FOUNDATION

Class: VI, MATHEMATICS

6. MULTIPLICATION AND DIVISION OF ALGEBRAIC EXPRESSIONS

Teaching Task (Jee Mains)

01. $x^3(x^5+10a)$

$= x^8 + 10ax^3$ Ans: A

02 $(-3x^2y) \times (4x^2y - 3xy^2 + 4x - 5y)$

$= -12x^4y^2 + 9x^3y^3 - 12x^3y + 15x^2y^2$

Ans. A

03 $\frac{4x^3 - 3x^2 + 4x}{2x} = 2x^2 - \frac{3}{2}x + 2$ Ans. A

04 $\frac{24a^2 + 48a}{6a+12} = \frac{48(6a+12)}{6a+12} = 4a$ Ans. D

05 $\left(\frac{-7}{5}x^2y\right) \times \left(\frac{3}{2}xy^2\right) \times \left(\frac{-6}{5}x^3y^2\right)$

$= \frac{63}{25}x^6y^5$ Ans. C

06 $(2m^2n - 4mn^2) \times (6m + 7n)$

$= 12m^3n + 14m^2n^2 - 24m^2n^2 - 28mn^3$

$= 12m^3n - 10m^2n^2 - 28mn^3$ Ans: A

07 $4y(2y-6) - 3(y-2) + 20, \quad y = -1$

$-4(-2-6) - 3(-1-2) + 20$

$= 32 + 9 + 20 = 61$ Ans: B

08 $5x * 2y * 3y = 30xyz$ Ans: C

09 $(x+5)(a-6)$

$= ax - 6x + 5a - 30$ Ans: A

10 $\frac{0.72p^3q^2}{0.12q^2p} = 6p^2$ Ans: B

11. $\frac{1-a+a^2}{1+a+a^2} = \frac{1-2+2^2}{1+2+2^2} = \frac{3}{7}$

Also $\frac{1+a}{3a+1} = \frac{1+2}{3\cdot 2+1} = \frac{3}{7}$ Ans: B, D

12 $\frac{x^2}{x \cdot x^2} = \frac{1}{x}$ (or) x^{-1} Ans: B, C

13 Statement I: $2xy \times 4x = 8x^2y$ (True)

Statement II: Conceptual (False) Ans: C

14. Statement I: $\frac{4a^4b^2}{6a^2b} = \frac{2a^2b}{3}$ (True)

Statement II: Conceptual (True) Ans: A

15 Assertion: $\frac{x^3-8}{x-2} = \frac{x^3-2^3}{x-2} = \frac{(x-2)(x^2+2x+4)}{(x-2)}$

$= x^2+2x+4$ (True)

Reason: Conceptual (True) Ans: A

16. Assertion: mathematically (True)

Reason: Conceptual (True) Ans: A

17 $A \times B = 4x^3y \times 6x^2y^2$

$= 24x^5y^3$

Ans: B

18 $\frac{A}{B} = \frac{4x^3y}{6x^2y^2} = \frac{2x}{3y}$

Ans: C

19 $\frac{15a^5b^4}{5a^2b^2} = 3a^3b^2$

Ans: A

20 3

Ans: B

21 1

Ans: 1

22 $\frac{9}{2}xy^3 \times \frac{2}{9xy^3} \times 5x^0y^0$

$= 5$

Ans: 5

23 a) $-\frac{2}{5}x \times \frac{5}{4}y = -\frac{1}{2}xy$ (r)

b) 0 (q)

c) $70xyz$ (s)

d) $60x^3y$ (p)

Ans: r, q, s, p

24 a) $\frac{85x^2}{1.7x^2} = 50$ (r)

b) $\frac{8.5x^4}{17x^2} = 0.5x^2$ (p)

c) $\frac{8.5x^4}{1.7x^2} = 5x^2$ (s)

d) $\frac{85x^6}{17x^2} = 5x^4$ (q)

Ans: r, p, s, q

LEARNERS TASK (CUQ's)

01.	$3pq^3 \times 4qr = 12pq^4r$	Ans: B
02	$-6a^4b^3c$	Ans: C
03	$-15a^6$	Ans: A
04	$3xy(x-y) = 3x^2y - 3xy^2$	Ans: A
05	$\frac{8}{5}x^2$	Ans: C
06	Conceptual	Ans: C
07	a^2+b^2+2ab	Ans: A
08	$-6xy$	Ans: C
09	$2\frac{1}{3}y \times 9 = \frac{7}{3}y \times 9 = 21y$	Ans: A
10	$-4abc^2$	Ans: B

JEE MAINS

01	$\frac{14x^2+21x}{2x+3} = \frac{7x(2x+3)}{(2x+3)} = 7x$	Ans: B
02	$-24x^2y^2$	Ans: C
03	$a^{x+y+z} = a^{3/2} \Rightarrow x+y+z = \frac{3}{2}$	Ans: C
04	-4	Ans: B
05	$5x \times 21y \times 32z = 3360xyz$	Ans: A
06	$x(x-2)+5$ $= 3(3-2)+5$ $= 3+5$ $= 8$	Ans: C

07 $\frac{-20m^5n^3x^2}{4m^3n^4x^2} = -\frac{5m^2}{n}$ Ans: D

08 $-\frac{3}{x}$ Ans: A

09 $x6$ Ans: B

10 $\frac{3}{5}$ st Ans: C

JEE ADVANCED

11. $\frac{20x^3y + 12x^2y^2 - 12xy}{2xy}$

$= \frac{2xy(10x^2 + 6xy - 6)}{2xy} = 10x^2 + 6xy - 6$

$= 2(5x^2 + 3xy - 3)$

Ans: A, C

12 $\frac{6x^3 + 9x^2}{3x} = \frac{3x(2x^2 + 3x)}{3x} = 2x^2 + 3x$

Ans: A, C, D

13 Statement I: mathematically (False)

Statement II: Conceptual (True) Ans: D

14 Statement I: $(x+1)(x+2)(x+3)$

$= (x^2 + 3x + 2)(x+3)$

$= x^3 + 3x^2 + 3x^2 + 9x + 2x + 6$

$= x^3 + 6x^2 + 11x + 6$ (True)

Statement II: Conceptual (True) Ans: A

15 Assertion: $(2x-3)(x+5)$

$= 2x^2 + 10x - 3x - 15 = 2x^2 + 7x - 15$ (True)

Reason: Conceptual (True) Ans: A

16 Assertion: Mathematically (TOUS)
Reason: Conceptual (TOUS)
Ans. A

17 $6bc$
Ans. B

18 $$\frac{7(a^3-b^3)(a+b)}{a^2+ab+b^2} = \frac{7(a-b)(a^2+ab+b^2)(a+b)}{(a^2+ab+b^2)}$$
$$= 7(a^2-b^2)$$
Ans. A

19. $(3x^2y)(-2xy^3) = -6x^3y^4$
Coefficient $= -6$
Ans. A

20. 3, 4
Ans. C

21 24
Ans. 24

22 $p^3+q^3 = (p+q)(p^2-pq+q^2) = 1331$
Ans. 1331

23 a) $4xy^2$ (S)
b) $-5x^2z$ (P)
c) $3x^2z$ (Q)
d) $2x^3+6x^2-1$ (R)
Ans: S, P, Q, R

24 a) $3m^3n^2$ (Q)
b) $9a^2b^2$ (P)
c) $6p^3q^3$ (R)
d) $5x^4y^5$ (S)
Ans. Q, P, R, S

$\Rightarrow$ THE END $\in$