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أجب عن جميع الأسئلة | تسلم الأسئلة مع كراسة الإجابة | مجموع الدرجات 50 درجة

Q1) i) What is Hydrocarbon Reservoir? — 3 درجات

ii) Given: — 10درجات

Area	= 26,700 acres
Net productive thickness	= 49 ft
Porosity	= 8%
Average S_{wi}	= 45%
Initial reservoir pressure, p_i	= 2980 psia
Abandonment pressure, p_a	= 300 psia
B_o at p_i	= 1.68 bbl/STB
B_o at p_a	= 1.15 bbl/STB
S_g at p_a	= 34%
S_{or} after water invasion	= 20%

The following quantities will be calculated:

1. Initial oil in place
2. Oil in place after volumetric depletion to abandonment pressure
3. Oil in place after water invasion at initial pressure
4. Oil reserve by volumetric depletion to abandonment pressure
5. Oil reserve by full water drive

Q2) i) What is the Reservoir Energy. — 5درجات

ii) Calculating water influx in water drive gas reservoir — 5درجات

Given:

Bulk reservoir volume , initial = 415.3 MM cu ft.
Average porosity = 0.172
Average connate water = 0.25
Initial pressure = 3200 Psia.
Bgi = 0.005262 cu ft/SCF @ 14.7 Psia and 60°F
Final pressure = 2925 Psia
Bgf = 0.0057 cu ft /SCF @ 14.7 Psia and 60°F
Cumulative water production = 15,200 bbl (surface)
Bw = 1.05 bbl/surface bbl
Gp = 935.4 MMSCF @ 14.7 Psia and 60°F
Bulk volume invaded by water at 2925 psia = 13.04 MMcu ft

Q3) Calculate water influx at the end of 1,2,3 and 4 years into a semicircle reservoir against a fault θ =180, with an aquifer of infinite extent. The initial and current reservoir pressures are 2700 and 2650 psi, respectively. The reservoir-aquifer system has the following properties.

	Reservoir	*Aquifer*
Radius , ft	*2500*	*∞*
h, ft	*25*	*20*
K, md	*80*	*90*
ϕ, %	*18*	*22*
μ_w, cp	*0.8*	*1.0*
C_w, Psi^{-1}	*0.9×10^{-6}*	*0.6×10^{-6}*
C_f, Psi^{-1}	*1.9×10^{-6}*	*0.4×10^{-6}*

10 درجات

Q4) Calculate the initial oil in place in a volumetric, under saturated reservoir.

Given:

Pi = 5000 Psig Pa = 3600 Psig

Bti = 1.35469 bll/STB

Bt = 1.37500 bll/STB @ 3600Psig

$C_w = 3.6\times10^{-6}$ Psi^{-1}

S_w = 20%

B_w = 1.04 bll/STB @ 3600 Psig

$C_f = 5.0\times10^{-6}$ Psi^{-1}

Np = 1.25 MM STB

Wp = 32,000 STB

We = 0

5درجات

Q5) A combination-drive reservoir contains 12 MMSTB of oil initially in place. The ratio of the original gas-cap volume to the original oil volume. m. is estimated as 0.20. The initial reservoir pressure is 2800 psia at 140°F. The reservoir produced 1.2 MMSTB of oil, 1000 MMscf of 0.85 specific gravity gas. and 60,000 STB of water by the time the reservoir pressure dropped to 2600 psi. The following PVT is available:

12 درجة

	2800 Psi	2600 Psi
Bo, bbl/STB	1.48	1.40
Rs, scf/STB	800	640
Bg, bbl/STB	0.0009	0.00098
Bt, bbl/STB	1.6	1.7
Bw,bbl/STB	1.01	1.01

S_{wi} = 25% $C_w = 1.5\times10^{-6}$ Psi^{-1} $C_f = 1.0\times10^{-6}$ Psi^{-1}

Calculate:

1. **Net Water Influx.**
2. **Primary Driving Indexes At 2600 Psi**

$$N = \frac{N_p\left[B_t + (R_p - R_{si})B_g\right] - (W_e - W_p B_w)}{(B_t - B_{ti}) + m\,B_{ti}\left[\frac{B_g}{B_{gi}} - 1\right] + B_{ti}(1+m)\left[\frac{S_{wi}c_w + c_f}{1 - S_{wi}}\right]\Delta p}$$

$B_t = B_o + (R_{si} - R_s)\,B_g$

$$N = \frac{Np\beta t - We + Wp\beta w}{\beta t - \beta ti + \beta ti\left[\frac{Cw\,Swi + Cf}{1 - Swi}\right]\Delta\bar{P}}$$

$$\frac{N(B_t - B_{ti})}{A} + \frac{NmB_{ti}(B_g - B_{gi})/B_{gi}}{A} + \frac{W_e - W_p B_w}{A} + \frac{NB_{oi}(1+m)\left[\frac{c_w S_{wi} + c_f}{1 - S_{wi}}\right](p_i - p)}{A} = 1$$

$A = N_p\,[B_t + (R_p - R_{si})\,B_g]$

Good Luck

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