كلية الهندسة – جامعة مصراتة

فصل الربيع 2014/2013		القسم/ الهندسة النفطية
المقرر / هندسة الانتاج I	الامتحان النهائي	الزمن / 3 ساعات
التاريخ / 17 / 6 / 2014		أستاذ المادة / أ.يحيى شرفي

أجب عن جميع الأسئلة الاتية

Question One: (15 Marks)

a) Explain how oil reservoirs can produce using the following drive mechanisms:
   - Solution gas drive mechanism
   - Water drive mechanism

b) Draw a sketch showing the basic components of a simple production system.

c) What are the sources of pressure drop inside the tubing or any completion string?

Question Two: (15 Marks)

a) Define Darcy's law, and what are the basic assumptions to use Darcy's law?

b) Describe the flow patterns in vertical and horizontal pipes?

c) Define the following terms:
   - Liquid Hold up
   - Steady state flow regime with equation

d) Discuss the effect of Gas Liquid Ratio (GLR) and tubing diameter on well's performance.

Question Three: (15 Marks)

a) Define Nodal Analysis and give two of the main objectives for using this technique.

b) What is the objective of selecting the bottom hole condition or completion interval as a solution node and write the inflow and outflow equations?

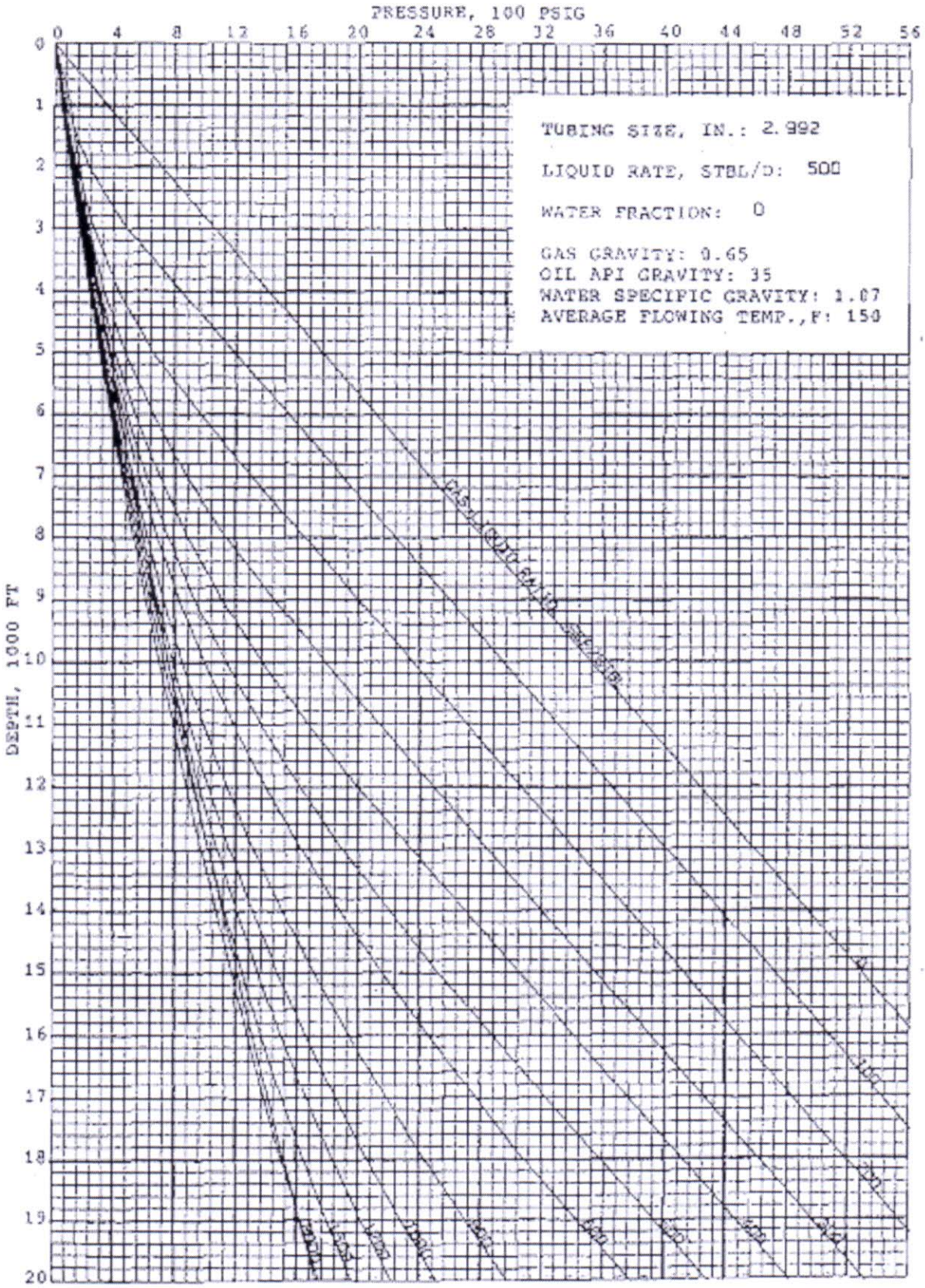
c) List the functions of the following production tools:
   - Wellhead system
   - X-mass tree
   - Packers
   - Tubing – Annulus communication equipments

