

6. INTEGERS

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Class: VI, MATHEMATICS

INTEGRATED. SOLUTIONS

TEACHING TASK
JEE MAINS LEVEL

01 $a + 2a = 3a$

Ans: A

02 Conceptual

Ans: A

03 $42 < 65$

Ans: A

04 $-32 < 32$

Ans: A

05 $2 + |-2| \square 2 + |-3|$
 $= 2 + 2 \square 2 + 3$
 $= 4 \square 5$

Ans: B

06 $7 + 6 + 8 = 9$

Ans: B

07 Conceptual

Ans: C

08 Let the two numbers be a, b
Given $ab < a + b$

$$\Rightarrow \frac{ab}{ab} < \frac{a}{ab} + \frac{b}{ab}$$

$$\Rightarrow 1 < \frac{1}{a} + \frac{1}{b}$$

A) $a=1, b=2$
 $\frac{1}{1} + \frac{1}{2} > 1 \checkmark$

B) $a=1, b=3$
 $1 + \frac{1}{3} > 1 \checkmark$

C) $\frac{1}{1} + \frac{1}{5} > 1 \checkmark$

Ans: D

09. let $n=2$, $n^3 = 2^3 = 8$ Even
 $n^2 = 2^2 = 4$, Even

Ans: B

10. let $n=1$, $2n+1 = 2 \cdot 1 + 1 = 3$, prime no.

Ans: D

11. let $n=0$, $2n-1 = 2 \cdot 0 - 1 = -1$

Ans: D

12. $x > 10$
 $\Rightarrow x - 10 > 0$

Ans: A

13. Descending order

c) $6 > 3 > -3 > -6 > -36 > -61$

Ans: C

14. $x > a \Rightarrow x - a > 0$
 $\Rightarrow |x - a| = x - a$

Ans: C

15. Ascending order

c) $-9 < -3 < -1 < 3 < 10$

Ans: C

JEE ADVANCED LEVEL

16. Conceptual

Ans: A, B, C

17. Conceptual

Ans: D

18. Statement I: $\leftarrow \begin{array}{cc} | & | \\ -5 & -2 \end{array} \rightarrow$ (True)

Statement II: $\begin{array}{cc} | & | \\ b & a \end{array}$ (False) Ans: C

19. Statement I: $| -(-2020) | = 2020$ (False)

Statement II: Conceptual (True)

Ans: D

$$20 \quad |-a| = -a \Rightarrow x < 0$$

③ Ans. A

$$21 \quad z > 0$$

Ans. B

$$22 \quad 55$$

Ans. B

$$23 \quad 1$$

Ans. 1

$$24 \quad 0$$

Ans. 0

$$25 \quad a + (-a) = 0$$

Ans. 0

$$26 \quad a) \text{ Conceptual } (P, q, r, s, t)$$

$$b) \text{ Conceptual } (P)$$

$$c) \text{ Conceptual } (q)$$

$$d) \text{ Conceptual } (\underline{s})$$

Ans. $(P, q, r, s, t), P, q, \underline{s}$

$$27 \quad a) 25(x)$$

$$b) \text{ ~~no~~ } |457| = 457 \quad (P, q, r, s, t)$$

$$c) 0(t)$$

$$d) -10 < 0, 10, 25, -10, (t, s, x, q)$$

Ans: $x, (P, q, r, s, t), t, (t, s, x, q)$

LEARNERS TASK (CUE'S)

$$01. \quad |3| = 3$$

Ans. B

$$02 \quad |-203| = 203$$

Ans. C

$$03 \quad 4 + |-1| + |-1| = 4 + 1 + 1 = 5$$

Ans. C

04. $|a+b| = a+b$, when $a+b > 0$

(4) Ans: A

05. $||1| + |-1|| = 1+1 = 2$

Ans: B

06. 0

Ans: A

07. $n=1$

Ans: D

08. Either positive or zero
or non-negative

Ans: A/C

09. $|a| = a$, $|-a| = a$, Difference = 0

Ans: C

10. $a+y$

Ans: A

JEE MAINS LEVEL

01. Descending order

Ans: A

A) $10 > 3 > 0 > -1 > -3 > -9$

02. $3-3+0 \leq 2+1+3$

Ans: A

$= 0 \leq 9$

03. $|a| = -a$, $a < 0$ $|b| = b$, $b > 0$

Ans: B

04. ~~$|a| \geq b$, $b < 0$, $a > 0$~~

Ans:

~~$\therefore a > b$ or $b < a$~~

04. $|a| = a$ since $a > 0$.

