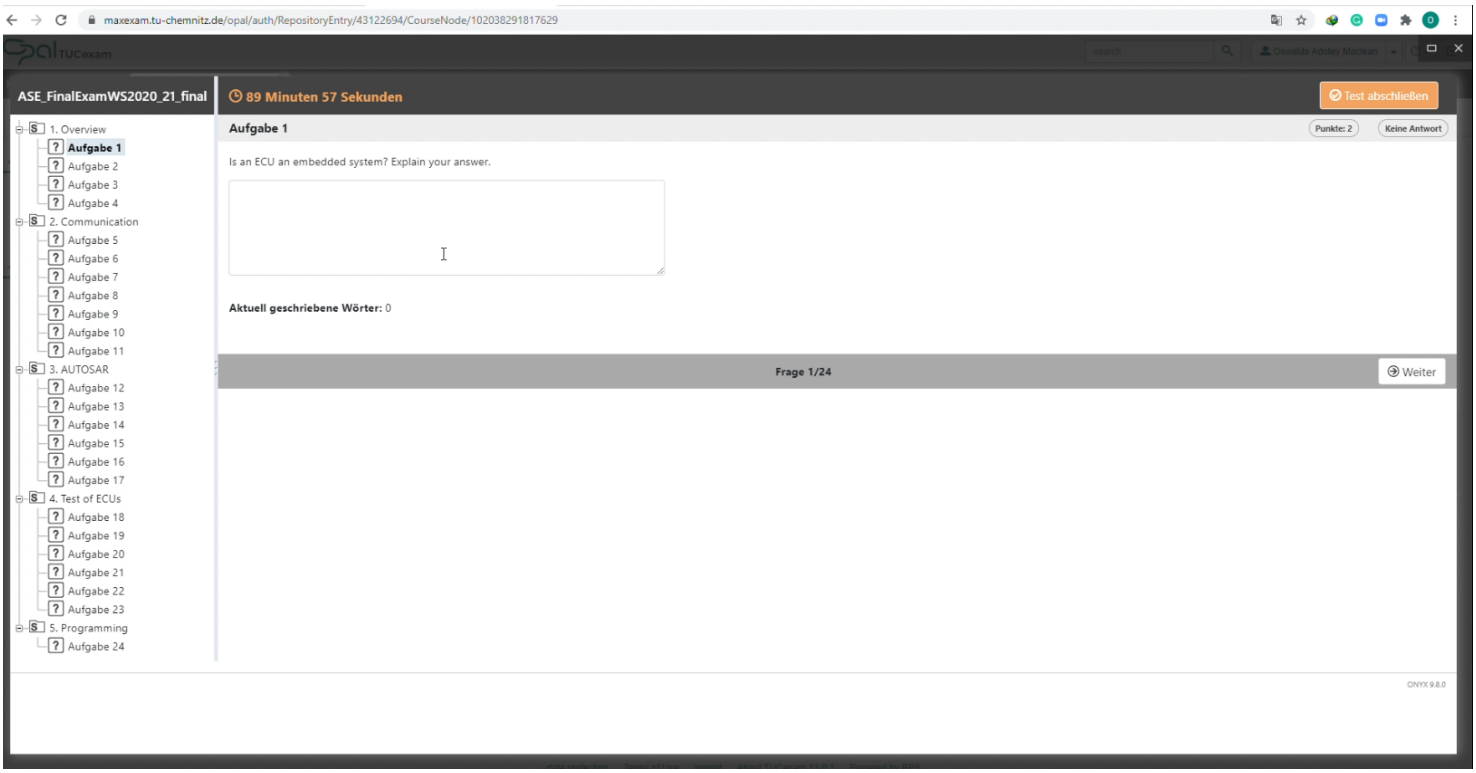
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ASE_FinalExamWS2020_21_final
89 Minuten 57 Sekunden
Test abschließen
1. Overview
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Aufgabe 18
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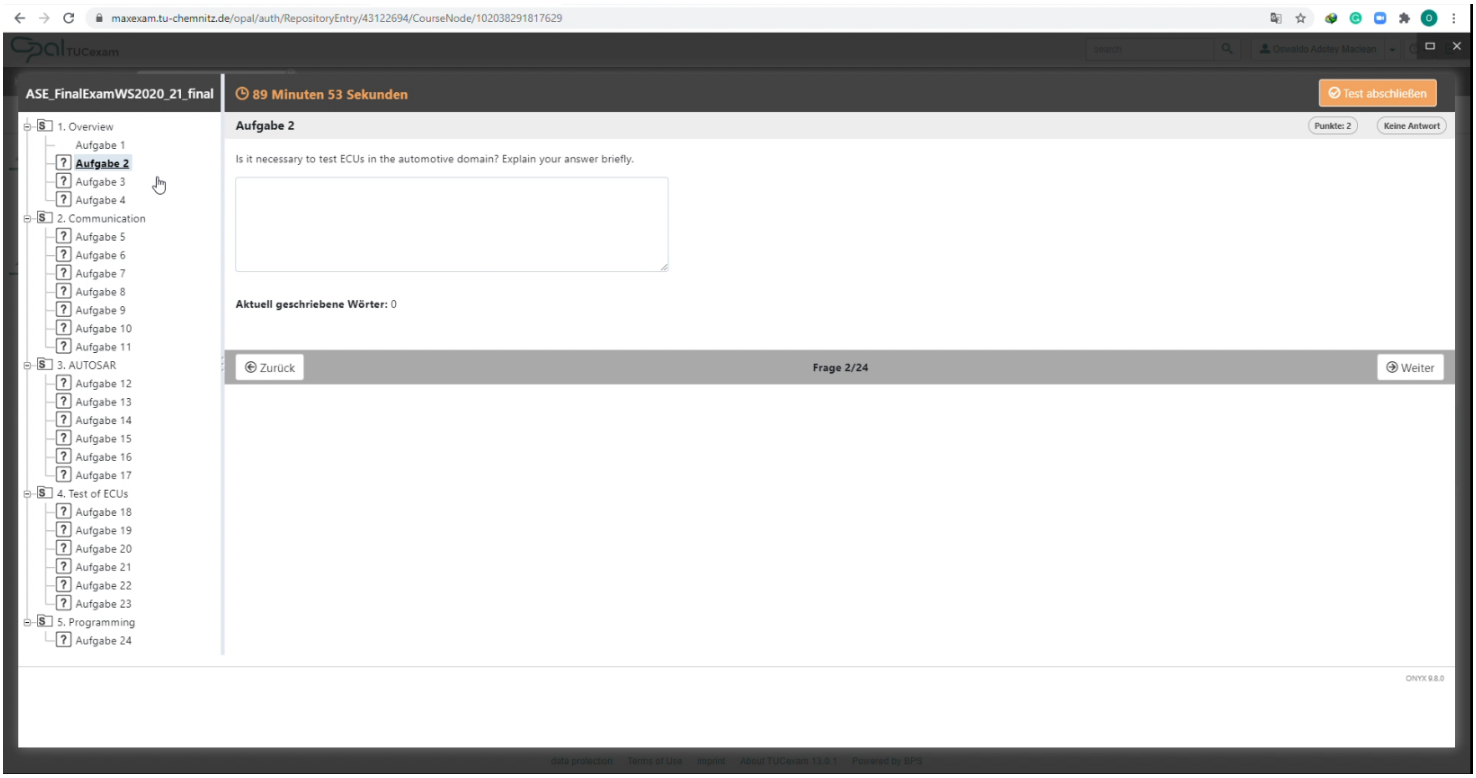
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 1
Punkte: 2
Keine Antwort
Is an ECU an embedded system? Explain your answer.
Aktuell geschriebene Wörter: 0
Frage 1/24
Weiter
ONYX 9.8.0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Test abschließen
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Aufgabe 17
4. Test of ECUs
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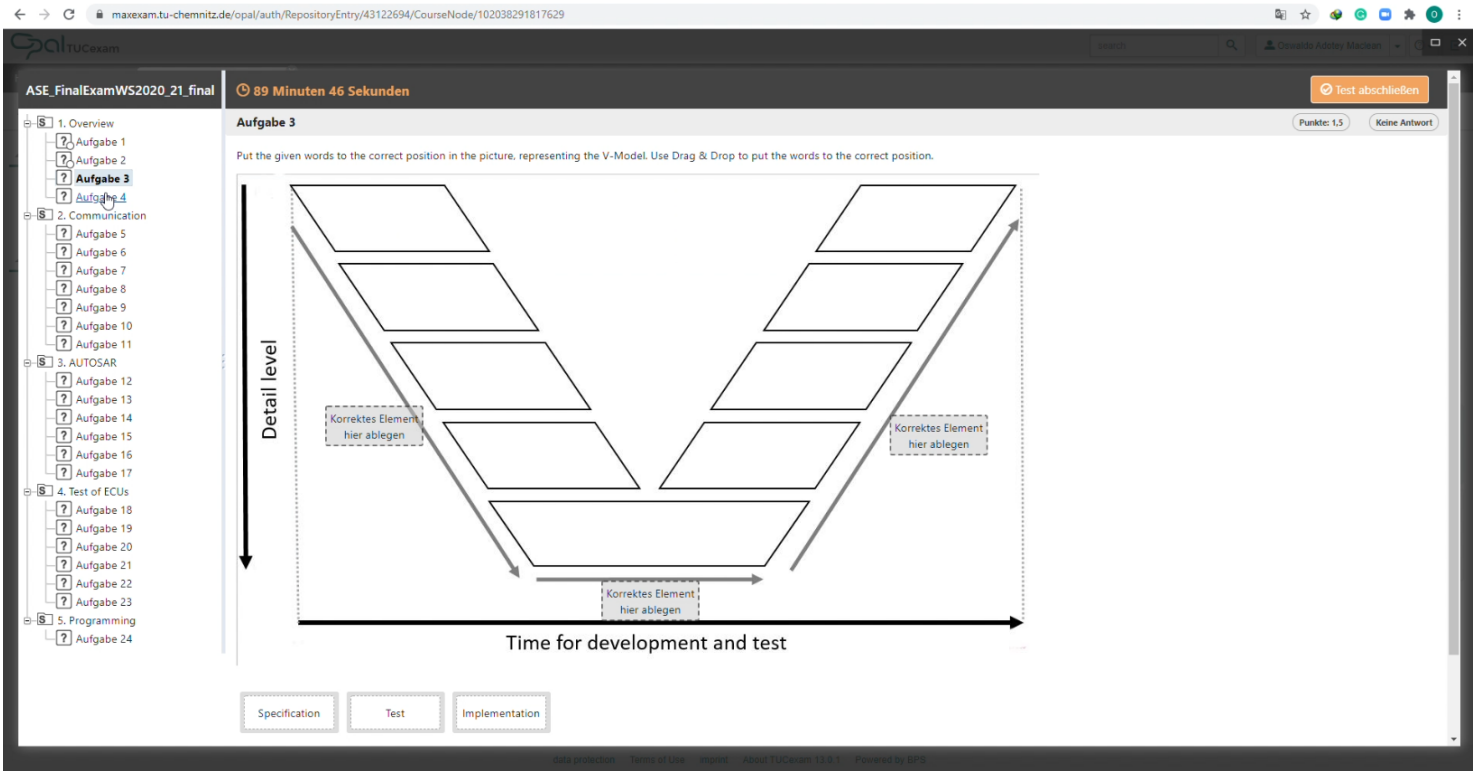
Aufgabe 21
Aufgabe 22
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 2
Punkte: 2
Keine Antwort
Is it necessary to test ECUs in the automotive domain? Explain your answer briefly.
Aktuell geschriebene Wörter: 0
Zurück
Frage 2/24
Weiter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Test abschließen
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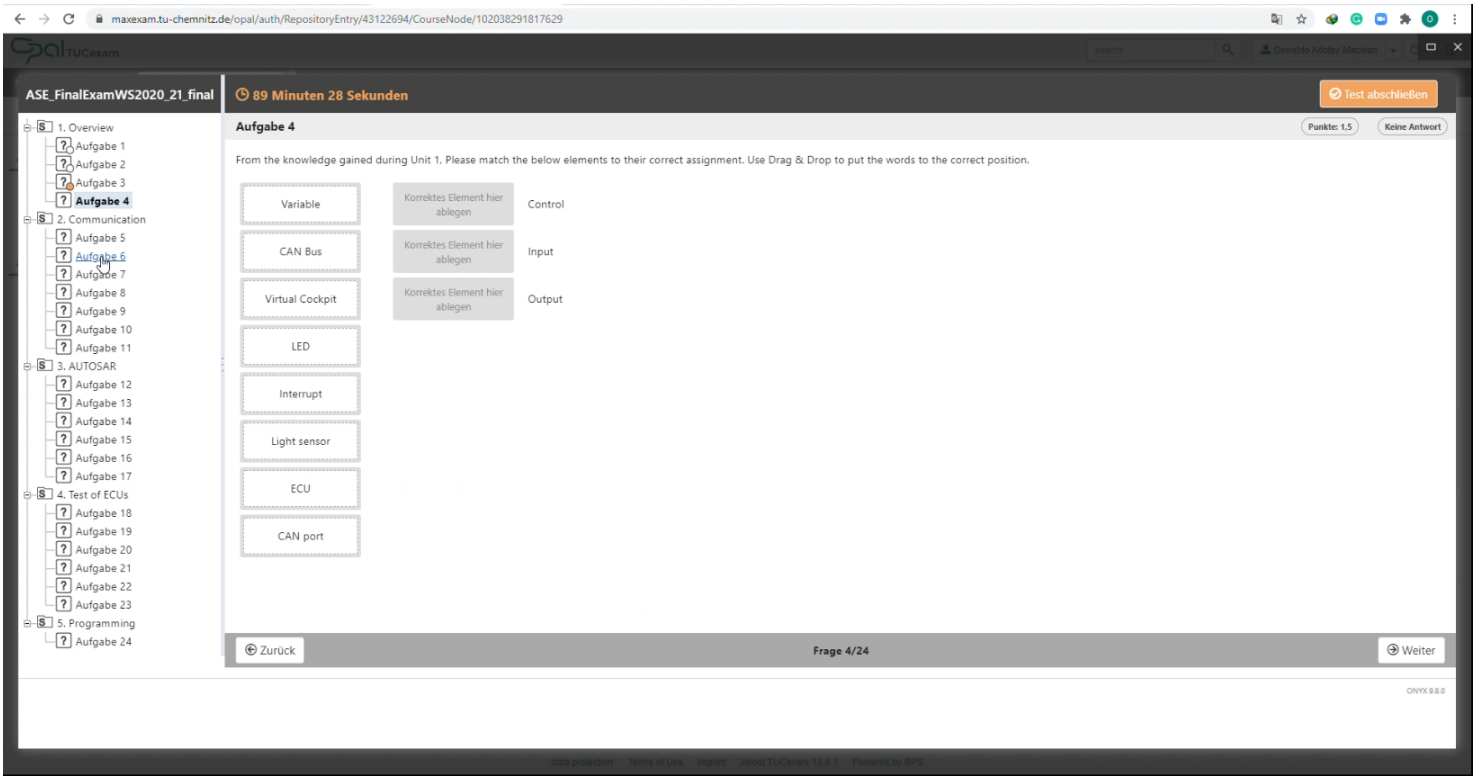
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 3
Punkte: 1,5
Keine Antwort
Put the given words to the correct position in the picture, representing the V-Model. Use Drag & Drop to put the words to the correct position.
Detail level
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Time for development and test
Specification
Test
Implementation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TUCexam
ASE_FinalExamWS2020_21_final
89 Minuten 28 Sekunden
Test abschließen
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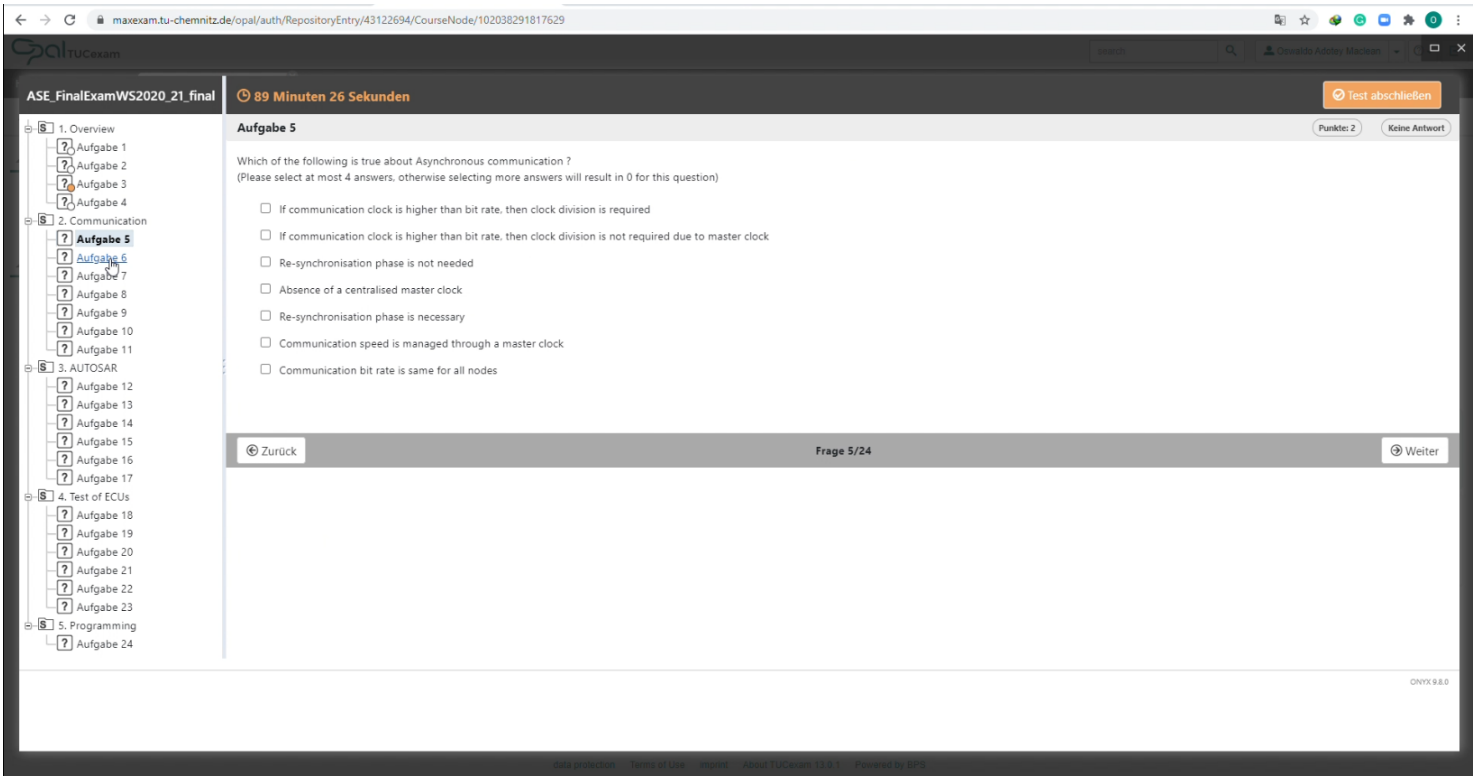
Aufgabe 22
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 4
Punkte: 1,5
Keine Antwort
From the knowledge gained during Unit 1, Please match the below elements to their correct assignment. Use Drag & Drop to put the words to the correct position.
Variable
CAN Bus
Virtual Cockpit
LED
Interrupt
Light sensor
ECU
CAN port
Korrektes Element hier ablegen
Control
Korrektes Element hier ablegen
Input
Korrektes Element hier ablegen
Output
Zurück
Frage 4/24
Weiter
ONYX 9.8.0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89 Minuten 26 Sekunden
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Aufgabe 20
Aufgabe 21
Aufgabe 22
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 5
Punkte: 2
Keine Antwort
Which of the following is true about Asynchronous communication ?
(Please select at most 4 answers, otherwise selecting more answers will result in 0 for this question)
If communication clock is higher than bit rate, then clock division is required
If communication clock is higher than bit rate, then clock division is not required due to master clock
Re-synchronisation phase is not needed
Absence of a centralised master clock
Re-synchronisation phase is necessary
Communication speed is managed through a master clock
Communication bit rate is same for all nodes
Zurück
Frage 5/24
Weiter
ONYX 9.8.0
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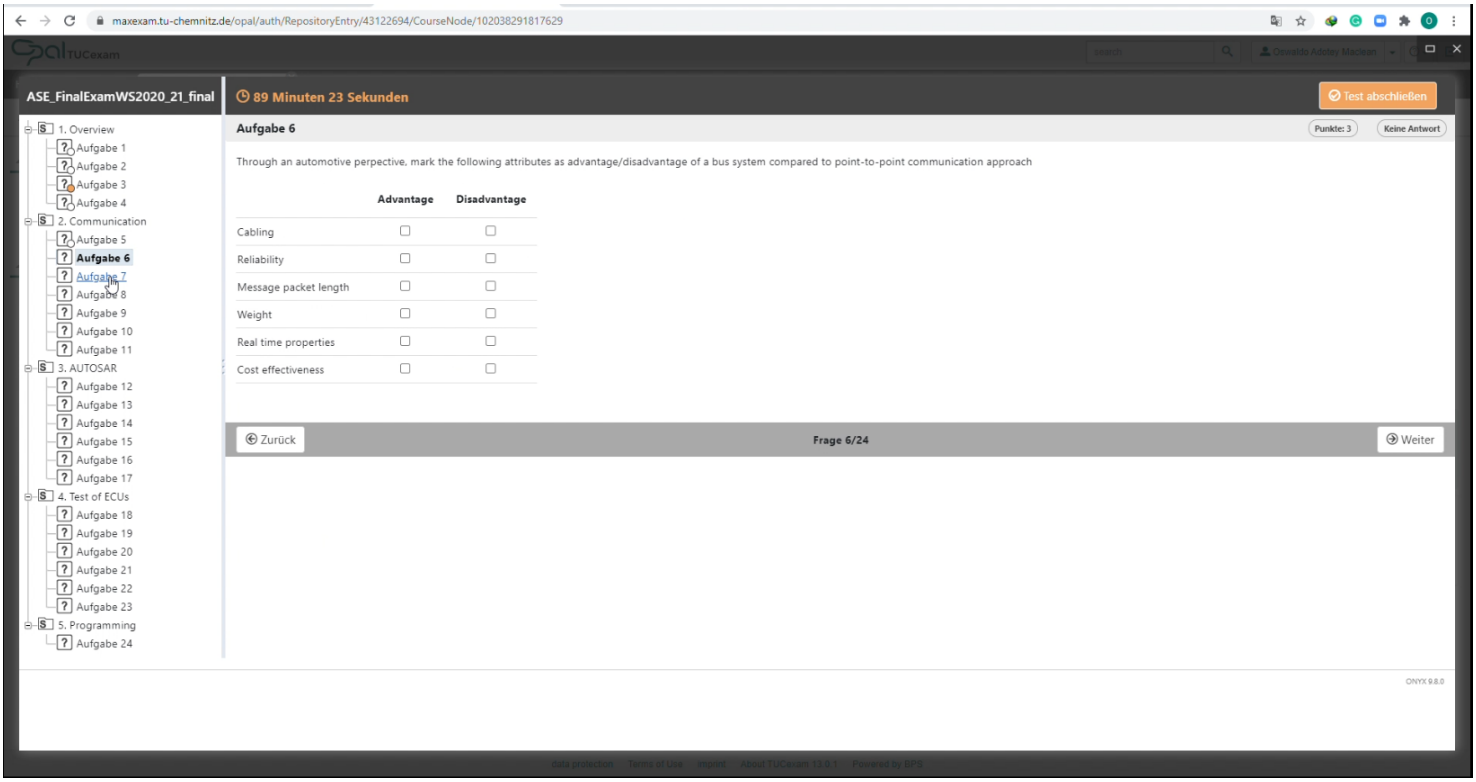
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89 Minuten 23 Sekunden
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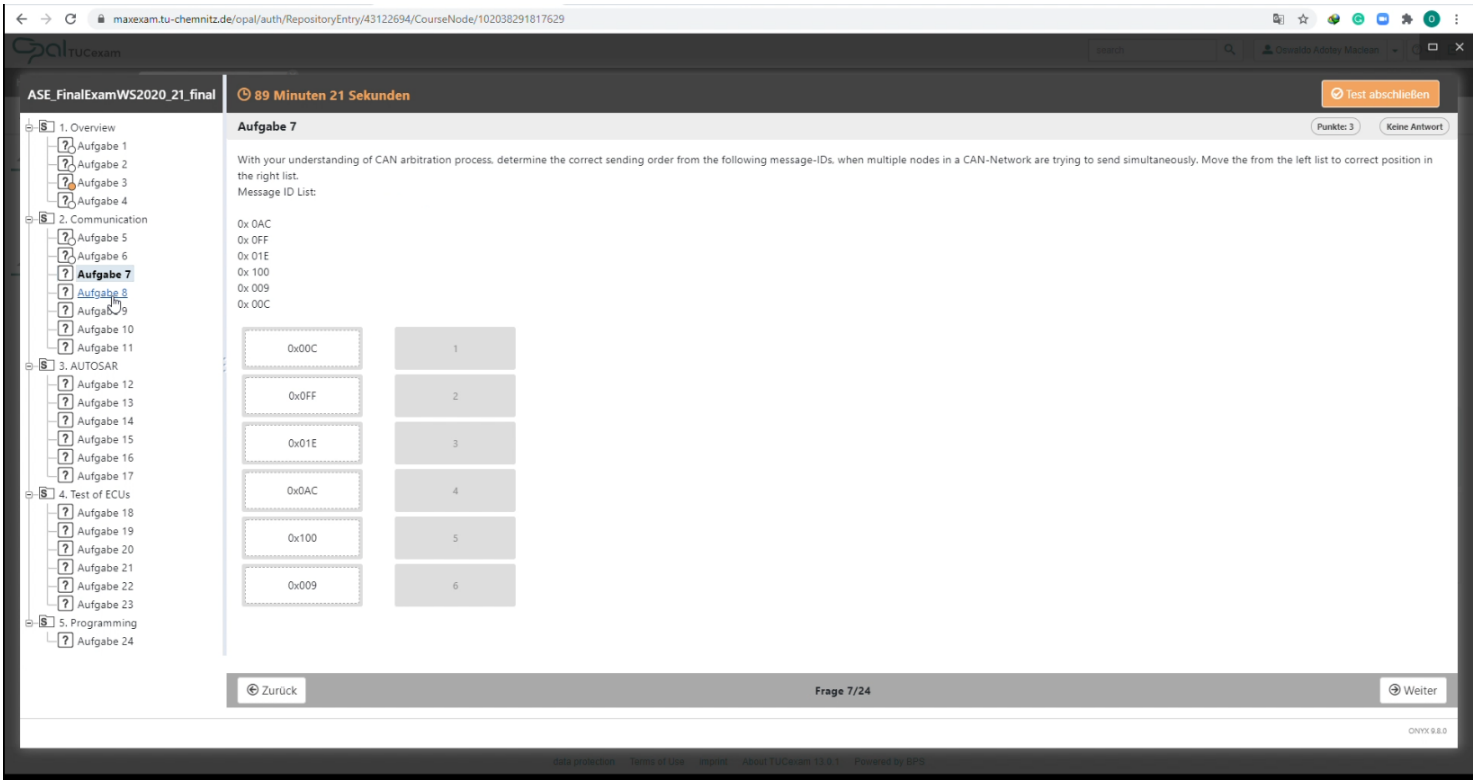
Aufgabe 24
Aufgabe 6
Punkte: 3
Keine Antwort
Through an automotive perpective, mark the following attributes as advantage/disadvantage of a bus system compared to point-to-point communication approach
Advantage
Disadvantage
Cabling
Reliability
Message packet length
Weight
Real time properties
Cost effectiveness
Zurück
Frage 6/24
Weiter
ONYX 9.8.0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89 Minuten 21 Sekunden
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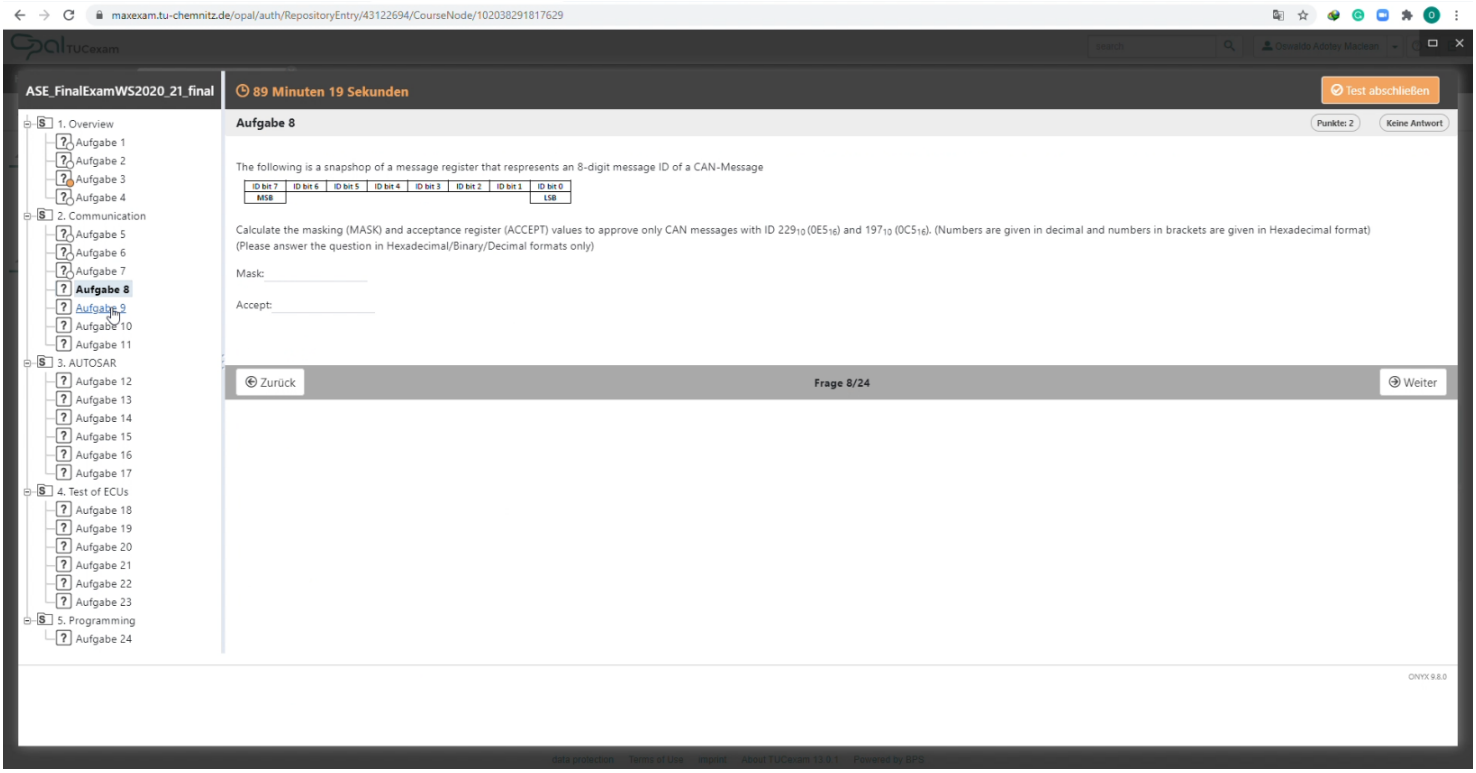
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 7
Punkte: 3
Keine Antwort
With your understanding of CAN arbitration process, determine the correct sending order from the following message-IDs, when multiple nodes in a CAN-Network are trying to send simultaneously. Move the from the left list to correct position in the right list.
Message ID List:
0x 0AC
0x 0FF
0x 01E
0x 100
0x 009
0x 00C
0x00C
0x0FF
0x01E
0x0AC
0x100
0x009
1
2
3
4
5
6
Zurück
Frage 7/24
Weiter
ONYX 9.8.0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89 Minuten 19 Sekunden
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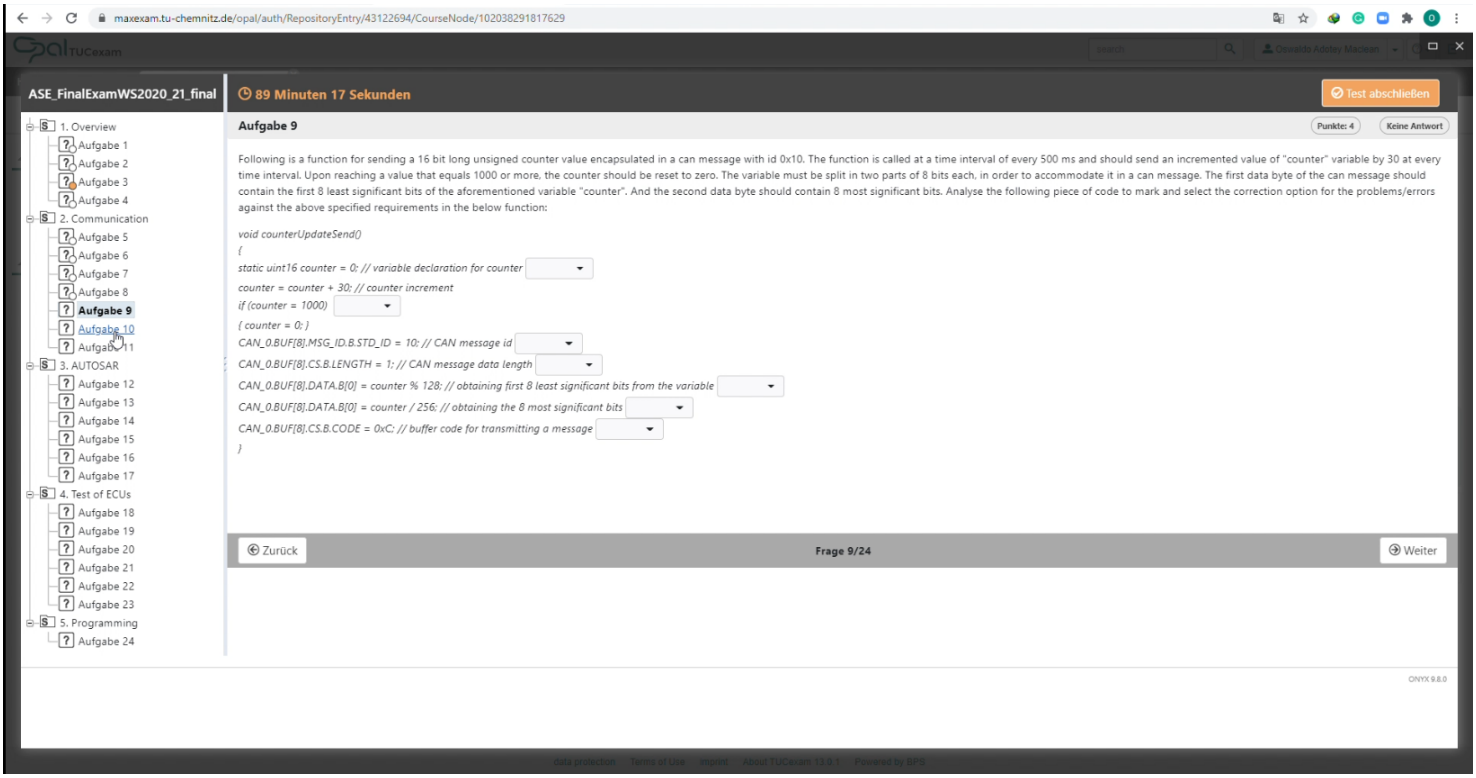
Aufgabe 8
Punkte: 2
Keine Antwort
The following is a snapshop of a message register that respresents an 8-digit message ID of a CAN-Message
ID bit 7
ID bit 6
ID bit 5
ID bit 4
ID bit 3
ID bit 2
ID bit 1
ID bit 0
MSB
LSB
Calculate the masking (MASK) and acceptance register (ACCEPT) values to approve only CAN messages with ID $229_{10}$ ($0E5_{16}$) and $197_{10}$ ($0C5_{16}$). (Numbers are given in decimal and numbers in brackets are given in Hexadecimal format)
(Please answer the question in Hexadecimal/Binary/Decimal formats only)
Mask:
Accept:
Zurück
Frage 8/24
Weiter
ONYX 9.8.0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Aufgabe 23
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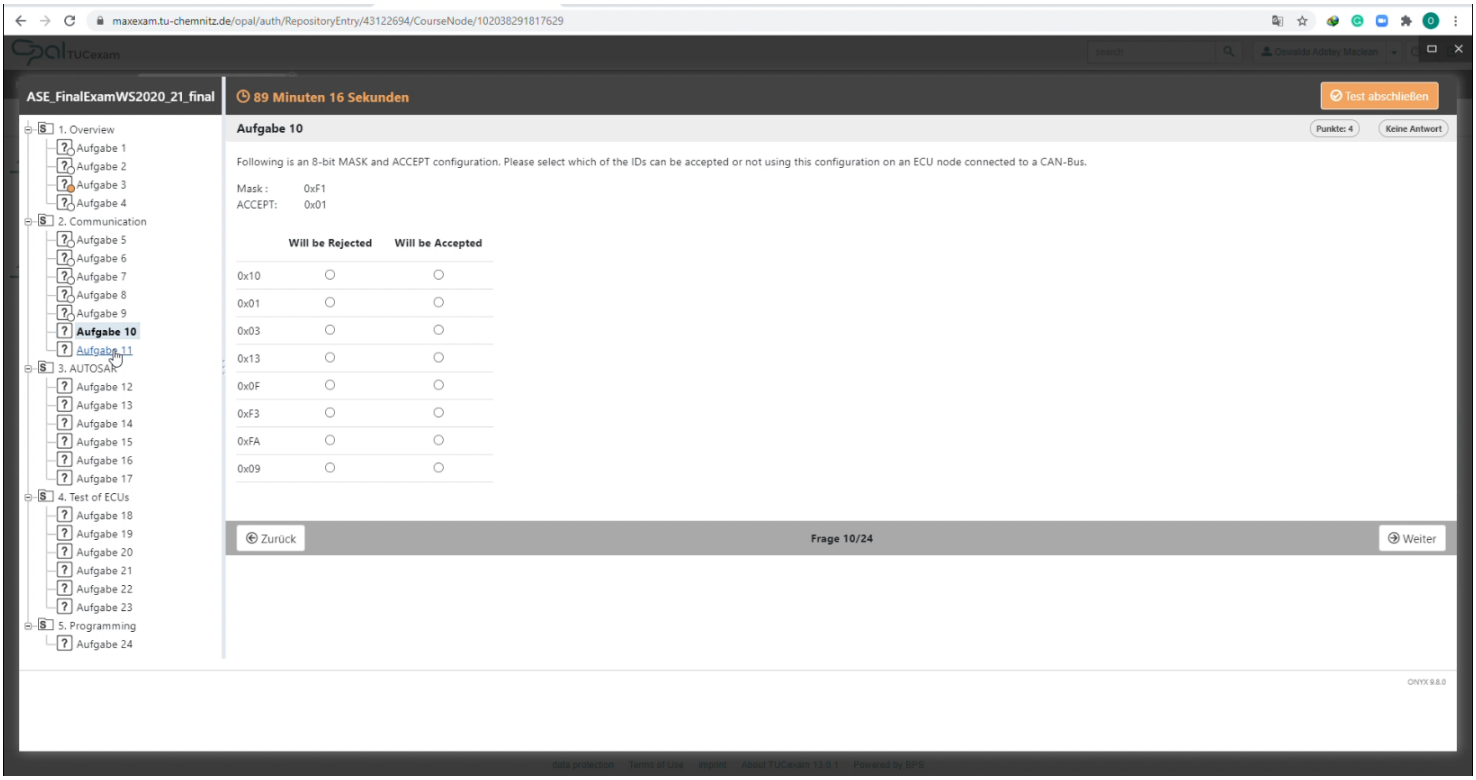
Aufgabe 24
Aufgabe 9
Punkte: 4
Keine Antwort
Following is a function for sending a 16 bit long unsigned counter value encapsulated in a can message with id 0x10. The function is called at a time interval of every 500 ms and should send an incremented value of "counter" variable by 30 at every time interval. Upon reaching a value that equals 1000 or more, the counter should be reset to zero. The variable must be split in two parts of 8 bits each, in order to accommodate it in a can message. The first data byte of the can message should contain the first 8 least significant bits of the aforementioned variable "counter". And the second data byte should contain 8 most significant bits. Analyse the following piece of code to mark and select the correction option for the problems/errors against the above specified requirements in the below function:
void counterUpdateSend()
{
static uint16 counter = 0; // variable declaration for counter
counter = counter + 30; // counter increment
if (counter = 1000)
{ counter = 0; }
CAN_0.BUF[8].MSG_ID.B.STD_ID = 10; // CAN message id
CAN_0.BUF[8].CS.B.LENGTH = 1; // CAN message data length
CAN_0.BUF[8].DATA.B[0] = counter % 128; // obtaining first 8 least significant bits from the variable
CAN_0.BUF[8].DATA.B[0] = counter / 256; // obtaining the 8 most significant bits
CAN_0.BUF[8].CS.B.CODE = 0xC; // buffer code for transmitting a message
}
Zurück
Frage 9/24
Weiter
ONYX 9.8.0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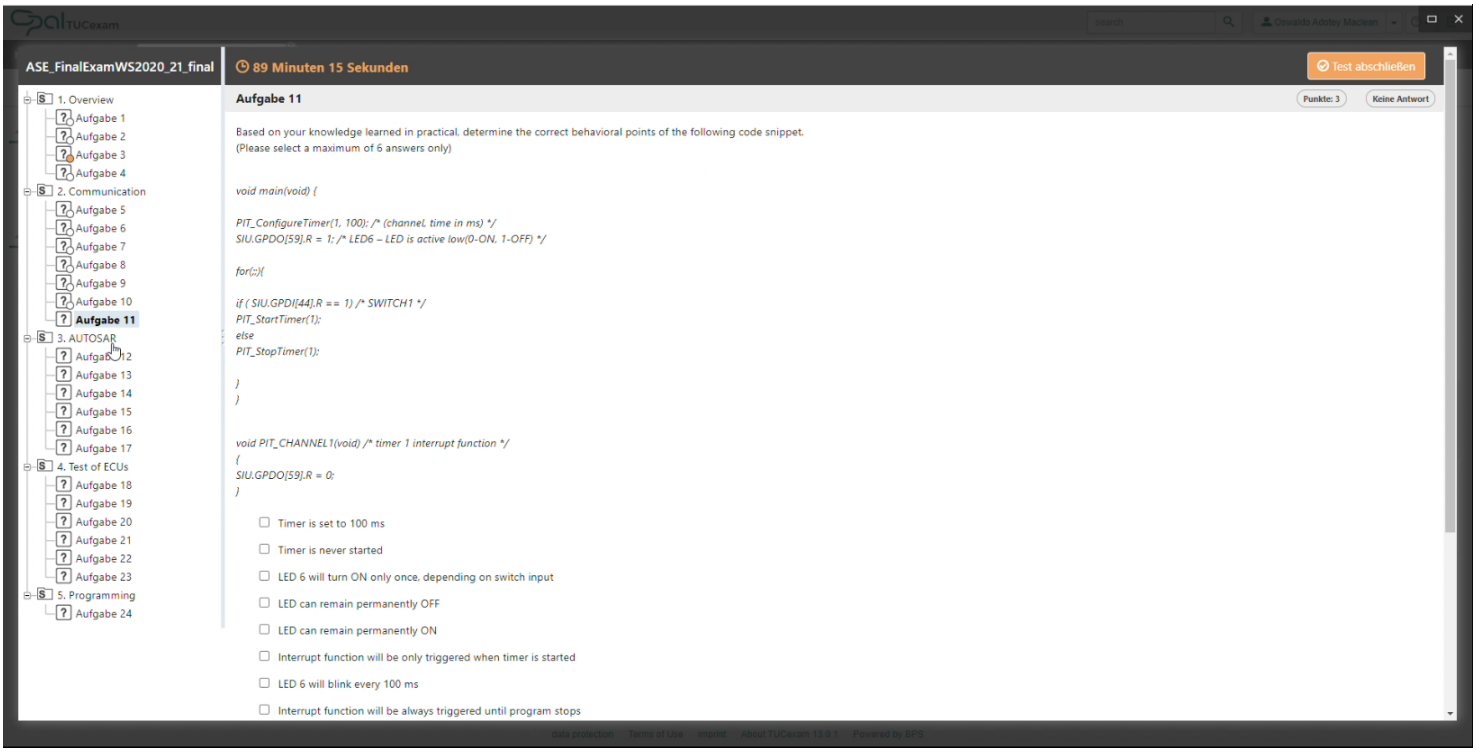
Aufgabe 10
Punkte: 4
Keine Antwort
Following is an 8-bit MASK and ACCEPT configuration. Please select which of the IDs can be accepted or not using this configuration on an ECU node connected to a CAN-Bus.
Mask : 0xF1
ACCEPT: 0x01
Will be Rejected
Will be Accepted
0x10
0x01
0x03
0x13
0x0F
0xF3
0xFA
0x09
Zurück
Frage 10/24
Weiter
ONYX 9.8.0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89 Minuten 15 Sekunden
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Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 11
Punkte: 3
Keine Antwort
Based on your knowledge learned in practical, determine the correct behavioral points of the following code snippet.
(Please select a maximum of 6 answers only)
void main(void) {
PIT_ConfigureTimer(1, 100); /* channel time in ms) */
SIU.GPDO[59].R = 1; /* LED6 – LED is active low(0-ON, 1-OFF) */
for(;;){
if ( SIU.GPDI[44].R == 1) /* SWITCH1 */
