MAT1011(CFE) - ELA

Assessment 3: Local Extrema and Laplace transform

Due-Date of Online Submission: 05.10.2018:

Guidelines for Submission:

- First download this question-sheet
- Create a matlab file (phani.m, for instance), in which the first few lines should be as follows:
  (a) Fall Semester 2018 - 19
  (b) Course: MAT1011(CFE) - ELA
  (c) Slot —————–
  (d) Assessment No. —————–
  (e) Regd. No. —————–
  (f) Name —————–

  Write the matlab programme or code in this file for each of the tasks given to you.
- Then generate the output. Scan the graphical output, also where ever required.
- Take the snap shot /Scan the m-file and the corresponding output file(s) neatly, which should be clearly visible.
- Make a **single pdf** file and upload it through the lab log-in portal.
- **Do not mail** the file to me.
- Follow the guidelines strictly. Any deviation from the above instructions will lead to the reduction in marks

Uploading of file in any other format (image files, zipped files etc.) *is not acceptable.*

Exercise 1 (6 marks). Using matlab, obtain and plot the points of local maximum, points of local minimum, or saddle points of the following functions $f(x)$. Also, sketch the graph of f in each case:

(a) $f(x) = 2x^3 - 15x^2 - 36x$

(b) $f(x) = x^4 - 2x^2$

(c) $f(x) = x^2 - 2\,|x|$

Exercise 2 (2 marks). Verify the first shifting property of the Laplace transform for $f(t) = t^2 + 3t - 1$.

Exercise 3 (2 marks). Verify the multiplication-by-t property of the Laplace transform for $f(t) = te^{-3t}$.