 - \{6 + 7\} = 118 - 13 = 105$$

43. E

$$? = \sqrt[3]{250047.99} \times 240\% \text{ of } 629.49$$

$$\approx 63 \times (240/100) \times 630 = 95256$$

44. D

$$2377.632 \div 18.05 - 4.56 \times 8.001 = ?$$

$$2380/18 - 5 \times 8 = 132 - 40 = 92$$

45. B

$$8.23^3 + 8^3 + 8.91^2 + (64.021)^{1/2} = ?$$

$$= 8^3 + 8^3 + 9^2 + \sqrt{64}$$

$$= 512 + 512 + 81 + 8 = 1113$$

46. C

$$\sqrt{527.995} + (9.9161)^2 + (11.296)^2 = X \div 0.008 / 2$$

$$\sqrt{529} + (10)^2 + (11)^2 = X \times 2/0.008$$

$$23 + 100 + 121 = X \times 250$$

$$X = 244 / 250 \approx 1$$

47. D

$$0.85\% \text{ of } 805 + 2.25\% \text{ of } 225 + 2.03\% \text{ of } 203 = ?$$

$$= 0.85/100 \times 800 + 2.25/100 \times 225 + 2.03/100 \times 203$$

$$= 6.8 + 5.0625 + 4.06 = 15.9225$$

$$= 16$$

48. B

$$? \approx 1584 \div \frac{25}{100} \times 352$$

$$? \approx \frac{1584 \times 100}{25 \times 352}$$

$$? \approx 18$$

49. C

$$18\% \text{ of } 256 + 35\% \text{ of } 290 - 15\% \text{ of } 385 = ?$$

$$\text{or, } ? \approx \frac{18}{100} \times 260 + \frac{35}{100} \times 300 - \frac{15}{100} \times 400$$

$$= 46.8 + 105 - 60 = 151.8 - 60 = 91.8 \approx 90$$

50. B

$$\approx 63.9\% \text{ of } 8920 + ?\% \text{ of } 5320 = 6830$$

$$\approx 5320 \times ? = (6830 - 5709) \times 100$$

$$? \approx 21$$