UNIVERSITY WEST

EXAMINATION

NIK400

Nätverksteknik för IoT och Industriell Kommunikation

Network Technology for IoT and Industrial Communication

Date	2024-01-09
Time	08:30 – 12:30
Examiner	Rashid Ali (HV)
Teacher	Rashid Ali (HV)
Visit	Ja, från kl. 09:30
Phone	0721765967
Permitted aid	None
Questions	5
Pages	6
Max points	30
Grading levels	15 for grade 3, 20 for grade 4, and 25 for grade 5
Date for result	latest 2024-03-04

State your anonymity code on each page in the question paper.

Good luck!

Theme 1: Industrial IoT and Network Communications

Question 1 (6p): Industry 4.0

a) What is the difference between Internet of Things and Industrial Internet of Things?

b) Write down the difference between Industry 3.0 and Industry 4.0?

c) Write down two Industry 4.0 related technologies and explain their main role in Industry 4.0?

Theme 1: Industrial IoT and Network Communications

Question 2 (6p): IoT and Network Communications

a) is chair a Thing? Write down at least two applications of a Smart Chair?

b) Write down the names of two of the most widespread and commonly used IoT application protocols?

c) Draw four layers of IoT and write the names of each layer?

Theme 1: Industrial IoT and Network Communications

Question 3 (6p): Positioning

a) Name the four terminologies used in tracking and wayfinding?

b) RSSI-based positioning is often unreliable due to the drops of the signal level by at least 75% if we double the distance between the object and the network node. Give at least one solution to enhance the accuracy in an RSSI-based positioning system?

c) Write down at least four tracking technologies for indoor use cases?

Theme 2: Robotics

Question 4 (6p):

a) What is an industrial robot and what are its advantages?

b) What is an industrial robot cell? And what is an industrial robot line?

c) Give an example of an industrial robot cell and an industrial robot line?

Theme 3: CAN Bus

Question 5 (6p):

a) What is the largest size of a CAN packet and what is bit-stuffing?

b) Twisted pair wires are often used for CAN networking. Describe which layers CAN standards work in an OSI network model?

c) What is CAN and which industries use CAN?