EduSahara™ Assignment

Name : Matrix Multiplication

Chapter : Matrices

Grade : ICSE Grade X

1. If A = $\begin{bmatrix} 5 & 0 \\ -8 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 0 & -7 \\ -9 & 4 \end{bmatrix}$, then A × B =

   (i) $\begin{bmatrix} 0 & -36 \\ -45 & 76 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & -35 \\ -48 & 76 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & -35 \\ -45 & 76 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & -35 \\ -45 & 79 \end{bmatrix}$ (v) $\begin{bmatrix} 0 & -35 \\ -45 & 76 \end{bmatrix}$

2. Which of the following is an identity matrix ?

   (i) $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

3. If A = $\begin{bmatrix} 1 & 1 & 2 \\ -1 & -1 & 1 \\ 1 & -2 & -2 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & -1 & 0 \\ -1 & -1 & 1 \\ 0 & 0 & -2 \end{bmatrix}$, then A × B =

   (i) $\begin{bmatrix} 0 & -2 & -3 \\ 0 & 2 & -3 \\ 3 & 4 & 2 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & -2 & -3 \\ 0 & 2 & -3 \\ 3 & 1 & 2 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & -2 & -3 \\ 0 & 2 & -3 \\ 3 & 0 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & -2 & -3 \\ 0 & 2 & -3 \\ 3 & 1 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} 0 & -2 & -3 \\ 0 & 2 & -2 \\ 3 & 1 & 2 \end{bmatrix}$

4. If A = $\begin{bmatrix} -2 & 2 & 2 \\ 2 & 2 & 0 \end{bmatrix}$ and B = $\begin{bmatrix} 2 & -1 \\ 2 & 3 \\ 0 & -1 \end{bmatrix}$, then A × B =

   (i) $\begin{bmatrix} -6 & 2 & 4 \\ 2 & 10 & 4 \\ -2 & -2 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & 6 \\ 8 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & 6 \\ 8 & 7 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & 4 \\ 8 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} -6 & 2 & -2 \\ 2 & 10 & -2 \\ 4 & 4 & 0 \end{bmatrix}$

5. If A = $\begin{bmatrix} -3 & 1 & -1 \\ -4 & -4 & -2 \\ -2 & 1 & -3 \end{bmatrix}$, then A^2 =

   (i) $\begin{bmatrix} 7 & -8 & 4 \\ 32 & 10 & 18 \\ 8 & -9 & 9 \end{bmatrix}$ (ii) $\begin{bmatrix} 7 & -7 & 4 \\ 32 & 10 & 18 \\ 8 & -9 & 9 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & -8 & 4 \\ 32 & 7 & 18 \\ 8 & -9 & 9 \end{bmatrix}$ (iv) $\begin{bmatrix} 7 & -8 & 4 \\ 32 & 10 & 17 \\ 8 & -9 & 9 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & -8 & 4 \\ 32 & 10 & 18 \\ 8 & -9 & 9 \end{bmatrix}$

6. If A = $\begin{bmatrix} 3 & -3 & 1 \\ 2 & 1 & -1 \\ 3 & -3 & 1 \end{bmatrix}$, then 9A =

   (i) $\begin{bmatrix} 26 & -27 & 9 \\ 18 & 9 & -9 \\ 27 & -27 & 9 \end{bmatrix}$ (ii) $\begin{bmatrix} 27 & -27 & 9 \\ 18 & 9 & -9 \\ 25 & -27 & 9 \end{bmatrix}$ (iii) $\begin{bmatrix} 30 & -27 & 9 \\ 18 & 9 & -9 \\ 27 & -27 & 9 \end{bmatrix}$ (iv) $\begin{bmatrix} 27 & -27 & 9 \\ 18 & 9 & -9 \\ 27 & -27 & 9 \end{bmatrix}$ (v) $\begin{bmatrix} 27 & -27 & 9 \\ 18 & 9 & -9 \\ 27 & -26 & 9 \end{bmatrix}$

