

LCM AND HCF

Class: VII, Mathematics

SOLUTIONS

①

(F⁺)

TEACHING TASK

JEE MAINS LEVEL

01. HCF { 816, 952 }

3

2

$$\begin{array}{r} 816 \overline{) 952} (1 \\ \underline{816} \\ 136 \end{array} \quad \begin{array}{r} 816 \overline{) 136} (6 \\ \underline{816} \\ 0 \end{array}$$

$\therefore \text{HCF} = 136$

Ans: —

02. HCF { 825, 990 }

$825 = 3 \times 5^2 \times 11 =$

$990 = 2 \times 3^2 \times 5 \times 11$

$\text{HCF} = 3 \times 5^2 \times 11$

Ans: C

03

$$\begin{array}{r} 312 \overline{) 468} (1 \\ \underline{312} \\ 156 \end{array} \quad \begin{array}{r} 312 \overline{) 156} (2 \\ \underline{312} \\ 0 \end{array}$$

$\therefore \text{HCF} = 156$

Ans: A, B

09. 560) 700 (1

$$\begin{array}{r} 560 \overline{) 700} (1 \\ \underline{560} \\ 140 \end{array} \quad \begin{array}{r} 560 \overline{) 140} (4 \\ \underline{560} \\ 0 \end{array}$$

Ans: B

06. option verification:

(2)

$$\text{HCF of } 27 \text{ and } 18 = 9$$

$\therefore$ Ans: A

07 $\text{H.C.F } \{36, 48\} = 6$

Ans: D

08 $\text{HCF} = 8$

Ans: D

09

10. Two numbers are $11 \times 3 \times 2$ and 11×7

Ans: A

11. $24 = 2^3 \times 3$

$$36 = 2^2 \times 3^2$$

$$\text{HCF} = 2^2 \times 3 = \text{9}$$

$$\begin{array}{r} 2 \overline{) 36} \\ 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array}$$

$$\begin{array}{r} 2 \overline{) 24} \\ 2 \overline{) 12} \\ 2 \overline{) 6} \\ 3 \end{array}$$

Ans: B

*12. $60 \overline{) 75} (1$

$$\begin{array}{r} 60 \\ 15 \overline{) 60} (4 \\ 60 \\ \hline 0 \end{array}$$

$$\text{HCF} = 15 = 3 \times 5$$

Ans: —

13. $45 \overline{) 75} (1$

$$\begin{array}{r} 45 \\ 30 \overline{) 45} (1 \\ 30 \\ 15 \overline{) 30} (2 \\ 30 \\ \hline 0 \end{array}$$

$$\text{HCF} = 15$$

Ans: C

$$\begin{array}{r} 2 \overline{) 12, 18} \\ 3 \overline{) 6, 9} \\ 2, 3 \end{array}$$

$$\text{LCM} = 2 \times 3 \times 2 \times 3 = 36$$

Ans: D

15 option verification: (108, 135)

$$\text{HCF} = 27 \quad \text{ratio} = 4:5$$

Ans: D



16 option verification

$$(119, 187) = 17$$

$$\text{Sum: } 119 + 187 = 306$$

$$\begin{array}{r} 119 \\ 187 \\ \hline 306 \end{array}$$

(3)

Ans: B

17 HCF {

$$18 \text{ LCM } \{20, 24, 36, 40\} = 360$$

$$360 \times 3 = \underline{1080}$$

Ans: B

$$19. \text{ LCM } \{63, 90, 135\} = 1890$$

$$\text{Required Ans} = 1890 + 11 = 1901$$

$$\begin{array}{r} 1890 \\ 1901 \\ \hline \end{array}$$

Ans: A

$$20. \begin{array}{r} 12 \overline{) 110} \\ \underline{108} \\ 2 \end{array}$$

$$\begin{array}{r} 12 \overline{) 125} \\ \underline{120} \\ 5 \end{array}$$

$\therefore$ Ans: 12

Ans: C

$$21. \text{ LCM } \{24, 36, 40\} = 360$$

Ans: C

$$22. 252 = 2^2 \times 3^2 \times 7$$

$$\begin{array}{r} 2 \overline{) 252} \\ \underline{2} \\ 2 \overline{) 126} \\ \underline{2} \\ 3 \overline{) 63} \\ \underline{3} \\ 3 \overline{) 21} \\ \underline{3} \\ 7 \end{array}$$