PIT_StartTimer(1);
else
PIT_StopTimer(1);
}
}
void PIT_CHANNEL1(void) /* timer 1 interrupt function */
{
SIU.GPDO[59].R = 0;
}
Timer is set to 100 ms
Timer is never started
LED 6 will turn ON only once, depending on switch input
LED can remain permanently OFF
LED can remain permanently ON
Interrupt function will be only triggered when timer is started
LED 6 will blink every 100 ms
Interrupt function will be always triggered until program stops
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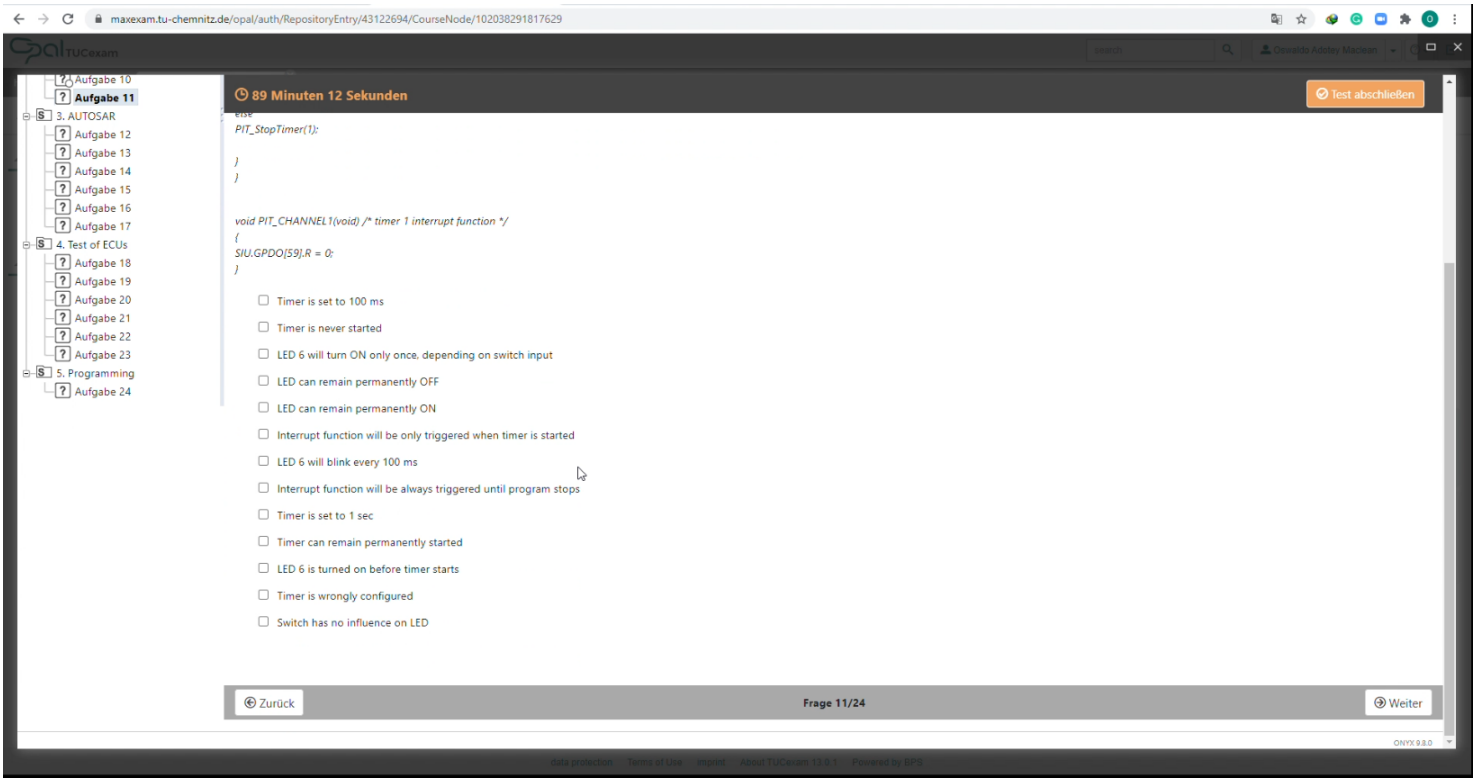
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Aufgabe 10
Aufgabe 11
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4. Test of ECUs
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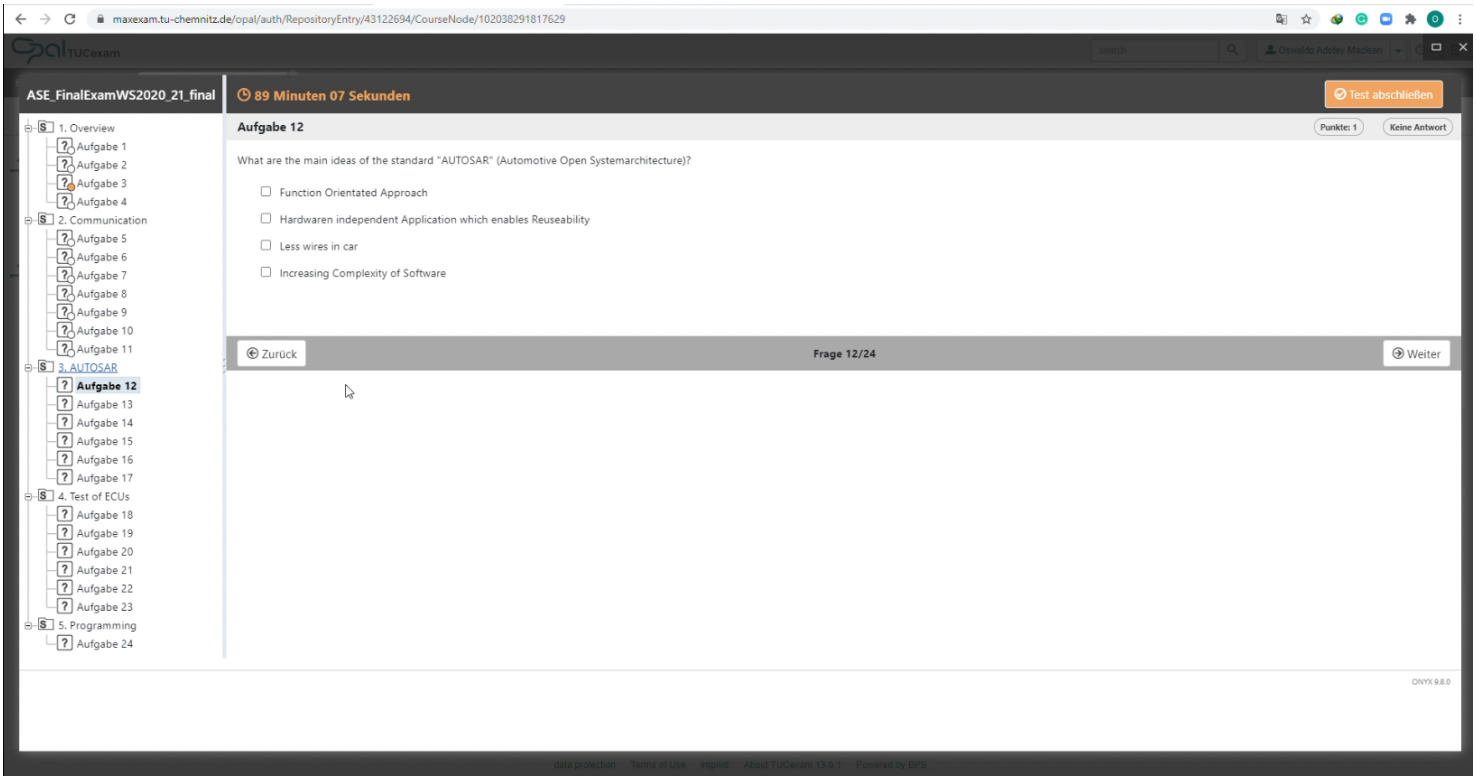
Aufgabe 22
Aufgabe 23
5. Programming
Aufgabe 24
89 Minuten 12 Sekunden
Test abschließen
else
PIT_StopTimer(1);
}
}
void PIT_CHANNEL1(void) /* timer 1 interrupt function */
{
SIU.GPDO[59].R = 0;
}
Timer is set to 100 ms
Timer is never started
LED 6 will turn ON only once, depending on switch input
LED can remain permanently OFF
LED can remain permanently ON
Interrupt function will be only triggered when timer is started
LED 6 will blink every 100 ms
Interrupt function will be always triggered until program stops
Timer is set to 1 sec
Timer can remain permanently started
LED 6 is turned on before timer starts
Timer is wrongly configured
Switch has no influence on LED
Zurück
Frage 11/24
Weiter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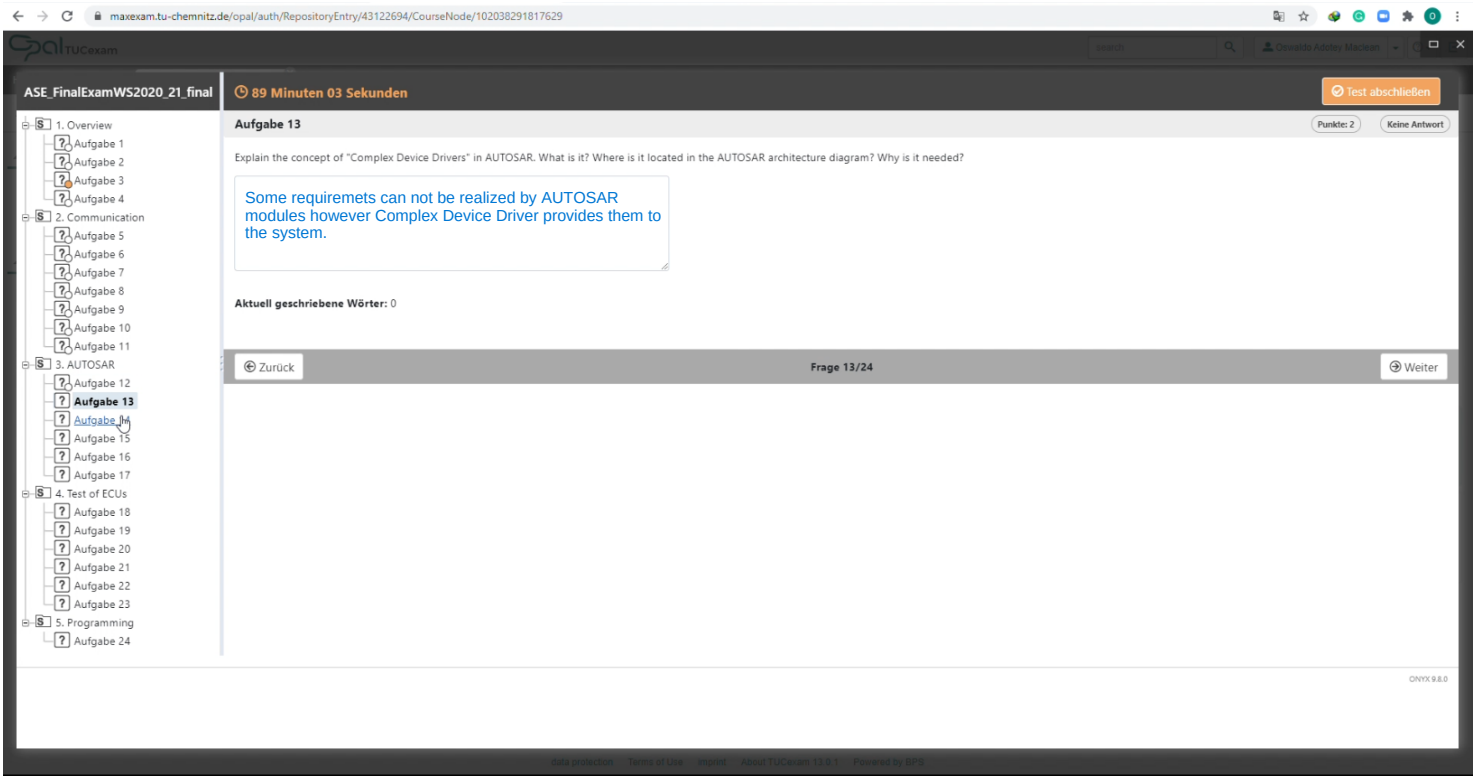
Aufgabe 12
Punkte: 1
Keine Antwort
What are the main ideas of the standard "AUTOSAR" (Automotive Open Systemarchitecture)?
Function Orientated Approach
Hardwaren independent Application which enables Reuseability
Less wires in car
Increasing Complexity of Software
Zurück
Frage 12/24
Weiter
ONYX 9.8.0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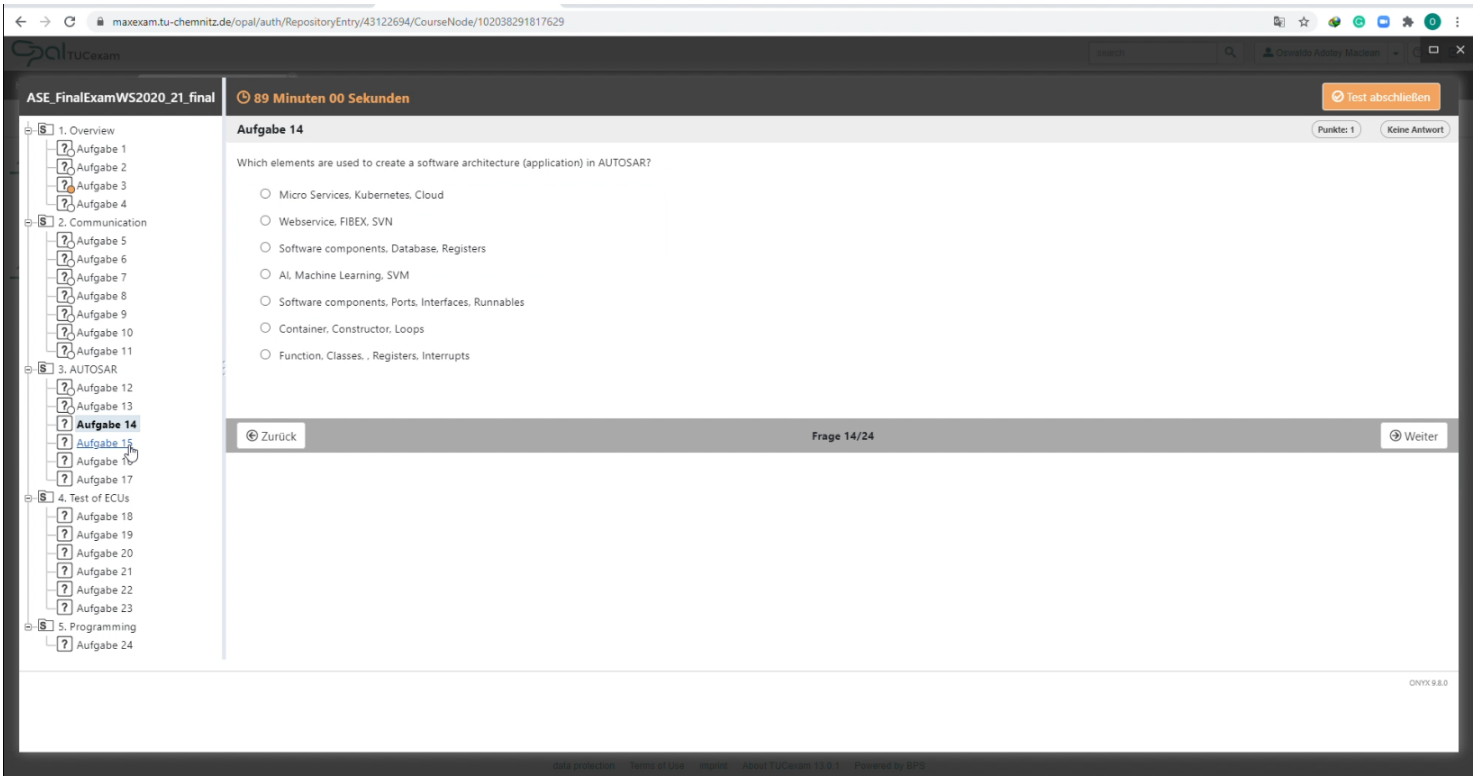
Punkte: 2
Keine Antwort
Explain the concept of "Complex Device Drivers" in AUTOSAR. What is it? Where is it located in the AUTOSAR architecture diagram? Why is it needed?
Some requiremets can not be realized by AUTOSAR modules however Complex Device Driver provides them to the system.
Aktuell geschriebene Wörter: 0
Zurück
Frage 13/24
Weiter
ONYX 9.8.0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Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 14
Punkte: 1
Keine Antwort
Which elements are used to create a software architecture (application) in AUTOSAR?
Micro Services, Kubernetes, Cloud
Webservice, FIBEX, SVN
Software components, Database, Registers
AI, Machine Learning, SVM
Software components, Ports, Interfaces, Runnables
Container, Constructor, Loops
Function, Classes. , Registers, Interrupts
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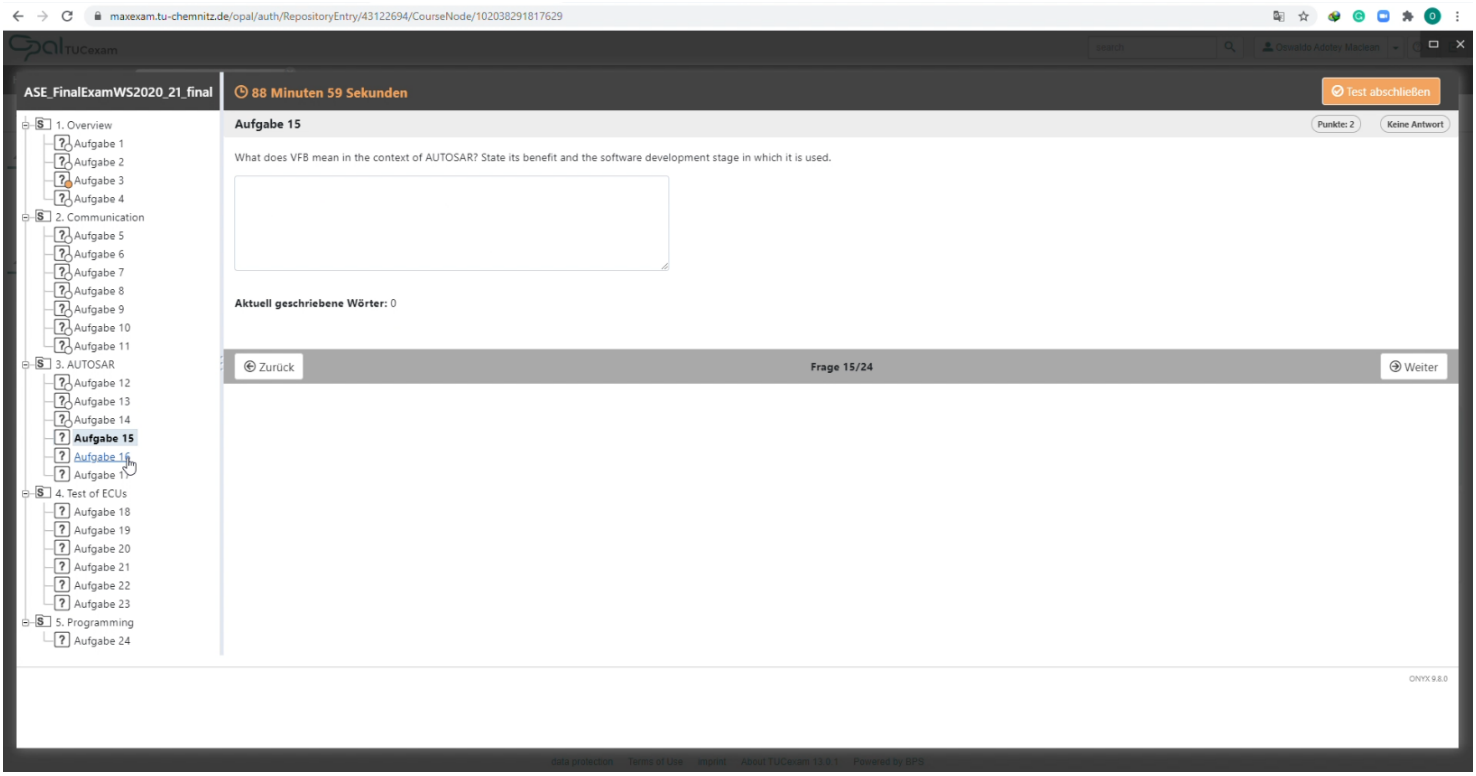
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Punkte: 2
Keine Antwort
What does VFB mean in the context of AUTOSAR? State its benefit and the software development stage in which it is used.
Aktuell geschriebene Wörter: 0
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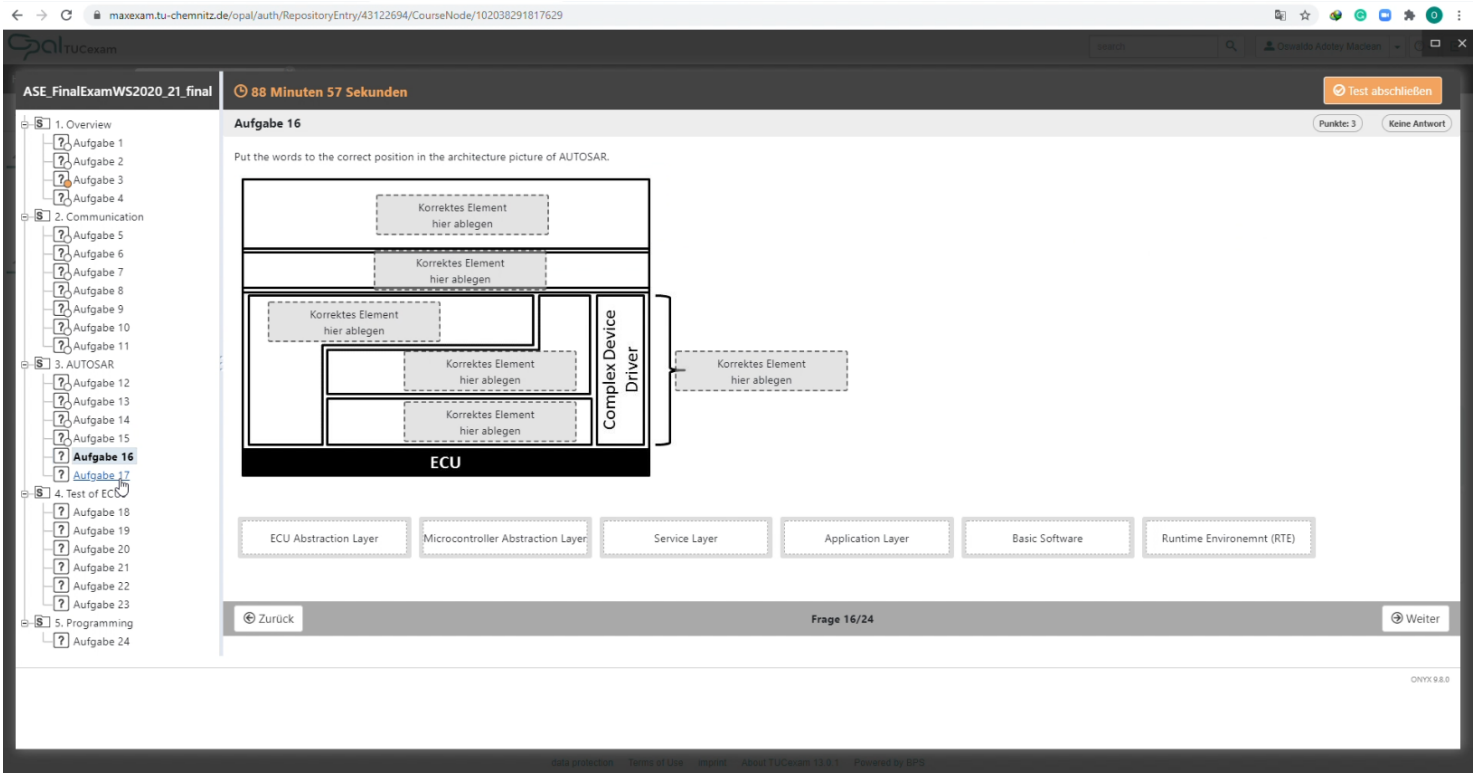
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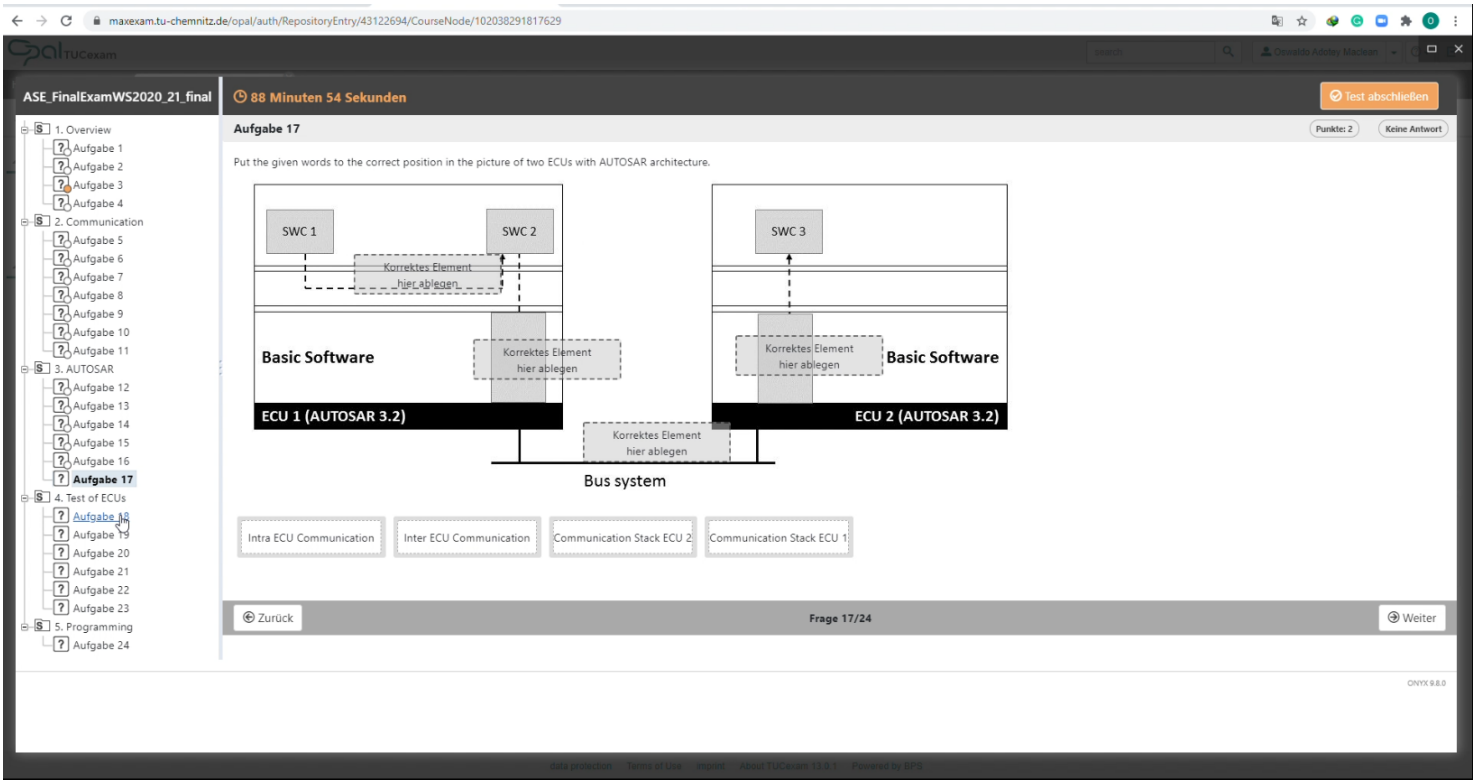
5. Programming
Aufgabe 24
Aufgabe 16
Punkte: 3
Keine Antwort
Put the words to the correct position in the architecture picture of AUTOSAR.
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Complex Device Driver
Korrektes Element hier ablegen
ECU
ECU Abstraction Layer
Microcontroller Abstraction Layer
Service Layer
Application Layer
Basic Software
Runtime Environemnt (RTE)
Zurück
Frage 16/24
Weiter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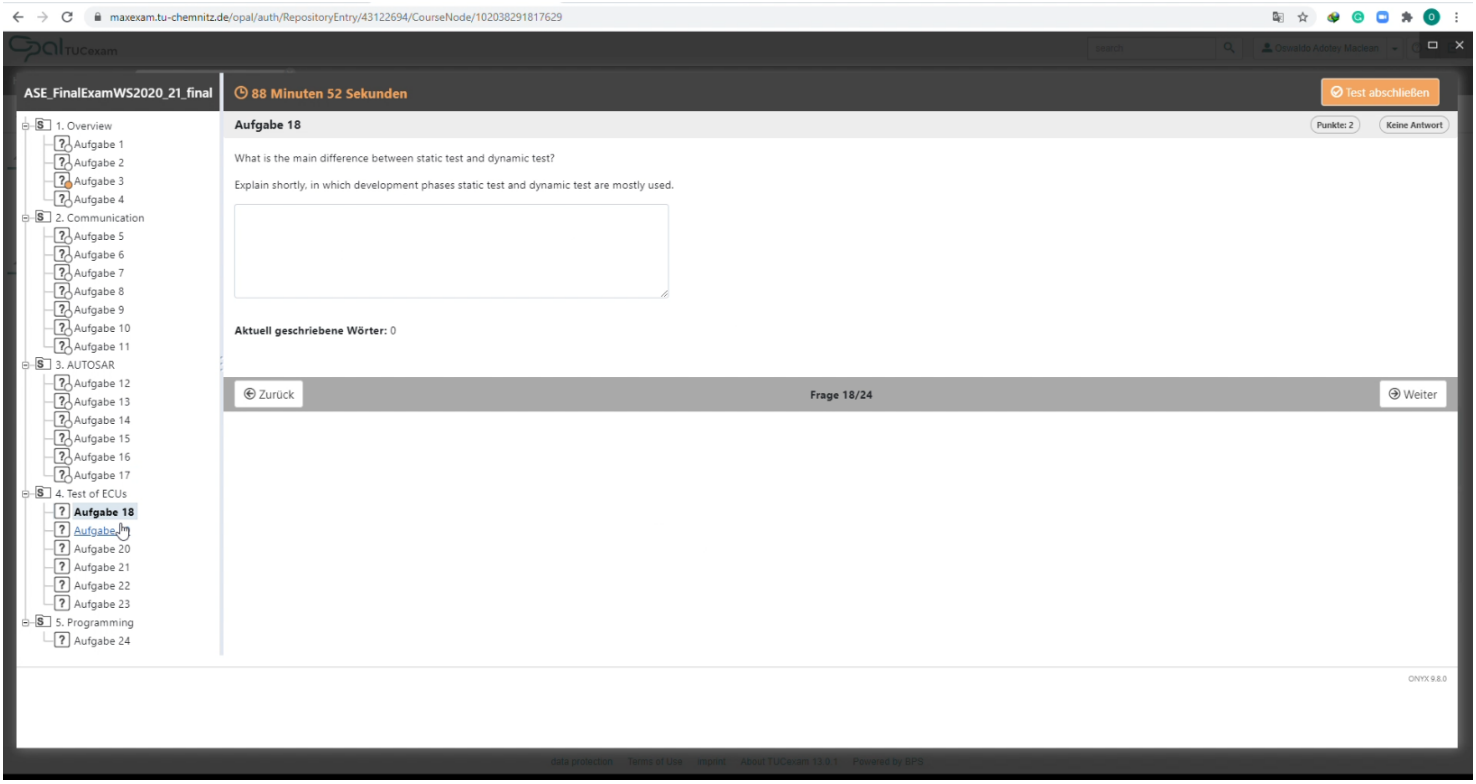
Punkte: 2
Keine Antwort
Put the given words to the correct position in the picture of two ECUs with AUTOSAR architecture.
SWC 1
SWC 2
SWC 3
Korrektes Element hier ablegen
Basic Software
Basic Software
ECU 1 (AUTOSAR 3.2)
ECU 2 (AUTOSAR 3.2)
Bus system
Intra ECU Communication
Inter ECU Communication
Communication Stack ECU 2
Communication Stack ECU 1
Zurück
Frage 17/24
Weiter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Punkte: 2
Keine Antwort
What is the main difference between static test and dynamic test?
Explain shortly, in which development phases static test and dynamic test are mostly used.
Aktuell geschriebene Wörter: 0
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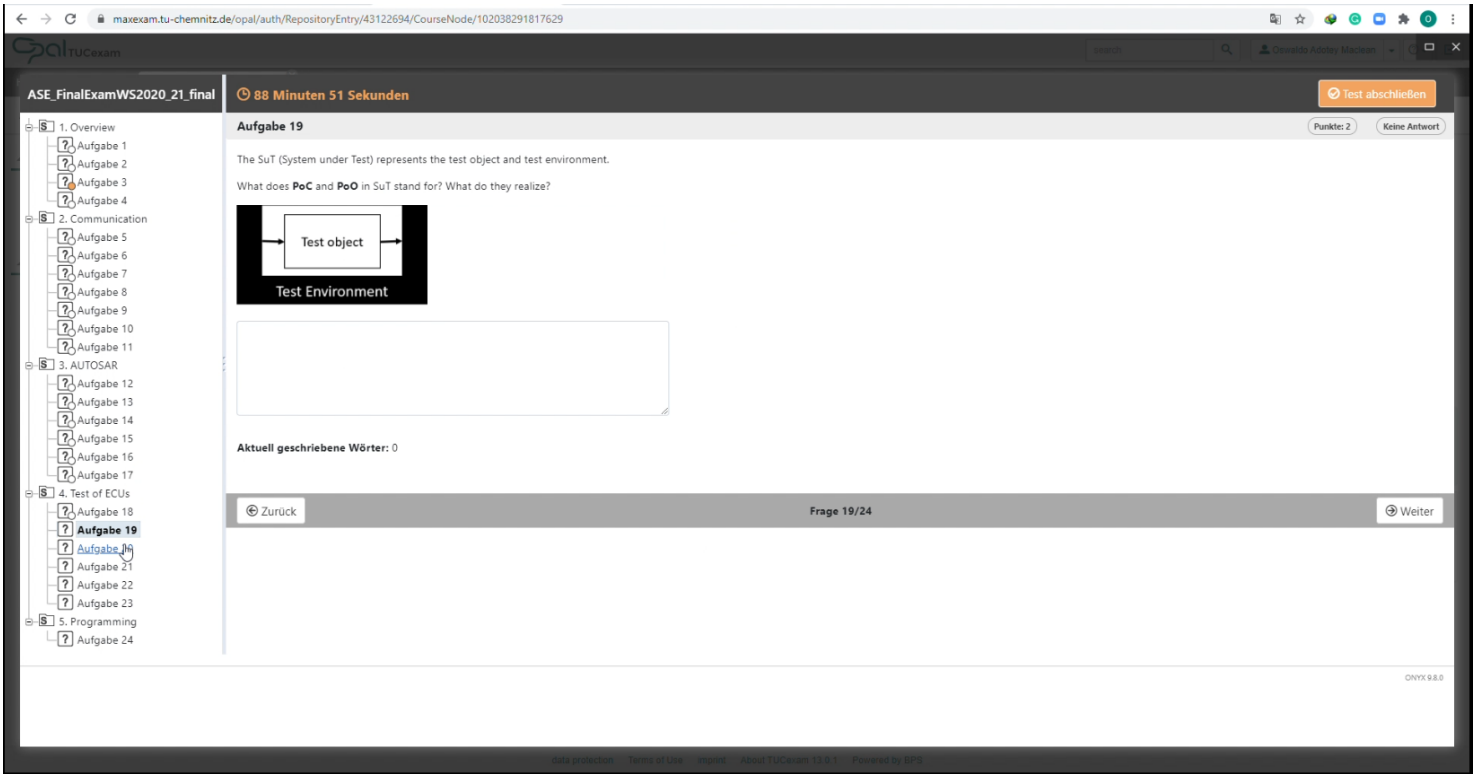
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Punkte: 2
Keine Antwort
The SuT (System under Test) represents the test object and test environment.
What does PoC and PoO in SuT stand for? What do they realize?
Test object
Test Environment
Aktuell geschriebene Wörter: 0
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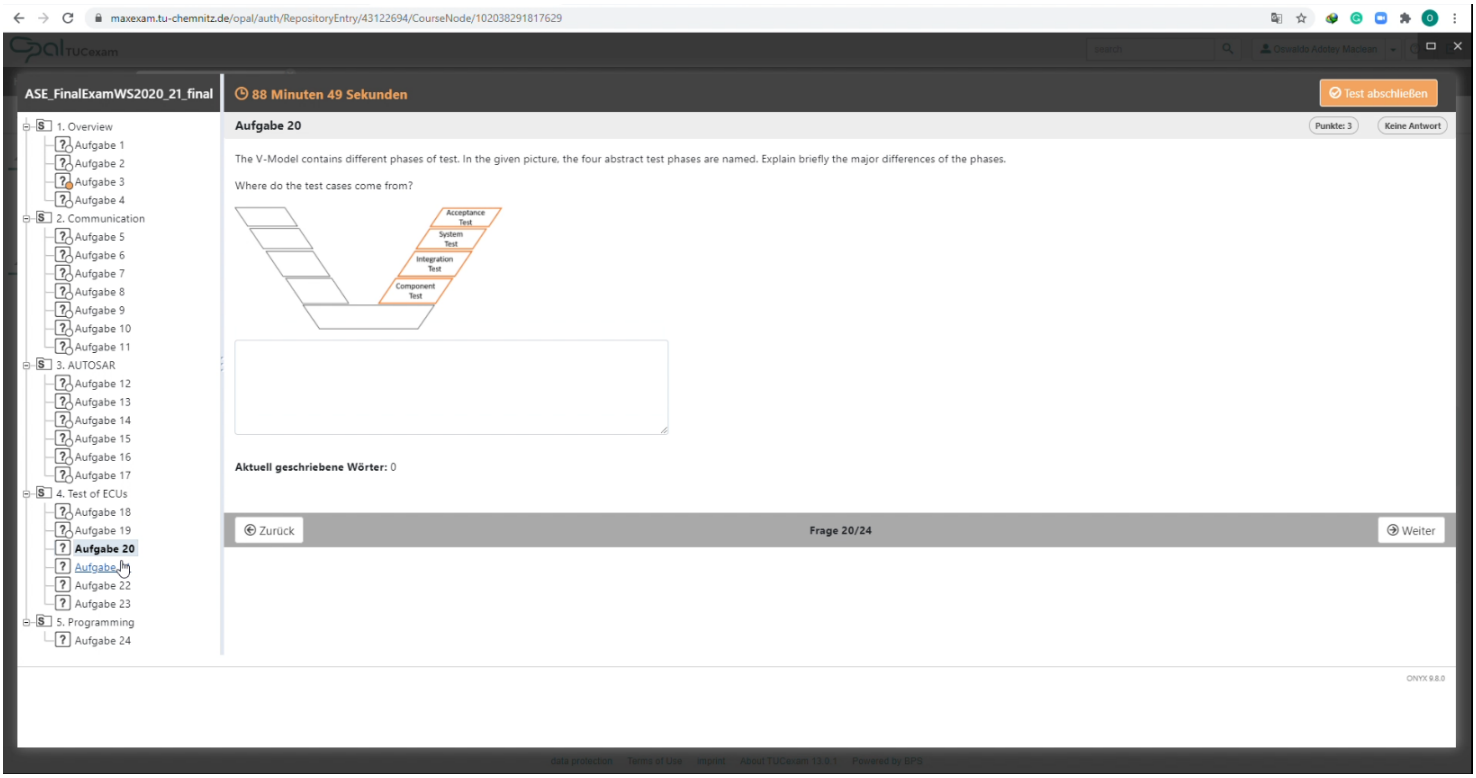
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Punkte: 3
Keine Antwort
The V-Model contains different phases of test. In the given picture, the four abstract test phases are named. Explain briefly the major differences of the phases.
Where do the test cases come from?
Acceptance Test
System Test
Integration Test
Component Test
Aktuell geschriebene Wörter: 0
Zurück
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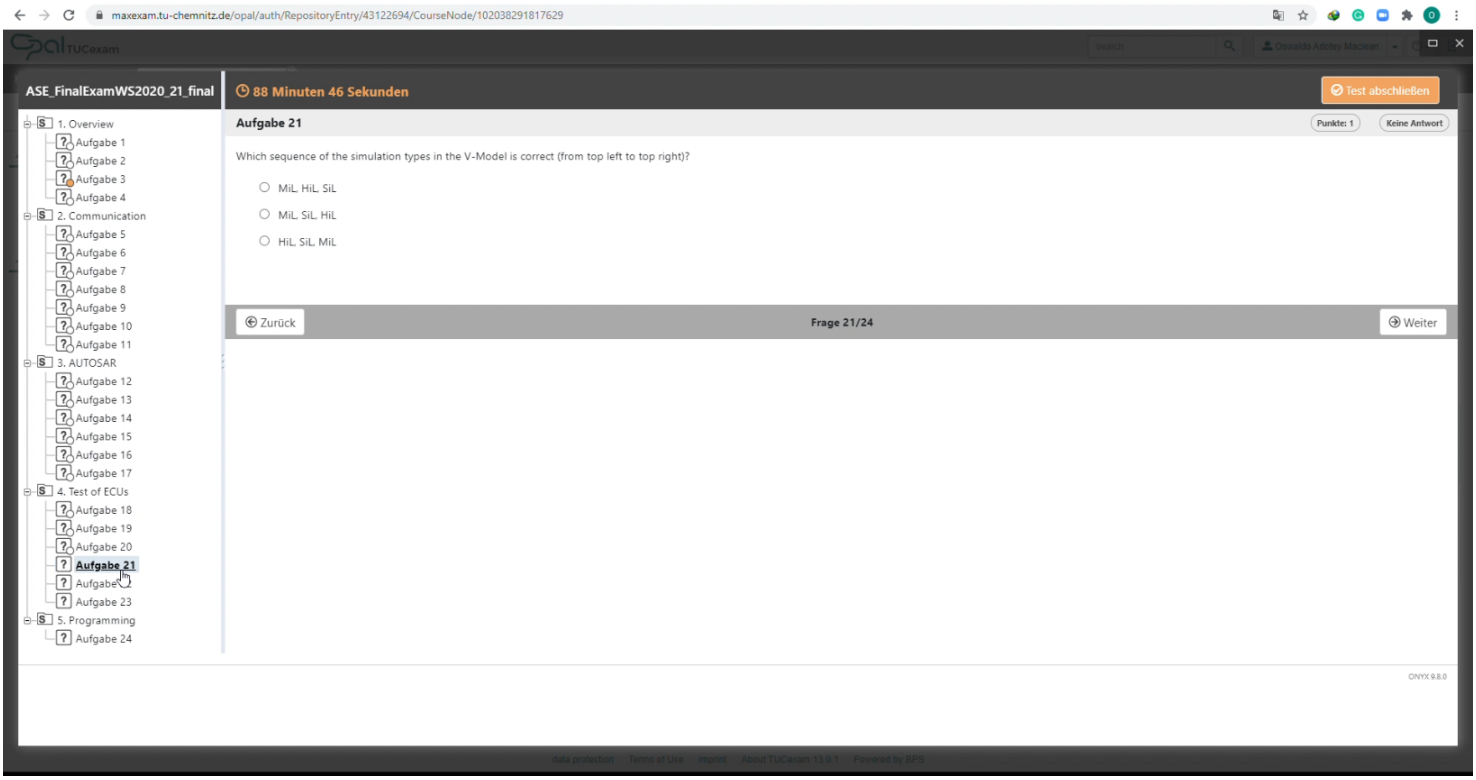
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Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 21
Punkte: 1
Keine Antwort
Which sequence of the simulation types in the V-Model is correct (from top left to top right)?
MiL, HiL, SiL
MiL, SiL, HiL
HiL, SiL, MiL
Zurück
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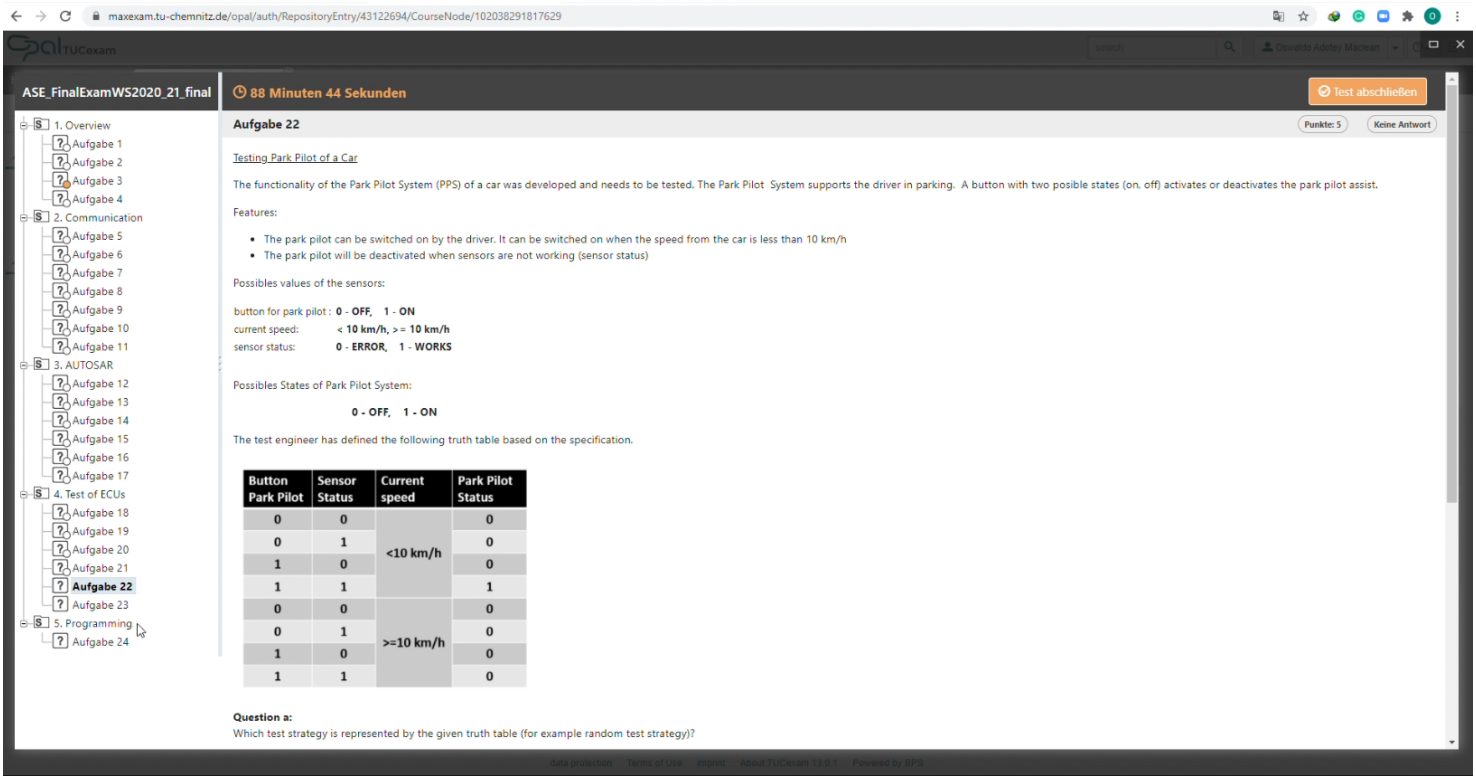
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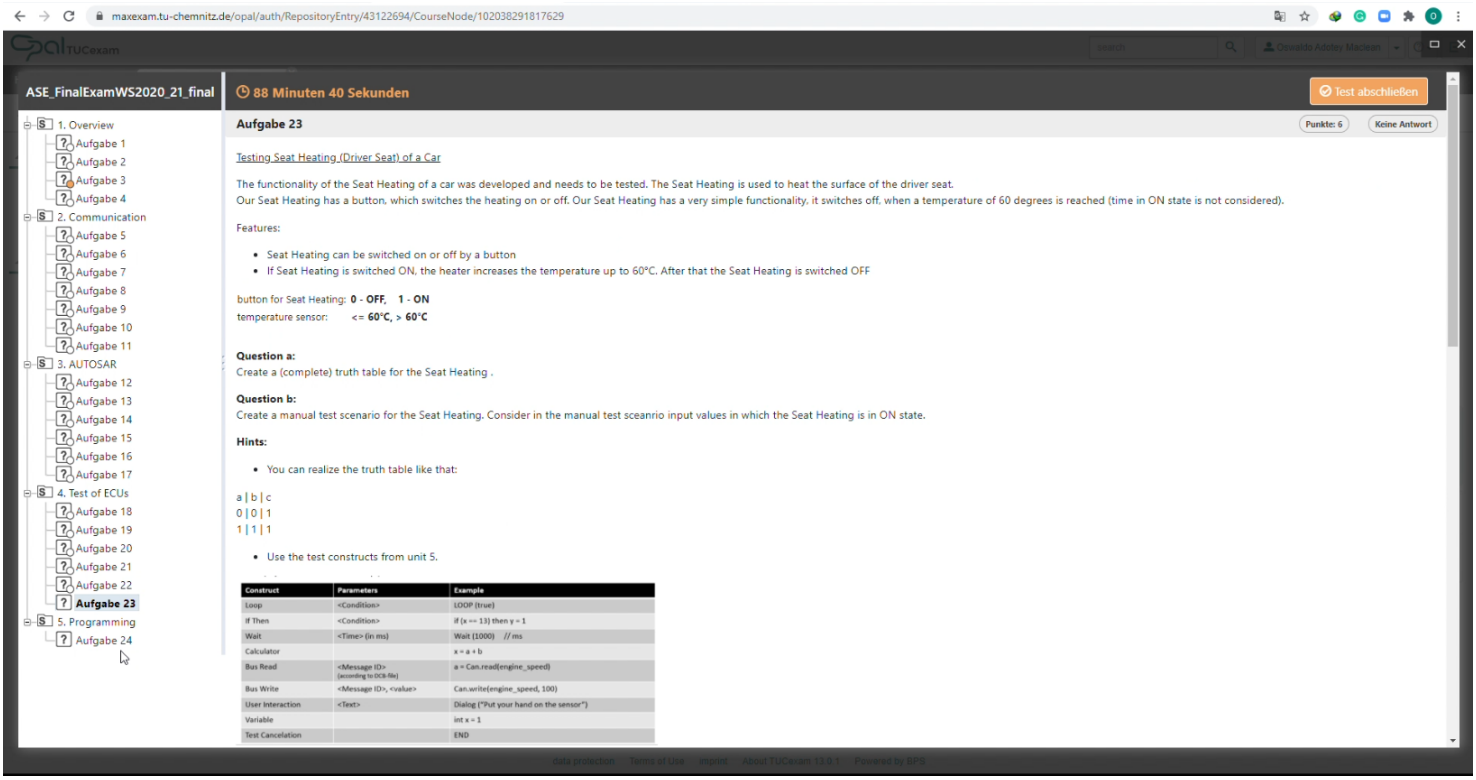
5. Programming
Aufgabe 24
Aufgabe 22
Punkte: 5
Keine Antwort
Testing Park Pilot of a Car
The functionality of the Park Pilot System (PPS) of a car was developed and needs to be tested. The Park Pilot System supports the driver in parking. A button with two posible states (on, off) activates or deactivates the park pilot assist.
Features:
The park pilot can be switched on by the driver. It can be switched on when the speed from the car is less than 10 km/h
The park pilot will be deactivated when sensors are not working (sensor status)
Possibles values of the sensors:
button for park pilot : 0 - OFF, 1 - ON
current speed: < 10 km/h, >= 10 km/h
sensor status: 0 - ERROR, 1 - WORKS
Possibles States of Park Pilot System:
0 - OFF, 1 - ON
The test engineer has defined the following truth table based on the specification.
Button Park Pilot
Sensor Status
Current speed
Park Pilot Status
0 0 <10 km/h 0
0 1 0
1 0 0
1 1 1
0 0 >=10 km/h 0
0 1 0
1 0 0
1 1 0
Question a:
Which test strategy is represented by the given truth table (for example random test strategy)?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Test abschließen
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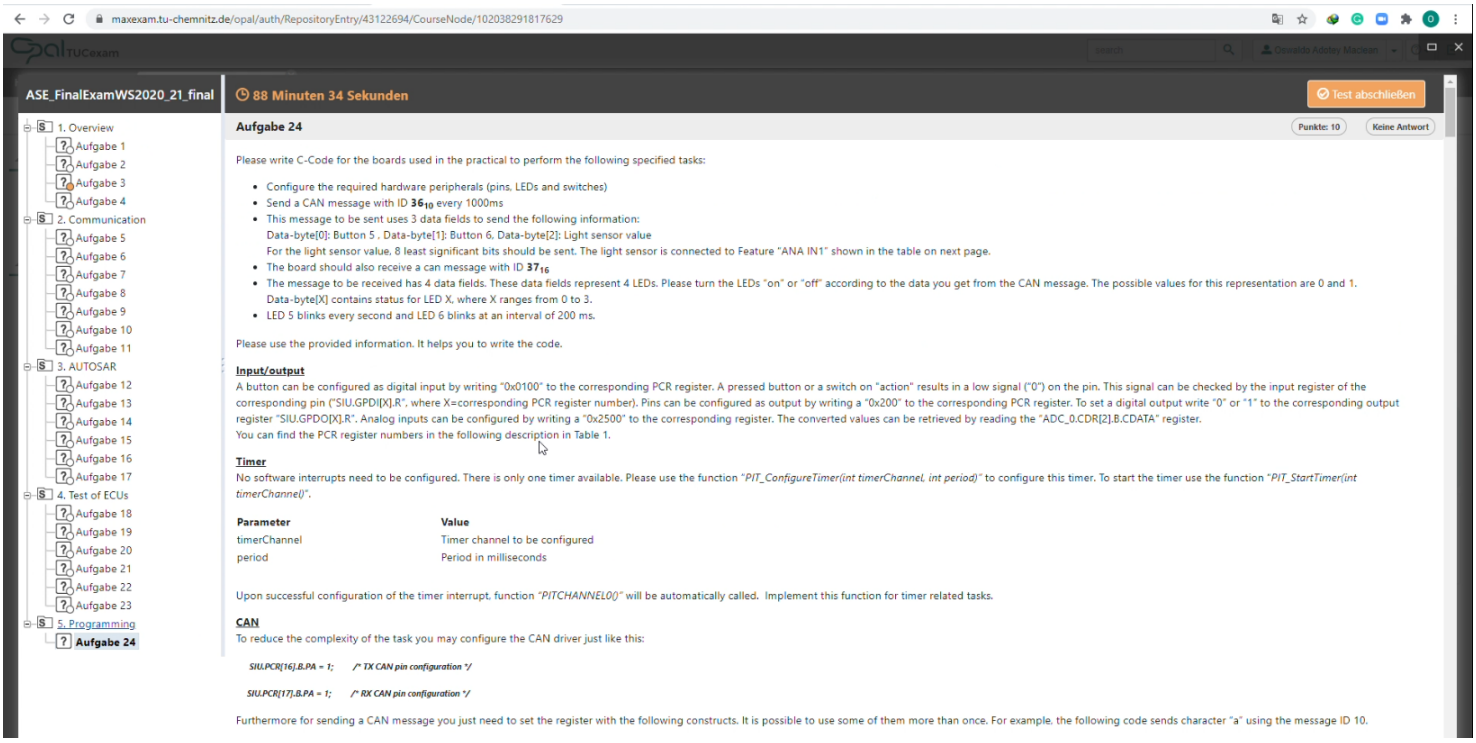
Aufgabe 24
Aufgabe 23
Punkte: 6
Keine Antwort
Testing Seat Heating (Driver Seat) of a Car
The functionality of the Seat Heating of a car was developed and needs to be tested. The Seat Heating is used to heat the surface of the driver seat.
Our Seat Heating has a button, which switches the heating on or off. Our Seat Heating has a very simple functionality, it switches off, when a temperature of 60 degrees is reached (time in ON state is not considered).
Features:
Seat Heating can be switched on or off by a button
