ASSIGNMENT #2
(Due November 27, 2019)

Compute the following for the given ground acceleration

(a) Displacement, relative velocity, total spectral acceleration, pseudo-spectral acceleration and pseudo-spectral velocity spectra for ξ = 0.02, 0.05, 0.1, 0.2, 0.3 and 0.5

(b) Read Sections 6.5 to 6.12 from "Dynamics of Structures – Theory and Applications to Earthquake Engineering" by Anil K Chopra to develop the design spectra for the response spectra obtained in part (a).

(c) Prepare a short summary of above reading as a PowerPoint presentation (20-25 slides of maximum length to present it in the class

(d) Discuss the results obtained in parts (a) and (b) by considering the following items:

- Influence of damping on spectral ordinates
- Total spectral acceleration vs. pseudo-spectral acceleration
- Relative spectral velocity vs. pseudo-spectral velocity
- Design spectra obtained in part (b) vs. actual response spectra obtained in part (a) – only for pseudo-spectral acceleration and displacement response spectra

(d) Use the revised national earthquake code of Turkey and develop the design spectrum of pseudo spectral acceleration obtained in part (a). [Read Chapter 2 in the revised national code to obtain the smoothed design spectra versions of pseudo-spectral acceleration in part (a)]. Obtain the corresponding displacement spectra and compare your results with those obtained in part (b).

Hint: Compute the spectra in part (a) up to T = 10s to answer the questions in parts (b), (c) and (d). You must use direct integration to solve for the response spectral quantities.