PRACTICE EXAM

Difficulty: MEDIUM

Questions: 10

Computer Engineering Exam - Syed Kaab Surkhi Material

Instructions: Please answer all questions to the best of your ability. Show your work for problem-solving questions to receive partial credit.

Section 1: Multiple Choice (4 points each)

Instructions: Choose the best answer for each question.

Question 1: According to the provided material, which of the following courses is NOT listed as a "Relevant Course" that Syed Kaab Surkhi has taken?
A) COE 318 - Software Systems
B) ELE 404 - Electronic Circuits I
C) COE 538 - Microprocessor Systems
D) COE 201 - Linear Algebra

Question 2: Which of the following frameworks has Syed Kaab Surkhi NOT listed under his technical skills?
A) Flask
B) Node.js
C) Ruby on Rails
D) React.js

Question 3: According to the electric boundary conditions, what is true of the tangential component of the electric field at the boundary between two dielectrics?
A) It is always discontinuous.
B) It is always zero.
C) It is always continuous.
D) It depends on the surface charge density.

Question 4: Which of the following companies has Syed Kaab Surkhi NOT worked for?
A) Toronto MetRobotics
B) Momentum AI
C) Echolabs
D) Blackberry

Section 2: Short Answer (6 points each)

Instructions: Answer each question in 2-3 complete sentences.

Question 5: Describe Syed Kaab Surkhi's contributions to the Metropolitan Hyperloop project and identify the technologies he utilized.

Question 6: Briefly explain the concept of piezoresistivity and how it is related to the Wheatstone bridge circuit.

Question 7: Explain the concept of the electric polarization field in dielectric materials, including its relationship to electric flux density and electric susceptibility.

Section 3: Problem-Solving (10 points each)

Instructions: Provide detailed solutions for each problem. Show all your work.

Question 8: Considering Syed's experience in developing full-stack AI applications, describe a potential system architecture (frontend, backend, database) for a new AI-powered language learning tool, drawing upon technologies mentioned in the resume. Justify your choice of each technology.

Question 9: In the context of the Toronto MetRobotics project, explain how SRT and UDP were used for the 10-camera system. Why were both protocols implemented, and what are the advantages of each in this application?

Question 10: Imagine Syed is tasked with improving the electric field continuity at the boundary between two dielectric materials in a sensor application. Describe two approaches he could take to minimize discontinuities in the electric field at the boundary, considering the electric boundary conditions.