EduSahara™ Assignment

Name : Matrix Multiplication

Chapter : Matrices

Grade : ICSE Grade X

1. If $A = \begin{bmatrix} -1 & 6 \\ -5 & -9 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 2 \\ -3 & 1 \end{bmatrix}$, then $A \times B =$

(i) $\begin{bmatrix} -26 & 4 \\ -15 & -19 \end{bmatrix}$ (ii) $\begin{bmatrix} -26 & 4 \\ -13 & -19 \end{bmatrix}$ (iii) $\begin{bmatrix} -26 & 4 \\ -12 & -19 \end{bmatrix}$ (iv) $\begin{bmatrix} -26 & 4 \\ -13 & -16 \end{bmatrix}$ (v) $\begin{bmatrix} -27 & 4 \\ -13 & -19 \end{bmatrix}$

2. Which of the following is an identity matrix ?

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

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

(i) $\begin{bmatrix} 9 & 11 & 0 \\ -7 & -6 & -4 \\ 10 & 10 & -1 \end{bmatrix}$ (ii) $\begin{bmatrix} 12 & 11 & 0 \\ -7 & -5 & -4 \\ 10 & 10 & -1 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 11 & 0 \\ -7 & -5 & -4 \\ 10 & 10 & -1 \end{bmatrix}$ (iv) $\begin{bmatrix} 9 & 11 & 0 \\ -7 & -7 & -4 \\ 10 & 10 & -1 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & 11 & 0 \\ -6 & -5 & -4 \\ 10 & 10 & -1 \end{bmatrix}$

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

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

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

(i) $\begin{bmatrix} 9 & 2 & -2 \\ -2 & 16 & -12 \\ -3 & 0 & 4 \end{bmatrix}$ (ii) $\begin{bmatrix} 9 & 2 & -2 \\ -3 & 16 & -12 \\ -3 & 2 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 2 & -2 \\ -3 & 16 & -12 \\ -3 & 0 & 4 \end{bmatrix}$ (iv) $\begin{bmatrix} 9 & 2 & -2 \\ -6 & 16 & -12 \\ -3 & 0 & 4 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & 2 & -2 \\ -3 & 16 & -12 \\ -3 & -1 & 4 \end{bmatrix}$

6. If $A = \begin{bmatrix} -3 & -3 & 1 \\ -1 & 1 & 0 \\ 1 & -1 & 1 \end{bmatrix}$, then $4A =$

(i) $\begin{bmatrix} -12 & -12 & 4 \\ -4 & 4 & 0 \\ 4 & -4 & 7 \end{bmatrix}$ (ii) $\begin{bmatrix} -12 & -12 & 4 \\ -4 & 4 & 0 \\ 4 & -4 & 4 \end{bmatrix}$ (iii) $\begin{bmatrix} -12 & -12 & 4 \\ -4 & 4 & 0 \\ 4 & -4 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} -12 & -12 & 4 \\ -4 & 4 & 0 \\ 4 & -4 & 5 \end{bmatrix}$ (v) $\begin{bmatrix} -12 & -12 & 4 \\ -4 & 4 & 0 \\ 4 & -5 & 4 \end{bmatrix}$

7. If $A = \begin{bmatrix} -2 & 1 \\ -1 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -2 \\ 0 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 1 \\ 0 & -2 \end{bmatrix}$,

then $(A \times B) \times C =$

(i) $\begin{bmatrix} -4 & -16 \\ -2 & -3 \end{bmatrix}$ (ii) $\begin{bmatrix} -4 & -16 \\ -5 & -2 \end{bmatrix}$ (iii) $\begin{bmatrix} -3 & -16 \\ -2 & -2 \end{bmatrix}$ (iv) $\begin{bmatrix} -4 & -16 \\ -2 & 0 \end{bmatrix}$ (v) $\begin{bmatrix} -4 & -16 \\ -2 & -2 \end{bmatrix}$