If Seat Heating is switched ON, the heater increases the temperature up to 60°C. After that the Seat Heating is switched OFF
button for Seat Heating: 0 - OFF, 1 - ON
temperature sensor: <= 60°C, > 60°C
Question a:
Create a (complete) truth table for the Seat Heating .
Question b:
Create a manual test scenario for the Seat Heating. Consider in the manual test sceanrio input values in which the Seat Heating is in ON state.
Hints:
You can realize the truth table like that:
a | b | c
0 | 0 | 1
1 | 1 | 1
Use the test constructs from unit 5.
Construct
Parameters
Example
Loop
<Condition>
LOOP (true)
If Then
<Condition>
if (x == 13) then y = 1
Wait
<Time> (in ms)
Wait (1000) // ms
Calculator
x = a + b
Bus Read
<Message ID> (according to DCB-file)
a = Can.read(engine_speed)
Bus Write
<Message ID>, <value>
Can.write(engine_speed, 100)
User Interaction
<Text>
Dialog ("Put your hand on the sensor")
Variable
int x = 1
Test Cancelation
END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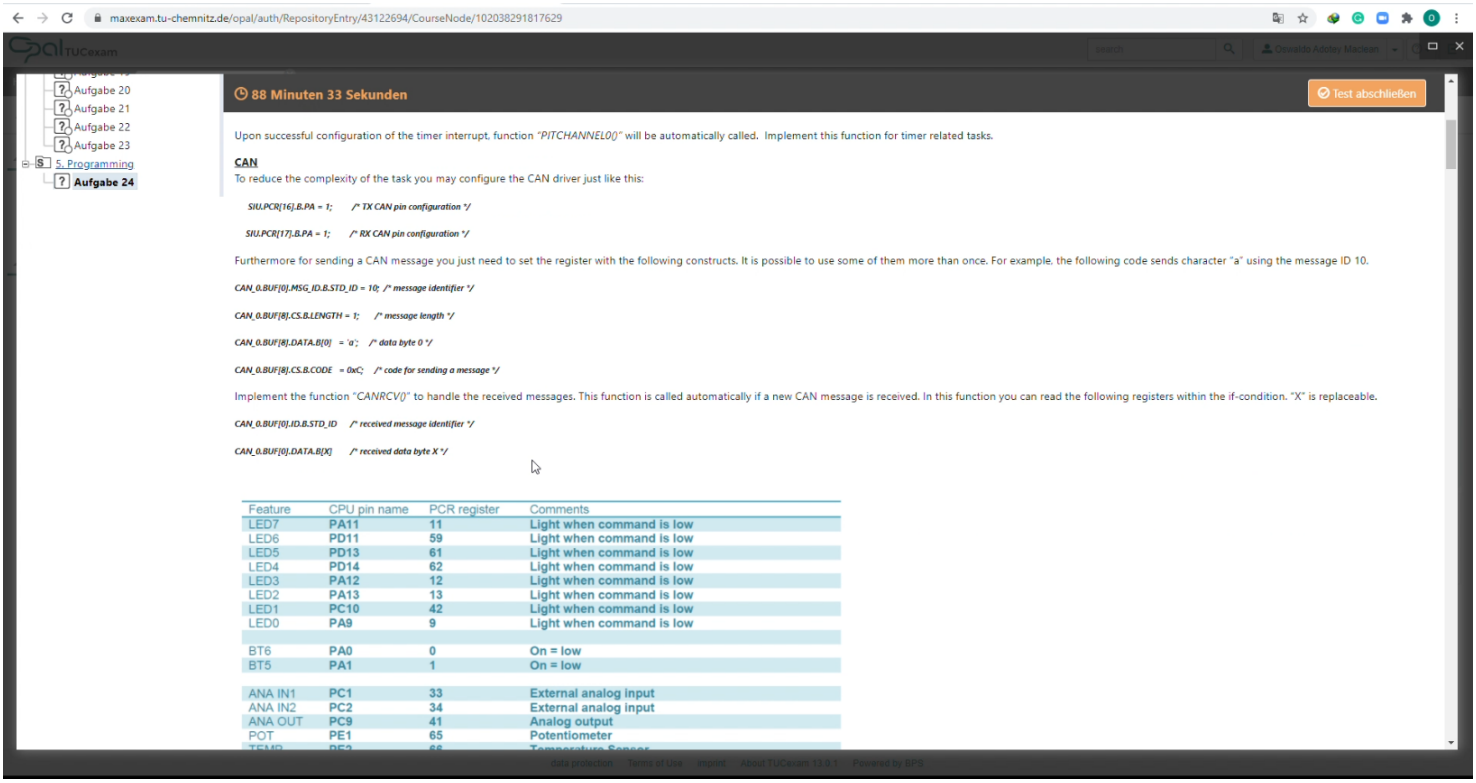
Punkte: 10
Keine Antwort
Please write C-Code for the boards used in the practical to perform the following specified tasks:
Configure the required hardware peripherals (pins, LEDs and switches)
Send a CAN message with ID 36₁₀ every 1000ms
This message to be sent uses 3 data fields to send the following information:
Data-byte[0]: Button 5 . Data-byte[1]: Button 6. Data-byte[2]: Light sensor value
For the light sensor value, 8 least significant bits should be sent. The light sensor is connected to Feature "ANA IN1" shown in the table on next page.
The board should also receive a can message with ID 37₁₆
The message to be received has 4 data fields. These data fields represent 4 LEDs. Please turn the LEDs "on" or "off" according to the data you get from the CAN message. The possible values for this representation are 0 and 1.
Data-byte[X] contains status for LED X, where X ranges from 0 to 3.
LED 5 blinks every second and LED 6 blinks at an interval of 200 ms.
Please use the provided information. It helps you to write the code.
Input/output
A button can be configured as digital input by writing "0x0100" to the corresponding PCR register. A pressed button or a switch on "action" results in a low signal ("0") on the pin. This signal can be checked by the input register of the corresponding pin ("SIU.GPDI[X].R", where X=corresponding PCR register number). Pins can be configured as output by writing a "0x200" to the corresponding PCR register. To set a digital output write "0" or "1" to the corresponding output register "SIU.GPDO[X].R". Analog inputs can be configured by writing a "0x2500" to the corresponding register. The converted values can be retrieved by reading the "ADC_0.CDR[2].B.CDATA" register.
You can find the PCR register numbers in the following description in Table 1.
Timer
No software interrupts need to be configured. There is only one timer available. Please use the function "PIT_ConfigureTimer(int timerChannel, int period)" to configure this timer. To start the timer use the function "PIT_StartTimer(int timerChannel)".
Parameter
Value
timerChannel
Timer channel to be configured
period
Period in milliseconds
Upon successful configuration of the timer interrupt, function "PITCHANNEL0()" will be automatically called. Implement this function for timer related tasks.
CAN
To reduce the complexity of the task you may configure the CAN driver just like this:
SIU.PCR[16].B.PA = 1; /* TX CAN pin configuration */
SIU.PCR[17].B.PA = 1; /* RX CAN pin configuration */
Furthermore for sending a CAN message you just need to set the register with the following constructs. It is possible to use some of them more than once. For example, the following code sends character "a" using the message ID 10.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Aufgabe 21
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88 Minuten 33 Sekunden
Test abschließen
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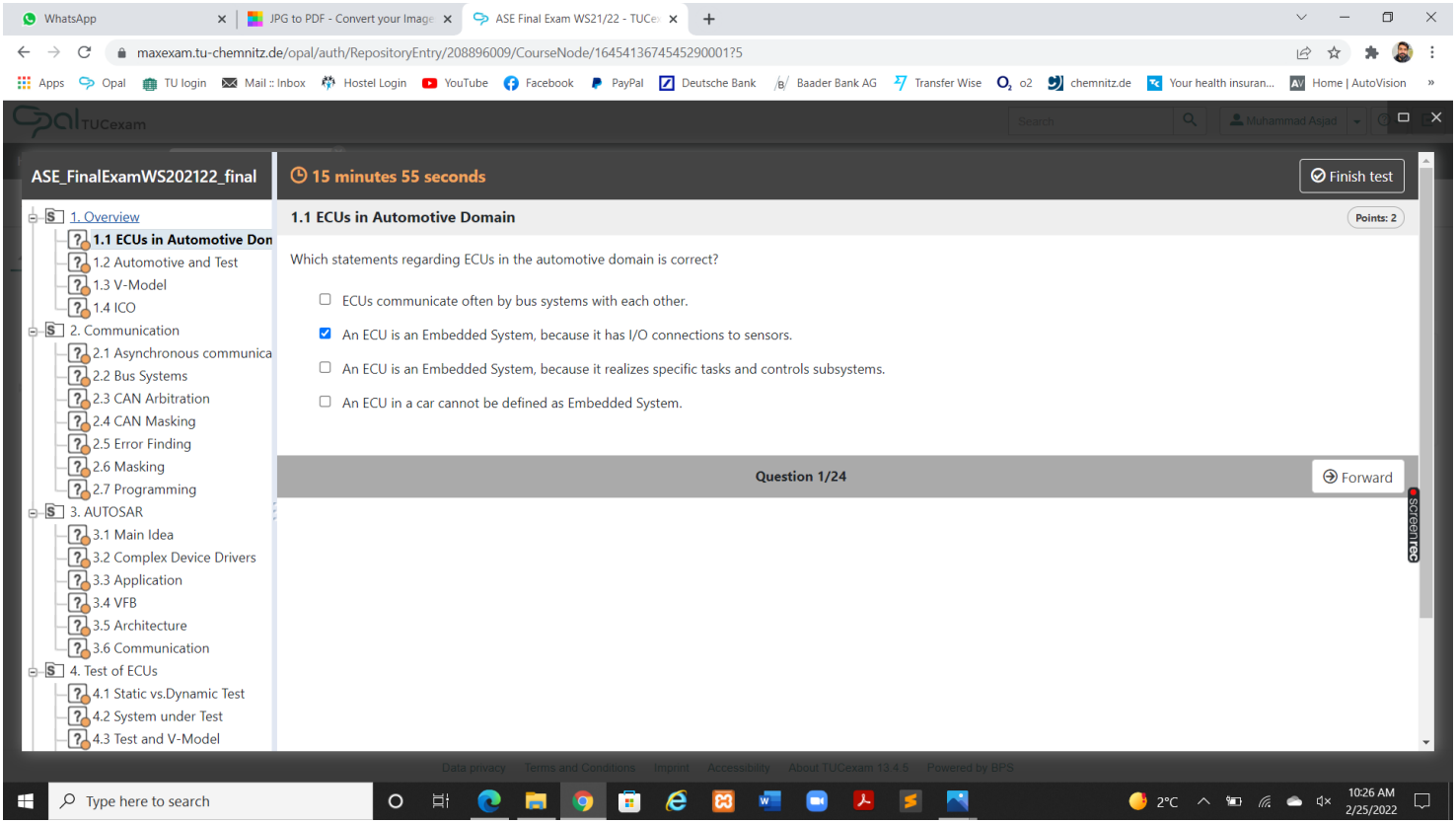
SIU.PCR[16].B.PA = 1; /* TX CAN pin configuration */
SIU.PCR[17].B.PA = 1; /* RX CAN pin configuration */
Furthermore for sending a CAN message you just need to set the register with the following constructs. It is possible to use some of them more than once. For example, the following code sends character "a" using the message ID 10.
CAN_0.BUF[0].MSG_ID.B.STD_ID = 10; /* message identifier */
CAN_0.BUF[8].CS.B.LENGTH = 1; /* message length */
CAN_0.BUF[8].DATA.B[0] = 'a'; /* data byte 0 */
CAN_0.BUF[8].CS.B.CODE = 0xC; /* code for sending a message */
Implement the function "CANRCV()" to handle the received messages. This function is called automatically if a new CAN message is received. In this function you can read the following registers within the if-condition. "X" is replaceable.
CAN_0.BUF[0].ID.B.STD_ID /* received message identifier */
CAN_0.BUF[0].DATA.B[X] /* received data byte X */
Feature CPU pin name PCR register Comments
LED7 PA11 11 Light when command is low
LED6 PD11 59 Light when command is low
LED5 PD13 61 Light when command is low
LED4 PD14 62 Light when command is low
LED3 PA12 12 Light when command is low
LED2 PA13 13 Light when command is low
LED1 PC10 42 Light when command is low
LED0 PA9 9 Light when command is low
BT6 PA0 0 On = low
BT5 PA1 1 On = low
ANA IN1 PC1 33 External analog input
ANA IN2 PC2 34 External analog input
ANA OUT PC9 41 Analog output
POT PE1 65 Potentiometer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2.5 Error Finding
2.6 Masking
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3.6 Communication
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4.1 Static vs.Dynamic Test
4.2 System under Test
4.3 Test and V-Model
1.1 ECUs in Automotive Domain
Points: 2
Which statements regarding ECUs in the automotive domain is correct?
ECUs communicate often by bus systems with each other.
An ECU is an Embedded System, because it has I/O connections to sensors.
An ECU is an Embedded System, because it realizes specific tasks and controls subsystems.
An ECU in a car cannot be defined as Embedded System.
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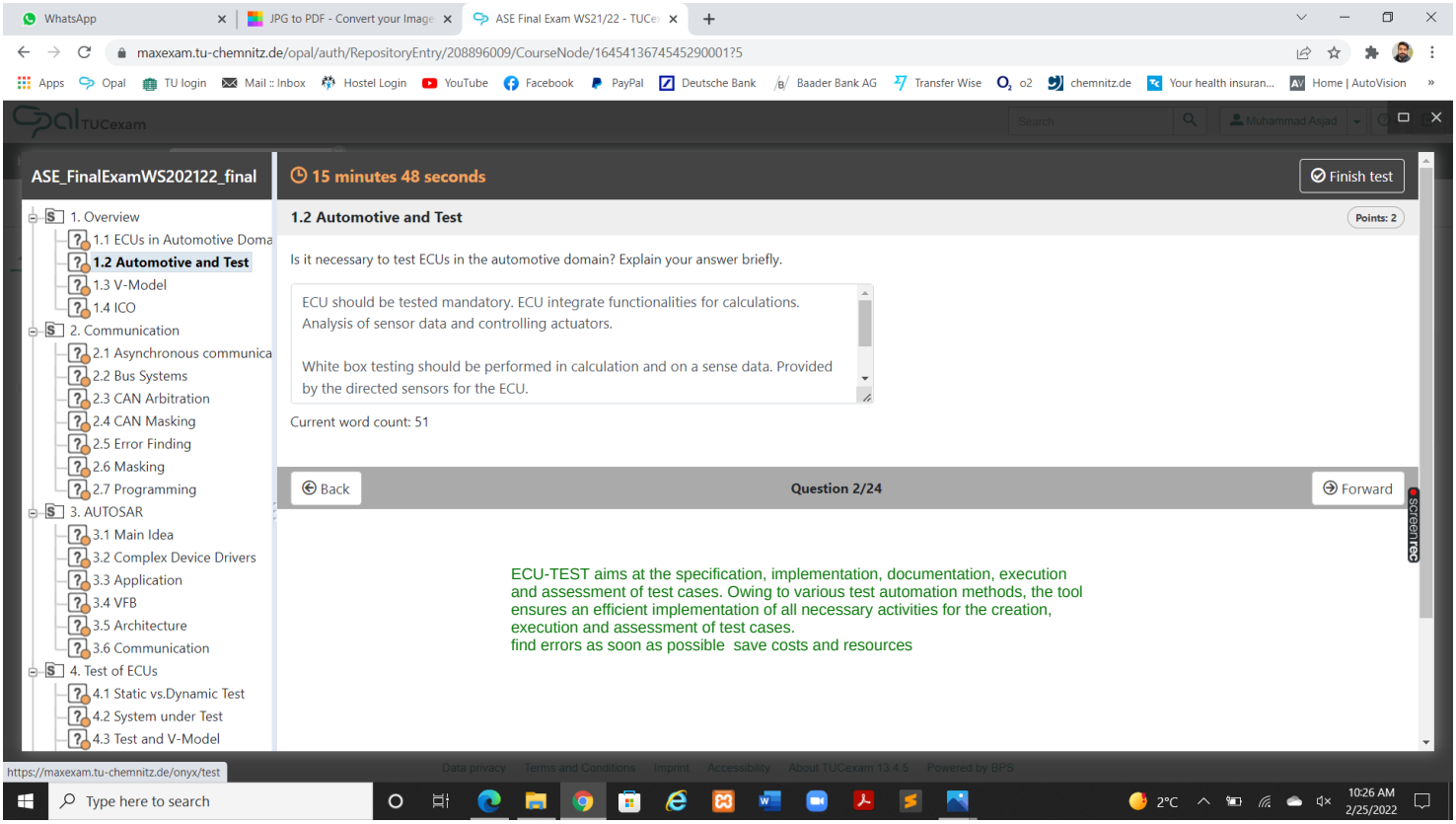
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Points: 2
Is it necessary to test ECUs in the automotive domain? Explain your answer briefly.
ECU should be tested mandatory. ECU integrate functionalities for calculations. Analysis of sensor data and controlling actuators.
White box testing should be performed in calculation and on a sense data. Provided by the directed sensors for the ECU.
Current word count: 51
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ECU-TEST aims at the specification, implementation, documentation, execution and assessment of test cases. Owing to various test automation methods, the tool ensures an efficient implementation of all necessary activities for the creation, execution and assessment of test cases.
find errors as soon as possible save costs and resources
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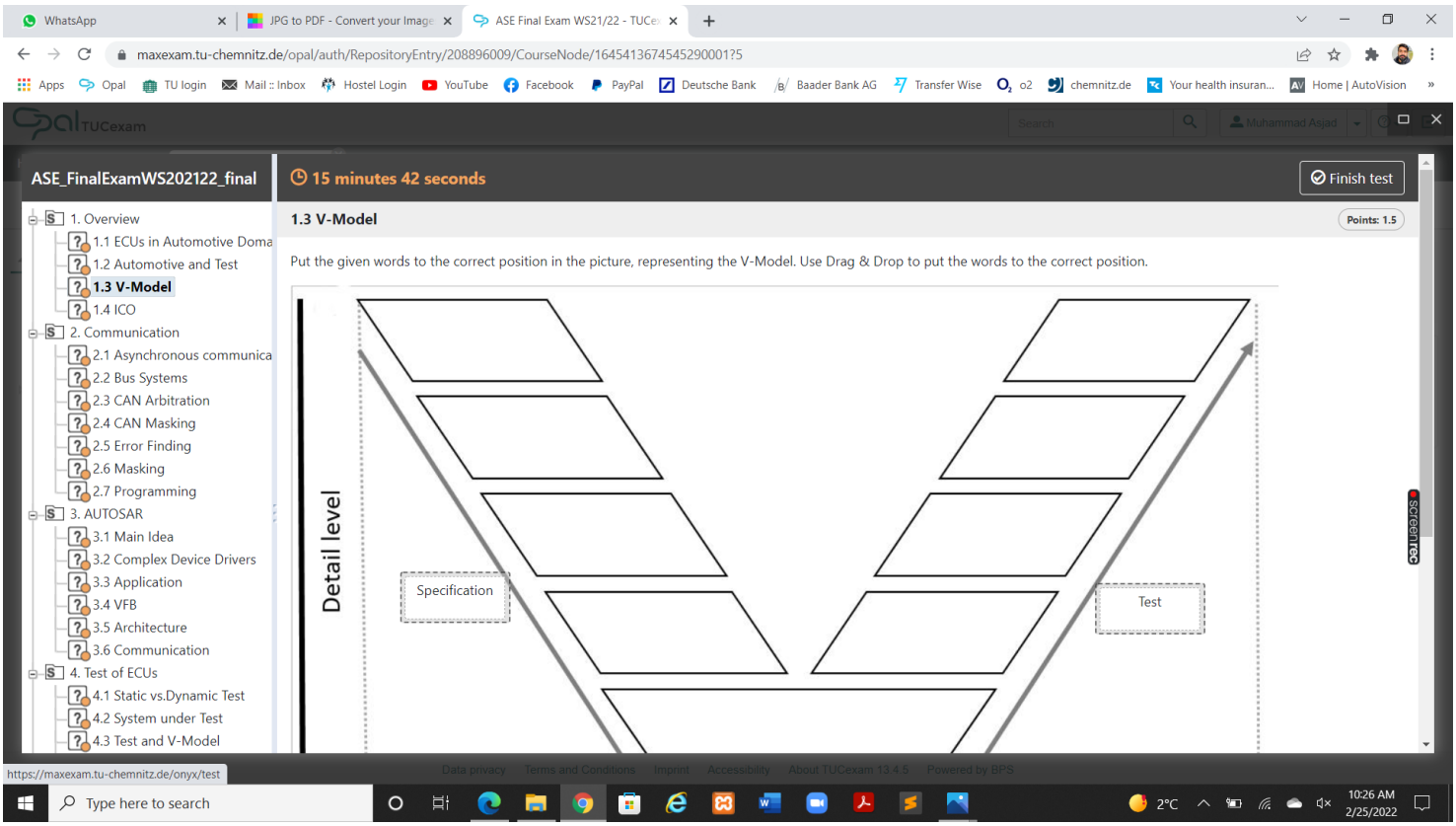
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1.3 V-Model
Points: 1.5
Put the given words to the correct position in the picture, representing the V-Model. Use Drag & Drop to put the words to the correct position.
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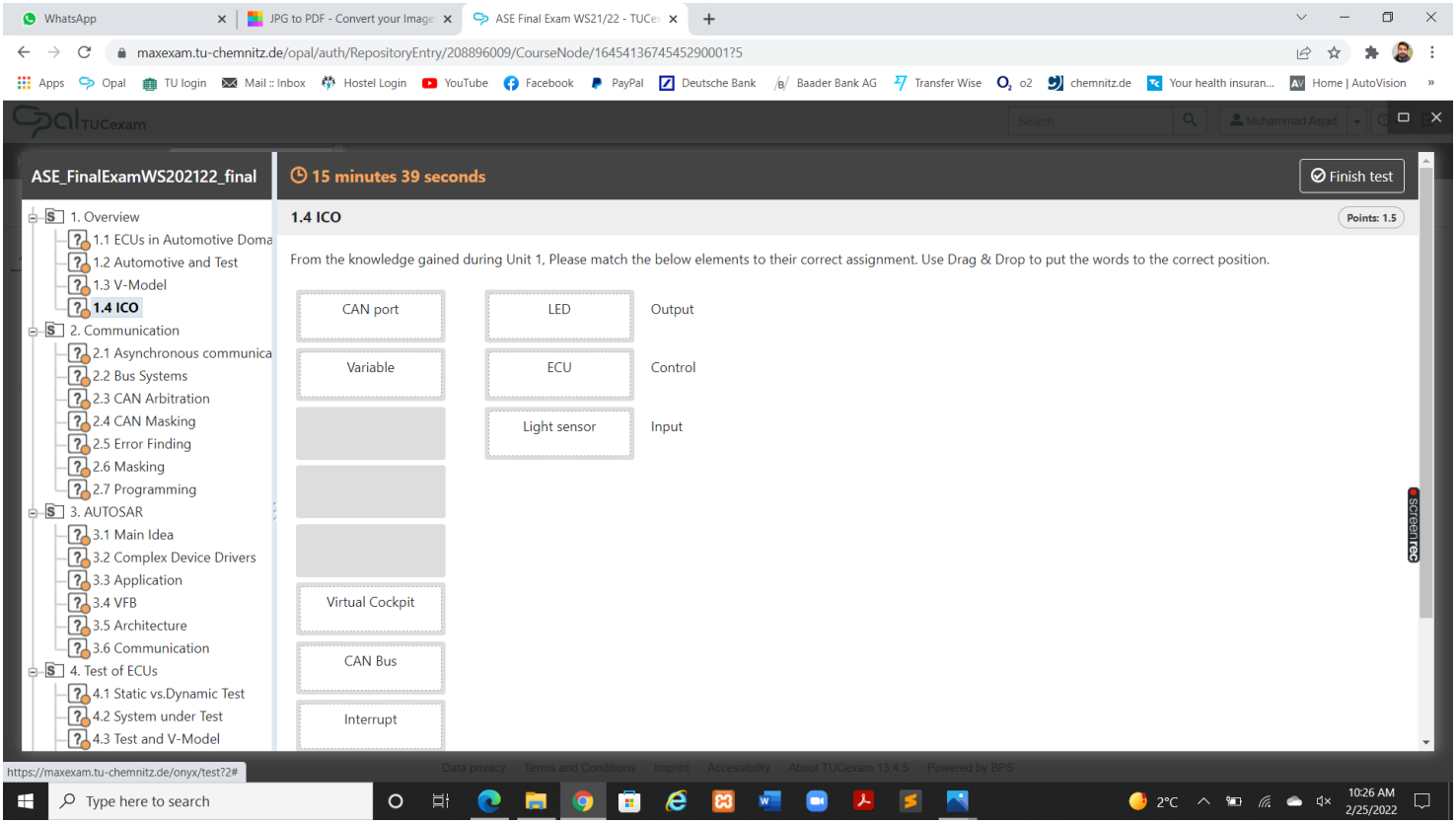
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1.4 ICO
Points: 1.5
From the knowledge gained during Unit 1, Please match the below elements to their correct assignment. Use Drag & Drop to put the words to the correct position.
CAN port
Variable
Virtual Cockpit
CAN Bus
Interrupt