7. If $A = \begin{bmatrix} -2 & 1 \\ -1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -2 & -2 \\ 1 & -1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 1 \\ -2 & 1 \end{bmatrix}$,
then $(A \times B) \times C =$

(i) $\begin{bmatrix} 4 & 8 \\ 4 & 6 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 8 \\ 4 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 8 \\ 4 & 4 \end{bmatrix}$ (iv) $\begin{bmatrix} 4 & 7 \\ 4 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} 4 & 9 \\ 4 & 4 \end{bmatrix}$

8. If $A = \begin{bmatrix} 2 & 1 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & -2 \\ 2 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} -2 & -2 \\ 0 & -1 \end{bmatrix}$,
then $(A \times B) + C =$

(i) $\begin{bmatrix} 0 & -4 \\ -2 & -7 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & -4 \\ -2 & -6 \end{bmatrix}$ (iii) $\begin{bmatrix} 0 & -4 \\ -2 & -4 \end{bmatrix}$ (iv) $\begin{bmatrix} -1 & -4 \\ -2 & -7 \end{bmatrix}$ (v) $\begin{bmatrix} -3 & -4 \\ -2 & -7 \end{bmatrix}$

9. If $A = \begin{bmatrix} 2 & -2 \\ 0 & -2 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 1 \\ -1 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 \\ 2 & -2 \end{bmatrix}$,
then $A \times (B + C) =$

(i) $\begin{bmatrix} -4 & 2 \\ 1 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} -4 & 2 \\ -2 & 0 \end{bmatrix}$ (iii) $\begin{bmatrix} -4 & 0 \\ -2 & 0 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 & 1 \\ -2 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} -4 & 2 \\ -2 & 1 \end{bmatrix}$

10. If $A = \begin{bmatrix} 7 & -7 \\ -7 & 9 \end{bmatrix}$ and $C = \begin{bmatrix} -42 & 7 & -7 \\ 40 & -9 & 15 \end{bmatrix}$,
find a matrix B satisfying $A \times B = C$

(i) $\begin{bmatrix} -7 & 0 & 3 \\ -1 & -1 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} -8 & 0 & 3 \\ -1 & -1 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} -7 & 1 & 3 \\ -1 & -1 & 4 \end{bmatrix}$ (iv) $\begin{bmatrix} -7 & 0 & 3 \\ -1 & -1 & 6 \end{bmatrix}$ (v) $\begin{bmatrix} -10 & 0 & 3 \\ -1 & -1 & 4 \end{bmatrix}$

11. If $A = \begin{bmatrix} -2 & 0 \\ 1 & -2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} -2 & 0 & -1 \\ 2 & 2 & 1 \end{bmatrix}$,
then compute the product $(A \times B) \times C =$

(i) $\begin{bmatrix} -4 & -8 & -2 \\ -2 & 0 & -3 \end{bmatrix}$ (ii) $\begin{bmatrix} -4 & -8 & -2 \\ -1 & 0 & -1 \end{bmatrix}$ (iii) $\begin{bmatrix} -2 & -8 & -2 \\ -2 & 0 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 & -8 & -2 \\ -3 & 0 & -1 \end{bmatrix}$ (v) $\begin{bmatrix} -4 & -8 & -2 \\ -2 & 0 & -1 \end{bmatrix}$

12. If $A = \begin{bmatrix} -9 & 9 \\ -2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -7 & -8 \\ -4 & -5 \end{bmatrix}$ and $C = \begin{bmatrix} 7 & 0 \\ 7 & 9 \end{bmatrix}$,
then compute $A^2 + BC =$

(i) $\begin{bmatrix} -42 & -126 \\ -51 & -52 \end{bmatrix}$ (ii) $\begin{bmatrix} -42 & -126 \\ -51 & -55 \end{bmatrix}$ (iii) $\begin{bmatrix} -42 & -126 \\ -53 & -54 \end{bmatrix}$ (iv) $\begin{bmatrix} -42 & -126 \\ -51 & -54 \end{bmatrix}$ (v) $\begin{bmatrix} -41 & -126 \\ -51 & -54 \end{bmatrix}$

