

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2022 - 23 Examination

Semester: 4TH
Subject Code: 203120257
Subject Name: Production Operations-1

Date: 27-03-2023
Time: 2:00 to 4:30
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark) **(15)**

1. Wellhead comprises of API SPECIFICATIONS as _____.
2. The general pipe length for Range 1 pipe in Production operations is _____.
3. Ballooning tends to _____ the tubing string.
4. Reynolds' Number is defined as the ratio of
 - A. Viscous to inertial Force
 - B. Viscous to Gravitational force
 - C. Inertial to viscous force
 - D. Inertial to Gravitational Force
5. Open Hole completions is used for _____ zones.
 - A. Consolidated
 - B. Unconsolidated
 - C. Sand and water cut Zone
 - D. All of these.
6. The best method of controlling sand production in a open-hole is
 - A. Bare-foot completion
 - B. Slotted Liner
 - C. Gravel-Pack
 - D. Single string with no packer
7. _____ completions offers the main bore to be cased and cemented while the lateral remain cased but uncemented.
8. Bullet Perforations is used in _____ formations.
9. What is Well Activation?
10. Name the Bullet type which is generally used for cement fracturing in completion wells.
11. _____ is a mode of flame propagation in a pre-mixed gas, and drives a leading shock front into the quiescent, unbrunt gas at supersonic velocity, immediately followed by a combustion zone
 - A. Combustion
 - B. Deflagration
 - C. Detonation
 - D. Air blast
12. $S = +ve$ implies $K_{skin} < K$, This result inferred to a condition that ΔP_{Skin} is _____.
13. Flow efficiency is a term which defines the well _____.
 - A. Undamaged Production Capacity
 - B. Porosity.
 - C. Relative Permeability
 - D. All of these.
14. What is Surfactant Removal in Formation Damage?
15. If the velocity of flow passing thru any duct is equal to the speed of sound the the flow is said to be _____.
 - A. Sub-Sonic
 - B. Super-Sonic
 - C. Sonic
 - D. Trans-Sonic

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Write a short Note on Christmas Tree with all valves function?

B) A two-phase reservoir at steady state is producing at a rate of 640STB/day with reservoir pressure of 4500psi. The well is stimulated with $r_w = 0.406$ ft, resulting in a skin being reduced from 20 to 2. What is the production rate at skin=2 keeping the same bottom-hole pressure where the $r_e = 1490$ ft.

C) Write a short note on Circulation Devices?

D) Mention the factors on which IPR and VLP exists in a production well.

Q.3 A) What is Perforation? Mention the difference between Bullet and Jet Perforation? **(07)**

B) A 48hours production was performed for a well depth of 6502ft. The well is flowing with a BHP of 1300psi for FE=0.7. The Static reservoir pressure is 2500psi. Calculate the FBHP if the well is assumed to be undamaged. **(08)**

OR

B) What is Packer? Write the purposes of a packer? What are the different types of packer? What are the different elements of packer? **(08)**

Q.4 A) Calculate the Absolute open flow potential in STB/day for a developed well with initial reservoir pressure = 3200psia. The well is developed in 160acre spacing. The drilled hole size is **(07)**

12.25in diameter.

Other parameters are as follows

$K = 30$ md ; $h = 40$ ft ; $\mu_o = 0.8$ cp ; $B_o = 1.2$ rb/stb ; $P_{wf} = 1500$ psia

OR

A) Explain the Flow regimes for a vertical well in multiphase condition. **(07)**

B) A productivity test was conducted on a single-phase crude oil well. The well is capable of producing 100 STB/day at a flowing bottom-hole pressure of 1000 psig. The 24-hour shut-in static pressure is found to be 1500 psig. The maximum oil flow rate (Q_{max}) is _____ STB/day. **(08)**