LED
ECU
Light sensor
Output
Control
Input
screenrec
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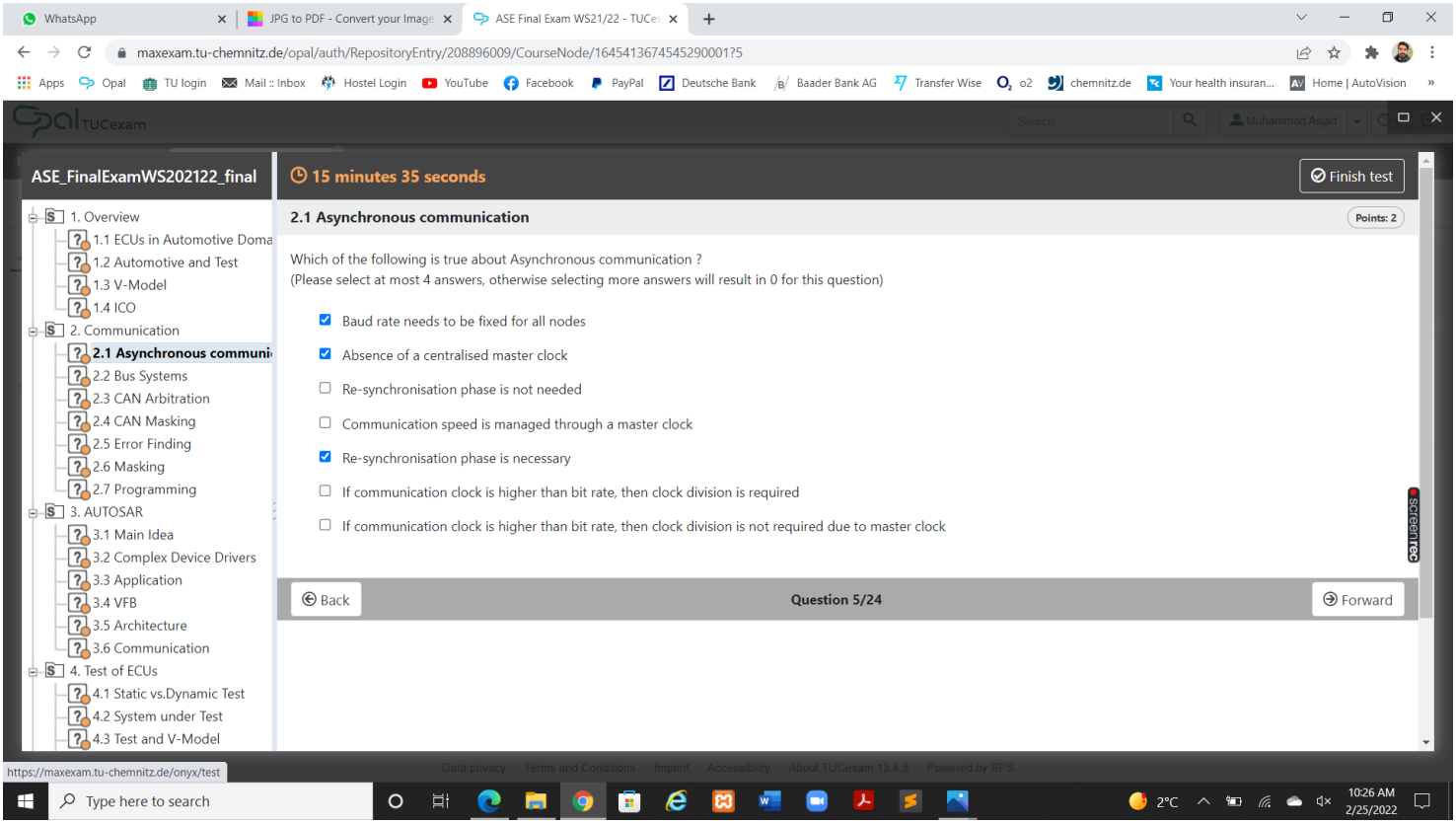
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2.1 Asynchronous communication
Points: 2
Which of the following is true about Asynchronous communication ?
(Please select at most 4 answers, otherwise selecting more answers will result in 0 for this question)
Baud rate needs to be fixed for all nodes
Absence of a centralised master clock
Re-synchronisation phase is not needed
Communication speed is managed through a master clock
Re-synchronisation phase is necessary
If communication clock is higher than bit rate, then clock division is required
If communication clock is higher than bit rate, then clock division is not required due to master clock
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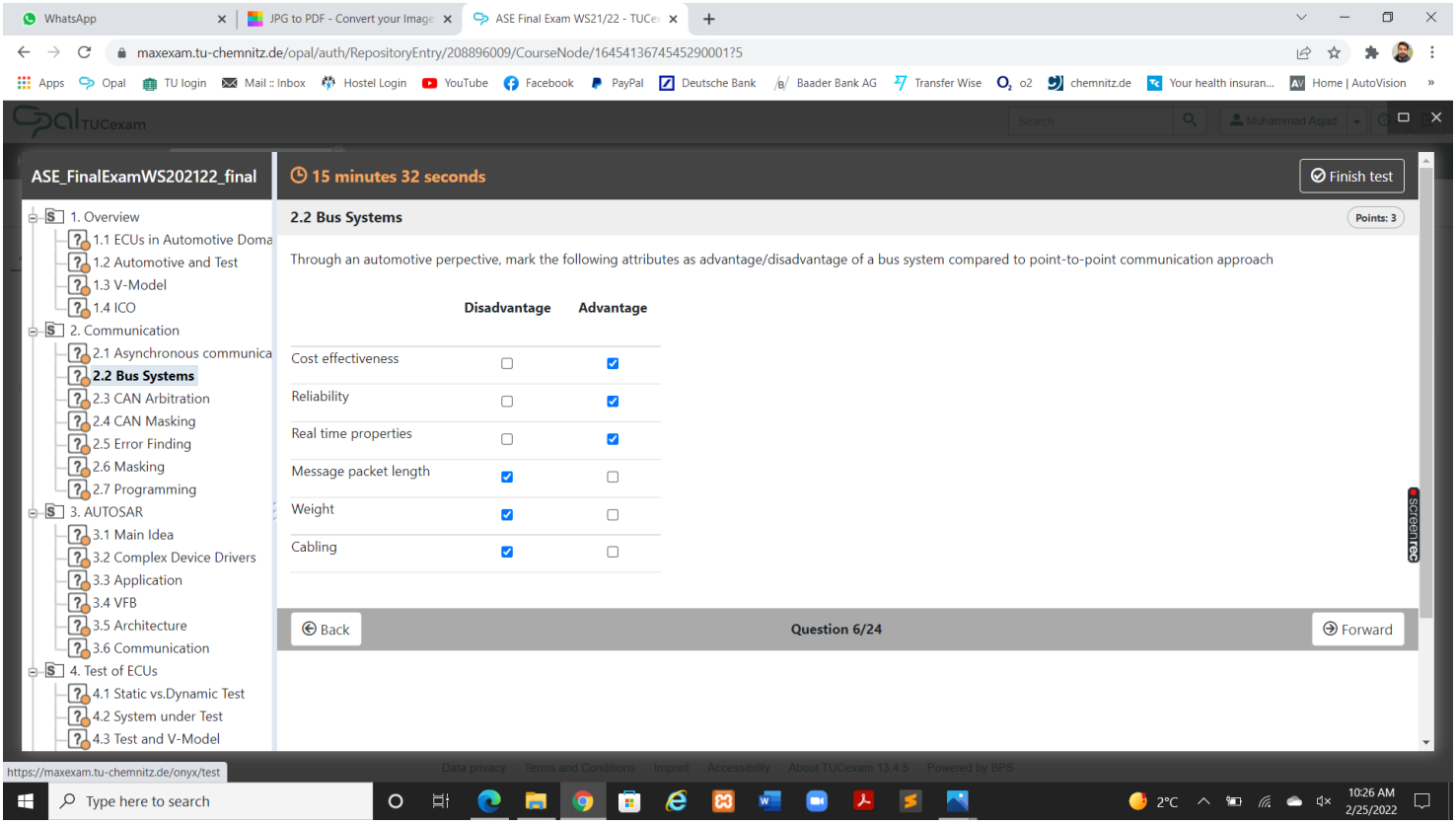
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2.2 Bus Systems
Points: 3
Through an automotive perpective, mark the following attributes as advantage/disadvantage of a bus system compared to point-to-point communication approach
Disadvantage
Advantage
Cost effectiveness
Reliability
Real time properties
Message packet length
Weight
Cabling
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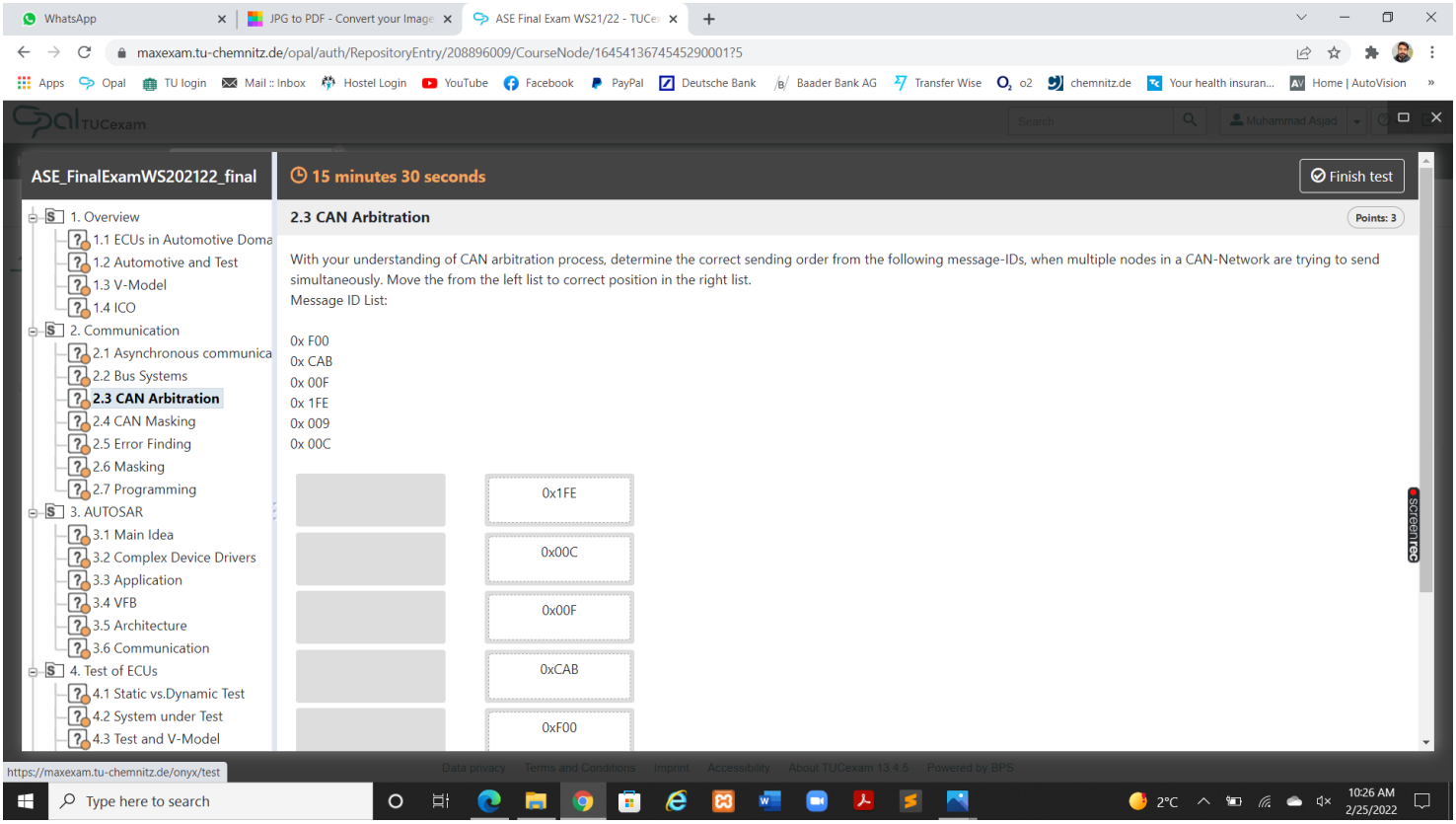
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2.3 CAN Arbitration
Points: 3
With your understanding of CAN arbitration process, determine the correct sending order from the following message-IDs, when multiple nodes in a CAN-Network are trying to send simultaneously. Move the from the left list to correct position in the right list.
Message ID List:
0x F00
0x CAB
0x 00F
0x 1FE
0x 009
0x 00C
0x1FE
0x00C
0x00F
0xCAB
0xF00
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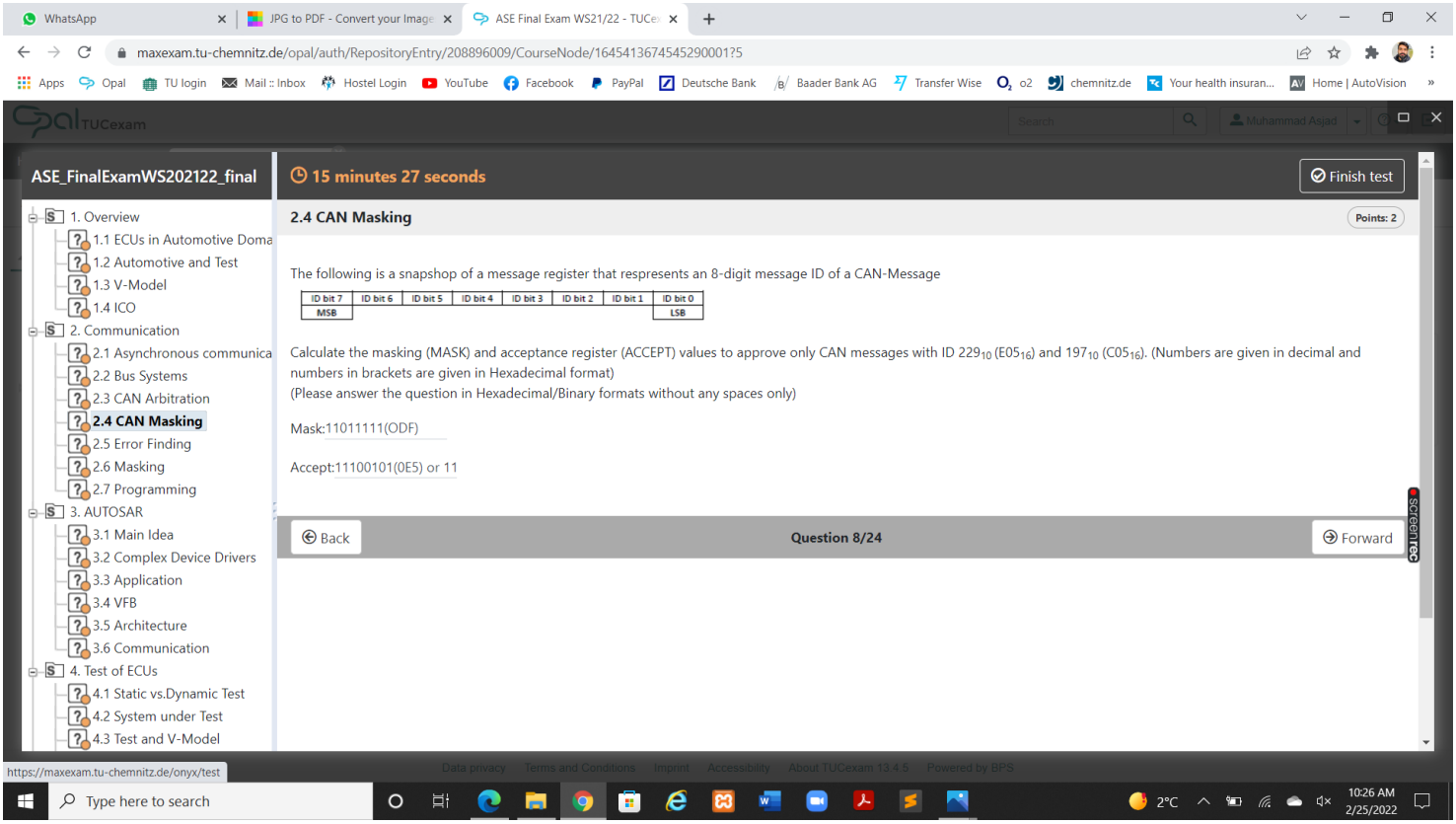
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2.4 CAN Masking
Points: 2
The following is a snapshop of a message register that respresents an 8-digit message ID of a CAN-Message
ID bit 7 MSB
ID bit 6
ID bit 5
ID bit 4
ID bit 3
ID bit 2
ID bit 1
ID bit 0 LSB
Calculate the masking (MASK) and acceptance register (ACCEPT) values to approve only CAN messages with ID 229$_{10}$ (E05$_{16}$) and 197$_{10}$ (C05$_{16}$). (Numbers are given in decimal and numbers in brackets are given in Hexadecimal format)
(Please answer the question in Hexadecimal/Binary formats without any spaces only)
Mask:11011111(ODF)
Accept:11100101(0E5) or 11
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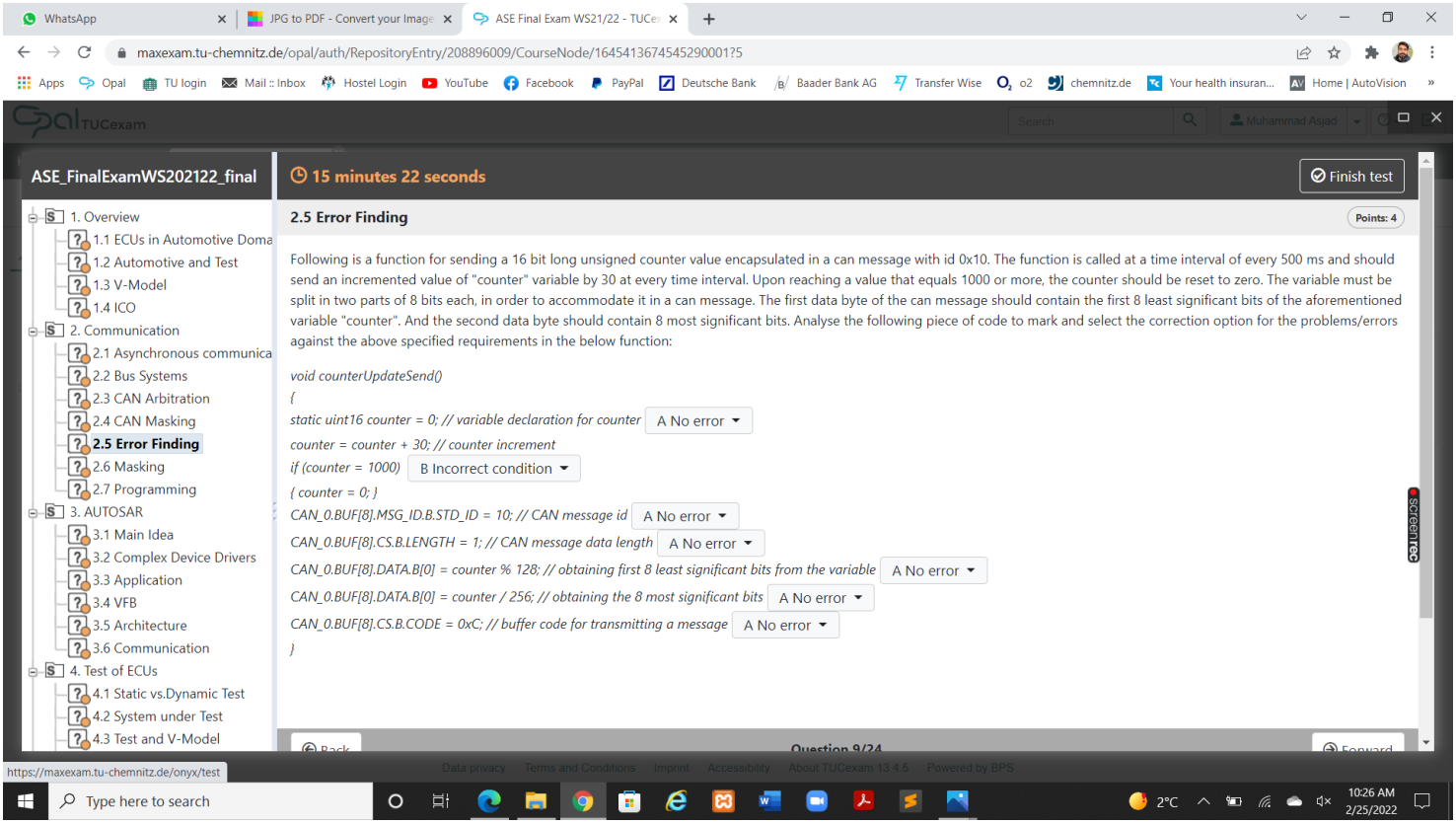
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Points: 4
Following is a function for sending a 16 bit long unsigned counter value encapsulated in a can message with id 0x10. The function is called at a time interval of every 500 ms and should send an incremented value of "counter" variable by 30 at every time interval. Upon reaching a value that equals 1000 or more, the counter should be reset to zero. The variable must be split in two parts of 8 bits each, in order to accommodate it in a can message. The first data byte of the can message should contain the first 8 least significant bits of the aforementioned variable "counter". And the second data byte should contain 8 most significant bits. Analyse the following piece of code to mark and select the correction option for the problems/errors against the above specified requirements in the below function:
void counterUpdateSend()
{
static uint16 counter = 0; // variable declaration for counter
A No error
counter = counter + 30; // counter increment
if (counter = 1000)
B Incorrect condition
{ counter = 0; }
CAN_0.BUF[8].MSG_ID.B.STD_ID = 10; // CAN message id
A No error
CAN_0.BUF[8].CS.B.LENGTH = 1; // CAN message data length
A No error
CAN_0.BUF[8].DATA.B[0] = counter % 128; // obtaining first 8 least significant bits from the variable
A No error
CAN_0.BUF[8].DATA.B[0] = counter / 256; // obtaining the 8 most significant bits
A No error
CAN_0.BUF[8].CS.B.CODE = 0xC; // buffer code for transmitting a message
A No error
}
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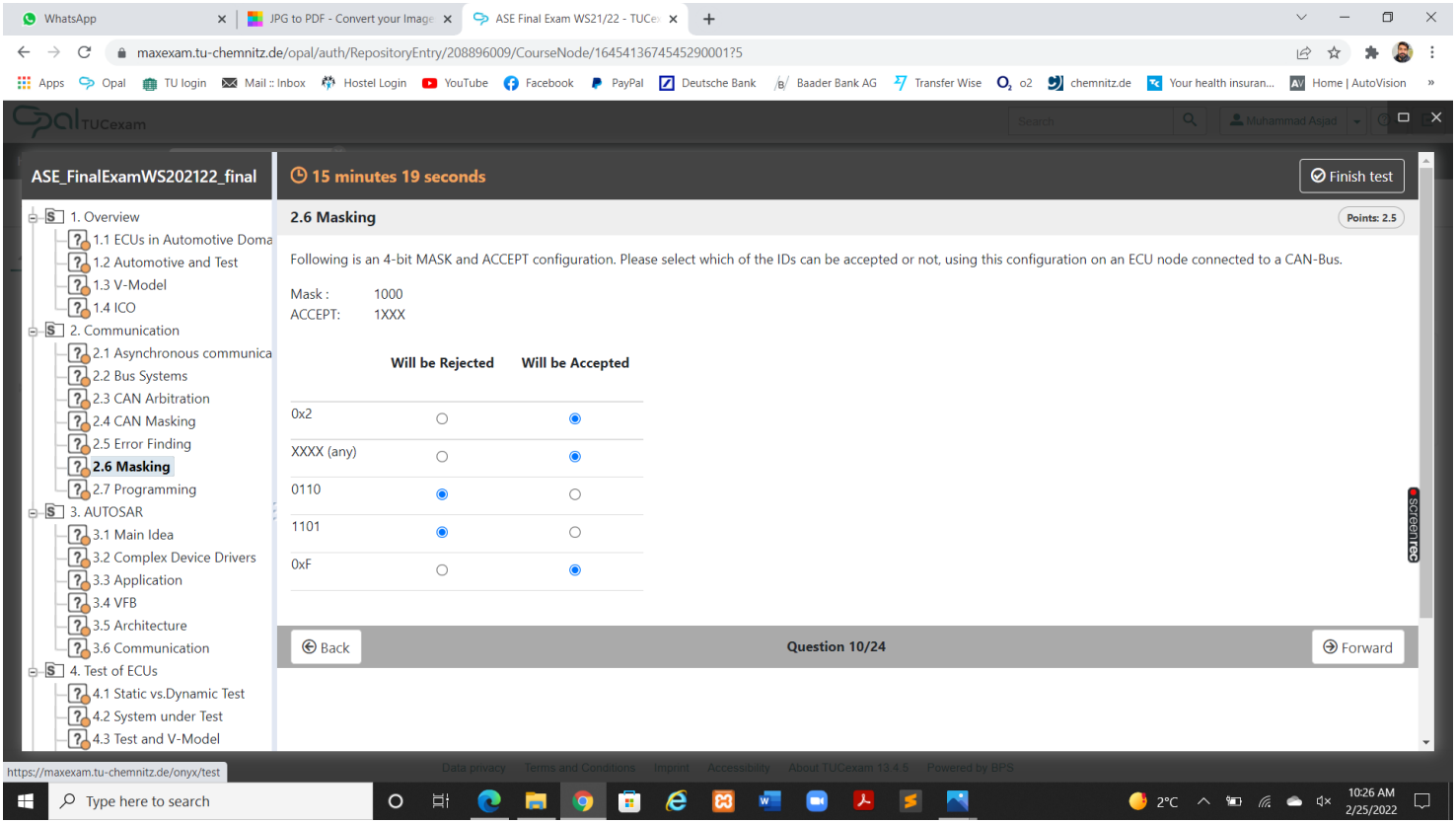
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Points: 2.5
Following is an 4-bit MASK and ACCEPT configuration. Please select which of the IDs can be accepted or not, using this configuration on an ECU node connected to a CAN-Bus.
Mask : 1000
ACCEPT: 1XXX
Will be Rejected
Will be Accepted
0x2
XXXX (any)
0110
1101
0xF
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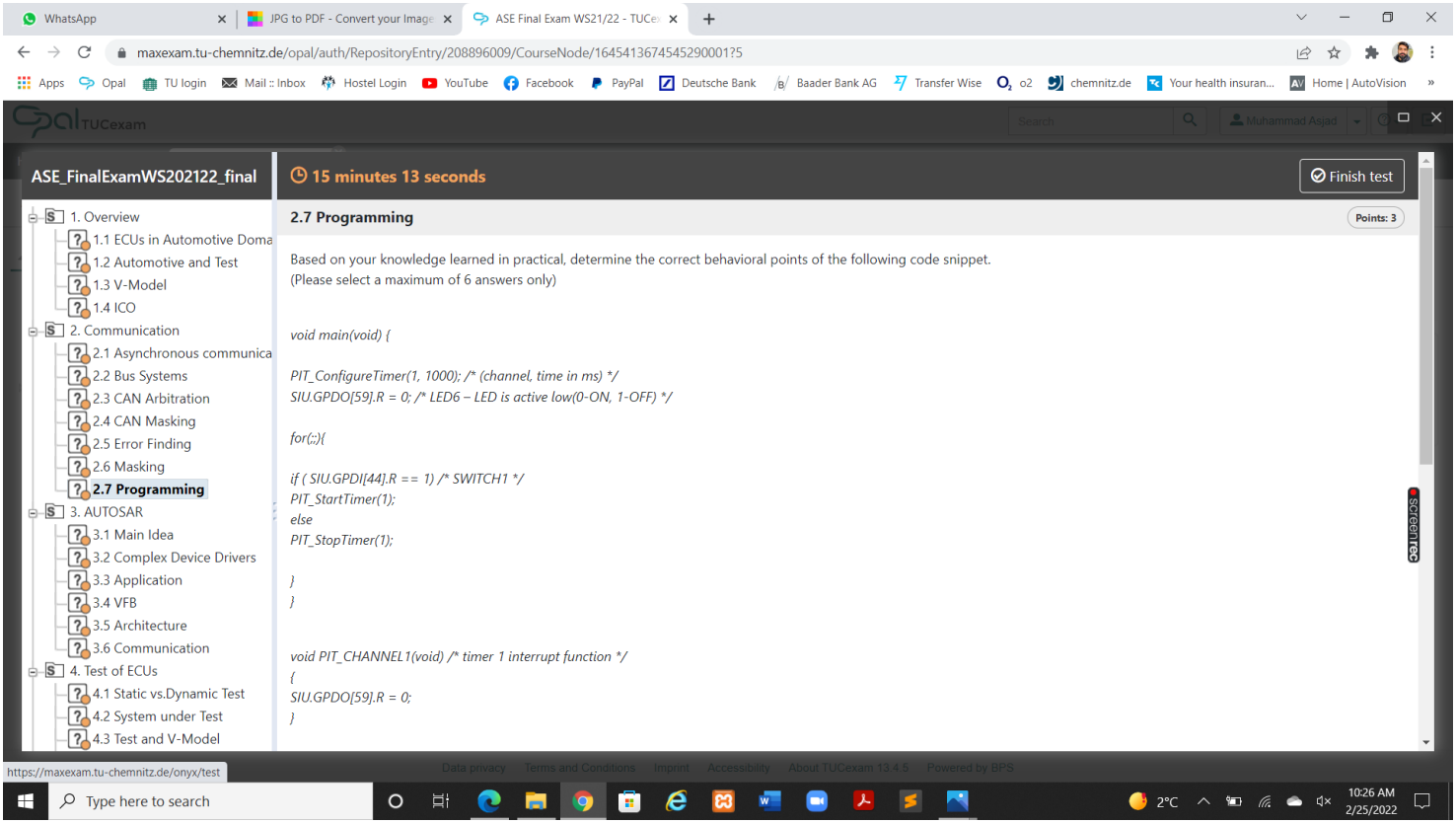
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Points: 3
Based on your knowledge learned in practical, determine the correct behavioral points of the following code snippet.
(Please select a maximum of 6 answers only)
void main(void) {
PIT_ConfigureTimer(1, 1000); /* (channel, time in ms) */
SIU.GPDO[59].R = 0; /* LED6 – LED is active low(0-ON, 1-OFF) */
for(;;){
if ( SIU.GPDI[44].R == 1) /* SWITCH1 */
PIT_StartTimer(1);
else
PIT_StopTimer(1);
}
}
void PIT_CHANNEL1(void) /* timer 1 interrupt function */
{
SIU.GPDO[59].R = 0;
}
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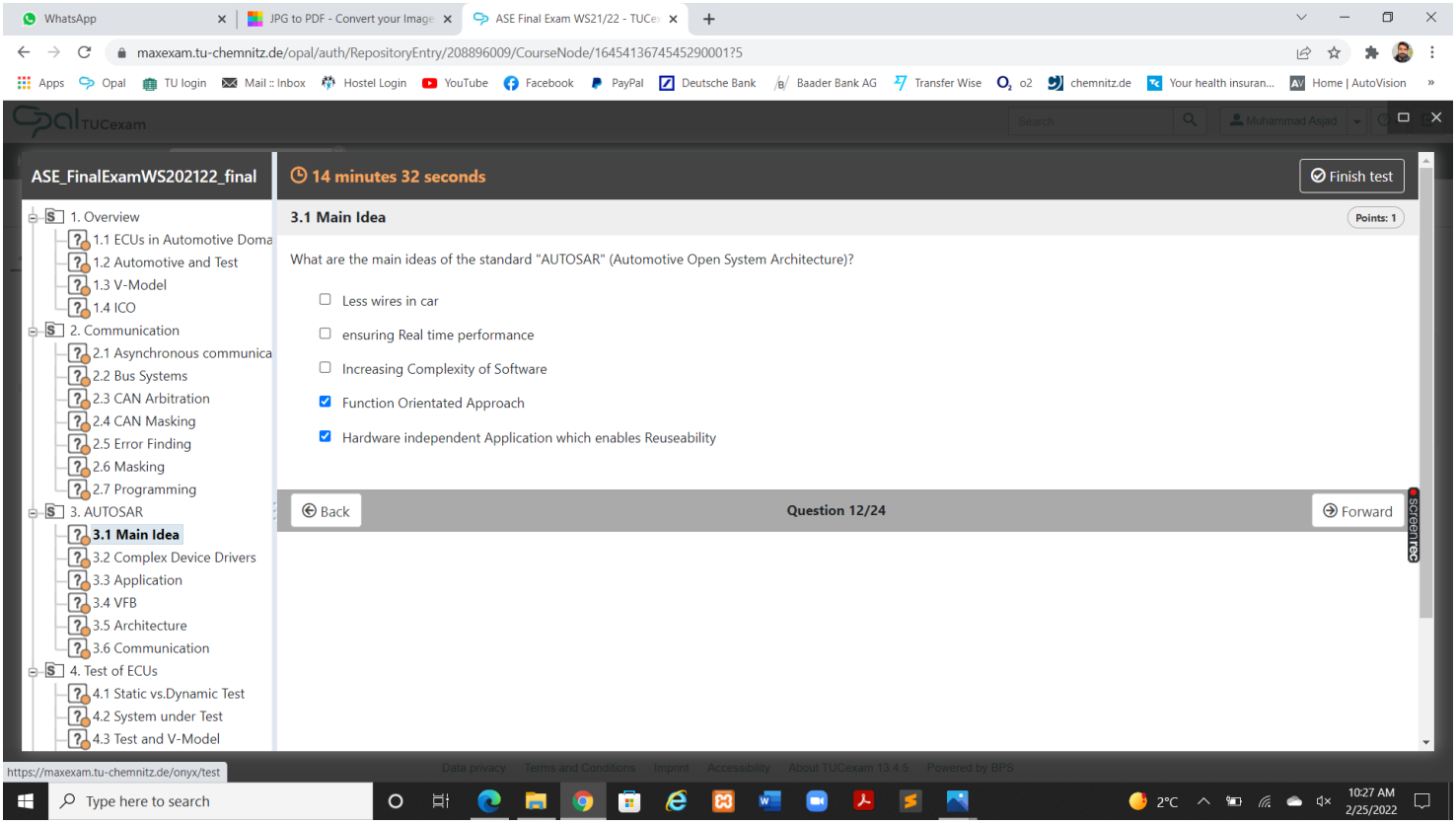
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Points: 1
What are the main ideas of the standard "AUTOSAR" (Automotive Open System Architecture)?
Less wires in car
ensuring Real time performance
Increasing Complexity of Software
Function Orientated Approach
Hardware independent Application which enables Reuseability
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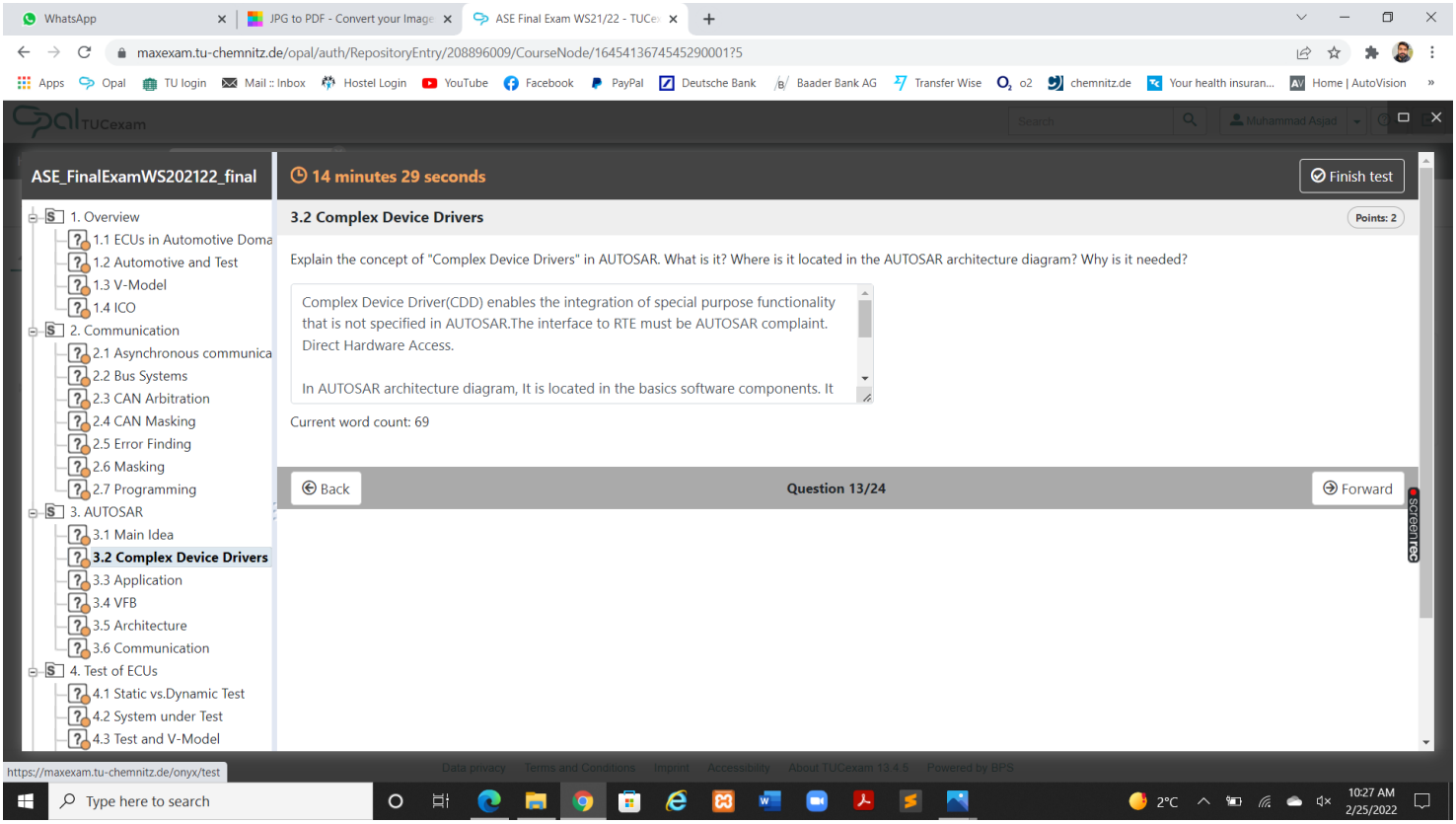
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3.2 Complex Device Drivers
Points: 2
Explain the concept of "Complex Device Drivers" in AUTOSAR. What is it? Where is it located in the AUTOSAR architecture diagram? Why is it needed?
Complex Device Driver(CDD) enables the integration of special purpose functionality that is not specified in AUTOSAR.The interface to RTE must be AUTOSAR complaint. Direct Hardware Access.
In AUTOSAR architecture diagram, It is located in the basics software components. It
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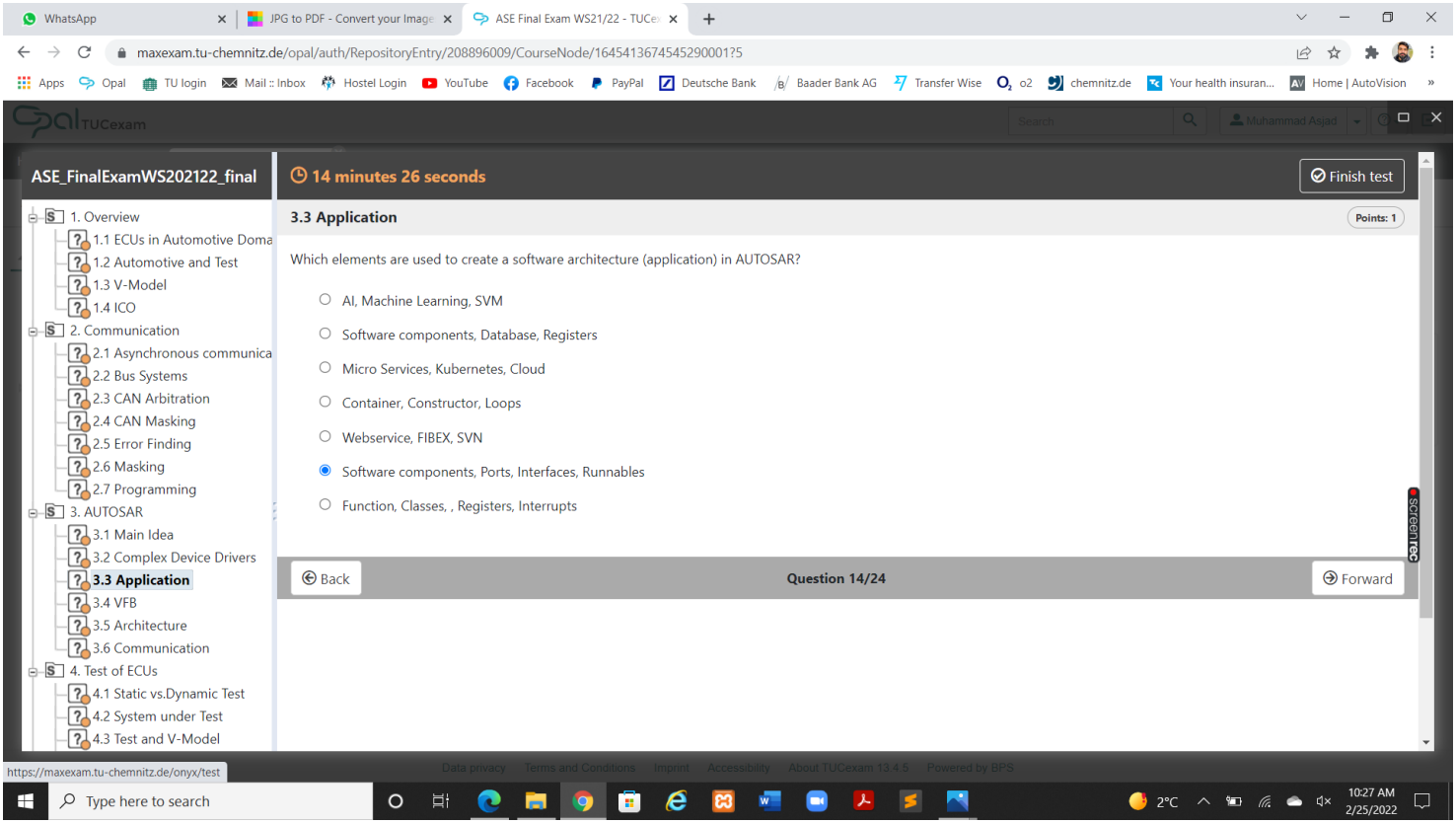
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Points: 1
Which elements are used to create a software architecture (application) in AUTOSAR?
AI, Machine Learning, SVM
Software components, Database, Registers
Micro Services, Kubernetes, Cloud
Container, Constructor, Loops
Webservice, FIBEX, SVN
Software components, Ports, Interfaces, Runnables
Function, Classes, , Registers, Interrupts
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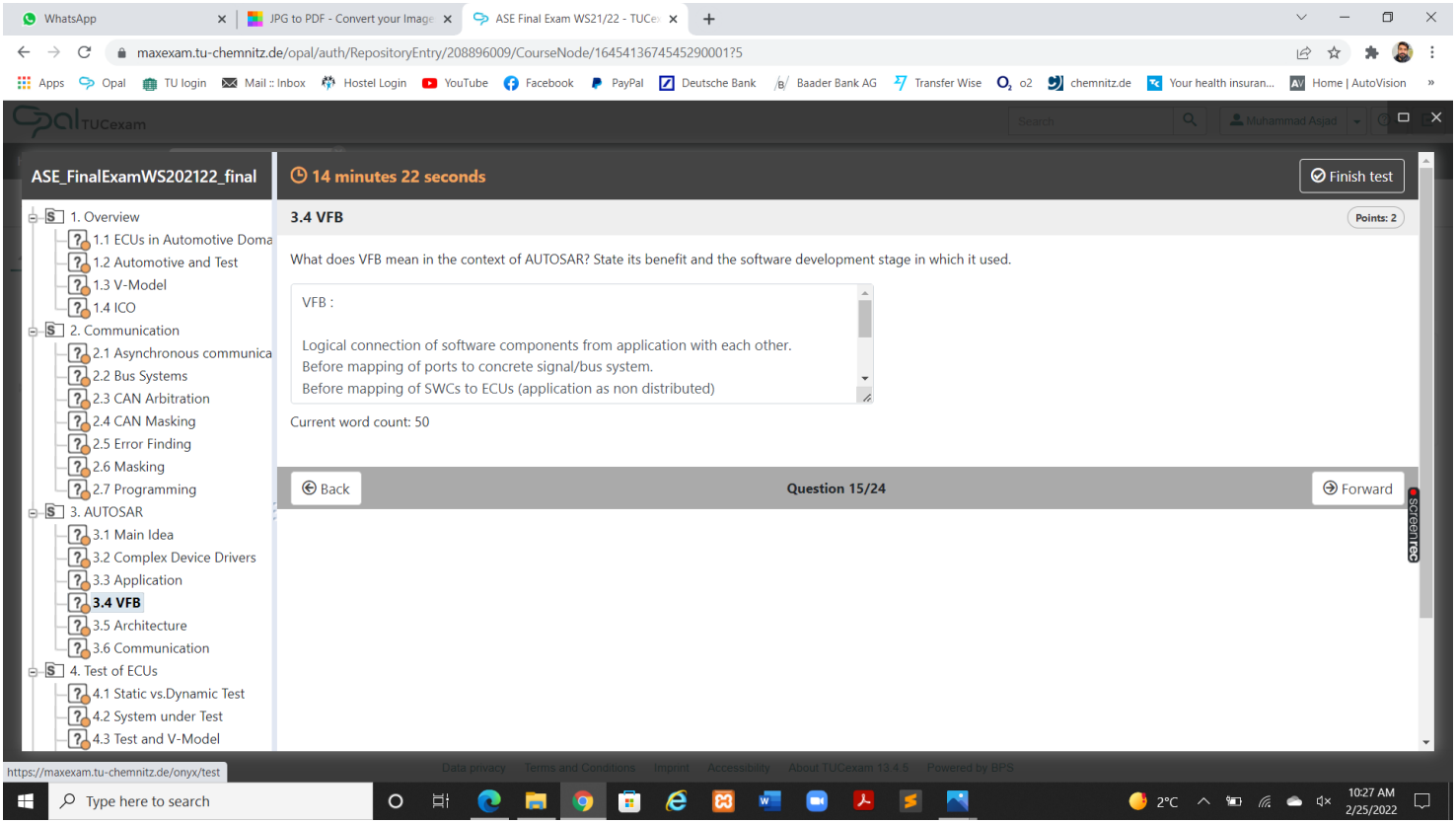
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3.4 VFB
Points: 2
What does VFB mean in the context of AUTOSAR? State its benefit and the software development stage in which it used.
VFB :
Logical connection of software components from application with each other.
Before mapping of ports to concrete signal/bus system.
Before mapping of SWCs to ECUs (application as non distributed)
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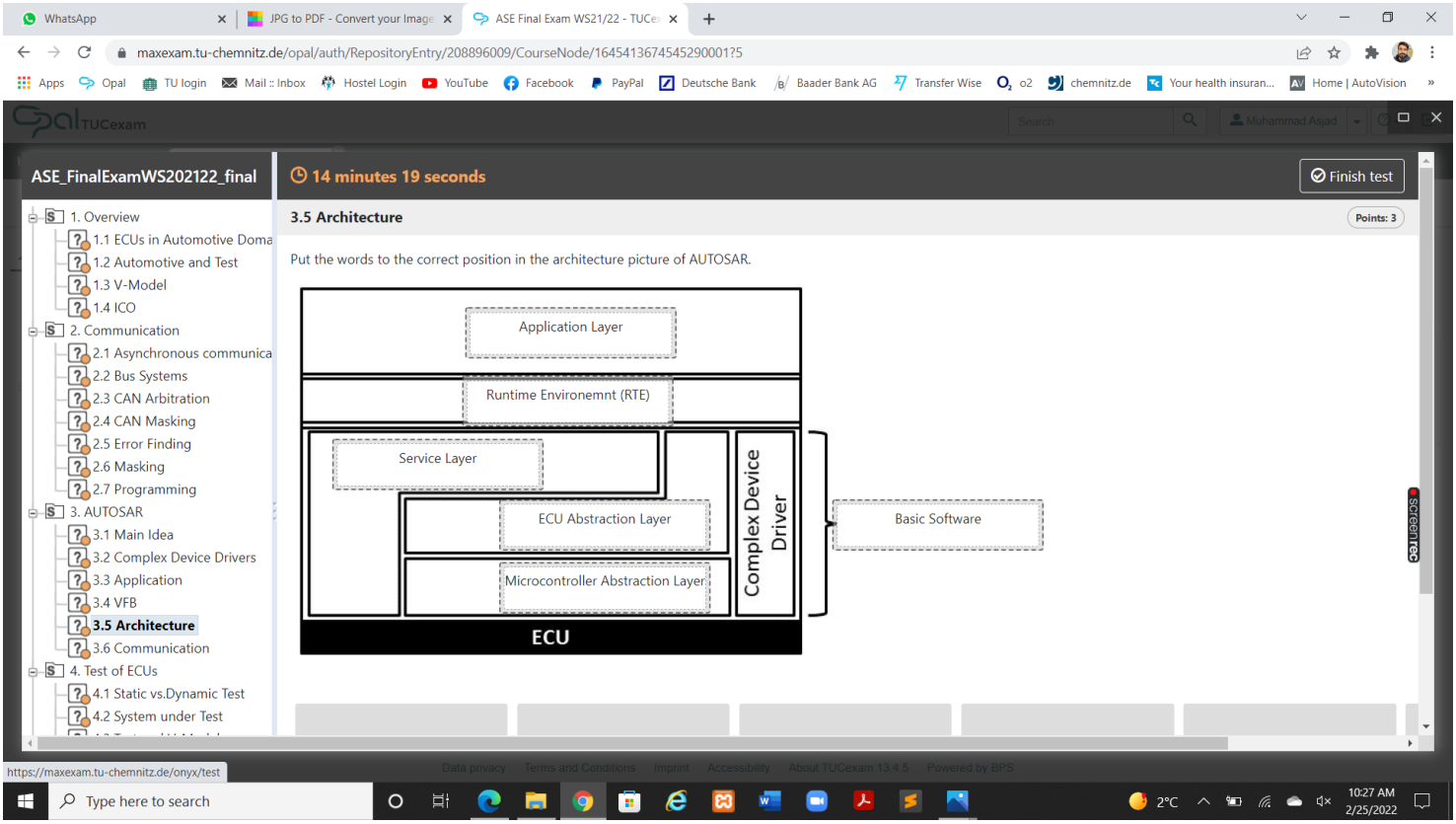
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Points: 3
Put the words to the correct position in the architecture picture of AUTOSAR.
Application Layer
Runtime Environemnt (RTE)
Service Layer
ECU Abstraction Layer
Microcontroller Abstraction Layer
Complex Device Driver
Basic Software
ECU
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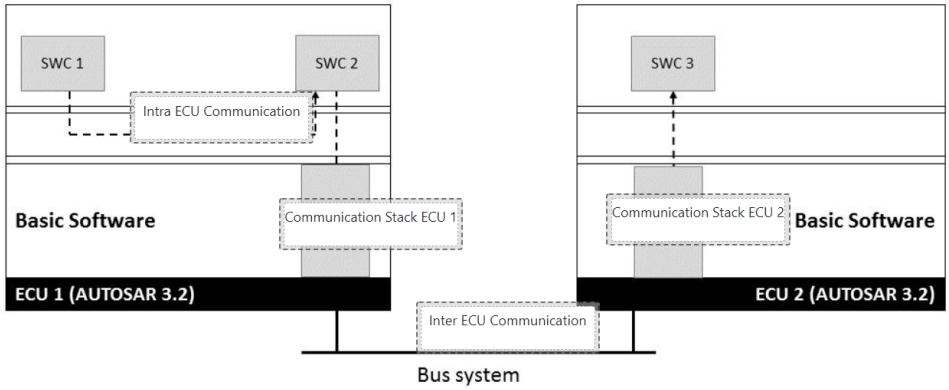
### 3.6 Communication