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

then $(A \times B) + C =$

(i) $\begin{bmatrix} 5 & 3 \\ -4 & -5 \end{bmatrix}$ (ii) $\begin{bmatrix} 3 & 2 \\ -4 & -5 \end{bmatrix}$ (iii) $\begin{bmatrix} 5 & 4 \\ -4 & -5 \end{bmatrix}$ (iv) $\begin{bmatrix} 5 & 2 \\ -4 & -6 \end{bmatrix}$ (v) $\begin{bmatrix} 5 & 2 \\ -4 & -5 \end{bmatrix}$

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

then $A \times (B + C) =$

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

10. If $A = \begin{bmatrix} 7 & 1 \\ 1 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} -22 & -64 \\ -2 & -8 \end{bmatrix}$,

find a matrix B satisfying $A \times B = C$

(i) $\begin{bmatrix} -2 & -8 \\ -7 & -8 \end{bmatrix}$ (ii) $\begin{bmatrix} -2 & -9 \\ -8 & -8 \end{bmatrix}$ (iii) $\begin{bmatrix} -2 & -11 \\ -8 & -8 \end{bmatrix}$ (iv) $\begin{bmatrix} -2 & -8 \\ -8 & -8 \end{bmatrix}$ (v) $\begin{bmatrix} -2 & -6 \\ -8 & -8 \end{bmatrix}$

11. If $A = \begin{bmatrix} 2 & 1 \\ -2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$ and $C = \begin{bmatrix} 1 \end{bmatrix}$,

then compute the product $(A \times B) \times C =$

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

12. If $A = \begin{bmatrix} -8 & -3 \\ 4 & -9 \end{bmatrix}$, $B = \begin{bmatrix} -2 & -7 \\ -5 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} -2 & 4 \\ -6 & 9 \end{bmatrix}$,

then compute $A^2 + BC =$

(i) $\begin{bmatrix} 98 & -20 \\ -57 & 49 \end{bmatrix}$ (ii) $\begin{bmatrix} 98 & -20 \\ -58 & 46 \end{bmatrix}$ (iii) $\begin{bmatrix} 98 & -21 \\ -58 & 49 \end{bmatrix}$ (iv) $\begin{bmatrix} 98 & -20 \\ -55 & 49 \end{bmatrix}$ (v) $\begin{bmatrix} 98 & -20 \\ -58 & 49 \end{bmatrix}$

13. If $A = \begin{bmatrix} 3 & 0 \\ -1 & 1 \end{bmatrix}$, then find AI

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

14. If $A = \begin{bmatrix} 2 & 9 \\ -3 & -6 \end{bmatrix}$, then find B satisfying $A \times B = A$

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

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

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

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

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

17. If $A = \begin{bmatrix} 5 & 2 \\ 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 2 \\ 8 & 2 \end{bmatrix}$, find $(A+B)(A-B)$

(i) $\begin{bmatrix} -52 & 9 \\ -60 & 12 \end{bmatrix}$ (ii) $\begin{bmatrix} -52 & 10 \\ -60 & 12 \end{bmatrix}$ (iii) $\begin{bmatrix} -52 & 8 \\ -60 & 12 \end{bmatrix}$ (iv) $\begin{bmatrix} -52 & 8 \\ -60 & 10 \end{bmatrix}$ (v) $\begin{bmatrix} -52 & 7 \\ -60 & 12 \end{bmatrix}$

18. If $A = \begin{bmatrix} 2 & 6 \\ 9 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 6 \\ 8 & 8 \end{bmatrix}$, find $A^2 - B^2$

(i) $\begin{bmatrix} -1 & -12 \\ -7 & -9 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & -10 \\ -7 & -9 \end{bmatrix}$ (iii) $\begin{bmatrix} 2 & -12 \\ -7 & -9 \end{bmatrix}$ (iv) $\begin{bmatrix} 1 & -12 \\ -7 & -10 \end{bmatrix}$ (v) $\begin{bmatrix} 1 & -12 \\ -7 & -9 \end{bmatrix}$

19. If $A = \begin{bmatrix} 9 & 4 \\ 6 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 9 \\ 7 & 6 \end{bmatrix}$, find $(A+B)^2$

