Faculty of Engineering (Shoubra) Engineering Mathematics and Physics Department



Benha University Mechanical Department 2st year Production Time allowed:30 Minutes

4th Quiz

Student Name in Arabic:

Section:

B.N°:

1) Solve for x(t) and y(t), given that x(0) = 0, y(0) = 3, and

$$\frac{dx}{dt} + \frac{dy}{dt} = 0, \quad x - \frac{dy}{dt} + y = e^t$$

2) Find F(s) of the following functions:

$$f(t) = \frac{e^{2t} - e^{-3t}}{t^2} \qquad \qquad f(t) = \left\{ \begin{array}{ll} \sin t & 0 < t \le \pi \\ t - \pi & \pi < t \le 2\pi \\ \pi & t > 2\pi \end{array} \right\}$$

3) Expand in Fourier series the following functions

$$f(x) = \begin{cases} \pi/2 + x, & -\pi \le x \le 0 \\ \pi/2 - x, & 0 < x \le \pi \end{cases}$$

$$f(x) = \begin{cases} x, & 0 \le x \le \pi \\ -(x - \pi), & \pi < x \le 2\pi \end{cases}$$