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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**Make-Up Examinations, July 2024**

**Semester**: VI

**Course Code**: PET228

**Course Name**: Workover and Stimulation

**Program** : B.Tech. (Petroleum)

**Date**: 04-07-2024

**Time**: 09:30 AM – 12:30 PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

**Part A [Memory Recall Questions]**

**Answer any three Questions. Each question carries ten marks. (3Qx 10M= 30M)**

1. Define well completion. Classify well completion patterns with suitable diagram.

(C.O.No.1) [Knowledge]

2. State any five well completion equipment along with their functions.

(C.O.No.1) [Knowledge]

3. Write a short note on- (a) Coil Tubing (b) Snubbing Unit (C.O.No.2) [Knowledge]

4. Mention any five consequences of “Sand Production” in an oil well. (C.O.No.4) [Knowledge]

5. Describe all three “Fracture Propagation models” with diagrams. (C.O.No.3) [Knowledge]

**Part B [Thought Provoking Questions]**

**Answer any two Questions. Each question carries fifteen marks. (2Qx15M=30M)**

6. Consider yourself as a completion engineer, elaborate the methods for mitigate sand production. (C.O.No.4) [Comprehension]

7. “Hydrofracturing can enhance productivity of well”- Briefly elucidate the quoted statement.

(C.O.No.4) [Comprehension]

8. Explain the criteria for selecting fracturing fluid. Elaborate the method for enhancing fracture conductivity. (C.O.No.4) [Comprehension]

**Part C [Problem Solving Questions]**

**Answer any two Questions. Each question carries twenty marks. (2Qx20M=40M)**

9. A sandstone with a porosity of 0.15 containing 12 v% dolomite 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 1.2 feet 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? (C.O.No.2) [Application]

10. A 25 wt% HCl is needed to propagate wormholes 3 ft from a 0.328-ft radius wellbore in a dolomite formation (specific gravity 2.87) with a porosity of 0.16. The designed injection rate is 0.15 bbl/min-ft, the diffusion coefficient is 10(-9) m2/sec, and the density of the 25% HCl is 1.15 g/cm3. In linear core floods, 4 pore volumes is needed for wormhole breakthrough at the end of the core. Calculate the acid volume requirement. (C.O.No.2) [Application]

11. A sandstone at a depth of 10,000 ft has a Poison’s ratio of 0.25 and a poro-elastic constant of 0.72. The average density of the overburden formation is 165 lb/cf. 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 the breakdown pressure for the sandstone.

(C.O.No.4) [Application]