$$23. \text{ HCF } \{48, 36, 72, 24\} = 12$$

$$\text{LCM } \{48, 36, 72, 24\} = 144$$

$$\text{We have } 12 \times 12 = 144$$

Ans: A

Ans: A

$$24. 462$$

Ans: C

$$25. \text{ L.C.M} \times \text{HCF} = \text{product of the No.}$$

$$12 \times \text{HCF} = 24$$

$$\therefore \text{HCF} = 2$$

Ans: B



*26

*27

$$28 \text{ LCM } \{72, 90, 120\} = 360$$

Ans: C

$$29. \text{ LCM } \{54, 72, 108\} = 216$$

Ans: A

$$30. \text{ LCM } \{63, 126, 189\} = 378$$

Ans: B

$$31 \text{ HCF } \left\{ \frac{5}{12}, \frac{7}{18} \right\} = \frac{\text{HCF} \{5, 7\}}{\text{LCM} \{12, 18\}} = \frac{1}{36}$$

Ans: A

$$32 \text{ HCF } \left\{ \frac{3}{10}, \frac{4}{15}, \frac{2}{5} \right\} = \frac{\text{HCF} \{3, 4, 2\}}{\text{LCM} \{10, 15, 5\}} = \frac{1}{30}$$

Ans: A

ADVANCED LEVEL

$$01. \text{ HCF } \{180, 225\} = 45$$

Ans: C

$$02 \quad 252 = 2^2 \times 3^2 \times 7$$

$$336 = 2^4 \times 3 \times 7$$

$$\text{HCF} = 2^2 \times 3 \times 7 = 84$$

Ans: A, B, C

$$03 \quad 1232 = 2^4 \times 7 \times 11$$

$$1584 = 2^4 \times 3^2 \times 11$$

$$\text{HCF} = 2^4 \times 11 = 176$$

Ans: B,

$$*04 \quad 90 = 2 \times 3^2 \times 5$$

$$120 = 2^3 \times 3 \times 5$$

$$\text{HCF} = 2 \times 3 \times 5 = 30$$

$$\begin{array}{r} 250 \\ 3(45) \\ 3(15) \\ 5 \end{array}$$

$$\begin{array}{r} 420 \\ 2(63) \\ 2(30) \\ 3(15) \\ 5 \end{array}$$

Ans:

$$05 \quad \text{HCF} \{312, 468\} = 156$$

$$\begin{array}{r} 312 \overline{) 468} \\ 312 \\ \hline 156 \end{array}$$

$$\begin{array}{r} 312 \overline{) 312} \\ 312 \\ \hline 0 \end{array}$$

$$\text{HCF} = 156$$

Ans: A, B



06. $720 \overline{) 900} \begin{array}{r} 1 \\ 720 \\ \hline 180 \end{array} \begin{array}{r} 720 \text{ (4)} \\ 720 \\ \hline 0 \end{array} \quad \text{HCF} = 180$

(5)

Ans: B, C

07 Conceptual

Ans: B, D

08 Conceptual

Ans: A, C

09 $40 = 2^3 \times 5$

$60 = 2^2 \times 3 \times 5$

$\text{LCM} = 2^3 \times 3 \times 5$

$$\begin{array}{r} 2(40) \\ 2(20) \\ 2(10) \\ 5 \end{array}$$

$$\begin{array}{r} 2(60) \\ 2(30) \\ 3(15) \\ 5 \end{array}$$

Ans: B

10 $\text{HCF} \left\{ \frac{3}{10}, \frac{4}{15}, \frac{2}{5} \right\} = \frac{1}{30}$

$\text{LCM} \left\{ \frac{3}{10}, \frac{4}{15}, \frac{2}{5} \right\} = \frac{12}{5}$

Ans: A,

11. $\text{HCF} \left\{ \frac{2}{7}, \frac{3}{14}, \frac{5}{21} \right\} = \frac{1}{42}$

$\text{LCM} \left\{ \frac{2}{7}, \frac{3}{14}, \frac{5}{21} \right\} = \frac{30}{7}$

Ans: B

*12.