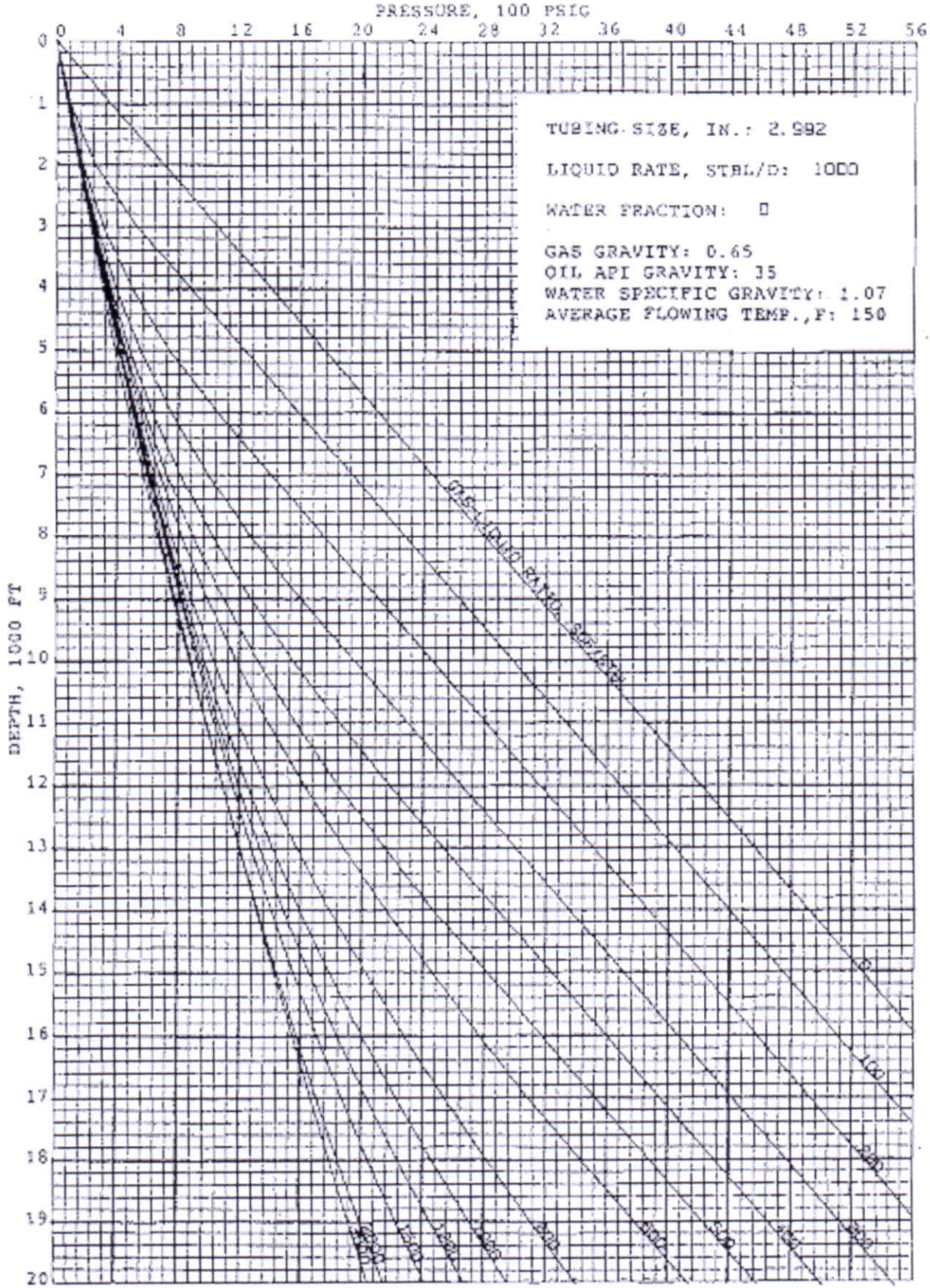
Question Four: (15 Marks)

