UFV - Universidade Federal de Viçosa

CCE - Departamento de Matemática

3^a Lista de exercícios de MAT 147 - Cálculo II

GABARITO

1. (a) $y = c_1e^t + c_2te^t$
   (b) $y = c_1e^{-t} + c_2e^{-2t}$
   (c) $y = c_1e^{-t/2} + c_2e^{3t/2}$
   (d) $y = c_1e^{t/2} + c_2e^t$
   (e) $y = c_1e^{-t}\cos t + c_2e^{-t}\text{sen}t$
   (f) $y = c_1e^t\cos\sqrt{5}t + c_2e^t\text{sen}\sqrt{5}t$
   (g) $y = c_1e^{-3t/4} + c_2te^{-3t/4}$
   (h) $y = c_1e^t\cos t + c_2e^t\text{sen}t$
   (i) $y = c_1e^{-3t/2} + c_2e^{3t/2}$
   (j) $y = c_1e^t\cos 3t + c_2e^t\text{sen}3t$
   (k) $y = c_1 + c_2e^{-5t}$
   (l) $y = c_1e^{-3t}\cos 2t + c_2e^{-3t}\text{sen}2t$
   (m) $y = c_1e^{(1+\sqrt{3})t} + c_2e^{(1-\sqrt{3})t}$
   (n) $y = c_1\cos(\frac{3t}{2}) + c_2\text{sen}(\frac{3t}{2})$
   (o) $y = c_1e^{-t/2}\cos(\frac{t}{2}) + c_2e^{-t/2}\text{sen}(\frac{t}{2})$

2. (a) $y = e^t$
   (b) $y = \dfrac{1}{2}\text{sen}2t$
   (c) $y = 2te^{3t}$
   (d) $y = -1 - e^{-3t}$
   (e) $y = -e^{(t-\frac{\pi}{2})}\text{sen}2t$
   (f) $y = -e^{-t/3}\cos 3t + \frac{5}{9}e^{-t/3}\text{sen}3t$
   (g) $y = \frac{1}{10}e^{-9(t-1)} + \frac{9}{10}e^{t-1}$
   (h) $y = (1+2\sqrt{3})\cos t - (2-\sqrt{3})\text{sen}t$
   (i) $y = 7e^{-2(t+1)} + 5te^{-2(t+1)}$

3. (a) $\varphi(t) = e^t$
   (b) $\varphi(t) = -\dfrac{2}{3}te^{-t}$
   (c) $\varphi(t) = \dfrac{3}{2}t^2e^{-t}$
   (d) $\varphi(t) = 2t^2e^{t/2}$

4. (a) $y = c_1\text{cos}t + c_2\text{sen}t - (\text{cos}t)\ln(\tan t + \sec t)$
   (b) $y = c_1\text{cos}3t + c_2\text{sen}3t - (\text{sen}3t)\ln(\tan 3t + \sec 3t) - 1$
   (c) $y = c_1e^{-2t} + c_2te^{-2t} - e^{-2t}\ln t$
   (d) $y = c_1\text{cos}2t + c_2\text{sen}2t + \dfrac{3}{4}(\text{sen}2t)\ln\text{sen}2t - \dfrac{3}{2}t\text{cos}2t$
   (e) $y = c_1\text{cos}(t/2) + c_2\text{sen}(t/2) + t\text{sen}(t/2) + 2[\ln\cos(t/2)]\cos(t/2)$
   (f) $y = c_1e^t + c_2te^t - \dfrac{1}{2}e^t\ln(1+t^2) + te^t\text{arctan}t$
   (g) $y = c_1\text{cos}2t + c_2\text{sen}2t + \dfrac{1}{2}\displaystyle\int[\text{sen}2(t-s)]g(s)ds$

5. (a) $\varphi(t) = \dfrac{1}{2} + t^2\ln t$
   (b) $\varphi(t) = -2t^2$

6. (a) $\varphi(t) = 4t^2\ln t$
   (b) $\varphi(t) = \dfrac{1}{12}t$

7. (a) $y = c_1e^{-t}\text{cos}2t + c_2e^{-t}\text{sen}2t + \frac{3}{17}\text{sen}2t - \frac{12}{17}\text{cos}2t$
   (b) $y = c_1e^{3t} + c_2e^{-t} + \frac{3}{16}te^{-t} + \frac{3}{8}t^2e^{-t}$
   (c) $y = c_1 + c_2e^{-2t} + \frac{3}{2}t - \frac{1}{2}\text{sen}2t - \frac{1}{2}\text{cos}2t$

(d) $y = c_1 \cos 3t + c_2 \operatorname{sen} 3t + \frac{1}{162}(9t^2 - 6t + 1)e^{3t} + \frac{2}{3}$

(e) $y = c_1 e^{-t} + c_2 e^{-t/2} + t^2 - 6t + 14 - \frac{3}{10}\operatorname{sen} t - \frac{9}{10}\cos t$

(f) $y = c_1 \cos t + c_2 \operatorname{sen} t - \frac{1}{3} t \cos 2t - \frac{5}{9}\operatorname{sen} 2t$

8. (a) $y = e^t - \frac{1}{2}e^{-2t} - t - \frac{1}{2}$

(b) $y = \frac{7}{10}\operatorname{sen} 2t - \frac{19}{40}\cos 2t + \frac{1}{4}t^2 - \frac{1}{8} + \frac{3}{5}e^t$

(c) $y = 4te^t - 3e^t + \frac{1}{6}t^3 e^t + 4$

(d) $y = e^{3t} + \frac{2}{3}e^{-t} - \frac{2}{3}e^{2t} - te^{2t}$