Points: 2

Put the given words to the correct position in the picture of two ECUs with AUTOSAR architecture.

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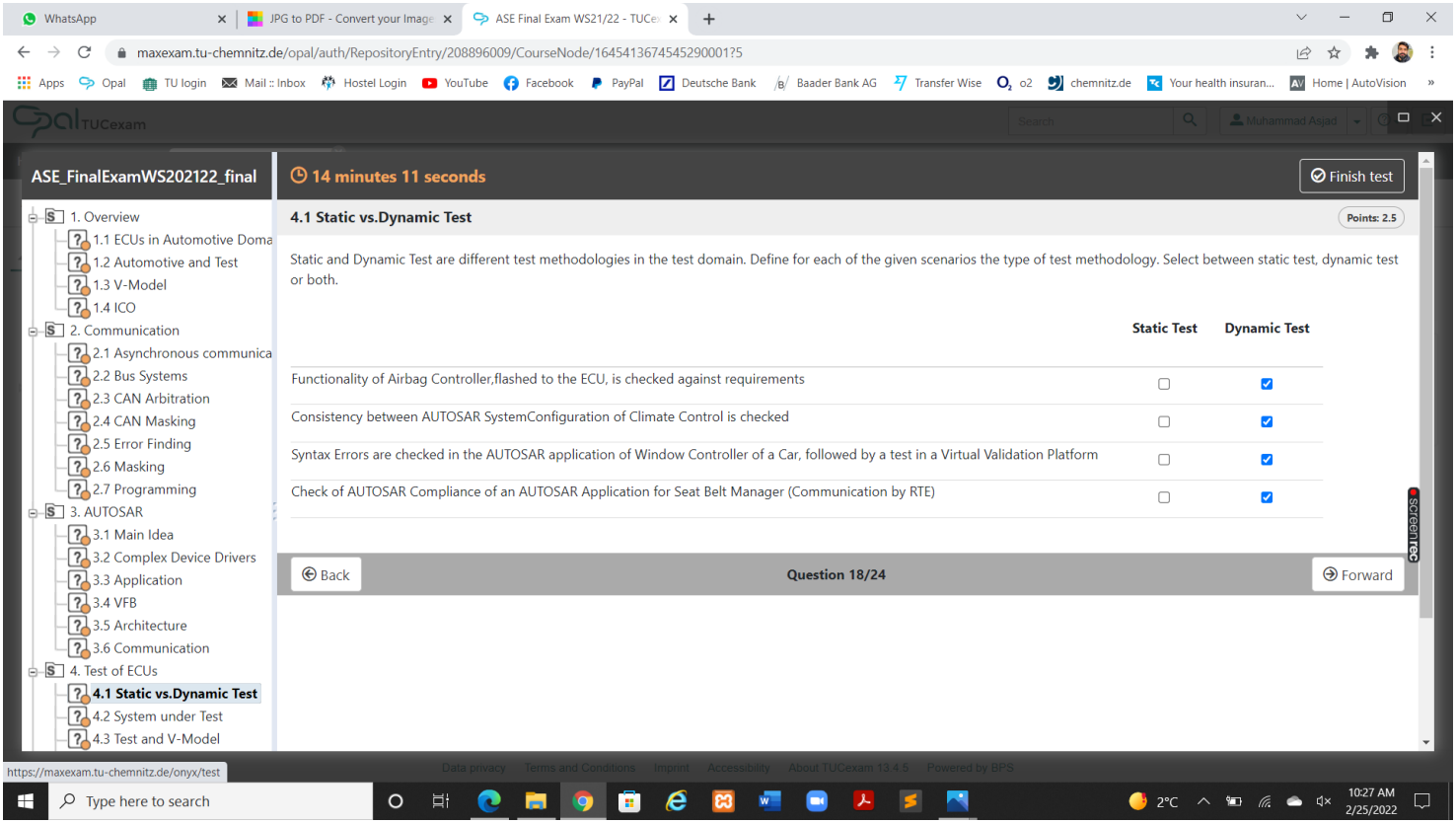
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4.1 Static vs.Dynamic Test
Points: 2.5
Static and Dynamic Test are different test methodologies in the test domain. Define for each of the given scenarios the type of test methodology. Select between static test, dynamic test or both.
Static Test
Dynamic Test
Functionality of Airbag Controller,flashed to the ECU, is checked against requirements
Consistency between AUTOSAR SystemConfiguration of Climate Control is checked
Syntax Errors are checked in the AUTOSAR application of Window Controller of a Car, followed by a test in a Virtual Validation Platform
Check of AUTOSAR Compliance of an AUTOSAR Application for Seat Belt Manager (Communication by RTE)
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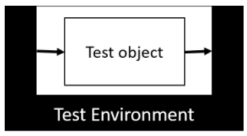
  - **4.2 System under Test**
  - 4.3 Test and V-Model

## 4.2 System under Test

Points: 2

The SuT (System under Test) represents the test object and test environment.

What does **PoC** and **PoO** in SuT stand for? What do they realize?




In system under test (SuT), point of control (Poc) realizes simulation of an object with test data and point of observation (PoO) realizes the output reading test object.

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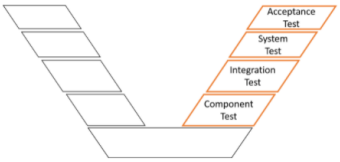
## 4.3 Test and V-Model

Points: 3

The V-Model contains different phases of test. In the given picture, the four abstract test phases are named. Explain briefly the major differences of the phases.

Where do the test cases come from?




Component Test:
Directly after development, small units, classes or modules are tested, often white box test.

Integration Test:

