

APPROXIMATION

Directions: What **approximate** value will come in place of question mark (?) in the following questions (You are not expected to calculate the exact value).

1. $9228.789 - 5021.832 + 1496.989 = ?$
a) 6500 b) 6000 c) 6300 d) 5700 e) 5100

ANSWER: d

Having a glance at the given options one can find out that the two nearest values have a difference of 300. So round off the numbers to the nearest ten's values.

$$\div 9228.789 \cong 9230; \quad 5021.832 \cong 5020 \quad \text{and} \quad 1496.989 \cong 1500$$

Now the equation will become

$$9230 - 5020 + 1500 = ?$$

$$\Rightarrow ? = 5710$$

But the nearest value is 5700.

[**Note:** Even rounding of the numbers to nearest hundred places gives the same answer]

2. $1002 \div 49 \times 99 - 1299 = ?$
a) 700 b) 600 c) 900 d) 250 e) 400

ANSWER: a

Here also the two nearest values have a difference of 150 (250 and 400). So the number can be rounded off to the nearest ten's places.

$$\div 1002 \cong 1000; \quad 49 \cong 50; \quad 99 \cong 100 \quad \text{and} \quad 1299 \cong 1300$$

Now the equation will become

$$1000 \div 50 \times 100 - 1300 = ?$$

$$\Rightarrow 20 \times 100 - 1300 = ?$$

$$\Rightarrow 2000 - 1300 = ?$$

$$\div ? = 700$$

3. $29.8\% \text{ of } 260 + 60.01\% \text{ of } 510 - 103.57 = ?$
a) 450 b) 320 c) 210 d) 280 e) 350

ANSWER: d

The difference between two nearest values is 70 (210 and 280). So round off the numbers to the nearest integers.

$$\div 29.8\% \text{ of } 260 \cong 30\% \text{ of } 260; \quad 60.01\% \text{ of } 510 \cong 60\% \text{ of } 510 \quad \text{and} \quad 103.57 \cong 104$$

Now the equation will become

$$30\% \text{ of } 260 + 60\% \text{ of } 510 - 104 = ?$$

$$\Rightarrow \frac{30}{100} \times 260 + \frac{60}{100} \times 510 - 104 = ?$$

$$\Rightarrow 78 + 306 - 104 = ?$$

$$\div ? = 384 - 104 = 280$$

4. $(21.98)^2 - (25.02)^2 + (13.03)^2 = ?$
a) 25 b) 120 c) 10 d) 65 e) 140

ANSWER: a

$$(21.98)^2 \cong (22)^2; \quad (25.02)^2 \cong (25)^2 \quad \text{and} \quad (13.03)^2 = (13)^2$$

- ∴ The equation will become
 $22^2 - 25^2 + 13^2 = ?$
 $\Rightarrow 484 - 625 + 169 = ?$
 $\Rightarrow 653 - 625 = ?$
∴ $? = 28$ so the nearest value is 25

5. $\sqrt{2498} \times \sqrt{625} \div \sqrt{99} = ?$
a) 110 b) 90 c) 200 d) 160 e) 125

ANSWER: e

- $\sqrt{2498} \cong \sqrt{2500} = 50$; $\sqrt{625} = 25$ and $\sqrt{99} \cong \sqrt{100} = 10$
∴ The equation will become
 $50 \times 25 \div 10 = ?$
 $\Rightarrow ? = 125$

6. $\left(\frac{24}{9}\right)^2 \times \frac{399}{39} \div \frac{41}{899} = ?$
a) 1600 b) 1650 c) 1700 d) 1550 e) 1750

ANSWER: a

$\left(\frac{24}{9}\right)^2 = \left(\frac{8}{3}\right)^2 = \frac{64}{9}$; $\frac{399}{39} \cong \frac{400}{40}$ and $\frac{41}{899} \cong \frac{40}{900}$

- ∴ The equation will now become

$\frac{64}{9} \times \frac{400}{40} \div \frac{40}{900} = ?$
 $\Rightarrow \frac{64}{9} \times \frac{400}{40} \times \frac{900}{40} = ?$
 $\Rightarrow \frac{64}{9} \times \frac{10}{1} \times \frac{90}{4} = ?$
∴ $? = 1600$

7. 67.99% of 1401 – 13.99% of 1299 = ?
a) 700 b) 720 c) 770 d) 800 e) 740

ANSWER: c

- 67.99% of 1401 $\cong 68\%$ of 1400 and 13.99% of 1299 $\cong 14\%$ of 1300
The equation will now become 68% of 1400 – 14% of 1300 = ?
 $\frac{68}{100} \times 1400 - \frac{14}{100} \times 1300 = ?$
 $\Rightarrow 14 \times (68 - 13) = ?$
∴ $? = 770$