13. If $A = \begin{bmatrix} 3 & -1 \\ -1 & 4 \end{bmatrix}$, then find AI

(i) $\begin{bmatrix} 3 & 1 \\ -1 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 3 & -4 \\ -1 & 4 \end{bmatrix}$ (iv) $\begin{bmatrix} 3 & -1 \\ -1 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} 4 & -1 \\ -1 & 4 \end{bmatrix}$

14. If $A = \begin{bmatrix} 7 & -4 \\ 2 & 6 \end{bmatrix}$, then find B satisfying $A \times B = A$

(i) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (iv) $\begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$

15. Which of the following are true for matrices A, B and C ?

a) $A\times(B+C)=(A\times B)+(A\times C)$
b) $(A\times B)=(B\times A)$
c) $(A\times I)=(I\times A)=I$
d) $A\times(B\times C)=(A\times B)\times C$
e) $(A+B)\times C=(A\times B)+(A\times C)$
f) $(A\times I)=(I\times A)=A$

(i) {c,d} (ii) {c,a,d} (iii) {a,d,f} (iv) {b,a} (v) {e,b,f}

16. If the order of matrix A is $m \times n$ and B is $n \times o$, then the order of $(A\times B)$ is

(i) $o \times m$ (ii) $m \times n$ (iii) $m \times o$ (iv) $n \times o$

17. If $A=\begin{bmatrix} 7 & 9 \\ 6 & 6 \end{bmatrix}$ and $B=\begin{bmatrix} 6 & 8 \\ 5 & 6 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} 30 & 13 \\ 23 & 11 \end{bmatrix}$ (ii) $\begin{bmatrix} 30 & 13 \\ 21 & 11 \end{bmatrix}$ (iii) $\begin{bmatrix} 29 & 13 \\ 23 & 11 \end{bmatrix}$ (iv) $\begin{bmatrix} 30 & 13 \\ 25 & 11 \end{bmatrix}$ (v) $\begin{bmatrix} 31 & 13 \\ 23 & 11 \end{bmatrix}$

18. If $A=\begin{bmatrix} 3 & 3 \\ 1 & 4 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 6 \\ 7 & 8 \end{bmatrix}$, find A^2-B^2

(i) $\begin{bmatrix} -34 & -39 \\ -63 & -87 \end{bmatrix}$ (ii) $\begin{bmatrix} -36 & -39 \\ -63 & -87 \end{bmatrix}$ (iii) $\begin{bmatrix} -32 & -39 \\ -63 & -87 \end{bmatrix}$ (iv) $\begin{bmatrix} -34 & -40 \\ -63 & -87 \end{bmatrix}$ (v) $\begin{bmatrix} -34 & -39 \\ -63 & -86 \end{bmatrix}$

19. If $A=\begin{bmatrix} 9 & 9 \\ 6 & 1 \end{bmatrix}$ and $B=\begin{bmatrix} 3 & 2 \\ 4 & 3 \end{bmatrix}$, find $(A+B)^2$

(i) $\begin{bmatrix} 254 & 174 \\ 160 & 126 \end{bmatrix}$ (ii) $\begin{bmatrix} 254 & 176 \\ 159 & 126 \end{bmatrix}$ (iii) $\begin{bmatrix} 254 & 176 \\ 160 & 128 \end{bmatrix}$ (iv) $\begin{bmatrix} 254 & 176 \\ 160 & 126 \end{bmatrix}$ (v) $\begin{bmatrix} 254 & 177 \\ 160 & 126 \end{bmatrix}$

20. If $A=\begin{bmatrix} 8 & 1 \\ 9 & 2 \end{bmatrix}$ and $B=\begin{bmatrix} 1 & 2 \\ 5 & 7 \end{bmatrix}$, find A^2+B^2+2AB

