UNIVERSITY OF ALASKA FAIRBANKS

COLLEGE OF ENGINEERING & MINES

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

SPRING 2022

Student Name Jacob Guenther

Course Name	Course Number	Course Section	Course CRN	Examination
INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING	EE F102	F01	34544	QUIZ

Examination Date	Examination Day	Examination Time	Examination Venue	Number of Printed Pages
31 JAN 2022	MONDAY	10:00 - 10:15	DU 252	6

Number of Questions	Maximum Points	Examination Type	Materials Allowed?	Calculators Allowed?
1	50	CLOSED BOOK	NO	YES

Course Instructor
DR. MAHER AL-BADRI

Formulas you may need:

$$\text{Life (h)} = \frac{\text{Capacity (Ah)}}{\text{Drain (A)}}$$

$$P=VI$$

$$\eta=\frac{P_{out}}{P_{in}}$$

1 hp=746 W

$$\eta=\frac{P_{out}}{P_{out}+P_{loss}}$$

Problem QZ-2-1 — Points Distribution

A dc motor operates at 120 V.
The motor's full load is 10 hp.
The motor is used to operate a mechanical load which accounts for 75% of the motor full load.
The load draws a current of 50 A.

For this operating conditions:

(a) Determine the power, in watts, drawn by the load. (15)

(b) Determine the power, in watts, the motor draws from the electric power supply to operate the load. (15)

(c) Determine the efficiency of the motor at this operating condition. (10)

(d) Determine the total losses in the motor. (10)

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SOLUTION: