**Matrices**

**MCQ-Single Correct**

1. If A = , then  is equal to:

(1)  (2) 

(3)  (4)  **[2017]**

2. If A =  and  , then 5a +b is equal to :

(1) 5 (2) 4

(3) 13 (4) -1 **[2016]**

3. If A =  is a matrix satisfying the equation , where I is identity matrix, then ordered pair (a,b) is equal to :

(1) (-2,1) (2) (2,1)

(3) (-2,-1) (4) (2,-1) **[2015]**

4. If A is a  non-singular matrix such that AA’=A’A and , then BB’ equals

(1) I + B (2) I

(3)  (4)  **[2014]**

5. If P =  is the adjoint of a matrix A and |A|=4, then α is equal to

(1) 11 (2) 5

(3) 0 (4) 4 **[2013]**

6. Let A =  . If u1 and u2 are column matrices such that Au1 =  and Au2 =  , then u1 + u2 is equal to

(1)  (2) 

(3)  (4)  **[2012]**

7. If  is the complex cube root of unity and matrix H =  , then  is equal to

(1)  (2) H

(3) 0 (4) -H **[2011]**

8. The number of non-singular matrices, with four entries as 1 and all other entries as 0, is

(1) 5 (2) 6

(3) at least 7 (4) less than 4 **[2010]**

9. Let A be a square matrix all of whose entries are integers. Then which one of the following is true?

(1) If detA = ±1 , then  exists but all its entries are not necessarily integers

(2) If detA = ±1 , then  exists and all its entries are non-integers

(3) If detA = ±1 , then  exists and all its entries are integers

(4) If detA = ±1 , then  need not exist **[2008]**

10. Let A =  . If || = 25, then  equals

(1)  (2) 1

(3) 1/5 (4) 5 **[2007]**

11. If A and B are square matrices of size  such that , then which of the following will be always true?

1. A = B
2. AB = BA
3. Either of A or B is a zero matrix
4. Either of A or B is an identity matrix **[2006]**

12. Let A =  and B =  , a , b  N. Then

(1) there cannot exist any B such that AB = BA

(2) there exist more than one but finite number of B’s such that AB = BA

(3) there exists exactly one B such that AB = BA

(4) there exist infinitely many B’s such that AB = BA **[2006]**

13. If , then the inverse of A is

1. A + I (2) A

(3) A – I (4) I – A

14. If A =  and I =  , then which one of the following holds for all , by the

principle of mathematical induction

1.  (2) 

(3)  (4)  **[2005]**

15. Let . The only correct statement about the matrix A is

(1) A is a zero matrix (2) 

(3)  does not exist (4) A = (-1)I, where I is a unit matrix

**[2004]**

16. Let (10) and  . If B is the inverse of matrix A , then α is

(1) -2 (2) 5

(3) 2 (4) -1 **[2004]**

17. If  and  , then

(1) ,  (2)  , 

(3)  ,  (4)  **[2003]**

**Assertion-Reason type**

1. Consider the following relation **R** on the set of real square matrices of order 3. **[2011]**

R = {(A,B)|A = for some invertible matrix P}.

**Statement – I** : R is an equivalence relation.

**Statement-II** : For any two invertible matrices M and N, .

1. Statement-I is True; Statement-II is true; Statement-II is **not** a correct explaination of Statement-I.
2. Statement-I is True; Statement-II is False.
3. Statement-I is False; Statement-II is true
4. Statement-I is True; Statement-II is true; Statement-II is a **correct** explaination of Statement-I.
5. Let A be a  matrix with non-zero entries and let , where I is identity matrix.

Define Tr(A) = sum of diagonal elements of A and |A| = determinant of matrix A. **[2010]**

**Statement-I** : Tr(A) = 0

**Statement-II** : |A|=1

1. Statement-I is True; Statement-II is true; Statement-II is **not** a correct explaination of Statement-I.
2. Statement-I is True; Statement-II is False.
3. Statement-I is False; Statement-II is true

(4) Statement-I is True; Statement-II is true; Statement-II is a **correct** explaination of Statement-I.

3. Let A be a matrix **[2009]**

**Statement-I** : adj(adj A) = A

**Statement-II** : |adj A| = |A|

1. Statement-I is True; Statement-II is true; Statement-II is **not** a correct explaination of Statement-I.
2. Statement-I is True; Statement-II is False.
3. Statement-I is False; Statement-II is true

(4) Statement-I is True; Statement-II is true; Statement-II is a **correct** explaination of Statement-I.

4. Let A be a  matrix with real entries. Let I be the identity matrix. Denote by tr(A), the sum of diagonal entries of A. Assume that  **[2008]**

**Statement-I** : If  and , then det A = -1.

**Statement-II** : If  and , then 

1. Statement-I is True; Statement-II is true; Statement-II is **not** a correct explaination of Statement-I.
2. Statement-I is True; Statement-II is False.
3. Statement-I is False; Statement-II is true
4. Statement-I is True; Statement-II is true; Statement-II is a **correct** explaination of Statement-I.