8. $5466.97 - 3245.01 + 1122.99 = ? + 2309.99$
a) 1130 b) 1000 c) 1100 d) 1030 e) 1060

ANSWER: d

$5466.97 \cong 5470$; $3245.01 \cong 3250$; $1122.99 \cong 1120$ and $2309.99 \cong 2310$

Now the equation will become

$$5470 - 3250 + 1120 = ? + 2310$$

$$\Rightarrow ? = 2220 + 1120 = 3340$$

$$\Rightarrow ? = 3340 - 2310 = 1030$$

9. $5998 \div 9.98 + 670.99 - 139.99 = ?$

a) 1080

b) 1280

c) 1180

d) 1130

e) 1230

ANSWER: d

$$5998 \cong 6000; \quad 9.98 \cong 10; \quad 670.99 \cong 670 \quad \text{and} \quad 139.99 \cong 140$$

The equation will become

$$6000 \div 10 + 670 - 140 = ?$$

$$\Rightarrow ? = 600 + 670 - 140$$

$$\Rightarrow ? = 1270 - 140 = 1130$$

10. $-(4.99)^3 + (29.98)^2 - (3.01)^4 = ?$

a) 550

b) 590

c) 620

d) 650

e) 690

ANSWER: e

$$(4.99)^3 \cong 5^3; \quad (29.98)^2 \cong 30^2 \quad \text{and} \quad (3.01)^4 \cong 3^4$$

Now the equation will become

$$-5^3 + 30^2 - 3^4 = ?$$

$$\Rightarrow ? = -125 + 900 - 81$$

$$\Rightarrow ? = 775 - 81 = 694$$

∴ The nearest value is 690

11. $499.99 + 1999 \div 39.99 \times 50.01 = ?$

a) 3200

b) 2700

c) 3000

d) 2500

e) 2400

ANSWER: c

$$499.99 \cong 500; \quad 1999 \cong 2000; \quad 39.99 \cong 40; \quad 50.01 \cong 50$$

Now the equation will become

$$500 + 2000 \div 40 \times 50 = ?$$

$$\Rightarrow ? = 500 + 50 \times 50 = 500 + 2500 = 3000$$

12. $[(7.99)^2 - (13.001)^2 + (4.01)^3]^2 = ?$

a) -1800

b) 1450

c) -1660

d) 1660

e) -1450

ANSWER: d

$$(7.99)^2 \cong 8^2; \quad (13.001)^2 \cong 13^2; \quad (4.01)^3 \cong 4^3$$

Now the equation will become

$$[8^2 - 13^2 + 4^3]^2 = ?$$

$$\Rightarrow ? = [64 - 169 + 64]^2$$

$$= [-41]^2 = 1681$$

The nearest value is 1660

13. $\frac{601}{49} \times \frac{399}{81} \div \frac{29}{201} = ?$

a) 520

b) 360

c) 460

d) 500

e) 420

ANSWER: e

$$\frac{601}{49} \cong \frac{600}{50}; \quad \frac{399}{81} \cong \frac{400}{80}; \quad \frac{29}{201} \cong \frac{30}{210}$$

Now the equation will become

$$\frac{600}{50} \times \frac{400}{80} \div \frac{30}{210} = ?$$

$$\Rightarrow \frac{600}{50} \times \frac{400}{80} \times \frac{210}{30} = ?$$

$$\Rightarrow ? = 12 \times 5 \times 7 = 420$$

14. $441.01 - 232.99 + 1649.99 = ? + 1225.92$
a) 600 b) 630 c) 660 d) 690 e) 720

ANSWER: b

$$441.01 \cong 441; \quad 232.99 \cong 233; \quad 1649.99 \cong 1650; \quad 1225.92 \cong 1226$$

∴ The equation will become

$$441 - 233 + 1650 = ? + 1226$$

$$? = 1858 - 1226 = 632$$

The nearest value is 630

15. $(21.5\% \text{ of } 999)^{1/3} + (42\% \text{ of } 601)^{1/2} = ?$
a) 18 b) 22 c) 26 d) 30 e) 33

ANSWER: b

$$(21.5\% \text{ of } 999)^{1/3} \cong (21.5\% \text{ of } 1000)^{1/3} \cong (215)^{1/3} \cong (216)^{1/3} = 6$$

$$(42\% \text{ of } 601)^{1/2} \cong (42\% \text{ of } 600)^{1/2} \cong (252)^{1/2} \cong 16$$

$$\therefore ? = 6 + 16 = 22$$