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| **Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

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| **Question Number** | **I** | **II** | **III** | **Total** |
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| **Question Number** | **1** | **2** | **3** | **4** | **5** | **6** | **Total** |
| **Answer** |  |  |  |  |  |  |  |

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| **Question I:****Choose the correct answer, then fill in the table above:****(1) If** $ A is 2×2 matrix and detA=7 $ **then** $detA^{T}=$**(a) 7 (b) -7 (c)** $\frac{1}{7}$ **(d) None of the previous****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** **(2) If** $A$ **is a** $4×5$ **matrix and**$B$ **is a** $5×7$ **matrix then** $B(AB)^{T}A$ **is** **(a)**$ 5×5$**matrix (b)**$ 4×7$ **matrix (c)**$7×7$ **matrix (d) None of the previous****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****(3) If** $A and B are 4×4$ **matrices such that** $tr\left(A\right)=6 and tr\left(5A^{T}-2I\right)=trB$**, then** $trB=$**(a) 23 (b) 26 (c) 28 (d) None of the previous** **(4) If** $A=\left[\begin{matrix}1&0&0\\0&0&0\\0&0&5\end{matrix}\right]$ **, then** $A$ **is****(a) invertible (b) elementary (c) non- invertible (d) None of the previous****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **(5) If** $A=\left[\begin{matrix}1&-1&2 \\0&1&0 \\0&0& 0 \end{matrix}\begin{matrix}1\\4\\1\end{matrix}\right]$ **is the augmented matrix of a linear system in the unknowns**$x,y, and z$**, then the system has** **(a)no solution (b) a unique solution (c)infinitely many solutions (d) None of the previous****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****(6) If** $B=\left[\begin{matrix}5&6\\1&0\end{matrix}\right]$ **then** $B^{-1}=$**(a)** $\left[\begin{matrix}\frac{1}{5}&\frac{1}{6}\\1&0\end{matrix}\right] $**(b)** $\left[\begin{matrix}0&-1\\-\frac{1}{6}&\frac{5}{6}\end{matrix}\right] $**(c)** $\left[\begin{matrix}2&-6\\-1&5\end{matrix}\right]$ **(d) None of the previous****\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****Question II:****In parts (a)–(g) determine whether the statement is true or false, and justify your answer.****(a) A linear system whose equations are all homogeneous must be consistent.** **(b) The system****x − x y = 6****x − y = 8****is a linear system.****(c) Elementary matrices must be square matrices.****(d) For all square matrices A and B of the same size, it is true that AB=BA****(e)If A is an n × n matrix that is not invertible, then the linear system Ax = 0** **has no solution.****(f) A symmetric matrix must be a square matrix.****(g) The transpose of a triangular matrix is a triangular matrix of the same kind.****Question III:**1. **Let** $A=\left[\begin{matrix}1&1&-2\\1&-1&2\\2&1&0\end{matrix}\right]$**then find**$A^{-1}$ **if it exist**
 |
|  **B Solve the linear system**$$\left\{\begin{matrix}x+z+w=2\\2x+2y+2w=2\\x+y-z-w=-1\end{matrix}\right.$$

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| $$x=$$ | $$y=$$ | $$z=$$ | $$w=$$ |

**c. For the following matrix** $$A=\left[\begin{matrix}1&0&0\\0&2&0\\0&0&-1\end{matrix}\right]$$ **Find** $p\left(A\right),$ **where** $p\left(x\right)=x^{4}-3x^{2}-2.$ |