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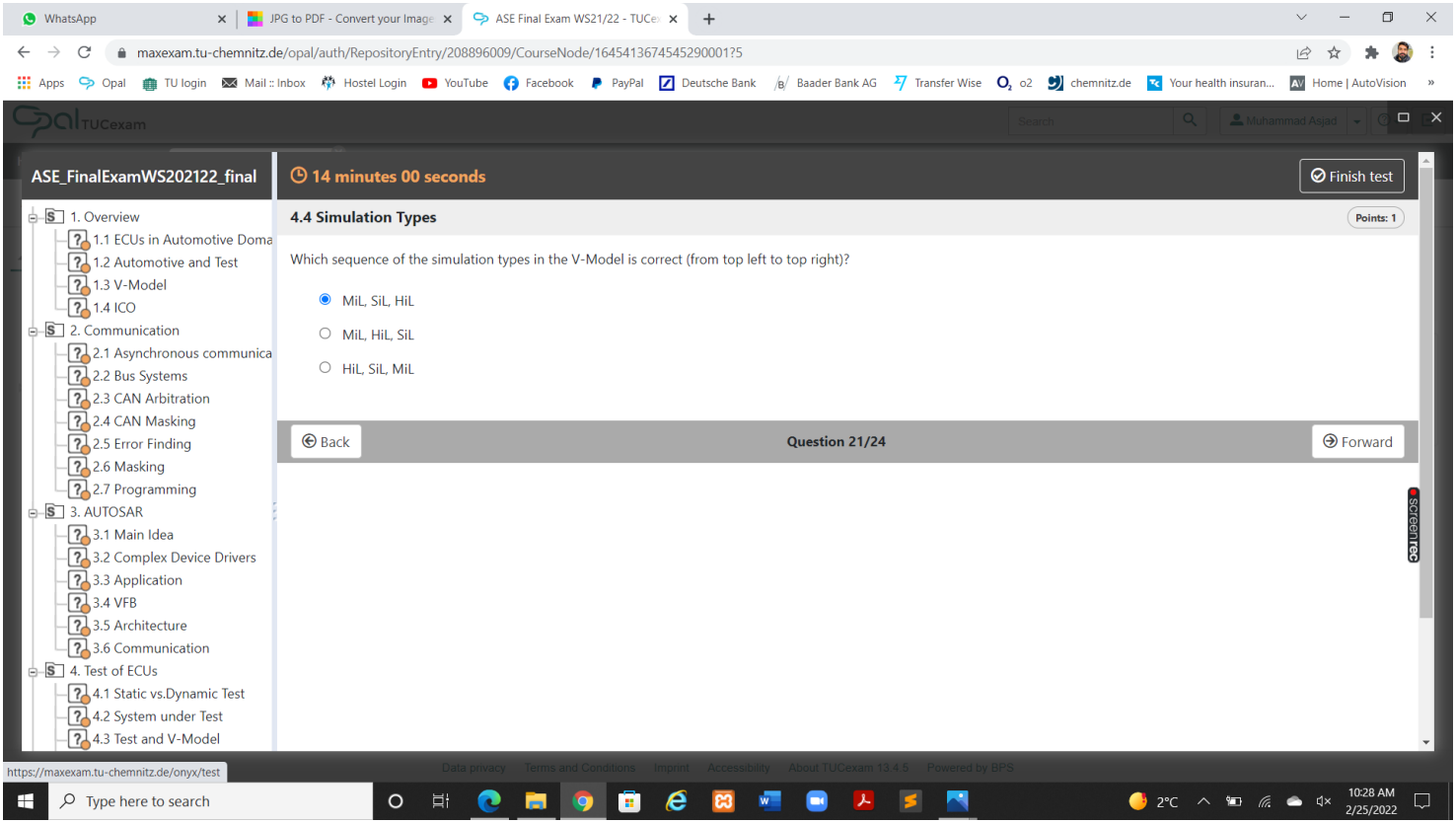
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4.4 Simulation Types
Points: 1
Which sequence of the simulation types in the V-Model is correct (from top left to top right)?
MiL, SiL, HiL
MiL, HiL, SiL
HiL, SiL, MiL
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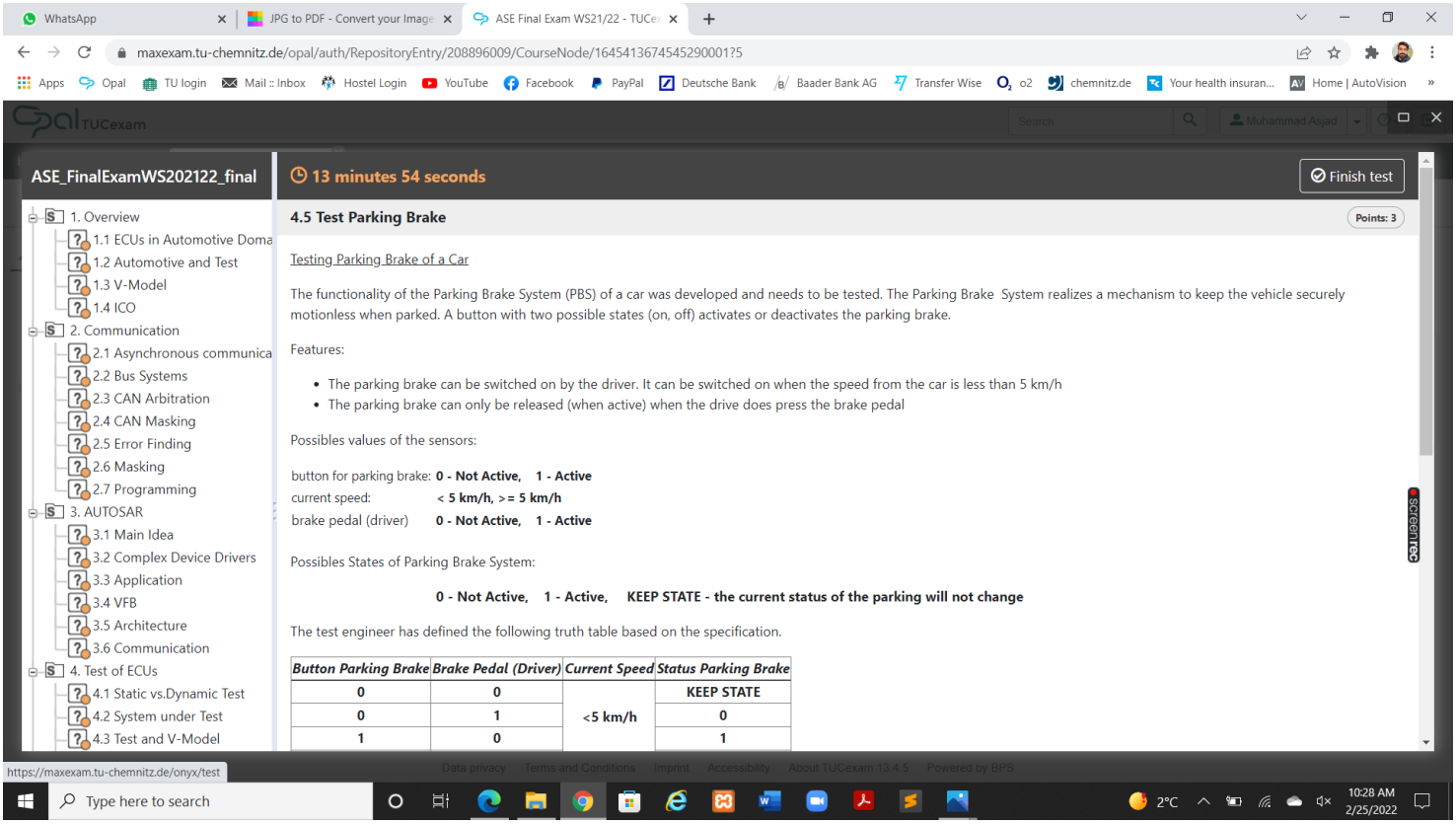
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4.5 Test Parking Brake
Points: 3
Testing Parking Brake of a Car
The functionality of the Parking Brake System (PBS) of a car was developed and needs to be tested. The Parking Brake System realizes a mechanism to keep the vehicle securely motionless when parked. A button with two possible states (on, off) activates or deactivates the parking brake.
Features:
The parking brake can be switched on by the driver. It can be switched on when the speed from the car is less than 5 km/h
The parking brake can only be released (when active) when the drive does press the brake pedal
Possibles values of the sensors:
button for parking brake: 0 - Not Active, 1 - Active
current speed: < 5 km/h, >= 5 km/h
brake pedal (driver) 0 - Not Active, 1 - Active
Possibles States of Parking Brake System:
0 - Not Active, 1 - Active, KEEP STATE - the current status of the parking will not change
The test engineer has defined the following truth table based on the specification.
Button Parking Brake
Brake Pedal (Driver)
Current Speed
Status Parking Brake
0
0
KEEP STATE
0
1
<5 km/h
0
1
0
1
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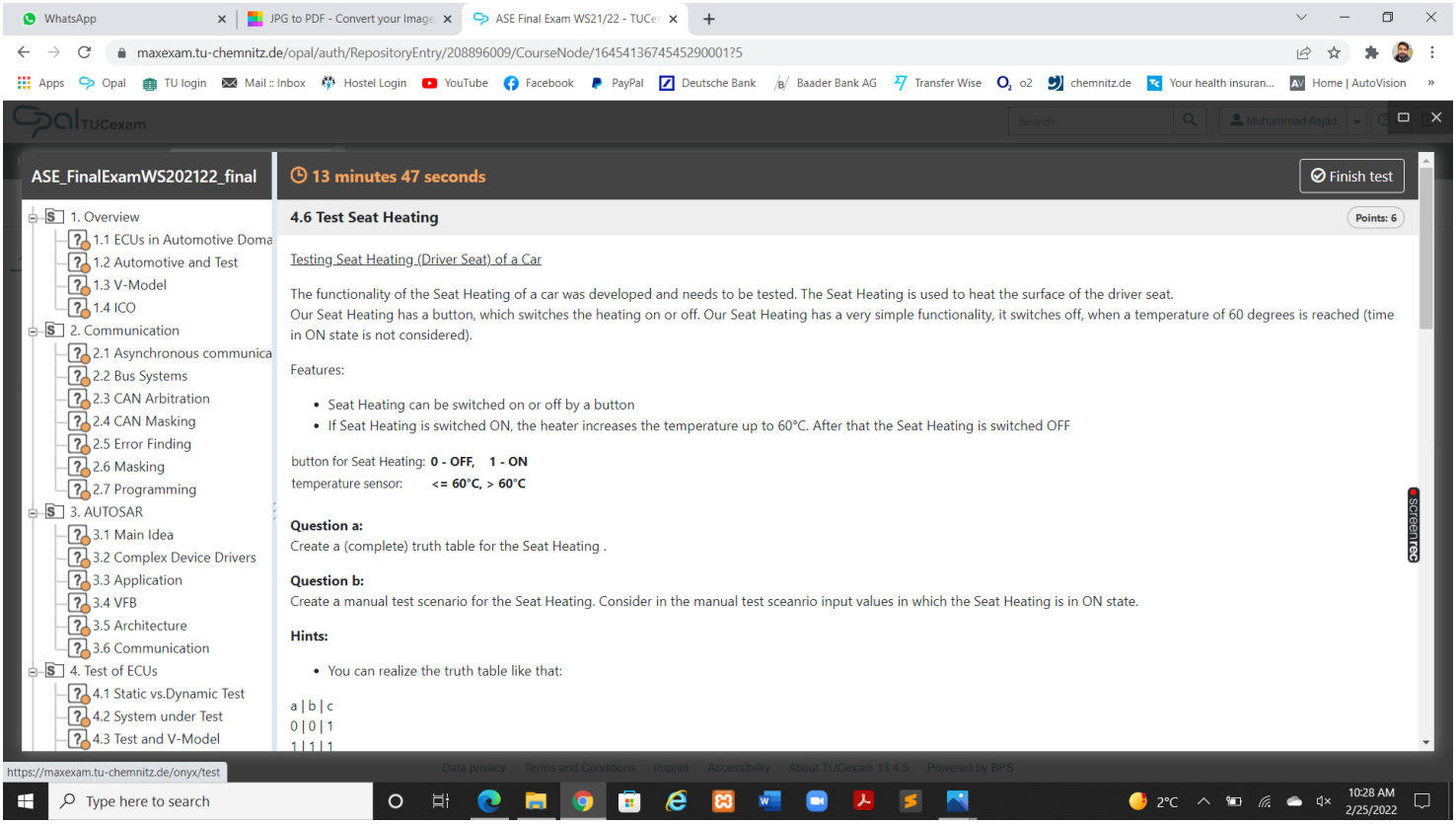
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4.6 Test Seat Heating
Points: 6
Testing Seat Heating (Driver Seat) of a Car
The functionality of the Seat Heating of a car was developed and needs to be tested. The Seat Heating is used to heat the surface of the driver seat.
Our Seat Heating has a button, which switches the heating on or off. Our Seat Heating has a very simple functionality, it switches off, when a temperature of 60 degrees is reached (time in ON state is not considered).
Features:
Seat Heating can be switched on or off by a button
If Seat Heating is switched ON, the heater increases the temperature up to 60°C. After that the Seat Heating is switched OFF
button for Seat Heating: 0 - OFF, 1 - ON
temperature sensor: <= 60°C, > 60°C
Question a:
Create a (complete) truth table for the Seat Heating .
Question b:
Create a manual test scenario for the Seat Heating. Consider in the manual test sceanrio input values in which the Seat Heating is in ON state.
Hints:
You can realize the truth table like that:
a | b | c
0 | 0 | 1
1 | 1 | 1
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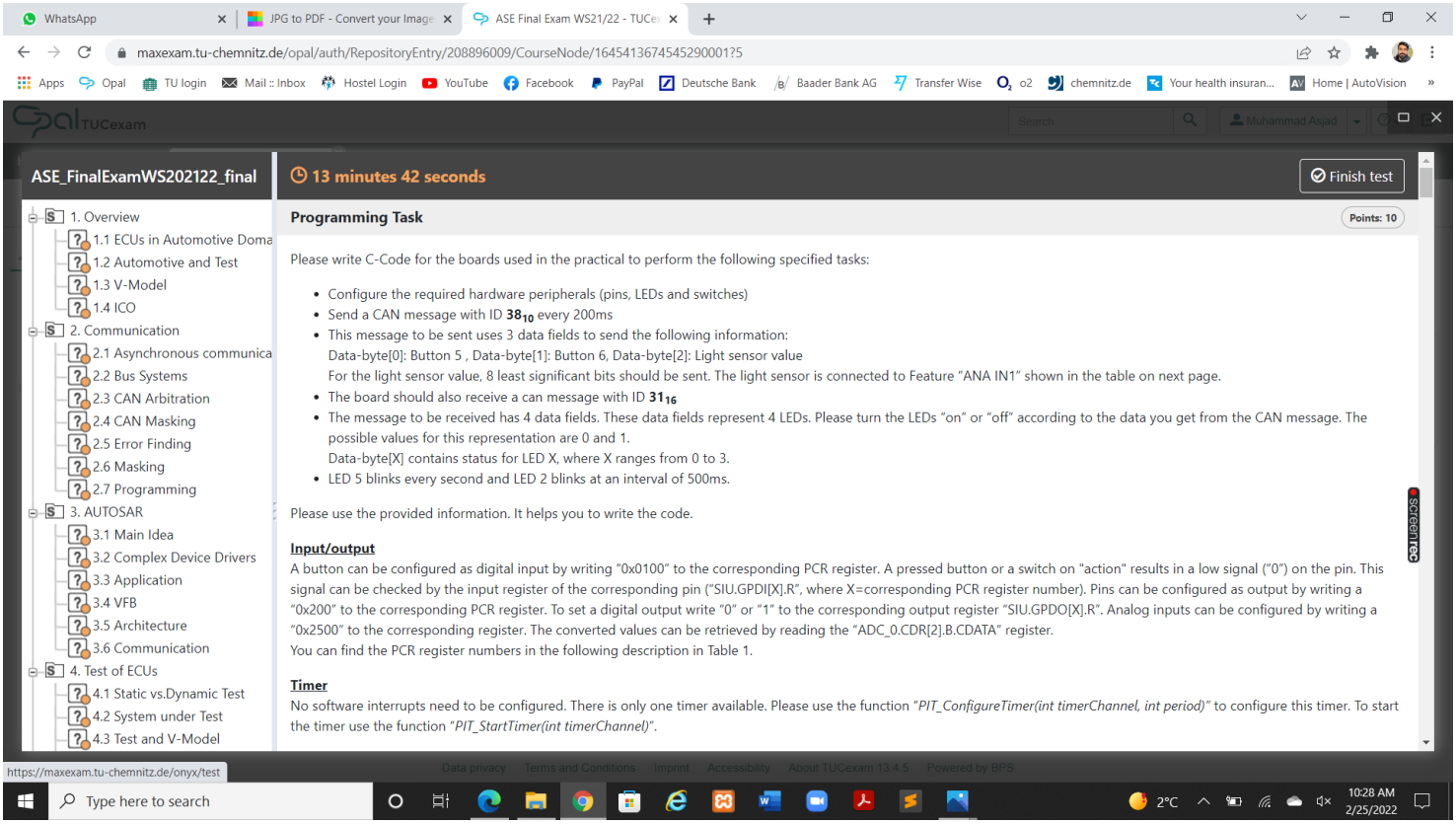
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Programming Task
Points: 10
Please write C-Code for the boards used in the practical to perform the following specified tasks:
Configure the required hardware peripherals (pins, LEDs and switches)
Send a CAN message with ID 38₁₀ every 200ms
This message to be sent uses 3 data fields to send the following information:
Data-byte[0]: Button 5 , Data-byte[1]: Button 6, Data-byte[2]: Light sensor value
For the light sensor value, 8 least significant bits should be sent. The light sensor is connected to Feature "ANA IN1" shown in the table on next page.
The board should also receive a can message with ID 31₁₆
The message to be received has 4 data fields. These data fields represent 4 LEDs. Please turn the LEDs "on" or "off" according to the data you get from the CAN message. The possible values for this representation are 0 and 1.
Data-byte[X] contains status for LED X, where X ranges from 0 to 3.
LED 5 blinks every second and LED 2 blinks at an interval of 500ms.
Please use the provided information. It helps you to write the code.
Input/output
A button can be configured as digital input by writing "0x0100" to the corresponding PCR register. A pressed button or a switch on "action" results in a low signal ("0") on the pin. This signal can be checked by the input register of the corresponding pin ("SIU.GPDI[X].R", where X=corresponding PCR register number). Pins can be configured as output by writing a "0x200" to the corresponding PCR register. To set a digital output write "0" or "1" to the corresponding output register "SIU.GPDO[X].R". Analog inputs can be configured by writing a "0x2500" to the corresponding register. The converted values can be retrieved by reading the "ADC_0.CDR[2].B.CDATA" register.
You can find the PCR register numbers in the following description in Table 1.
Timer
No software interrupts need to be configured. There is only one timer available. Please use the function "PIT_ConfigureTimer(int timerChannel, int period)" to configure this timer. To start the timer use the function "PIT_StartTimer(int timerChannel)".
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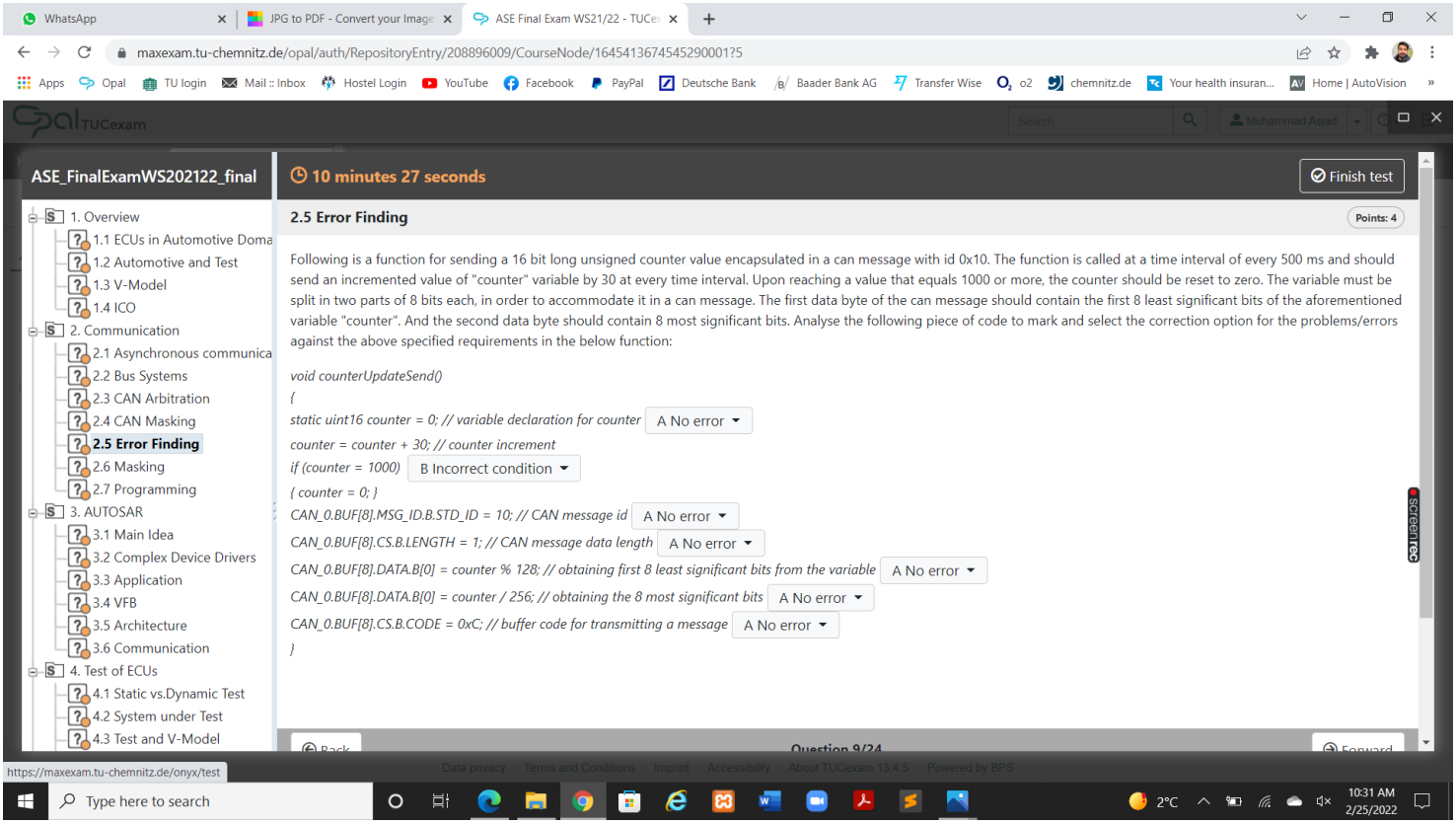
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1. Overview
1.1 ECUs in Automotive Doma
1.2 Automotive and Test
1.3 V-Model
1.4 ICO
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2.2 Bus Systems
2.3 CAN Arbitration
2.4 CAN Masking
2.5 Error Finding
2.6 Masking
2.7 Programming
3. AUTOSAR
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3.3 Application
3.4 VFB
3.5 Architecture
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4.1 Static vs.Dynamic Test
4.2 System under Test
4.3 Test and V-Model
2.5 Error Finding
Points: 4
Following is a function for sending a 16 bit long unsigned counter value encapsulated in a can message with id 0x10. The function is called at a time interval of every 500 ms and should send an incremented value of "counter" variable by 30 at every time interval. Upon reaching a value that equals 1000 or more, the counter should be reset to zero. The variable must be split in two parts of 8 bits each, in order to accommodate it in a can message. The first data byte of the can message should contain the first 8 least significant bits of the aforementioned variable "counter". And the second data byte should contain 8 most significant bits. Analyse the following piece of code to mark and select the correction option for the problems/errors against the above specified requirements in the below function:
void counterUpdateSend()
{
static uint16 counter = 0; // variable declaration for counter
A No error
counter = counter + 30; // counter increment
if (counter = 1000)
B Incorrect condition
{ counter = 0; }
CAN_0.BUF[8].MSG_ID.B.STD_ID = 10; // CAN message id
A No error
CAN_0.BUF[8].CS.B.LENGTH = 1; // CAN message data length
A No error
CAN_0.BUF[8].DATA.B[0] = counter % 128; // obtaining first 8 least significant bits from the variable
A No error
CAN_0.BUF[8].DATA.B[0] = counter / 256; // obtaining the 8 most significant bits
A No error
CAN_0.BUF[8].CS.B.CODE = 0xC; // buffer code for transmitting a message
A No error
}
Back
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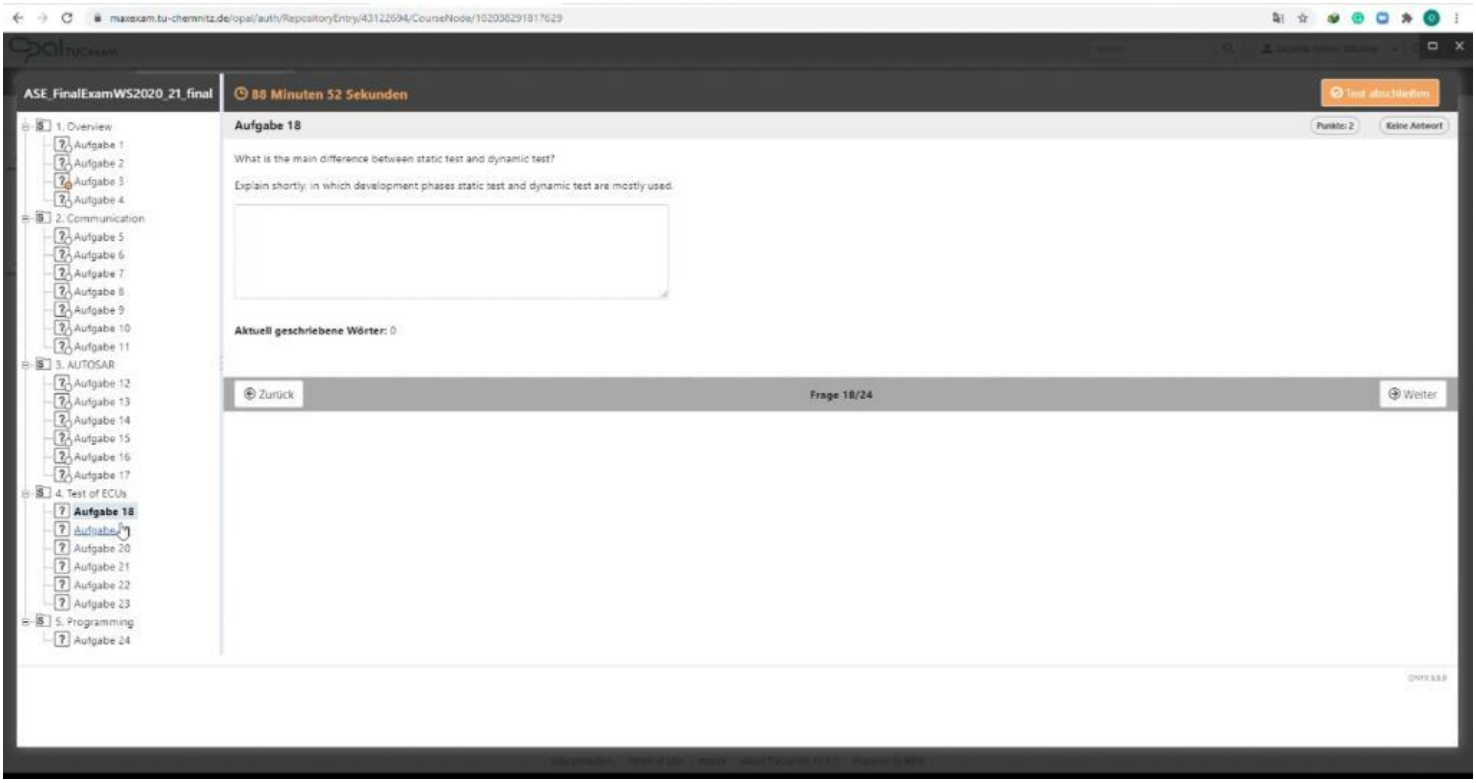
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88 Minuten 52 Sekunden
Test abschließen
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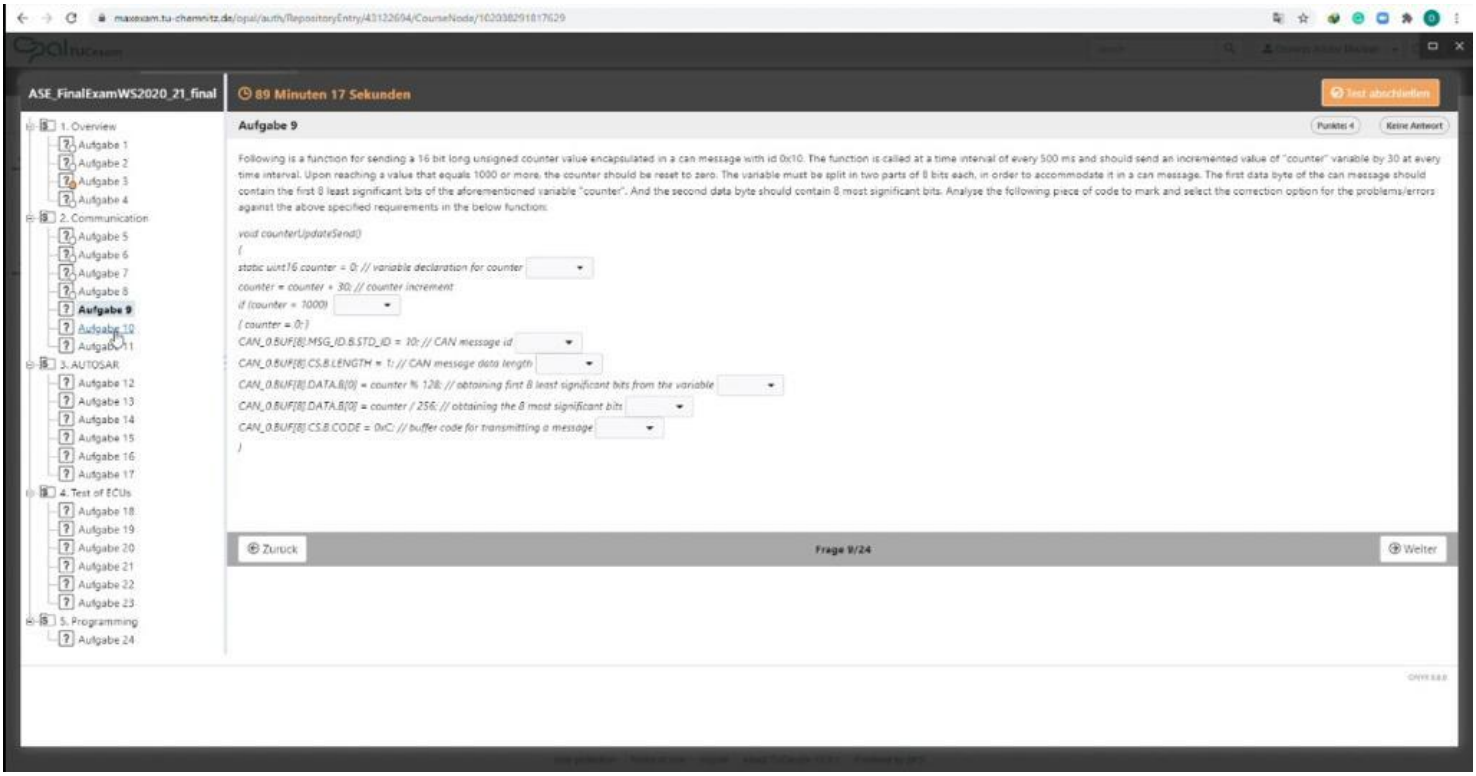
Aufgabe 24
Aufgabe 18
Punkte: 2
Keine Antwort
What is the main difference between static test and dynamic test?
Explain shortly: in which development phases static test and dynamic test are mostly used.
Aktuell geschriebene Wörter: 0
Zurück
Frage 18/24
Weiter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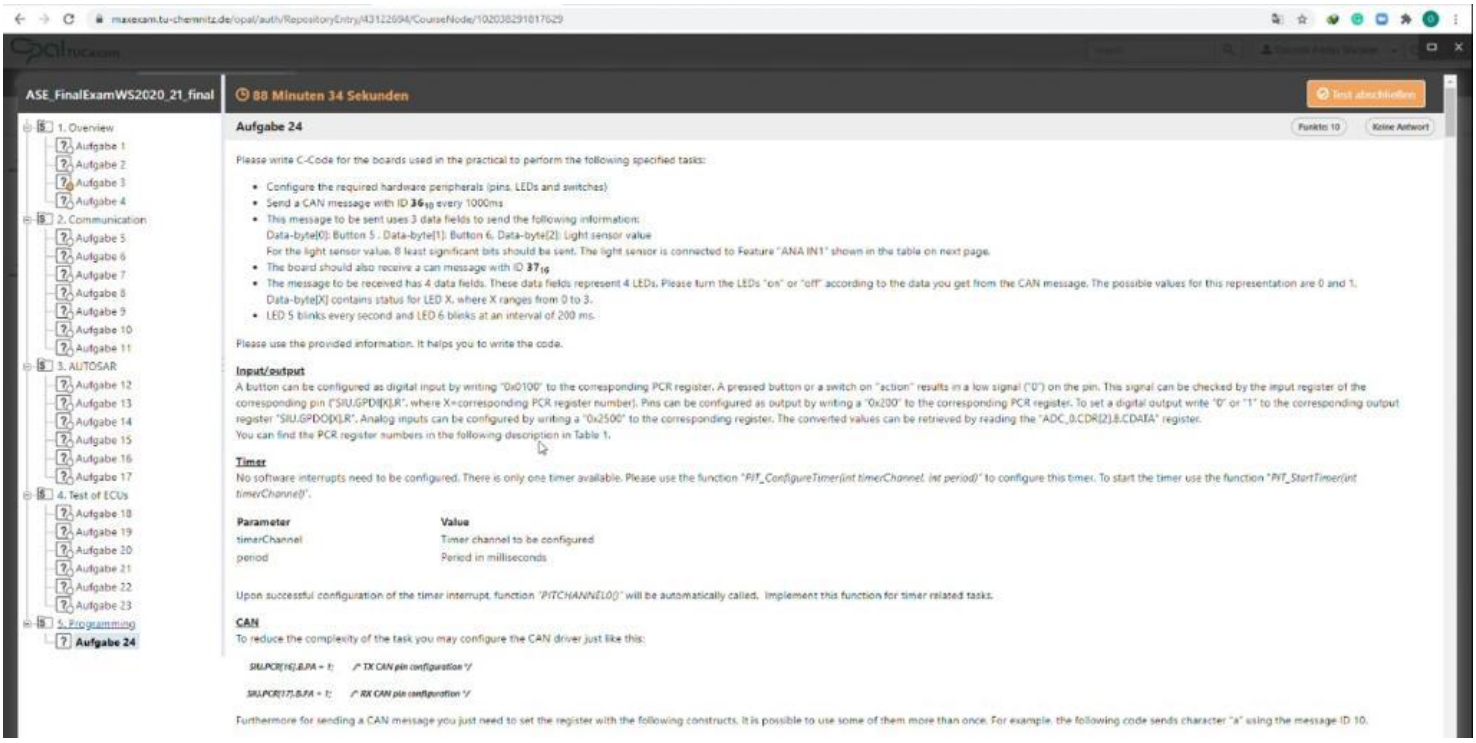
Punkte 4
Keine Antwort
Following is a function for sending a 16 bit long unsigned counter value encapsulated in a can message with id 0x10. The function is called at a time interval of every 500 ms and should send an incremented value of "counter" variable by 30 at every time interval. Upon reaching a value that equals 1000 or more, the counter should be reset to zero. The variable must be split in two parts of 8 bits each, in order to accommodate it in a can message. The first data byte of the can message should contain the first 8 least significant bits of the aforementioned variable "counter". And the second data byte should contain 8 most significant bits. Analyse the following piece of code to mark and select the correction option for the problems/errors against the above specified requirements in the below function:
void counterUpdateSend()
{
static uint16 counter = 0; // variable declaration for counter
counter = counter + 30; // counter increment
if (counter = 1000)
{ counter = 0; }
CAN_0.BUF[8].MSG_ID.B.STD_ID = 10; // CAN message id
CAN_0.BUF[8].CS.B.LENGTH = 1; // CAN message data length
CAN_0.BUF[8].DATA.B[0] = counter % 128; // obtaining first 8 least significant bits from the variable
CAN_0.BUF[8].DATA.B[0] = counter / 256; // obtaining the 8 most significant bits
CAN_0.BUF[8].CS.B.CODE = 0xC; // buffer code for transmitting a message
}
Zurück
Frage 9/24
Weiter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Test abschließen
1. Overview
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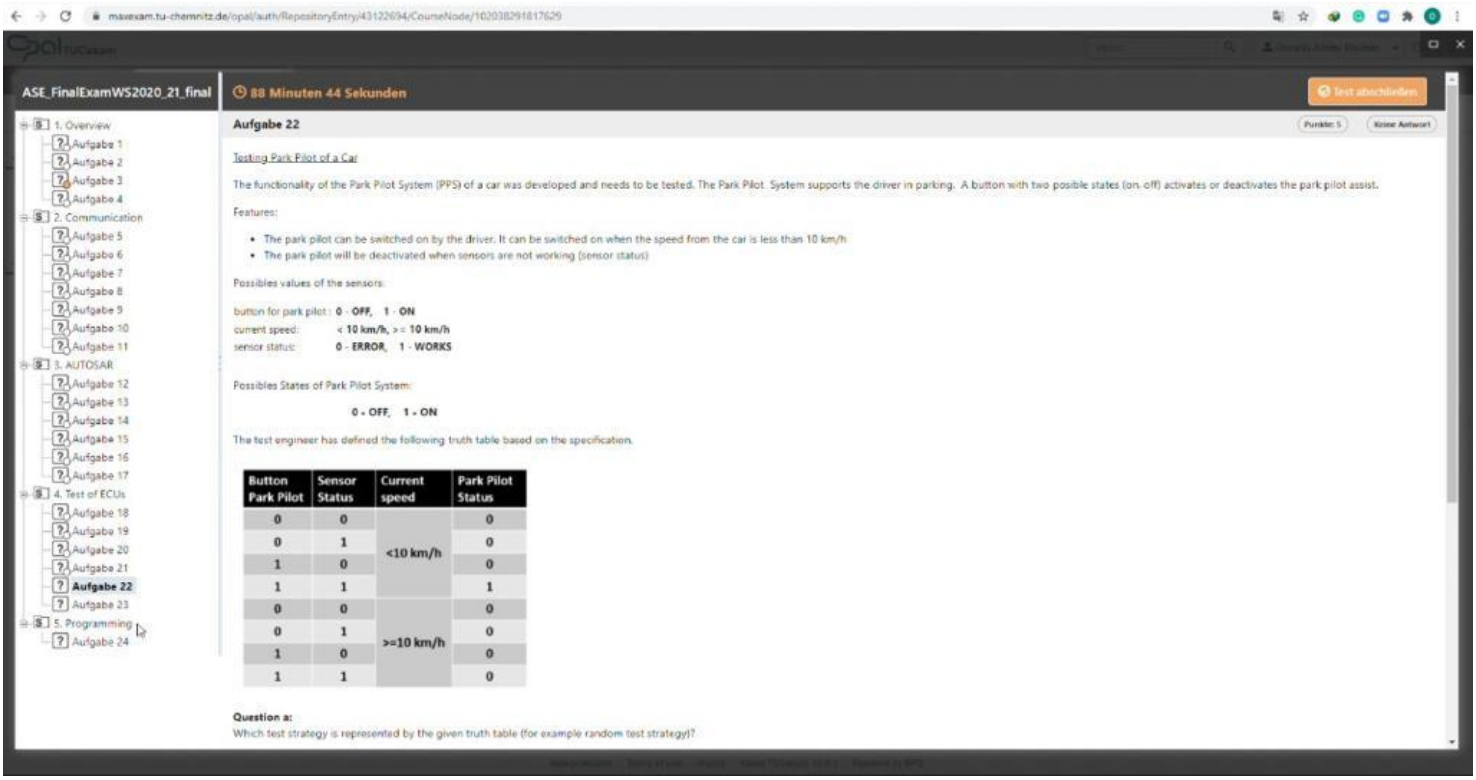
Punkte 10
Keine Antwort
Please write C-Code for the boards used in the practical to perform the following specified tasks:
Configure the required hardware peripherals (pins, LEDs and switches)
Send a CAN message with ID $36_{10}$ every 1000ms
This message to be sent uses 3 data fields to send the following information:
Data-byte[0]: Button 5 ; Data-byte[1]: Button 6, Data-byte[2]: Light sensor value
For the light sensor value, 8 least significant bits should be sent. The light sensor is connected to Feature "ANA IN1" shown in the table on next page.
The board should also receive a can message with ID $37_{16}$
The message to be received has 4 data fields. These data fields represent 4 LEDs. Please turn the LEDs "on" or "off" according to the data you get from the CAN message. The possible values for this representation are 0 and 1.
Data-byte[X] contains status for LED X, where X ranges from 0 to 3.
LED 5 blinks every second and LED 6 blinks at an interval of 200 ms.
Please use the provided information. It helps you to write the code.
Input/output
A button can be configured as digital input by writing "0x0100" to the corresponding PCR register. A pressed button or a switch on "action" results in a low signal ("0") on the pin. This signal can be checked by the input register of the corresponding pin ("SIU.GPDI[X].R", where X=corresponding PCR register number). Pins can be configured as output by writing a "0x200" to the corresponding PCR register. To set a digital output write "0" or "1" to the corresponding output register "SIU.GPDO[X].R". Analog inputs can be configured by writing a "0x2500" to the corresponding register. The converted values can be retrieved by reading the "ADC_0.CDR[2].B.CDATA" register.