13 $p = a \times b \times c \times d$
 $q = b \times c \times d \times 4$

$\text{HCF} \{ p, q \} = bcd$

Ans: A

*14 LCM

Ans: —

*15 $\text{LCM} \{ 25, 30, 35 \} = 1050$

Ans: —

16. Conceptual

Ans: A, C, D

17. A: $\text{HCF} \{ 18, 27, 36 \} = 9$ (True)

R: Conceptual (True)

Ans: A



- 18 A: $HCF\{21, 22\} = 1$ (True) (b)
R: Conceptual (True) Ans: A
-
- 19 A: $HCF\{36, 48\} = 12$ (True) 26) 48 (1
36
12) 12 (3
36
0
R: Conceptual (True) Ans: A
-
- 20 A: HCF Conceptual (True)
R: Conceptual (True) Ans: A
-
- 21 A: $HCF\{126, 180\} = 18$ (False) 126) 180 (1
126
54) 126 (2
108
18) 54 (3
54
0
R: Conceptual (True) Ans: B
-
- 22 A: $HCF\{56, 72, 96\} = 8$ {False}
R: Conceptual (False) Ans: D
-
- 23 A: $HCF\{72, 90\} = 24$
 $LCM\{72, 90\} = 288$ R: (True) Ans: ~~D~~
-
- 24 A: Conceptual (True)
R: Conceptual (True) Ans: A
-
- 25 A: Conceptual (True)
R: Conceptual (True) Ans: A
-
- 26 A: $HCF\left\{\frac{3}{4}, \frac{5}{6}\right\} = \frac{HCF\{3, 5\}}{LCM\{4, 6\}} = \frac{1}{12}$ (True) 4) 6
4
2) 3
2
0
R: False Ans: C

$$27. A: LCM \left\{ \frac{2}{3}, \frac{4}{5}, \frac{8}{15} \right\} = \frac{LCM \{2, 4, 8\}}{HCF \{3, 5, 15\}}$$

$$= \frac{8}{15} \text{ (True)}$$

L: Conceptual (False)

$$\begin{array}{r} 2 \overline{) 2, 4, 8} \text{ (1)} \\ 2 \overline{) 1, 2, 4} \\ 1 \overline{) 1, 2} \\ 3 \overline{) 5} \text{ (1)} \\ 3 \overline{) 2} \end{array}$$

Ans: C

$$28 \text{ SI: } LCM \{120, 20\} = 120 \text{ (True)}$$

SD: Conceptual (True)

Ans: A

$$29 \text{ SI: } LCM \{3, 5\} = 15 \text{ (True)}$$

SD: Conceptual (True)

Ans: A

$$30 \text{ HCF } \{3, 4\} = 12$$

Ans: 12

$$31 \text{ HCF } \{36, 48\} = 12$$

$$\begin{array}{r} 36 \overline{) 48} \text{ (1)} \\ 36 \\ \hline 12 \overline{) 36} \text{ (3)} \\ 36 \\ \hline 0 \end{array}$$

Ans: 12

$$32 \text{ HCF } \{8, 12, 16\} = 4$$

Ans: 4

$$33 \text{ HCF } \{18, 24, 36\} = 6$$

Ans: 6

$$34 \text{ HCF } \{252, 315\} = 63$$

$$\begin{array}{r} 252 \overline{) 315} \text{ (1)} \\ 252 \\ \hline 63 \overline{) 252} \text{ (4)} \\ 252 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 63 \overline{) 315} \\ 126 \\ \hline 189 \\ 189 \\ \hline 0 \end{array}$$

Ans: 63

35

35

$$\begin{array}{r} 120 \overline{) 180} (1 \\ \underline{120} \\ 60 \end{array}$$

$$\therefore \text{HCF} = 60$$

(8)

$$\begin{array}{r} 120 \overline{) 120} (2 \\ \underline{120} \\ 0 \end{array}$$

Ans: 60

36

$$\begin{array}{r} 24 \overline{) 510} (21 \\ \underline{48} \\ 30 \\ \underline{24} \\ 6 \end{array}$$

$$\begin{array}{r} 24 \overline{) 270} (11 \\ \underline{24} \\ 30 \\ \underline{24} \\ 6 \end{array}$$

Ans: 6

$\therefore 6$ should be subtracted.

