PART B—Final exam, Friday, 9th May, 2014
Duration: 9:00—11:00am

Instructions

- Open book. Open notes. Use all you can except your neighbour.
- Write your answers in this booklet. You might want to use a pencil just in case of erasures.
- You need writing material and a simple calculator.
Design a matrix acidizing treatment for the well described below. The design should give the recommended acid types, concentrations, volumes for the preflush, mainflush and afterflush acid stages, and a table showing the evolution of skin with volume of acid injected. The table should contain at least 3 rows. Assume the acid restores the damaged region of the reservoir to initial conditions. Include the effect of viscous skin (oil viscosity is greater than viscosity of the acid). Acid viscosity~1cp.
Question 2

Carbonate Acidizing

Data
Acid type: 15% HCl
Treating temperature: 200 degF
Injection rate: 0.05 bpm/ft
Well radius: 0.35 ft
Formation porosity: 0.25

a) Calculate the radius around the well to which a wormhole has penetrated assuming 50 gals/ft of acid is pumped into the chalk formation. Use the Volumetric model and the core flood results shown in Figure 16-8 of the PPS book or Figure 1 below. (10 points)
b) Using the Buijse-Glasbergen model, what is the wormhole radius (ft) and wormhole velocity (ft/min) when
i. Time = 0
ii. Time=5 minutes
iii. Time=10 minutes

Also, use either Figure 16-8 of the PPS book or Figure 1 above. (15 points)