

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

Semester: 7
Subject Code: 203120435
Subject Name: Well Performance and Intervention

Date: 08/10/2022
Time: 10:30 am to 01:00 pm
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 Which of the following type of completion is used when more than one zone to produce from one tubing string

- a) Open hole completion
- b) Liner hole completion
- c) Coming led completion
- d) Multiple zone completion

2. Which of the following property does a fracturing fluid hold generally?

- a) Shear thickening
- b) Shear thinning
- c) Newtonian
- d) None of the above

3. Which of the following well stimulation technique is used to remove acid soluble scales present in wellbore?

- a) Matrix acidizing
- b) Acid washing
- c) Hydraulic fracturing
- d) Acid fracturing

4. in fracturing the fracture is created _____ to the minimum horizontal stress

- a) Parallel
- b) Perpendicular
- c) Both
- d) None of the above

5. Which of the following proppant has lowest compressive stress?

- a) Sinister Bauxite
- b) Ceramic proppant
- c) Sand
- d) All have equal compressive stress

6. _____ model assume very high fracture height when compared to fracture length?

7.As the pore pressure increases, fracture pressure _____

8.Matrix acid treatment is suitable for _____ permeability and _____ Skin

9. The reservoir which have been fractured generally have _____ porosity and _____ permeability.

10. For matrix acidizing injection pressure is _____ than fracture pressure.

11. What do you mean by productivity index?

12. Write any two mechanisms can possibly damage a formation.

13. What do you mean by snubbing unit?

14. What do you mean by G-S ratio?

15. How do you define fold of increase?

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

- A) What do you mean by Sand control? Write a short note on mechanical methods of sand
- B) What do you mean by workover fluid? Briefly describe criteria for selection of workover fluid

- C) A gas reservoir has a permeability of 1 md. A vertical well of 0.328-ft radius draws the reservoir from the center of an area of 160 acres. If the well is hydraulically fractured to create a 1,000-ft long, 0.12-in. wide fracture of 100,000 md permeability around the center of the drainage area, what would be the fracture conductivity?

- D) For the reaction between 15 wt% HCl solution and calcite, calculate the gravimetric and volumetric dissolving power of the acid solution.

Q.3 A) What do you mean by formation damage? Write various reasons of formation damage. **(07)**
B) How do you define Acidizing? Briefly describe acidizing of sandstone and carbonate formation **(08)**

OR

B) What do you mean by workover rig system? Describe conventional and Non-conventional workover rig system **(08)**

Q.4 A) A Sandstone at a depth of 10,000 ft has a Poisson's ratio of 0.25 and a poro-elastic constant of 0.72. The average density of the overburden formation is 165 lb/ft³. The pore pressure gradient in the sandstone is 0.38 psi/ft. Assuming a tectonic stress of 2,000 psi and a tensile strength of the sandstone of 1,000 psi, predict principal stress & the breakdown pressure for the sandstone. **(07)**

OR

A) A sandstone with a porosity of 0.2 containing 10 v% calcite (CaCO₃) is to be acidized with HF/HCl mixture solution. A preflush of 15 wt% HCl solution is to be injected ahead of the mixture to dissolve the carbonate minerals and establish a low pH environment. If the HCl preflush is to remove all carbonates in a region within 1 ft beyond a 0.328-ft radius wellbore before the HF/HCl stage enters the formation, what minimum preflush volume is required in terms of gallon per foot of pay zone? **(07)**

B) What do you mean by Hydraulic fracturing? Describe mechanics of fracturing. **(08)**