You can find the PCR register numbers in the following description in Table 1.
Timer
No software interrupts need to be configured. There is only one timer available. Please use the function "PIT_ConfigureTimer(int timerChannel, int period)" to configure this timer. To start the timer use the function "PIT_StartTimer(int timerChannel)".
Parameter
Value
timerChannel
Timer channel to be configured
period
Period in milliseconds
Upon successful configuration of the timer interrupt, function "PITCHANNEL0()" will be automatically called. Implement this function for timer related tasks.
CAN
To reduce the complexity of the task you may configure the CAN driver just like this:
SIU.PCR[16].B.PA = 1; /* TX CAN pin configuration */
SIU.PCR[17].B.PA = 1; /* RX CAN pin configuration */
Furthermore for sending a CAN message you just need to set the register with the following constructs. It is possible to use some of them more than once. For example, the following code sends character "a" using the message ID 10.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88 Minuten 44 Sekunden
Test abschließen
1. Overview
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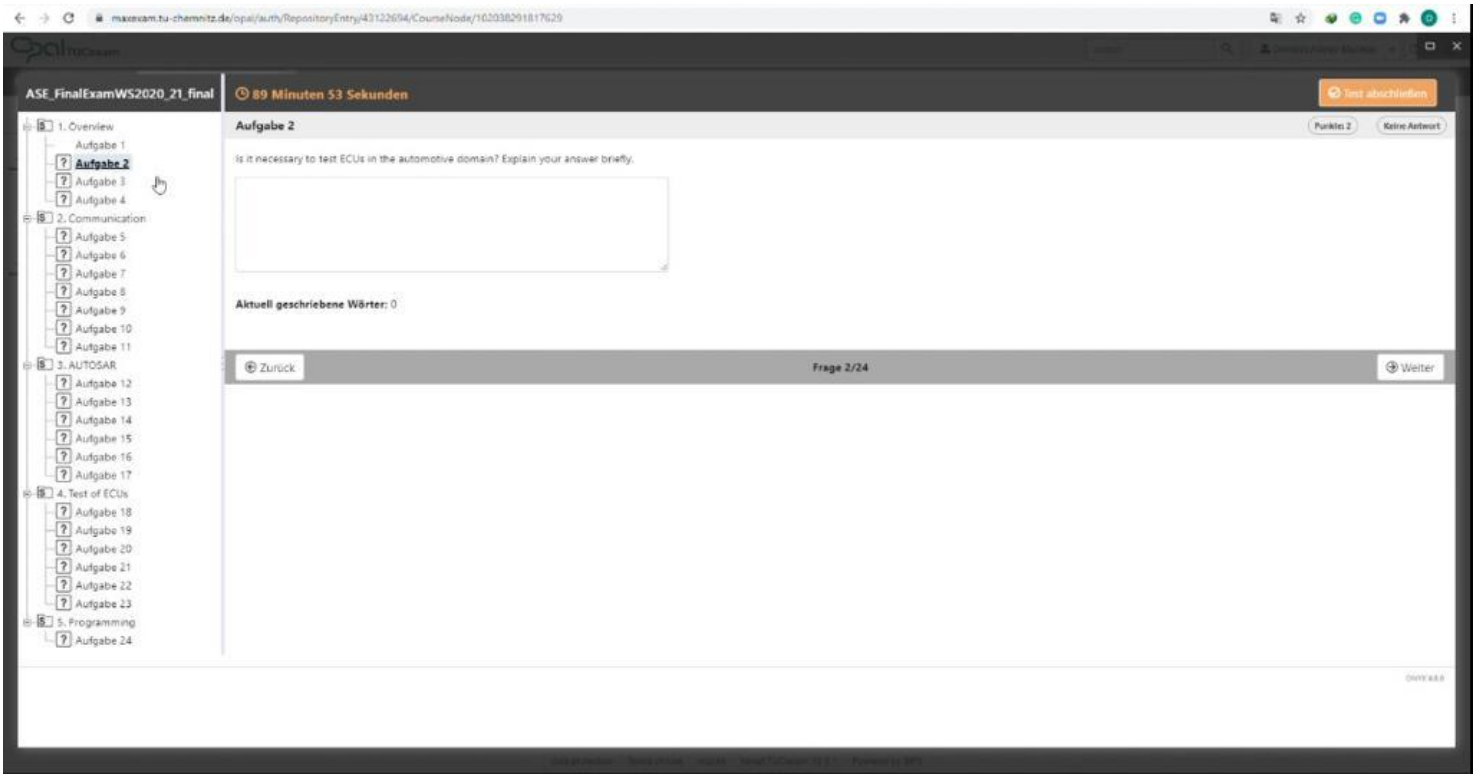
Punkte: 5
Keine Antwort
Testing Park Pilot of a Car
The functionality of the Park Pilot System (PPS) of a car was developed and needs to be tested. The Park Pilot System supports the driver in parking. A button with two possible states (on, off) activates or deactivates the park pilot assist.
Features:
The park pilot can be switched on by the driver. It can be switched on when the speed from the car is less than 10 km/h
The park pilot will be deactivated when sensors are not working (sensor status)
Possibles values of the sensors:
button for park pilot : 0 - OFF, 1 - ON
current speed: < 10 km/h, >= 10 km/h
sensor status: 0 - ERROR, 1 - WORKS
Possibles States of Park Pilot System:
0 - OFF, 1 - ON
The test engineer has defined the following truth table based on the specification.
Button Park Pilot
Sensor Status
Current speed
Park Pilot Status
0 0 <10 km/h 0
0 1 0
1 0 0
1 1 1
0 0 >=10 km/h 0
0 1 0
1 0 0
1 1 0
Question a:
Which test strategy is represented by the given truth table (for example random test strategy)?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Aufgabe 24
Aufgabe 2
Punkte 2
Keine Antwort
Is it necessary to test ECUs in the automotive domain? Explain your answer briefly.
Aktuell geschriebene Wörter: 0
Zurück
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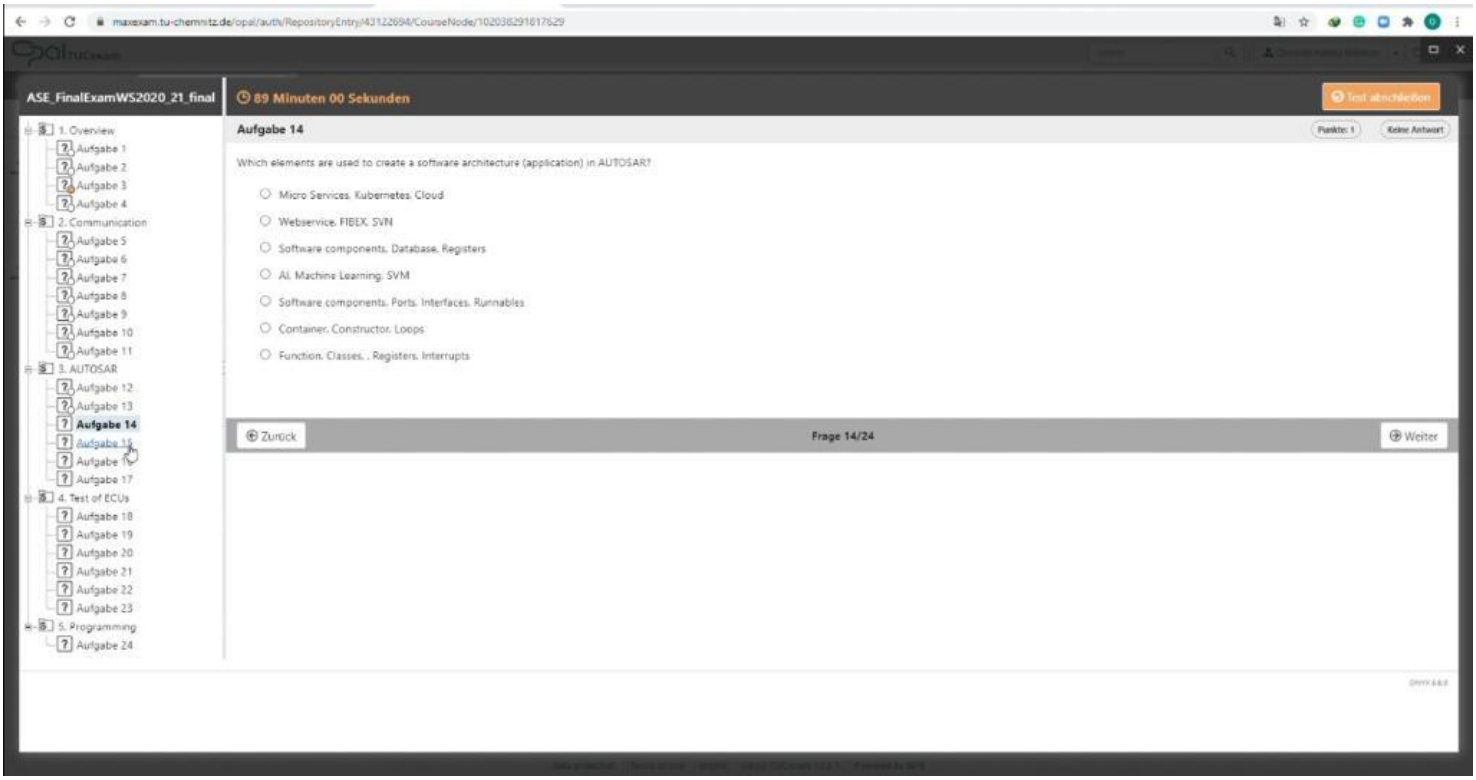
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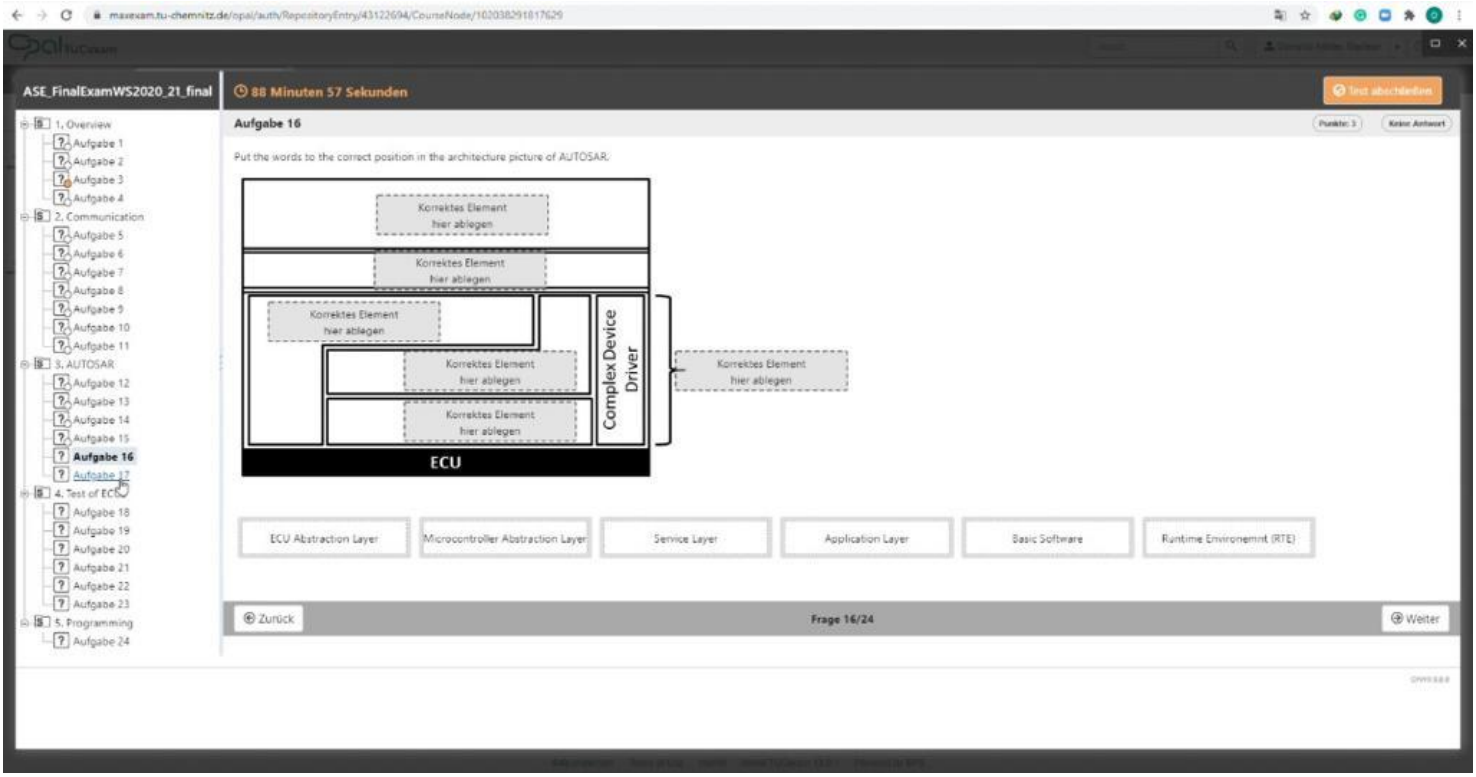
Punkte: 1
Keine Antwort
Which elements are used to create a software architecture (application) in AUTOSAR?
Micro Services, Kubernetes, Cloud
Webservice, FIBEX, SVN
Software components, Database, Registers
AI, Machine Learning, SVM
Software components, Ports, Interfaces, Runnables
Container, Constructor, Loops
Function, Classes, , Registers, Interrupts
Zurück
Frage 14/24
Weiter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Aufgabe 24
Aufgabe 16
Punkte: 3
Keine Antwort
Put the words to the correct position in the architecture picture of AUTOSAR.
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Korrektes Element hier ablegen
Complex Device Driver
Korrektes Element hier ablegen
ECU
ECU Abstraction Layer
Microcontroller Abstraction Layer
Service Layer
Application Layer
Basic Software
Runtime Environemnt (RTE)
Zurück
Frage 16/24
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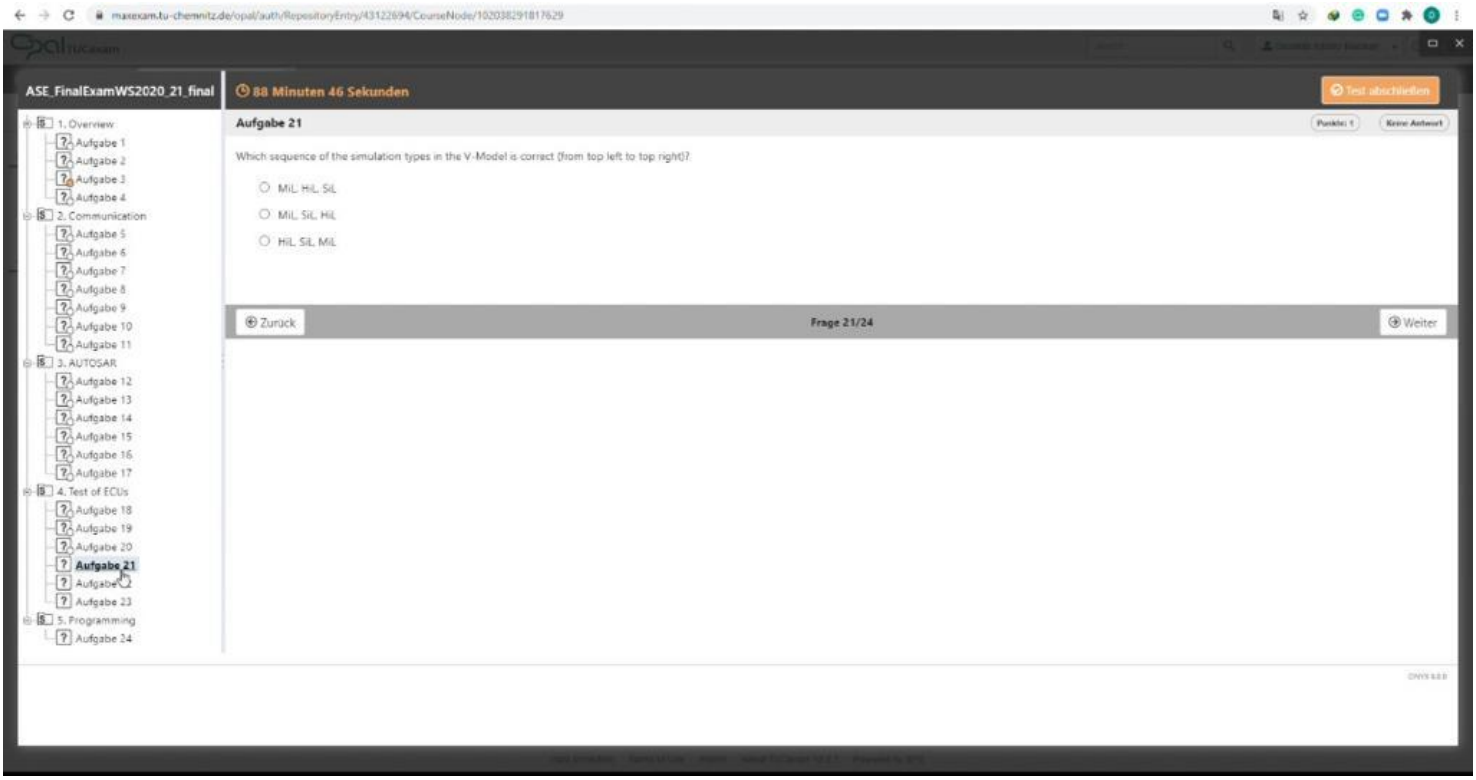
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Test abschließen
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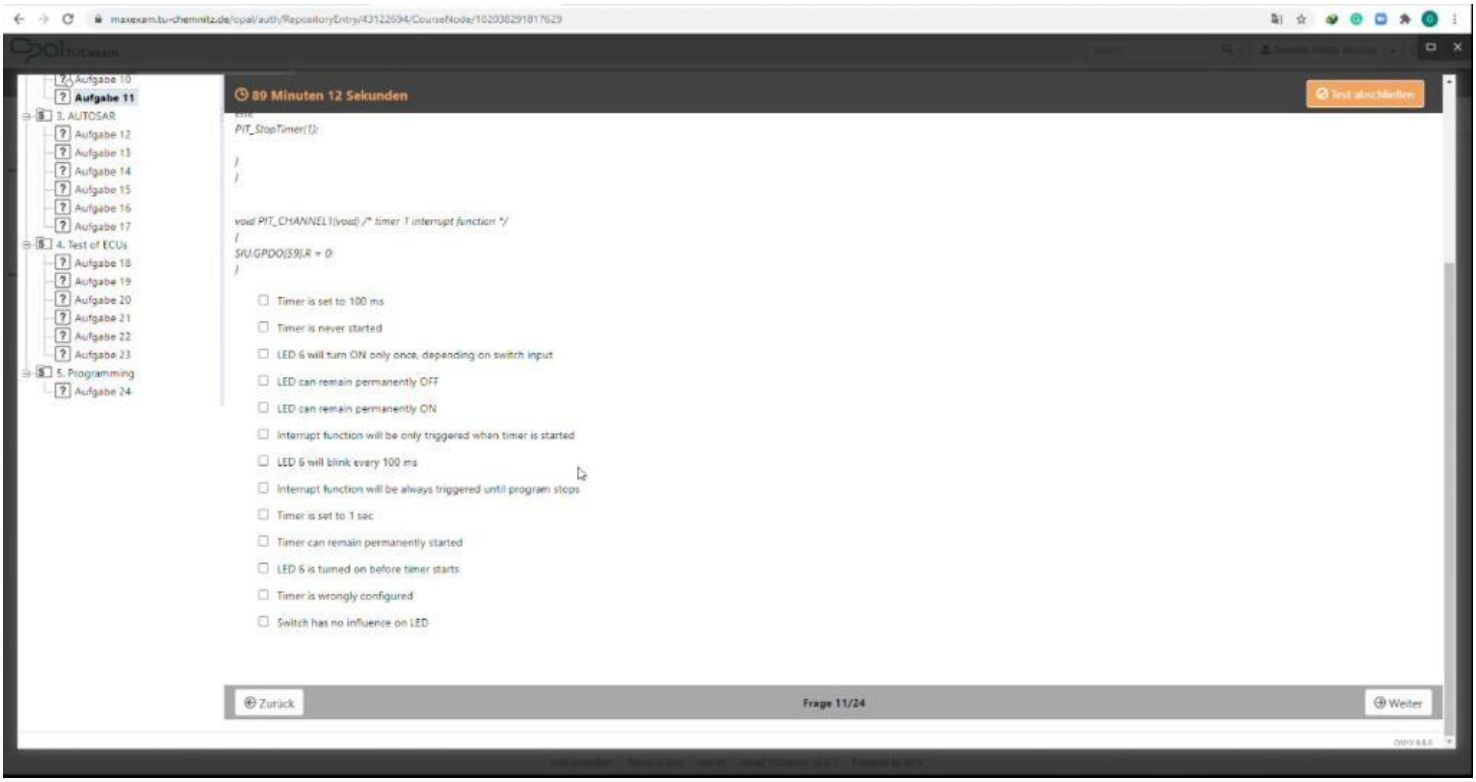
Punkte: 1
Keine Antwort
Which sequence of the simulation types in the V-Model is correct (from top left to top right)?
MiL, HiL, SiL
MiL, SiL, HiL
HiL, SiL, MiL
Zurück
Frage 21/24
Weiter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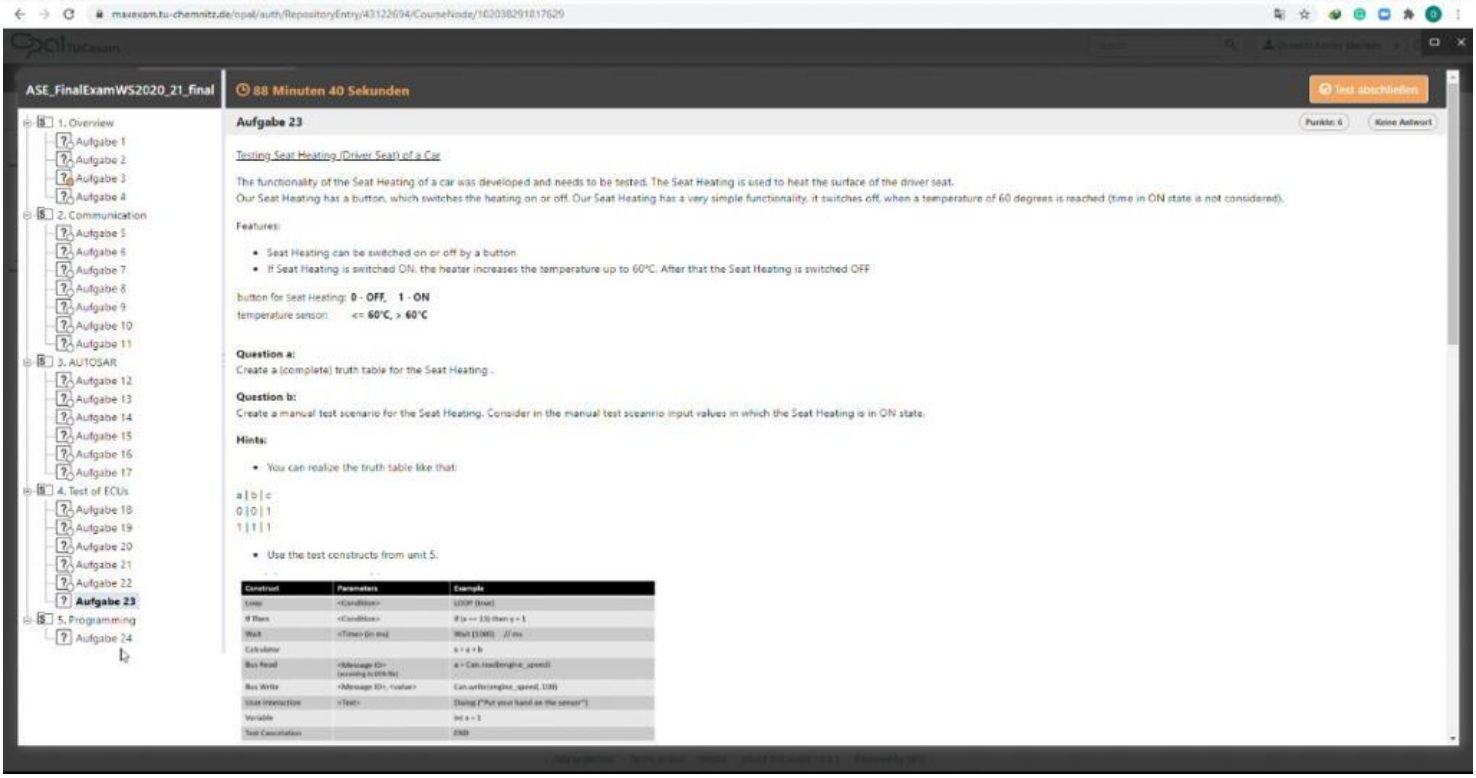
5. Programming
Aufgabe 24
89 Minuten 12 Sekunden
Test abschließen
PIT_StopTimer(1);
}
}
void PIT_CHANNEL1(void) /* timer 1 interrupt function */
{
SIU.GPDO[59].R = 0;
}
Timer is set to 100 ms
Timer is never started
LED 6 will turn ON only once, depending on switch input
LED can remain permanently OFF
LED can remain permanently ON
Interrupt function will be only triggered when timer is started
LED 6 will blink every 100 ms
Interrupt function will be always triggered until program stops
Timer is set to 1 sec
Timer can remain permanently started
LED 6 is turned on before timer starts
Timer is wrongly configured
Switch has no influence on LED
Zurück
Frage 11/24
Weiter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Test abschließen
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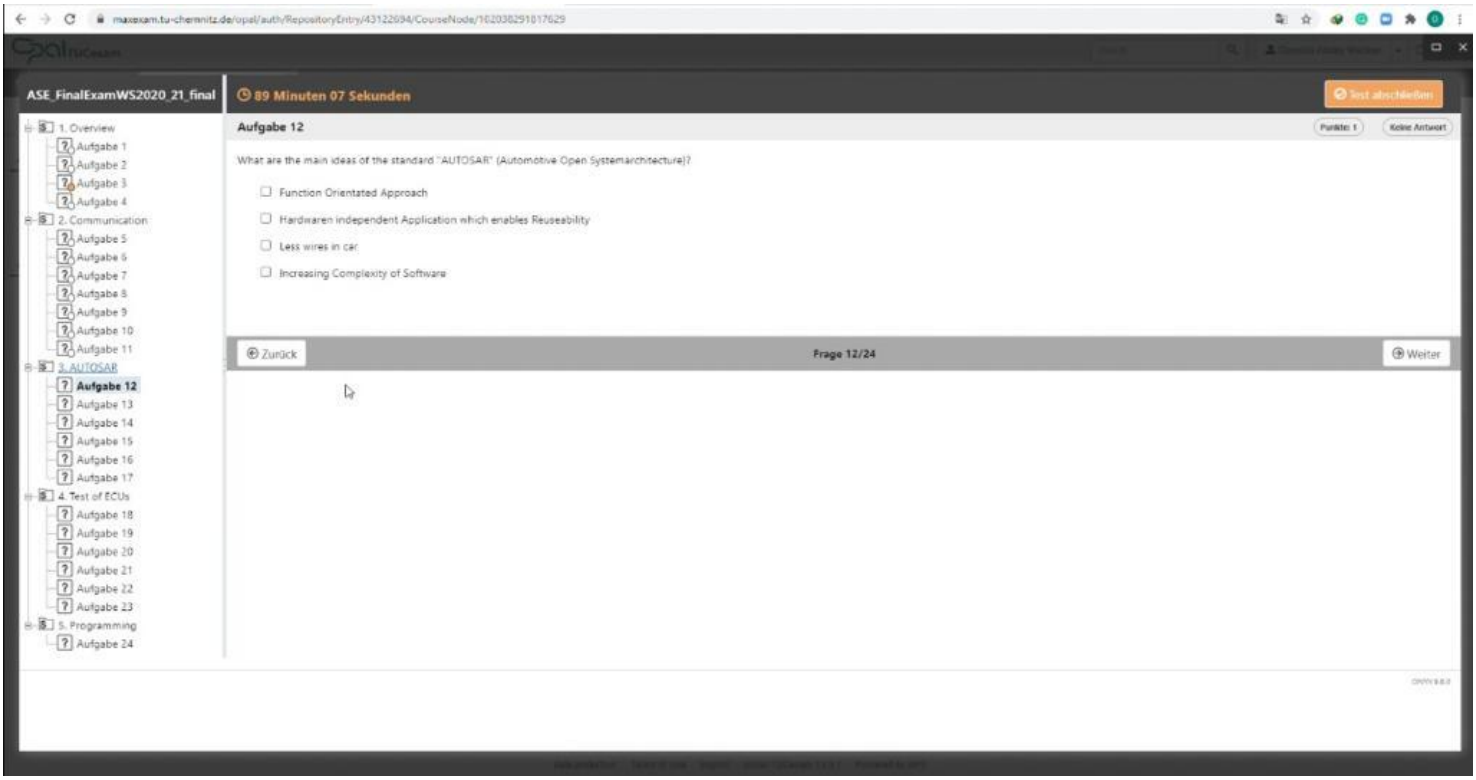
Punkte: 6
Keine Antwort
Testing Seat Heating (Driver Seat) of a Car
The functionality of the Seat Heating of a car was developed and needs to be tested. The Seat Heating is used to heat the surface of the driver seat.
Our Seat Heating has a button, which switches the heating on or off. Our Seat Heating has a very simple functionality, it switches off, when a temperature of 60 degrees is reached (time in ON state is not considered).
Features:
Seat Heating can be switched on or off by a button
If Seat Heating is switched ON, the heater increases the temperature up to 60°C. After that the Seat Heating is switched OFF
button for Seat Heating: 0 - OFF, 1 - ON
temperature sensor: <= 60°C, > 60°C
Question a:
Create a (complete) truth table for the Seat Heating.
Question b:
Create a manual test scenario for the Seat Heating. Consider in the manual test scenario input values in which the Seat Heating is in ON state.
Hints:
You can realize the truth table like that:
a | b | c
0 | 0 | 1
1 | 1 | 1
Use the test constructs from unit 5.
Construct
Parameters
Example
Loop
<Condition>
LOOP (true)
If then
<Condition>
If (x == 13) then y = 1
Wait
<Time> (in ms)
Wait (1000) // ms
Calculator
a = a + b
Bus Read
<Message ID> (according to DBC file)
a = Can.read(engine_speed)
Bus Write
<Message ID>, <value>
Can.write(engine_speed, 100)
User Interaction
<Text>
Dialog ("Put your hand on the sensor")
Variable
int a = 1
Test Conclusion
END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Test abschließen
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2. Communication
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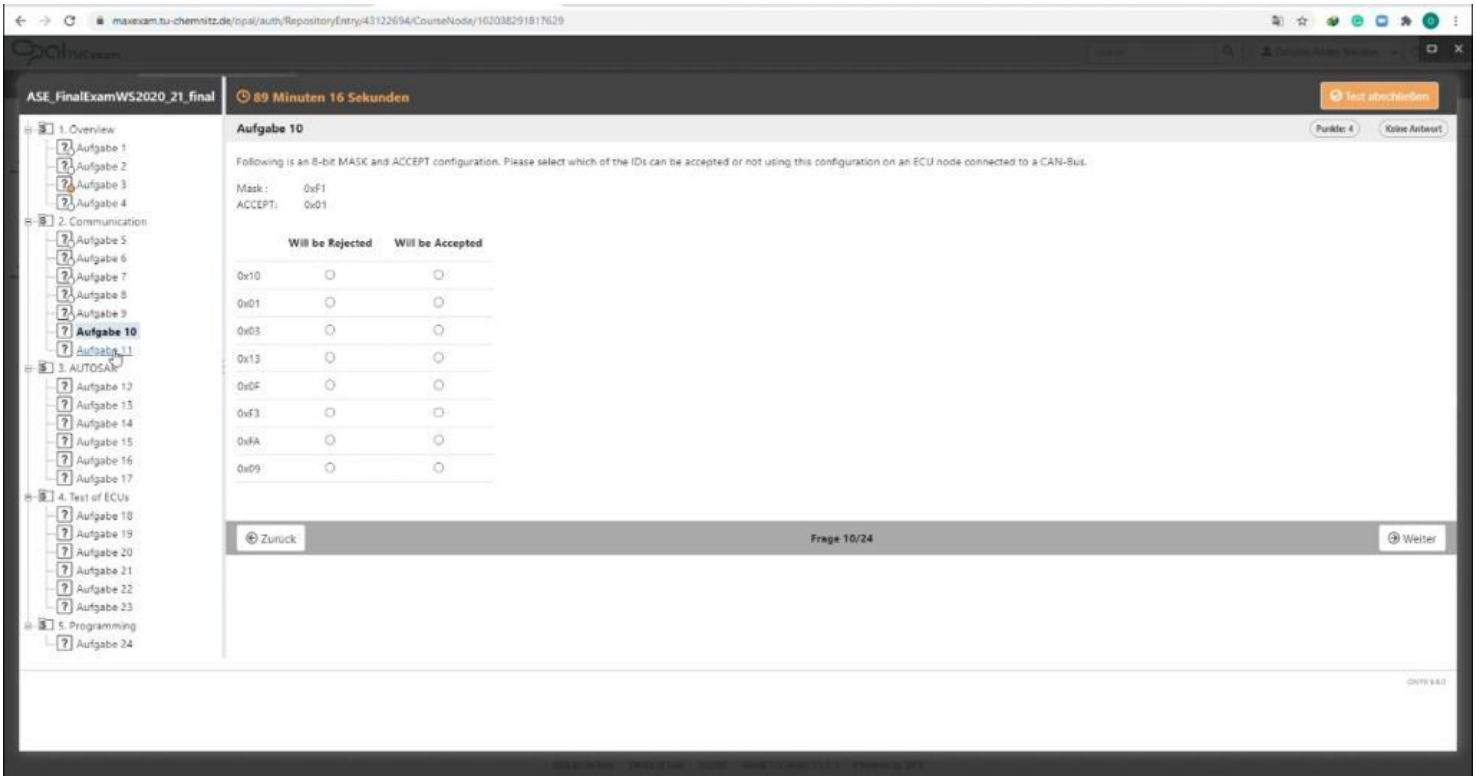
Aufgabe 24
Aufgabe 12
Punkte: 1
Keine Antwort
What are the main ideas of the standard "AUTOSAR" (Automotive Open Systemarchitecture)?
Function Orientated Approach
Hardwaren independent Application which enables Reuseability
Less wires in car
Increasing Complexity of Software
Zurück
Frage 12/24
Weiter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89 Minuten 16 Sekunden
Test abschließen
1. Overview
Aufgabe 1
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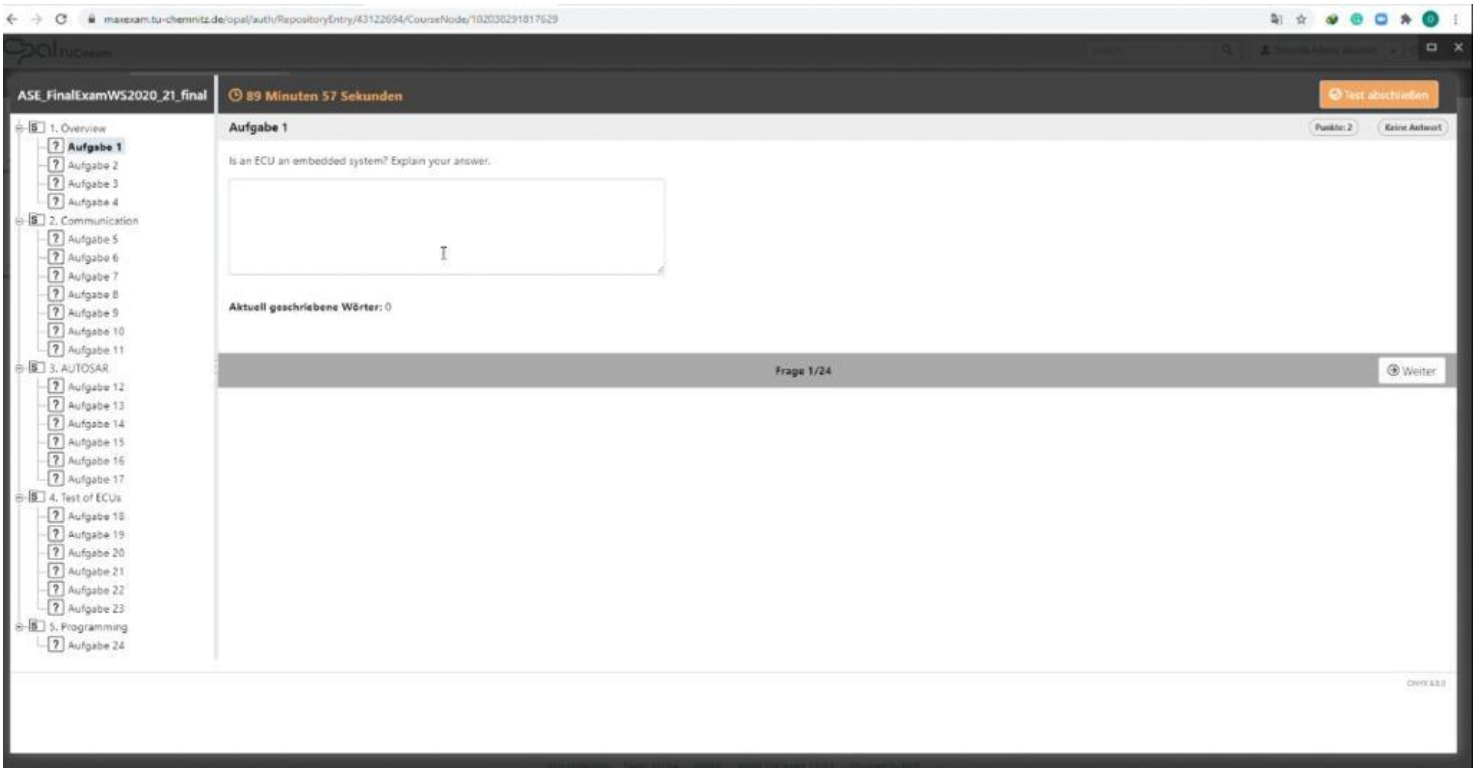
Aufgabe 21
Aufgabe 22
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 10
Punkte: 4
Keine Antwort
Following is an 8-bit MASK and ACCEPT configuration. Please select which of the IDs can be accepted or not using this configuration on an ECU node connected to a CAN-Bus.
Mask: 0xF1
ACCEPT: 0x01
Will be Rejected
Will be Accepted
0x10
0x01
0x03
0x13
0x0F
0xF3
0xFA
0x09
Zurück
Frage 10/24
Weiter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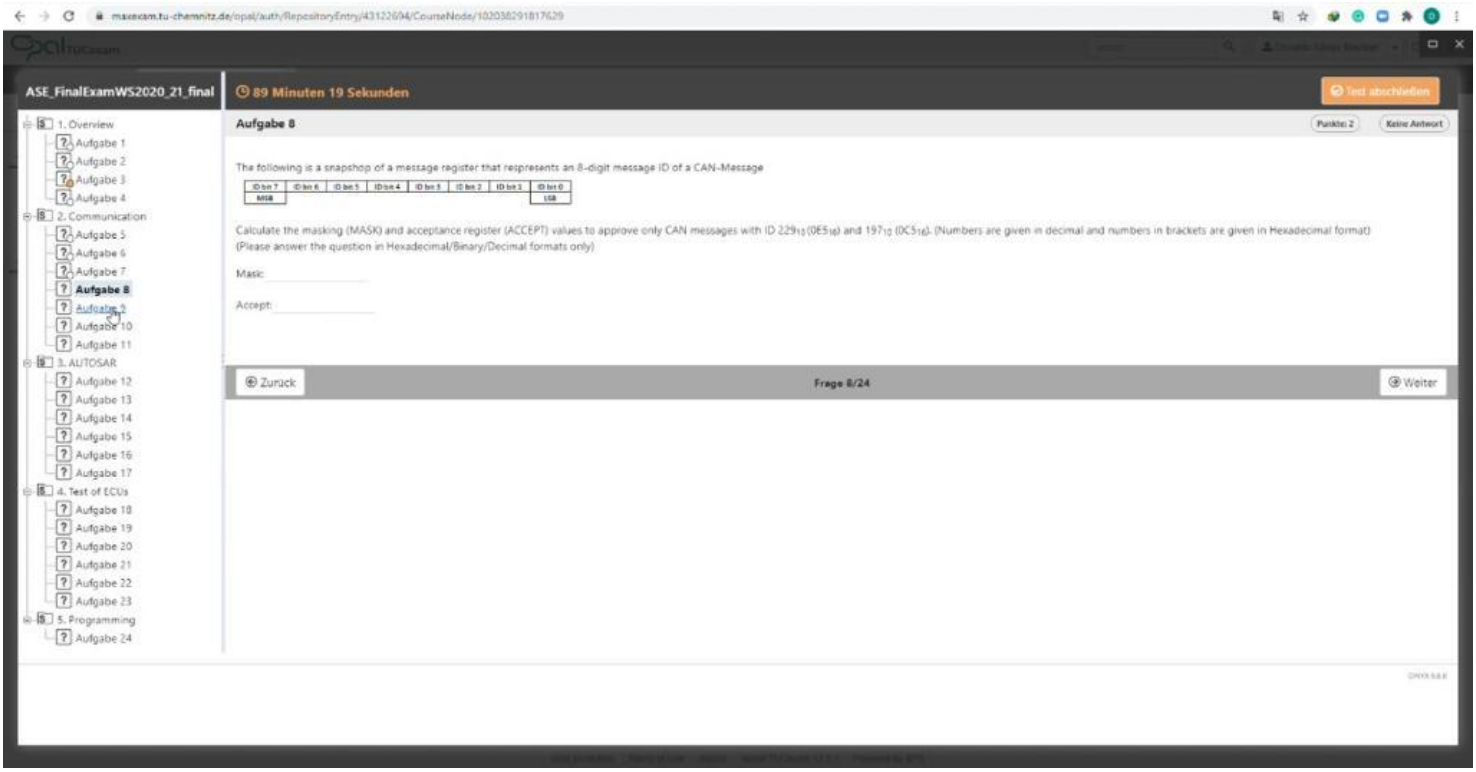
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 1
Punkte: 2
Keine Antwort
Is an ECU an embedded system? Explain your answer.
Aktuell geschriebene Wörter: 0
Frage 1/24
Weiter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89 Minuten 19 Sekunden
Test abschließen
1. Overview
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Aufgabe 3
Aufgabe 4
2. Communication
Aufgabe 5
Aufgabe 6
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Aufgabe 11
3. AUTOSAR
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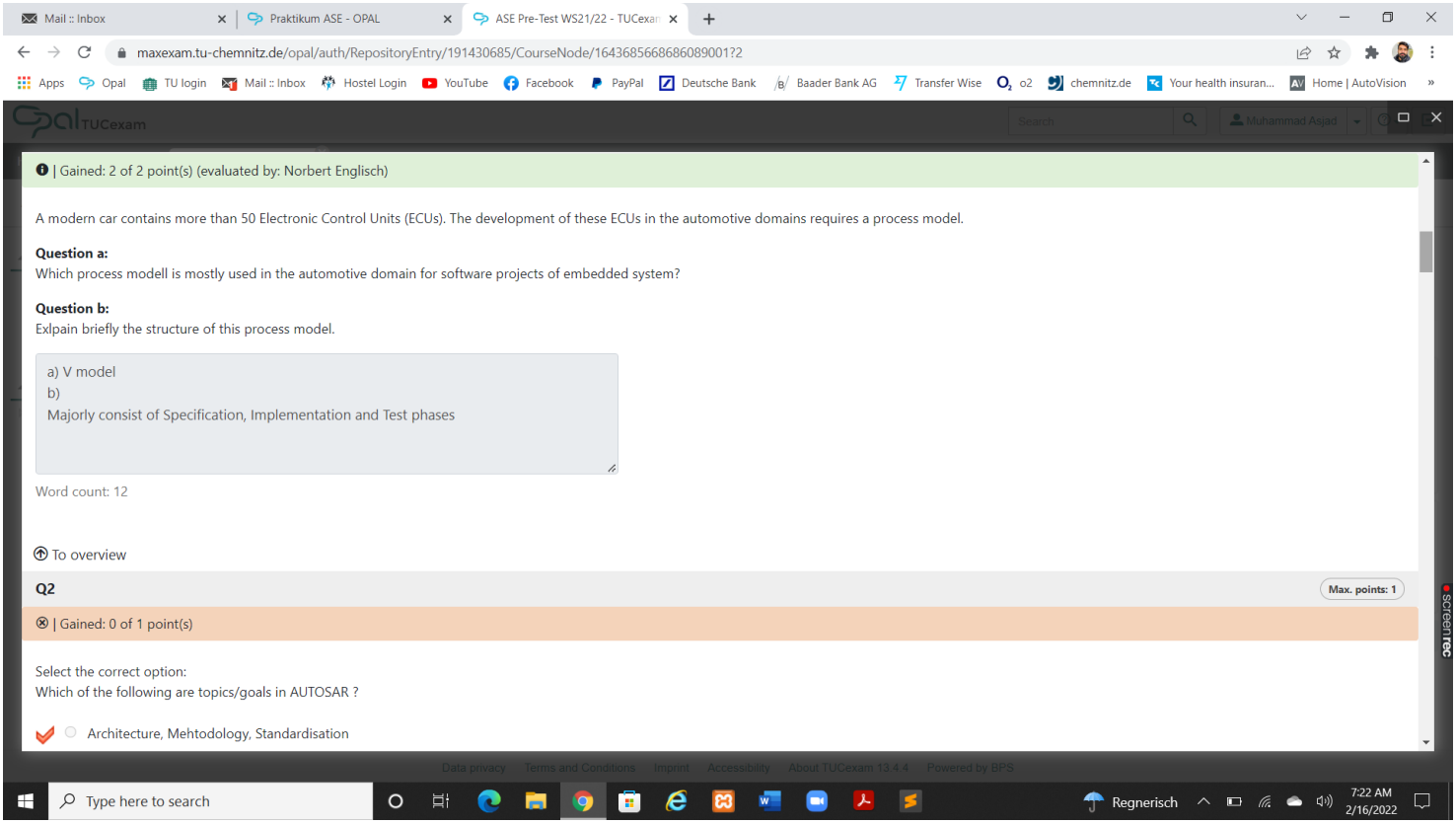
Aufgabe 23
5. Programming
Aufgabe 24
Aufgabe 8
Punkte: 2
Keine Antwort
The following is a snapshop of a message register that respresents an 8-digit message ID of a CAN-Message
ID bit 7
ID bit 6
ID bit 5
ID bit 4
ID bit 3
ID bit 2
ID bit 1
ID bit 0
MSB
LSB
Calculate the masking (MASK) and acceptance register (ACCEPT) values to approve only CAN messages with ID $229_{10}$ ($0E5_{16}$) and $197_{10}$ ($0C5_{16}$). (Numbers are given in decimal and numbers in brackets are given in Hexadecimal format)
(Please answer the question in Hexadecimal/Binary/Decimal formats only)
Mask:
Accept:
Zurück
Frage 8/24
Weiter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Muhammad Asjad
| Gained: 2 of 2 point(s) (evaluated by: Norbert Englisch)
A modern car contains more than 50 Electronic Control Units (ECUs). The development of these ECUs in the automotive domains requires a process model.
Question a:
Which process modell is mostly used in the automotive domain for software projects of embedded system?
Question b:
Exlpain briefly the structure of this process model.
a) V model
b)
Majorly consist of Specification, Implementation and Test phases
Word count: 12
To overview
Q2
Max. points: 1
| Gained: 0 of 1 point(s)
Select the correct option:
Which of the following are topics/goals in AUTOSAR ?
Architecture, Mehtodology, Standardisation
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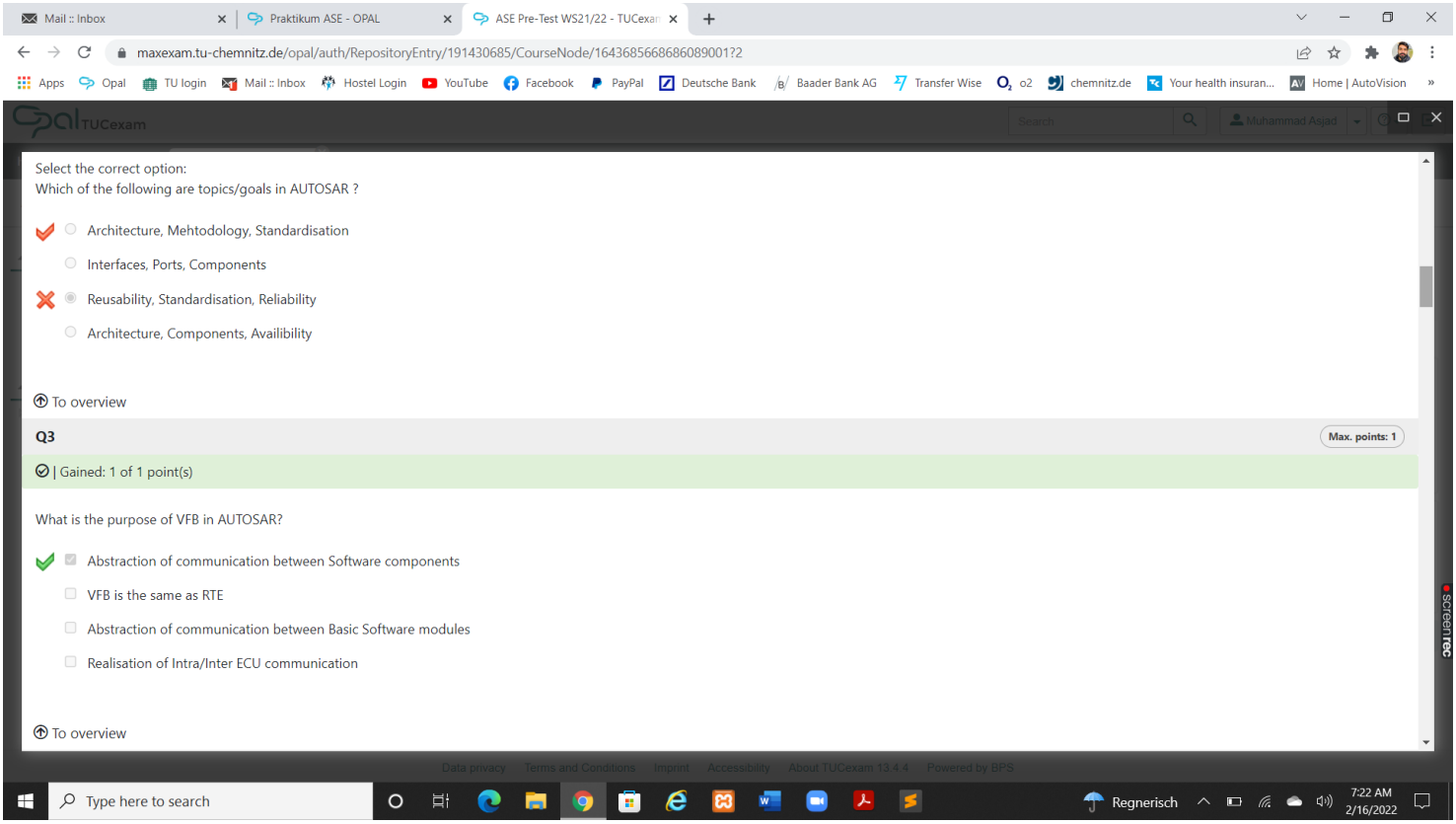
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Select the correct option:
Which of the following are topics/goals in AUTOSAR ?
Architecture, Mehtodology, Standardisation
Interfaces, Ports, Components
Reusability, Standardisation, Reliability
Architecture, Components, Availibility
To overview
Q3
Max. points: 1
| Gained: 1 of 1 point(s)
What is the purpose of VFB in AUTOSAR?
Abstraction of communication between Software components
VFB is the same as RTE
Abstraction of communication between Basic Software modules
Realisation of Intra/Inter ECU communication
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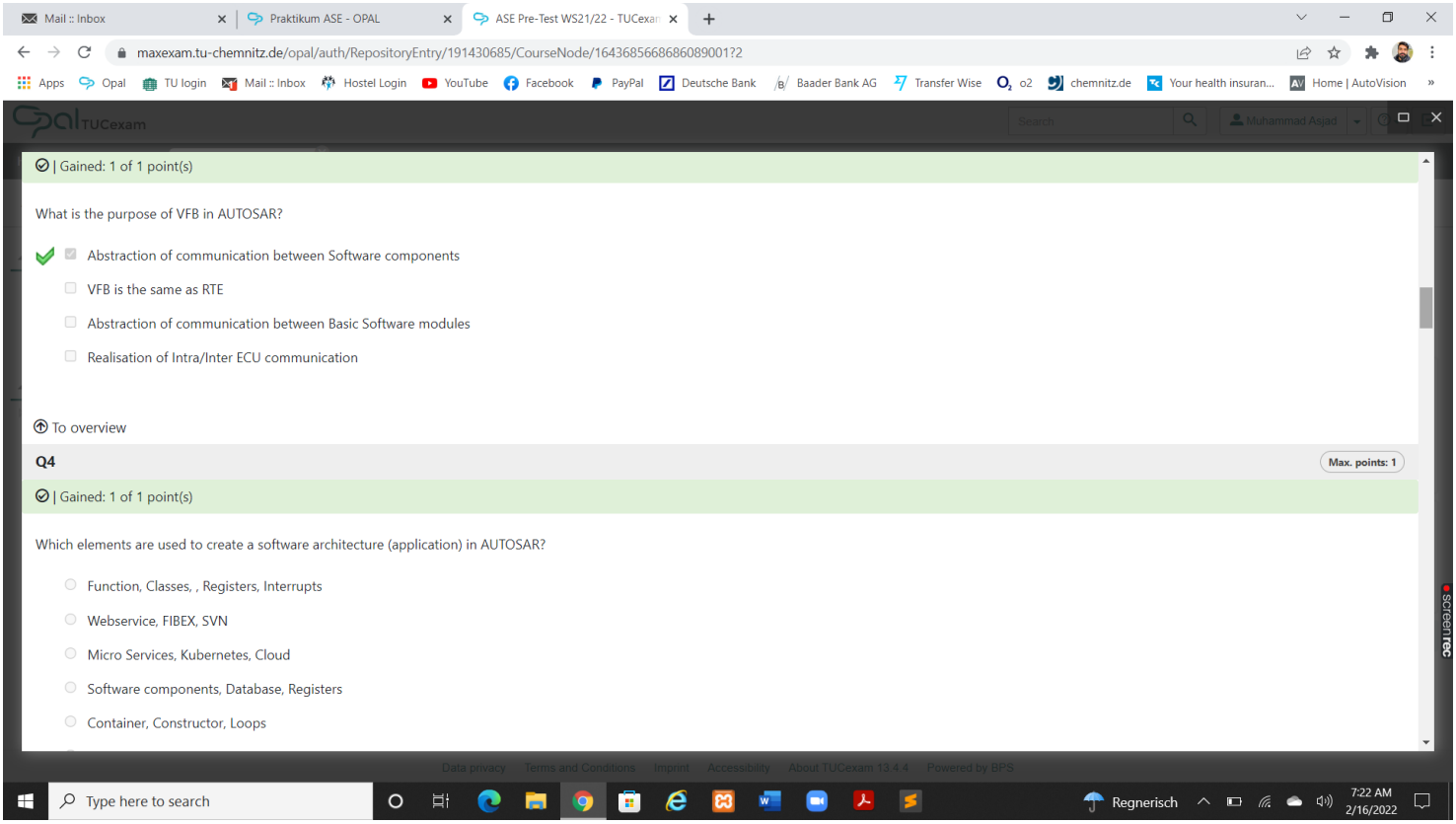
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Muhammad Asjad
| Gained: 1 of 1 point(s)
What is the purpose of VFB in AUTOSAR?
Abstraction of communication between Software components
VFB is the same as RTE
Abstraction of communication between Basic Software modules
Realisation of Intra/Inter ECU communication
To overview
Q4
Max. points: 1
| Gained: 1 of 1 point(s)
Which elements are used to create a software architecture (application) in AUTOSAR?
Function, Classes, , Registers, Interrupts
Webservice, FIBEX, SVN
Micro Services, Kubernetes, Cloud
Software components, Database, Registers
Container, Constructor, Loops
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| Gained: 1 of 1 point(s)