37. a) $\text{HCF} \{ 5, 7 \} = 5 \times 7 = 35$

b) $\text{LCM} \{ \text{prime no} \} = \text{Their product}$

c) $\text{LCM} \{ 8, 9, 25 \} = 8 \times 9 \times 25 = 1800$

d) $\text{HCF} \{ 8, 9, 25 \} = 1$

Ans: q, p, s, r

38 a) product of 2 nos = $\text{HCF} \times \text{LCM}$

b) twin primes

c) co-primes

d) co-primes

Ans: r, s, q, p

LEARNERS TASK

Ques

01. Conceptual

Ans: A

02.

$$\begin{array}{r} 45 \overline{) 150} \\ \underline{15} \\ 0 \end{array}$$

02

$$45 \overline{) 75} (1$$

$$\underline{45}$$

$$30 \overline{) 45} (1$$

$$\underline{30}$$

$$15 \overline{) 30} (2$$

$$\underline{30}$$

$$\underline{0}$$

$$HCF = 15$$

(9)

Ans: B

03

$$24 = 2^3 \times 3$$

$$36 = 2^2 \times 3^2$$

$$HCF = 2^2 \times 3 = 12$$

$$2 \overline{) 24}$$

$$\underline{212}$$

$$2 \overline{) 6}$$

$$\underline{2}$$

$$2 \overline{) 36}$$

$$\underline{216}$$

$$3 \overline{) 9}$$

$$\underline{3}$$

Ans: B

04

$$45 = 3^2 \times 5$$

$$60 = 2^2 \times 3 \times 5$$

$$HCF = 3 \times 5 = 15$$

$$3 \overline{) 45}$$

$$\underline{315}$$

$$5$$

$$2 \overline{) 60}$$

$$\underline{230}$$

$$3 \overline{) 15}$$

$$\underline{5}$$

Ans: C

05

$$63 \overline{) 84} (1$$

$$\underline{63}$$

$$21 \overline{) 63} (3$$

$$\underline{63}$$

$$\underline{0}$$

$$HCF = 21$$

Ans: C

06

$$80 \overline{) 120} (1$$

$$\underline{80}$$

$$40 \overline{) 80} (2$$

$$\underline{80}$$

$$\underline{0}$$

$$HCF = 40$$

Ans: —

07

$$14 = 2 \times 7$$

$$28 = 2^2 \times 7$$

$$LCM = 2^2 \times 7 = 28$$

$$2 \overline{) 14}$$

$$\underline{7}$$

$$2 \overline{) 28}$$

$$\underline{214}$$

$$7$$

Ans: B



08 Conceptual

Ans: D

09

$$8 \overline{) 12} (1$$

$$\begin{array}{r} 8 \\ 4 \overline{) 8} (2 \\ 8 \\ \hline 0 \end{array}$$

$$\text{HCF} = 4$$

(10)

Ans: D

10. Conceptual

Ans: B

11.

$$2 \times 3 = 6$$

Ans: B

12.

Conceptual

Ans: C

13.

$$100 = 2^2 \times 5^2$$

$$\begin{array}{r} 2 \overline{) 100} \\ 2 \overline{) 50} \\ 5 \overline{) 25} \\ 5 \end{array}$$

Ans: C

14.

Conceptual

Ans: B

15

Conceptual

Ans: A

16.

Conceptual

Ans: B

17.