Given $|a| = -b$

Ans: B

$\therefore a = -b \Rightarrow$



5

Ans. B

05 $a+b+c < 0$

06 $a = 2+2+1=5$ | $a+b=12$
 $b = 3+3+1=7$ | $a+b > 0$

Ans: D

07 $a+b < 0$, $x+y > 0$
 $\therefore a+b < x+y$

Ans. B

08 $x+1 > 0$, $y+1 < 0$
 $x+1 > y+1 \Rightarrow x > y$

Ans. A

09 $|l+m| = l+m = a+b$
 $l=a, m=b$ (or) $l=b, m=a$

Ans: D

10 $|y| = -x$, $|x| = -y$
 $|x| + |y| = -y - x = -(x+y)$
 $\therefore x+y = -(|x| + |y|)$

Ans: C

11 $|a+b|=5$ | $|b+d|=-10$ | $|c+a|=-15$
not possible | not possible

please discard this question

12. $|x| > |y| > |z|$
opt: a. $|20| > |-15| > |10|$

Ans. B

(6)

$$13 \quad |x-a| = x-a$$

$$|x-a| = a-x$$

$$|x-a| + |x-a| = (x-a) + (a-x)$$

$$\Rightarrow 2|x-a| = 0$$

Ans: D

$$14 \quad |a| = b-c \quad |b-c| = (b-c)$$

$$\Rightarrow a = \pm(b-c) \quad \Rightarrow b-c > 0$$

$$\text{Case (i)} \quad a = b-c \quad \Rightarrow b-a = c$$

$$\text{Case (ii)} \quad a = -(b-c) \Rightarrow a+b = -c$$

Ans: B

15 JEE ADVANCED LEVEL

Ans: A, B

01 Conceptual

Ans: A, B, C

02 Conceptual

Ans: D

03 Conceptual

$$04 \quad |-1| + |+1| + |-1| + \dots \quad (111 \text{ times})$$

$$= 1 + 1 + 1 + \dots \quad (111 \text{ times})$$

$$= 1 \times 111 = 111 = 3 \times 37$$

Ans: D

$$05 \quad |a-b| = a-b \quad (\because a-b > 0 \text{ (False)})$$

$$\text{Statement II: } |a-b| = -(a-b) \quad (\because a-b < 0) \text{ (False)}$$

Ans: B



06 Statement I: $|a-b| = |a| + |b|$ (False) ①
Statement II: Conceptual (True) Ans: D

07 Given $x+y > 0$, $x-y < 0$
 $\Rightarrow (x+y)(x-y) < 0$
 $\Rightarrow x^2 - y^2 < 0$
 $\Rightarrow |x^2 - y^2| = -(x^2 - y^2)$
 $= y^2 - x^2$ Ans: B

08 $a+b < 0$, $a-b < 0$
 $\Rightarrow (a+b)(a-b) > 0$
 $\Rightarrow a^2 - b^2 > 0$
 $\Rightarrow |a^2 - b^2| = a^2 - b^2$
 $= -(b^2 - a^2)$ Ans: B

09 $m+n > 0$, $m-n > 0$
 $\Rightarrow (m+n)(m-n) > 0$
 $\Rightarrow m^2 - n^2 > 0$
 $\therefore |m^2 - n^2| = m^2 - n^2$ Ans: B

10 $x < y \Rightarrow x - y < 0$
 $\therefore |x - y| = -(x - y) = y - x$

Ans: A

11 $l > m \Rightarrow l - m > 0$
 $|l - m| = l - m$

Ans: B

$$12. \quad q > p \Rightarrow q - p > 0 \Rightarrow p - q < 0 \quad (4)$$

$$\therefore |p - q| = -(p - q) = q - p$$

Ans: B

$$13 \quad 9999$$

Ans: 9999

$$14 \quad \frac{1 - 100 + 200 + 300 + 400}{1 + 2 + 3 + 4}$$

$$= \frac{801}{10} = 80.1 \rightarrow \text{Integral value} = 80$$

Ans: 80

$$15 \quad \left| 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{6} \right| = \left| \frac{12}{6} \right| = 2$$

$$= \left| \frac{6 + 3 + 2 + 1}{6} \right|$$

Ans: 2

$$16 \quad a) \quad a < 2 \Rightarrow a - 2 < 0$$

$$2 < b \Rightarrow b - 2 > 0$$

$$|a - 2| + |b - 2|$$

$$= -(a - 2) + (b - 2) = b - a \quad (s)$$

$$b) \quad a > 2 \Rightarrow a - 2 > 0$$

$$b < 2 \Rightarrow b - 2 < 0$$

$$\therefore |a - 2| + |b - 2|$$

$$= (a - 2) - (b - 2) = a - b \quad (t)$$

$$c) \quad a > 2 \Rightarrow a - 2 > 0; \quad 2 < b \Rightarrow b - 2 > 0$$

$$|a - 2| + |b - 2| = (a - 2) + (b - 2) = a + b - 4 \quad (p)$$

$$d) \quad a < 2, \quad 2 > b$$

$$|a - 2| + |b - 2| = -(a - 2) - (b - 2) = 4 - a - b \quad (s)$$

Ans: s, t, p, s



17

$$a) a > 0, b > 0, c < 0 \Rightarrow abc < 0$$

$$\therefore |abc| = -(abc) (Q)$$

$$b) a < 0, b < 0, c > 0 \Rightarrow abc > 0$$

$$|abc| = abc (P)$$

$$c) a < 0, b > 0, c > 0 \Rightarrow abc < 0$$

$$\therefore |abc| = -(abc) (Q)$$

$$d) a > 0, b > 0, c > 0 \Rightarrow abc > 0$$

$$\therefore |abc| = abc (P)$$

Ans: Q, P, Q, P

$\Rightarrow$ THE END $\in$