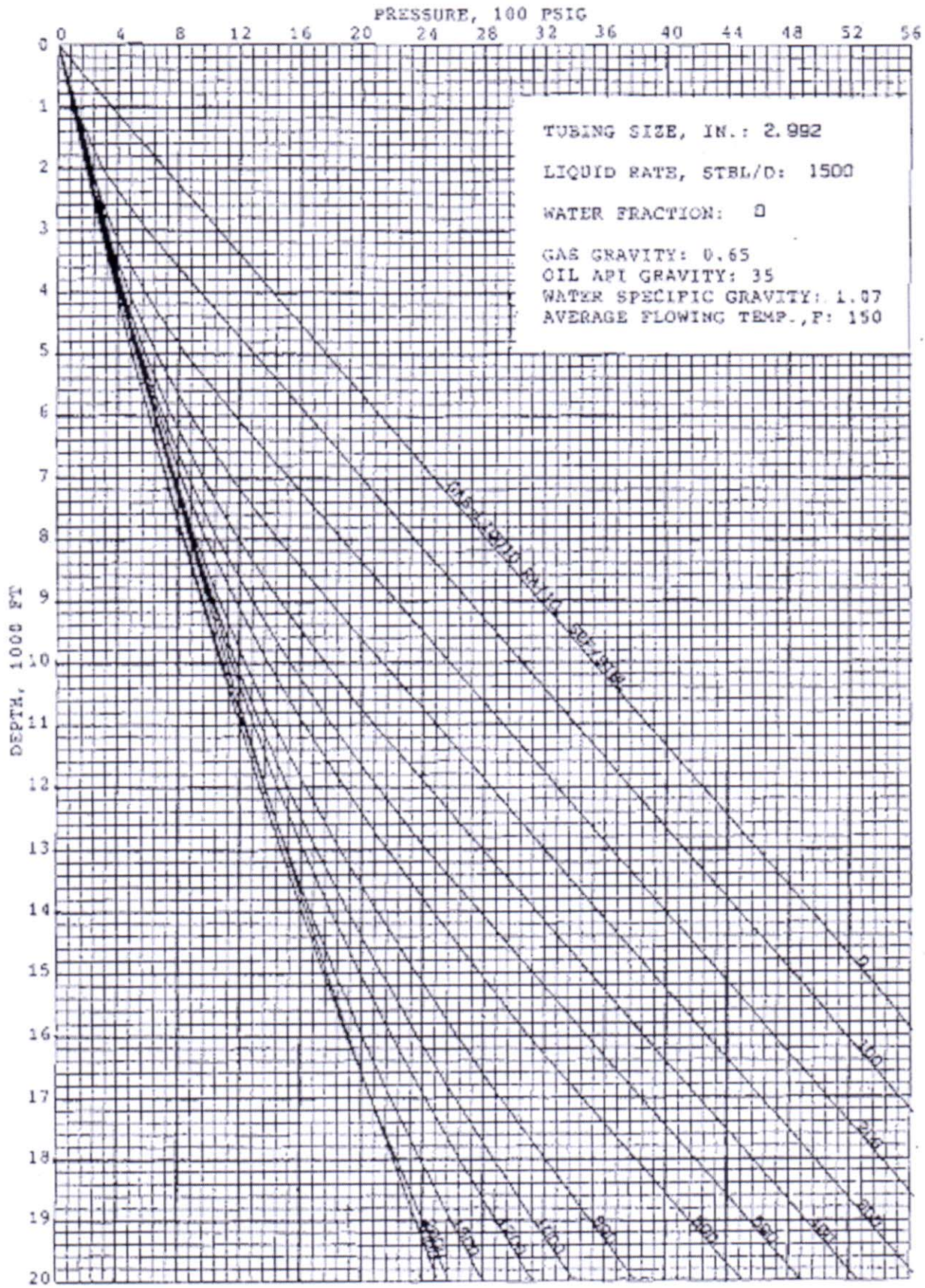
A well is producing from a saturated reservoir with an initial pressure of 2500 psi, the bubble point pressure was at 1800 psi, GLR is 200 Scf/STB the production rate is 500 STB/d using 3 inches ID tubing, wellhead pressure is 240 psi, and the productivity index was 1.2 STB/d/psi. If the well depth was 6000 feet, find the following:

a) Draw the IPR curve
b) Draw the TPR curve
c) What is the operating point

انتهت الأسئلة


PRESSURE, 100 PSIG
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56
DEPTH, 1000 FT
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TUBING SIZE, IN.: 2.992
LIQUID RATE, STBL/D: 500
WATER FRACTION: 0
GAS GRAVITY: 0.65
OIL API GRAVITY: 35
WATER SPECIFIC GRAVITY: 1.07
AVERAGE FLOWING TEMP.,F: 150
GAS/LIQUID RATIO, SCF/STB
100
200
300
400
500
600
700
800
900
1000
1500
2000


PRESSURE, 100 PSIG
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56
DEPTH, 1000 FT
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TUBING SIZE, IN.: 2.992
LIQUID RATE, STBL/D: 1000
WATER FRACTION: 0
GAS GRAVITY: 0.65
OIL API GRAVITY: 35
WATER SPECIFIC GRAVITY: 1.07
AVERAGE FLOWING TEMP.,F: 150
GOR, LIQUID RATIO, SCF/STB
0
100
200
300
400
500
600
700
800
900
1000
1500
2000
2500
3000


PRESSURE, 100 PSIG
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56
DEPTH, 1000 FT
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
TUBING SIZE, IN.: 2.992
LIQUID RATE, STBL/D: 1500
WATER FRACTION: 0
GAS GRAVITY: 0.65
OIL API GRAVITY: 35
WATER SPECIFIC GRAVITY: 1.07
AVERAGE FLOWING TEMP.,F: 150
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000