Conceptual

Ans: B

18

$$\text{LCM of } 72, 90, 120 = 360$$

Ans: B

19.

$$\text{HCF of } \left\{ \frac{2}{5}, \frac{4}{15}, \frac{6}{25} \right\} = \frac{2}{75}$$

Ans: —

20

$$\text{LCM of } \left\{ \frac{2}{3}, \frac{5}{6}, \frac{3}{5} \right\} = \frac{30}{1} = 30$$

Ans: —

JEE MAIN LEVEL

01.

$$\text{HCF of } 126, 189 = 63$$

Ans: C

02

$$\text{HCF of } 144, 216 = 72$$

Ans: B



03
* $770 = 2 \times 5 \times 7 \times 11$
 $990 = 2 \times 3^2 \times 5 \times 11$
 $HCF = \{ 2 \times 5 \times 11 \}$
 $= 110$

$$\begin{array}{r} 2 \overline{) 770} \\ \underline{5} 285 \\ 7 \overline{) 77} \\ \underline{77} \\ 11 \end{array}$$

(11)

$$\begin{array}{r} 2 \overline{) 990} \\ \underline{3} 495 \\ 3 \overline{) 165} \\ \underline{5} 55 \\ 5 \overline{) 55} \\ \underline{55} \\ 11 \text{ Ans} \end{array}$$

04
Ans: D

05 $HCF = 10$

Ans: B

06 $HCF \{ 32, 24 \} = 8$
 (Option verification)

07 $HCF \{ 56, 72 \} = \cancel{2 \times 8} 8$
 $56 = 2^3 \times 7$
 $72 = 2^3 \times 3^2$

Ans: C

08 $HCF \{ 84, 126 \} = 42$

Ans:

09
$$\begin{array}{r} 36 \overline{) 54} (1 \\ \underline{36} \\ 12 \overline{) 36} (3 \\ \underline{36} \\ 0 \end{array}$$
 $HCF = 12$

Ans: C

10 option verification: $\{ 23, 69 \}$
 $HCF \{ 23, 69 \} = 23$
 Difference = $69 - 23 = 46$

Ans: D

11 option verification: opt: B $\{ 155, 217 \}$
 $HCF \{ 155, 217 \} = 31$
 Sum $155 + 217 = 372$

Ans: B

12

13 option verification: opt: A (29, 87)

$$HCF \{29, 87\} = 29$$

$$Difference = 87 - 29 = 58$$

Ans: A, C

14 option verification: opt: B (55, 7)

$$HCF \{55, 7\} = 385$$

15

$$16. LCM \{16, 24, 40\} = 240$$

$$240 \times 41 = 9840$$

Ans: B

$$17. HCF \{45, 135, 105\} = 15$$

Ans: A

$$18. LCM \{20, 24, 36, 40\} = 360$$

$$360 \times 28 = 10080$$

Ans: C

$$19. HCF \{325, 225\} = 25 \text{ cm} = 0.25 \text{ m}$$

Ans: A

$$20. 999987$$

Ans: C

$$21. HCF \{20000, 30000\} = 10,000 = 10 \text{ lit}$$

Ans: A

22. option verification: opt: C : 7

$$\begin{array}{r} 7 \overline{) 171} \quad 24 \quad 7 \overline{) 251} \quad 35 \\ \underline{14} \quad \underline{21} \\ 31 \quad 41 \\ \underline{28} \quad \underline{35} \\ (3) \quad (6) \end{array}$$

Ans: C

$$23. LCM \left\{ \frac{36}{225}, \frac{48}{150}, \frac{72}{65} \right\} = \frac{144}{5}$$

Ans: C

ADVANCED LEVEL

(3)

01. $HCF\{120, 150\} = 30$

$$\begin{array}{r} 120 \overline{)150} (1 \\ \underline{120} \\ 30 \end{array}$$

$$\begin{array}{r} 120 \overline{)120} (1 \\ \underline{120} \\ 0 \end{array}$$

Ans: —

02. $HCF\{405, 567\} =$

$$405 = 3^4 \times 5$$

$$567 = 3^4 \times 7$$

$$HCF = 3^4 \times 1 = 81$$

Ans: A, B

03. $825 = 3 \cdot 5^2 \cdot 11$

$$990 = 2 \cdot 3^2 \cdot 5 \cdot 11$$

$$HCF = 3 \cdot 5 \cdot 11 = 165$$

Ans: A, B, C

04.