(i) $\begin{bmatrix} 425 & 338 \\ 338 & 269 \end{bmatrix}$ (ii) $\begin{bmatrix} 425 & 338 \\ 340 & 269 \end{bmatrix}$ (iii) $\begin{bmatrix} 425 & 338 \\ 337 & 269 \end{bmatrix}$ (iv) $\begin{bmatrix} 423 & 338 \\ 338 & 269 \end{bmatrix}$ (v) $\begin{bmatrix} 425 & 339 \\ 338 & 269 \end{bmatrix}$

20. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$, find $A^2 + B^2 + 2AB$

(i) $\begin{bmatrix} 74 & 70 \\ 27 & 30 \end{bmatrix}$ (ii) $\begin{bmatrix} 74 & 70 \\ 26 & 30 \end{bmatrix}$ (iii) $\begin{bmatrix} 74 & 70 \\ 26 & 28 \end{bmatrix}$ (iv) $\begin{bmatrix} 76 & 70 \\ 26 & 30 \end{bmatrix}$ (v) $\begin{bmatrix} 74 & 69 \\ 26 & 30 \end{bmatrix}$

21. If $A = \begin{bmatrix} 6 & 8 \\ 1 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 1 \\ 1 & 4 \end{bmatrix}$, find $(A-B)^2$

(i) $\begin{bmatrix} 3 & 42 \\ 0 & 16 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 42 \\ -2 & 16 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 & 42 \\ 0 & 16 \end{bmatrix}$ (iv) $\begin{bmatrix} 4 & 43 \\ 0 & 16 \end{bmatrix}$ (v) $\begin{bmatrix} 7 & 42 \\ 0 & 16 \end{bmatrix}$

22. If $A = \begin{bmatrix} 9 & 6 \\ 4 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 8 \\ 4 & 6 \end{bmatrix}$, find $A^2 + B^2 - 2AB$

(i) $\begin{bmatrix} 44 & -84 \\ 43 & 17 \end{bmatrix}$ (ii) $\begin{bmatrix} 44 & -82 \\ 44 & 17 \end{bmatrix}$ (iii) $\begin{bmatrix} 44 & -84 \\ 44 & 17 \end{bmatrix}$ (iv) $\begin{bmatrix} 44 & -84 \\ 41 & 17 \end{bmatrix}$ (v) $\begin{bmatrix} 44 & -84 \\ 45 & 17 \end{bmatrix}$

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

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

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24. If $A = \begin{bmatrix} 9 & (-5) \end{bmatrix}$, $B = \begin{bmatrix} x \\ y \end{bmatrix}$, then $(A \times B) =$

(i) $\begin{bmatrix} 9x & 9y \\ (-5x) & (-5y) \end{bmatrix}$ (ii) $\begin{bmatrix} (9x-5y) & (9x-5y) \end{bmatrix}$ (iii) $\begin{bmatrix} (9x-5y) \end{bmatrix}$ (iv) $\begin{bmatrix} 9x & (-5x) \\ 9y & (-5y) \end{bmatrix}$

(v) $\begin{bmatrix} (9x-5y) \\ (9x-5y) \end{bmatrix}$

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25. If $A = \begin{bmatrix} 5 & 2 \\ -4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 2 \\ 4 & 3 \end{bmatrix}$ and $D = \begin{bmatrix} -119 & -17 \\ -56 & 55 \end{bmatrix}$,
$5A - 9B + 9C = D$, then C = ?

(i) $\begin{bmatrix} -9 & -1 \\ 0 & 8 \end{bmatrix}$ (ii) $\begin{bmatrix} -9 & 0 \\ 0 & 8 \end{bmatrix}$ (iii) $\begin{bmatrix} -9 & -4 \\ 0 & 8 \end{bmatrix}$ (iv) $\begin{bmatrix} -9 & -1 \\ 0 & 10 \end{bmatrix}$ (v) $\begin{bmatrix} -10 & -1 \\ 0 & 8 \end{bmatrix}$

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26. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, $B = \begin{bmatrix} -2 & 2 \\ -1 & 7 \end{bmatrix}$ and $C = \begin{bmatrix} 5 & 1 \\ 4 & 44 \end{bmatrix}$
and $(A \times B) = C$, find A

