فصل الربيع 2014 /2015 كلية الهندسة – جامعة مصراتة القســـم/ الهندسة النفط

الامتحان النهائي لمقرر / آليات حفر وإنتاج (PE322) الزمــن / ثلاث ساعات

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أسم الطالب: رقم الطالب:

Q_1: Assuming a 10 ppg mud being circulating at 700 GPM at a depth of 10000 ft TVD the circulating pump pressure is 3000 psi. if the circulating friction losses in the system are as follows:

Pressure losses through pipe/collars	1200 psi
Pressure losses in the annulus	200 psi

a) what is static bottom hole pressure? (5 pts)
b) What is the equivalent circulating density (ECD) (5 pts)

Q_2: The mud logger places a cupful of rice in the drillstring when a connection is made. The drill string is composed of 8500 ft of 5-in drill pipe (ID 4.278-in) and 500 ft of 6-in drill collars having ID of 3-in. the pump is a double acting with pump factor of 0.18 bbl/cycle and operates at volumetric efficiency of 90%. The hole data as following:

1) 9 5/8-in (ID 8.68-in)casing set at 4700 ft
2) 8 ½-in hole drilled to 9000 ft

a) Estimate the number of pump cycles required to move the rice from surface to bit. (3 pts)
b) Estimate the number of pump cycles required to move the rice from bit to shale shaker. (3 pts)
c) Estimate the total number of pump cycles required to detect the rice at shale shaker. (1 pt)
d) If the penetration rate of the bit is 2 min/ft and the pump speed is 60 cycle/min. how many feet are drilled by the bit before the rice travel from the bit to the surface. (3 pts)

Q_3:

a) what are the types of directional patterns? (5 pts)
b) what are the basic directional control principles and define the use of each principle? (5 pts)

Q_4: give a brief notes about the following fishing equipment:

a) Overshots (5 pts)
b) Washover Pipe (5 pts)

Q_5:

a) What is a kick? (2 pts)
b) What criteria are necessary for a kick to occur? (4 pts)
c) What is a blowout? (2 pts)
d) What is an underground blowout? (2 pts)

Q-6:Define the following:

a) Overburden Pressure (2 pts)
b) Formation Pressure (2 pts)
c) Fracture Pressure (2 pts)
d) Mud Hydrostatic Pressure (2 pts)
e) Swab Pressure (2 pts)