05. $198 \overline{)297} (1$

$$\begin{array}{r} 198 \\ \underline{198} \\ 99 \end{array}$$

$$99 \overline{)198} (2$$

$$\begin{array}{r} 198 \\ \underline{198} \\ 0 \end{array}$$

$HCF = 99$

Ans: B, C

06. $864 \overline{)972} (1$

$$\begin{array}{r} 864 \\ \underline{864} \\ 108 \end{array}$$

$$108 \overline{)864} (8$$

$$\begin{array}{r} 864 \\ \underline{864} \\ 0 \end{array}$$

$HCF = 108$

Ans: B, C

07.

08. $324 \overline{)432} (1$

$$\begin{array}{r} 324 \\ \underline{324} \\ 108 \end{array}$$

$$108 \overline{)324} (3$$

$$\begin{array}{r} 324 \\ \underline{324} \\ 0 \end{array}$$

$HCF = 108$

Ans: D



09. LCM $\{56, 72\} =$

$$56 = 2^3 \cdot 7$$

$$72 = 2^3 \cdot 3^2$$

$$\text{LCM} = 2^3 \cdot 3^2 \cdot 7$$

$$= 8 \times 9 \times 7$$

$$= 504$$

14 14

Ans: —

10. Conceptual

Ans: B, C, D

11. A: Conceptual (True)

R: Conceptual (True)

Ans: A

12. A: Conceptual (True)

R: False

Ans: C

13. A: Conceptual (True)

R: Conceptual (True)

Ans: A

14. A: HCF $\{35, 45\} = 5$ (True)

R: Conceptual (True)

Ans: A

15. A: HCF $\{14, 196\} = 14$ (True)

R: Conceptual (True)

Ans: A

16. A: HCF $\left\{\frac{5}{8}, \frac{7}{12}\right\} = \frac{1}{24}$

LCM $\left\{\frac{5}{8}, \frac{7}{12}\right\} = \frac{35}{4}$ (False)

R: Conceptual (True)

Ans: A

17. A: HCF $\left\{\frac{1}{2}, \frac{1}{3}\right\} = \frac{1}{6}$ (True)

R: Conceptual (True)

Ans: A

18. A: LCM $\left\{\frac{3}{4}, \frac{5}{6}\right\} = \frac{15}{2}$ (False)

R: Conceptual (True)

Ans: C



Statement type questions :

(15) (16)

19. SI: Conceptual (True)

SI: $37 \times 111 = 4107$

HCF of $\{37, 111\} = 37$ (True)

Ans: A

20. $HCF\left\{\frac{9}{10}, \frac{12}{25}, \frac{18}{35}, \frac{21}{40}\right\} = \frac{3}{1400}$

Ans: C

21. $X \rightarrow 24$
 $Y \rightarrow 36$
 $Z \rightarrow 48$
 $HCF\{24, 36, 48\} = 12$

Ans: A

22. $12 = 2^2 \times 3$

$$\begin{array}{r} 2 \overline{) 12} \\ \underline{4} \\ 8 \\ \underline{6} \\ 0 \end{array}$$

Ans: A

23. Conceptual:

Ans: A

24. $HCF\{36, 84\} = 12$

Ans: 12

25. $HCF\{84, 126\} = 42$

Ans: 42

26. $HCF\{72, 96\} = 18$

Ans: 18

27. $HCF\{198, 297\} = 99$

Ans: 99

28. $HCF\{144, 192\} = 48$

Ans: 48

29. $LCM\{20, 30, 40\} = 120$

Ans: 120

30. $HCF\{90, 120\} = 30$

Ans: 30

31. a) factors of 18 = $\{1, 2, 3, 6, 9, 18\}$, factors of 24 = $\{1, 2, 3, 4, 6, 8, 12, 24\}$
Common factors = $\{1, 2, 3, 6\} \rightarrow$ No: 4

b) $HCF\{55, 121\} = 11$

c) $LCM\{12, 24\} = 24$

d) factors of 38 = $\{1, 2, 19, 38\}$

factors of 57 = $\{1, 3, 19, 57\}$

Common factors = $\{1, 19\}$. No: 2

$\Rightarrow$ THE END

Ans: —, S, T, —