(i) $\begin{bmatrix} 111 & 72 \\ 168 & 136 \end{bmatrix}$ (ii) $\begin{bmatrix} 110 & 72 \\ 168 & 136 \end{bmatrix}$ (iii) $\begin{bmatrix} 110 & 70 \\ 168 & 136 \end{bmatrix}$ (iv) $\begin{bmatrix} 109 & 72 \\ 168 & 136 \end{bmatrix}$ (v) $\begin{bmatrix} 110 & 72 \\ 171 & 136 \end{bmatrix}$

21. If $A=\begin{bmatrix} 5 & 7 \\ 7 & 2 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 1 \\ 5 & 1 \end{bmatrix}$, find $(A-B)^2$

(i) $\begin{bmatrix} 21 & 26 \\ 8 & 13 \end{bmatrix}$ (ii) $\begin{bmatrix} 21 & 24 \\ 8 & 13 \end{bmatrix}$ (iii) $\begin{bmatrix} 21 & 24 \\ 7 & 13 \end{bmatrix}$ (iv) $\begin{bmatrix} 21 & 24 \\ 5 & 13 \end{bmatrix}$ (v) $\begin{bmatrix} 22 & 24 \\ 8 & 13 \end{bmatrix}$

22. If $A=\begin{bmatrix} 2 & 2 \\ 3 & 3 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 7 \\ 4 & 5 \end{bmatrix}$, find A^2+B^2-2AB

(i) $\begin{bmatrix} 18 & 11 \\ 7 & -4 \end{bmatrix}$ (ii) $\begin{bmatrix} 18 & 13 \\ 7 & -4 \end{bmatrix}$ (iii) $\begin{bmatrix} 18 & 11 \\ 7 & -3 \end{bmatrix}$ (iv) $\begin{bmatrix} 18 & 11 \\ 7 & -6 \end{bmatrix}$ (v) $\begin{bmatrix} 17 & 11 \\ 7 & -4 \end{bmatrix}$

23. Which of the following are true ?

a) If A X B is possible, the no of cols in A must be equal to no of cols in B
b) If A X B is possible, the no of cols in A must be equal to no of rows in B
c) If A X B is possible, the no of rows in A must be equal to no of rows in B
d) If A X B is possible, the no of rows in A must be equal to no of cols in B

(i) {d,a,b} (ii) {a,b} (iii) {b} (iv) {c,b}

24. If $A = \begin{bmatrix} (-6) & (-3) \end{bmatrix}$, $B = \begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} (-6x) & (-6y) \\ (-3x) & (-3y) \end{bmatrix}$ (ii) $\begin{bmatrix} (-6x-3y) \\ (-6x-3y) \end{bmatrix}$ (iii) $\begin{bmatrix} (-6x) & (-3x) \\ (-6y) & (-3y) \end{bmatrix}$

(iv) $\begin{bmatrix} (-6x-3y) & (-6x-3y) \end{bmatrix}$ (v) $\begin{bmatrix} (-6x-3y) \end{bmatrix}$

25. If $A = \begin{bmatrix} -7 & -9 \\ -6 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} -8 & 6 \\ -6 & -9 \end{bmatrix}$ and $D = \begin{bmatrix} -94 & -126 \\ -96 & 30 \end{bmatrix}$,

$10A - 6B + 9C = D$, then C = ?

(i) $\begin{bmatrix} -8 & -2 \\ -8 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} -8 & 0 \\ -8 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} -8 & 0 \\ -8 & 6 \end{bmatrix}$ (iv) $\begin{bmatrix} -8 & 1 \\ -8 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} -8 & -1 \\ -8 & 4 \end{bmatrix}$

26. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, $B = \begin{bmatrix} -5 & -7 \\ 7 & -8 \end{bmatrix}$ and $C = \begin{bmatrix} -43 & 11 \\ 21 & -24 \end{bmatrix}$

and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 3 & -4 \\ 0 & 3 \end{bmatrix}$ (ii) $\begin{bmatrix} 3 & -4 \\ -1 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 3 & -4 \\ 1 & 3 \end{bmatrix}$ (iv) $\begin{bmatrix} 0 & -4 \\ 0 & 3 \end{bmatrix}$ (v) $\begin{bmatrix} 3 & -4 \\ 2 & 3 \end{bmatrix}$

