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**Presidency University**

**Bengaluru**

 **SCHOOL OF ENGINEERING**

**Make-Up Examinations, July 2024**

**Semester**: 5&7

**Course Code**: PET3011

**Course Name**: Well Intervention Technology

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

**Date**: 04/July/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. “Potential formation damage caused by matrix stimulation fluids”- Briefly elucidate the quoted statement. (C.O.No.4) [Comprehension]

8. Explain the below mention graph w.r.t. well stimulation and pressure draw down.



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

**Part C [Problem Solving Questions]**

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

9. A 28 wt% HCl is needed to propagate wormholes 3 ft from a 0.328-ft radius wellbore in a limestone formation (specific gravity 2.71) with a porosity of 0.15. The designed injection rate is 0.1 bbl/ min-ft, the diffusion coefficient is 109 m2=sec, and the density of the 28% HCl is 1:14 g=cm3. In linear core floods, 1.5 pore volume is needed for wormhole breakthrough at the end of the core. Calculate the acid volume requirement using (a) Daccord’s model and (b) the volumetric model.

 (C.O.No.2) [Application]

10. A carbonate at a depth of 12,000 ft has a Poison’s ratio of 0.3 and a poro-elastic constant of 0.75. The average density of the overburden formation is 178 lb/cf. The pore–pressure gradient in the sandstone is 0.35 psi/ft. Assuming a tectonic stress of 2,000 psi and a tensile strength of the sandstone of 1,500 psi, predict the breakdown pressure for the sandstone.

 (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]