Mansoura University Faculty of Engineering Math. &Eng. Physics Dept.	BME Prog. - Level 100 Course code: MTH 101 Course name: Math-3	Mid- term exam: 2016-2017 Time Allowed: 45 min Full mark : 20 open book exam	
رقم المجموعة:			الإسم (عربى):

Question 1[6points]: Answer by √ or ×

(1) The two families of trajectories $y = ce^{x^2}$ and $x = ce^{y^2}$ are orthogonal. [ ]

(2) $y = \cos x$ represents solution to the **B.V.P.** $y'' + 4y = 0, \quad y(0) = 0, \quad y(\pi/2) = 1$. [ ]

(3) $y = \sinh 2x$ represents solution to the **I.V.P.** $y'' + 4y = 0, \quad y(0) = 0, \quad y'(0) = 2$. [ ]

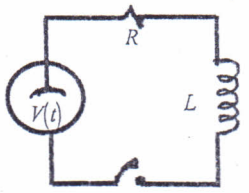
Question 2 [4 points]: Complete the following:

(1) The order of the O.D.E. $(y'')^5 + y'(y'')^3 - y = 0$ equal: ..... while the degree equal: .....

(2) The general first order linear O.D.E. takes the form: .....

and its general solution takes the form: .....

(3) In the **L-R electric circuit** shown in Fig.



The ODE that describes the current **I(t)** is:.....

The general solution is: **I(t)** = ...

Question 3[5points]: Find the solution to the **I.V.P.** of **Bernoulli** type: $y' + y + y^3 e^{4x} = 0, \quad y(0) = 1$.

Question 4 [يتم حلها خلف الورقة] [5points] : Find the general solution to **Euler** O.D.E. $xy'' + y' - x = 0$.

Answer of question 3