

تاريخ الامتحان: 2014/1/26

القسم: هندسة النفط

الزمن: 2:30 ساعتان ونصف

الامتحان النهائي لمقرر / هندسة الغاز الطبيعي للمكمن (امتحان مفتوح)

رقم القيد: (.....)

أستاذ المادة: ماجد الصادق النفيس خريف 2014/2013

Q1:

(20 points)

A natural gas has the following composition

Composition	Mol %
C ₁	86.02
C ₂	7.70
C ₃	4.26
i-C ₄	0.57
n-C ₄	0.87
i-C ₅	0.11
n-C ₅	0.14
C ₆	0.33

For pressure 750 psia and temperature 150 °F, calculate

1. Gas specific gravity.
2. Z- factor
3. Gas compressibility and formation volume factor
4. Gas viscosity

Q2:

(20 points)

Given the viscosity and gas deviation factor data of gas which has a specific gravity of 0.8, estimate the pseudopressure function, $m(p)$.

P(psi)	μ_g (cp)	Z
0	0.0127	1
400	0.01286	0.937
1200	0.0153	0.832
1600	0.0168	0.794
2000	0.0184	0.77

Q3:

(20 points)

A volumetric gas reservoir has the following production history.

Time, t (years)	Reservoir pressure, p (psia)	Z	Cumulative production, G_p (MMMscf)
0	1798	0.869	0
0.5	1680	0.87	0.96
1	1540	0.88	2.12
1.5	1428	0.89	3.21
2	1335	0.9	3.92

The following data is also available:

$$\phi = 13\%$$

$$S_{wi} = 0.52$$

$$A = 1060 \text{ acres,}$$

$$h = 54 \text{ ft,}$$

$$T = 164 \text{ }^\circ\text{F}$$

Calculate the gas initially in place volumetrically and from the MBE.

Good Luck