27. If $B = \begin{bmatrix} 9 & 1 \\ 9 & 7 \end{bmatrix}$ and $C = \begin{bmatrix} 72 & 14 \\ 45 & 23 \end{bmatrix}$ and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 7 & 0 \\ 2 & 3 \end{bmatrix}$ (ii) $\begin{bmatrix} 7 & 1 \\ 2 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & 1 \\ 4 & 3 \end{bmatrix}$ (iv) $\begin{bmatrix} 7 & -1 \\ 2 & 3 \end{bmatrix}$ (v) $\begin{bmatrix} 7 & 2 \\ 2 & 3 \end{bmatrix}$

28. If $B = \begin{bmatrix} 6 & 7 \\ 6 & 8 \end{bmatrix}$ and $C = \begin{bmatrix} 36 & 44 \end{bmatrix}$ and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 4 & 2 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} 3 & 2 \end{bmatrix}$ (v) $\begin{bmatrix} 4 & 3 \end{bmatrix}$

29. Given $A = \begin{bmatrix} 9 & -5 \\ 4 & -3 \end{bmatrix}$ find B such that AB = BA = A

(i) $\begin{bmatrix} 1 & -3 \\ 0 & 1 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$ (iv) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$

30. Find X if $A = \begin{bmatrix} 9 & 7 \\ -8 & 0 \end{bmatrix}$, AX = B and $B = \begin{bmatrix} -109 & -39 \\ 72 & 16 \end{bmatrix}$

(i) $\begin{bmatrix} -9 & -2 \\ -4 & -4 \end{bmatrix}$ (ii) $\begin{bmatrix} -9 & -2 \\ -3 & -3 \end{bmatrix}$ (iii) $\begin{bmatrix} -9 & 0 \\ -4 & -3 \end{bmatrix}$ (iv) $\begin{bmatrix} -9 & -2 \\ -4 & -3 \end{bmatrix}$ (v) $\begin{bmatrix} -11 & -2 \\ -4 & -3 \end{bmatrix}$

31. Given $A = \begin{bmatrix} 0 & -5 \\ -6 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} -25 \\ 16 \end{bmatrix}$,

find P such that AP = B

(i) $\begin{bmatrix} -7 \\ 5 \end{bmatrix}$ (ii) $\begin{bmatrix} -6 \\ 3 \end{bmatrix}$ (iii) $\begin{bmatrix} -6 \\ 6 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 \\ 5 \end{bmatrix}$ (v) $\begin{bmatrix} -6 \\ 5 \end{bmatrix}$

32. Given $A = \begin{bmatrix} -3 & 1 & 1 \\ 2 & -1 & -4 \\ -3 & 3 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -14 \\ 7 \\ -18 \end{bmatrix}$,

find P such that AP = B

(i) $\begin{bmatrix} 4 \\ -3 \\ 3 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 \\ -3 \\ -2 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 \\ -3 \\ 0 \end{bmatrix}$ (iv) $\begin{bmatrix} 4 \\ -3 \\ 2 \end{bmatrix}$ (v) $\begin{bmatrix} 4 \\ -3 \\ 1 \end{bmatrix}$

Assignment Key

1) (v)	2) (v)	3) (ii)	4) (ii)	5) (i)	6) (iv)
7) (ii)	8) (i)	9) (ii)	10) (i)	11) (v)	12) (iv)
13) (iv)	14) (iii)	15) (iii)	16) (iii)	17) (i)	18) (i)
19) (iv)	20) (ii)	21) (ii)	22) (i)	23) (iii)	24) (v)
25) (ii)	26) (i)	27) (ii)	28) (i)	29) (iv)	30) (iv)
31) (v)	32) (v)				