KFUPM, Math 202 (T142): Introduction to Differential Equations

KFUPM Semester 142

Dept. Math. & Stat.

A.Y:2014/2015

Test 5	Tuesday (May 12, 2015)				
Name:	ID:				

Exercise 1: Find a particular solution of

$$X' = A(t)X + \begin{bmatrix} 1 \\ 1 \end{bmatrix},$$

given that

$$M(t) = \begin{bmatrix} 2 & 2e^{-2t} \\ 2e^{2t} & 4 \end{bmatrix}$$

is a fundamental matrix for the complementary system.

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Exercise 2:

(a) Find a particular solution of

$$X'(t) = \begin{bmatrix} 2 & -1 & -1 \\ 1 & 0 & -1 \\ 1 & -1 & 0 \end{bmatrix} X(t) + \begin{bmatrix} e^t \\ 0 \\ e^{-t} \end{bmatrix}.$$

(b) Find the general solution of the previous differential system

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Exercise 3: Find e^{tA} , for $A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$ and solve the differential system X' = AX.

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