(i) $\begin{bmatrix} -3 & 1 \\ -6 & 8 \end{bmatrix}$ (ii) $\begin{bmatrix} -3 & 1 \\ -3 & 8 \end{bmatrix}$ (iii) $\begin{bmatrix} -3 & 2 \\ -6 & 8 \end{bmatrix}$ (iv) $\begin{bmatrix} -5 & 1 \\ -6 & 8 \end{bmatrix}$ (v) $\begin{bmatrix} -3 & 1 \\ -7 & 8 \end{bmatrix}$

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27. If $B = \begin{bmatrix} 9 & 8 \\ 3 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 90 & 101 \\ 90 & 87 \end{bmatrix}$ and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 7 & 7 \\ 9 & 3 \end{bmatrix}$ (ii) $\begin{bmatrix} 6 & 9 \\ 9 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 7 & 9 \\ 12 & 3 \end{bmatrix}$ (iv) $\begin{bmatrix} 7 & 9 \\ 10 & 3 \end{bmatrix}$ (v) $\begin{bmatrix} 7 & 9 \\ 9 & 3 \end{bmatrix}$

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28. If $B = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 19 & 48 \end{bmatrix}$ and $(A \times B) = C$, find A

(i) $\begin{bmatrix} 7 & 1 \end{bmatrix}$ (ii) $\begin{bmatrix} 9 & 3 \end{bmatrix}$ (iii) $\begin{bmatrix} 9 & 2 \end{bmatrix}$ (iv) $\begin{bmatrix} 8 & 1 \end{bmatrix}$ (v) $\begin{bmatrix} 9 & 1 \end{bmatrix}$

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29. Given $A = \begin{bmatrix} -3 & -1 \\ 1 & 8 \end{bmatrix}$ find B such that AB = BA = A

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

30. Find X if $A = \begin{bmatrix} 5 & -5 \\ 5 & 1 \end{bmatrix}$, $AX = B$ and $B = \begin{bmatrix} -25 & 80 \\ 29 & 26 \end{bmatrix}$

(i) $\begin{bmatrix} 3 & 7 \\ 9 & -9 \end{bmatrix}$ (ii) $\begin{bmatrix} 4 & 7 \\ 11 & -9 \end{bmatrix}$ (iii) $\begin{bmatrix} 4 & 8 \\ 9 & -9 \end{bmatrix}$ (iv) $\begin{bmatrix} 4 & 7 \\ 9 & -9 \end{bmatrix}$ (v) $\begin{bmatrix} 4 & 7 \\ 6 & -9 \end{bmatrix}$

31. Given $A = \begin{bmatrix} -9 & -6 \\ 6 & -7 \end{bmatrix}$ and $B = \begin{bmatrix} 117 \\ 21 \end{bmatrix}$,

find P such that $AP = B$

(i) $\begin{bmatrix} -6 \\ -9 \end{bmatrix}$ (ii) $\begin{bmatrix} -7 \\ -12 \end{bmatrix}$ (iii) $\begin{bmatrix} -4 \\ -9 \end{bmatrix}$ (iv) $\begin{bmatrix} -7 \\ -10 \end{bmatrix}$ (v) $\begin{bmatrix} -7 \\ -9 \end{bmatrix}$

32. Given $A = \begin{bmatrix} 3 & 4 & 1 \\ 3 & -3 & 1 \\ 4 & -3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -24 \\ 4 \\ 0 \end{bmatrix}$,

find P such that $AP = B$

(i) $\begin{bmatrix} -2 \\ -4 \\ 0 \end{bmatrix}$ (ii) $\begin{bmatrix} -2 \\ -3 \\ -2 \end{bmatrix}$ (iii) $\begin{bmatrix} -5 \\ -4 \\ -2 \end{bmatrix}$ (iv) $\begin{bmatrix} -3 \\ -4 \\ -2 \end{bmatrix}$ (v) $\begin{bmatrix} -2 \\ -4 \\ -2 \end{bmatrix}$

Assignment Key

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