Faculty of Engineering (Shoubra)
Engineering Mathematics and
Physics Department

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

3rd Quiz

Student Name in Arabic: **Section:**   **B.N. :**

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

  a) $f(t) = \sin t$, $t > 2$, b) $\dfrac{e^{2t} - e^{-3t}}{t^2}$, c) $f(t) = t+4$, $f(t+2) = f(t)$

2) Solve the differential equation

$$y`` - 3\,y` + 2y = 20\,e^{5t}, \quad y(0) = 7, \; y`(0) = 2$$

3) Verify

  a) $\displaystyle\int_0^\infty \dfrac{t^{ac-1}}{(1+t^c)^{a+b}}\,dt = \dfrac{1}{c}\beta(a,b)$,   b) $\displaystyle\int_0^1 \dfrac{t^{aq-1}}{\sqrt[q]{(1-t^q)}}\,dt = \dfrac{1}{q}\beta(a,1\text{-}1/q)$

Dr. khaled Elnaggar