Which elements are used to create a software architecture (application) in AUTOSAR?

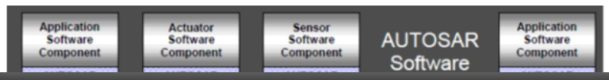
- Function, Classes, , Registers, Interrupts
- Webservice, FIBEX, SVN
- Micro Services, Kubernetes, Cloud
- Software components, Database, Registers
- Container, Constructor, Loops
- AI, Machine Learning, SVM
- ✔ Software components, Ports, Interfaces, Runnables

To overview

**Q5** Max. points: 1

| Gained: 1 of 1 point(s)

What is the name of the AUTOSAR architecture module that is marked by a cirle in the below picture :

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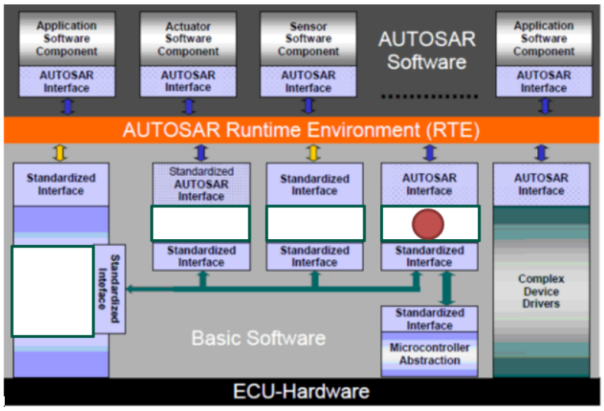
| Gained: 1 of 1 point(s)

What is the name of the AUTOSAR architecture module that is marked by a cirle in the below picture :




- Services
- Operating System

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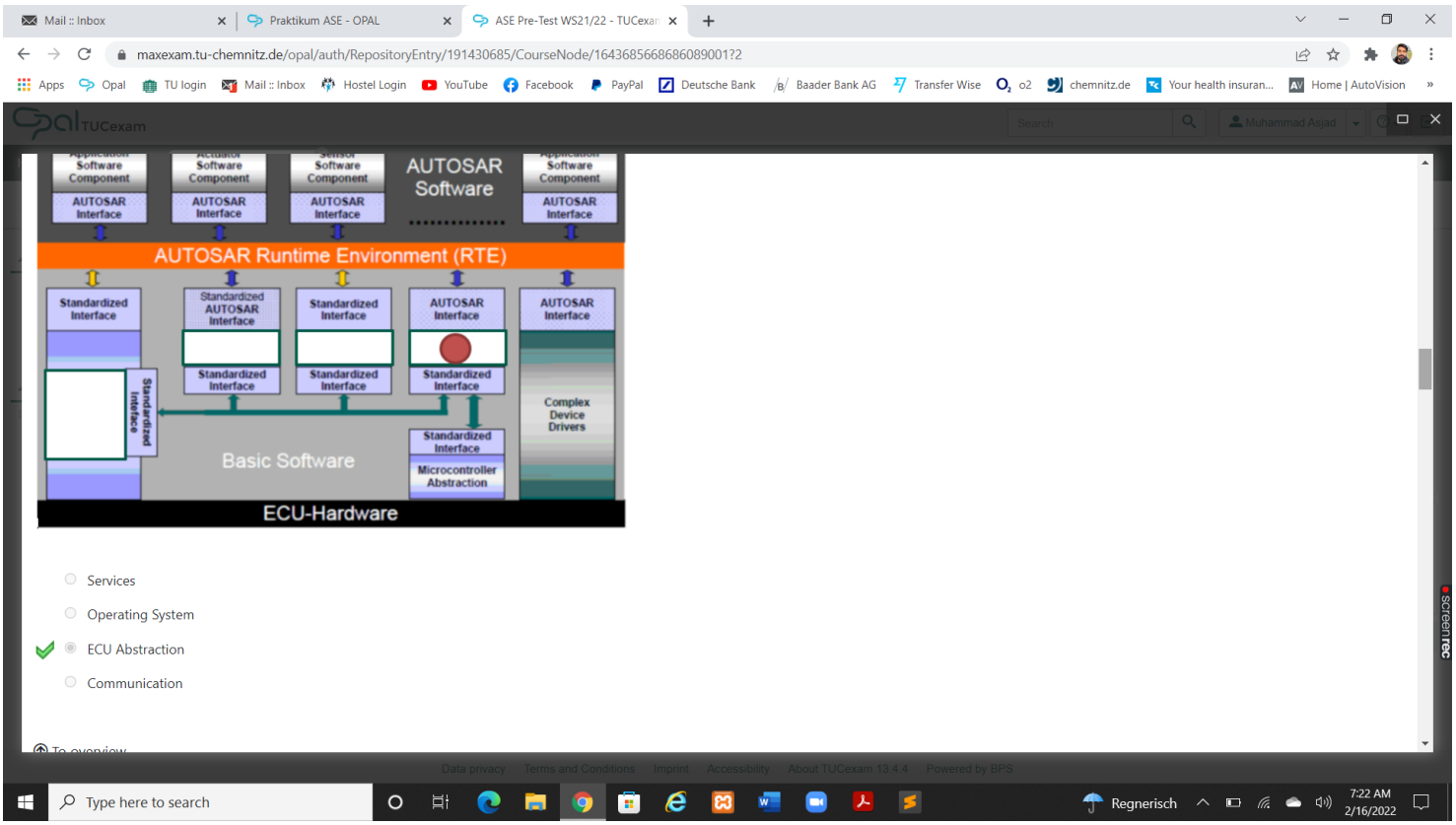
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Application Software Component
AUTOSAR Interface
AUTOSAR Software
AUTOSAR Runtime Environment (RTE)
Standardized Interface
Standardized AUTOSAR Interface
AUTOSAR Interface
Complex Device Drivers
Basic Software
Microcontroller Abstraction
ECU-Hardware
Services
Operating System
ECU Abstraction
Communication
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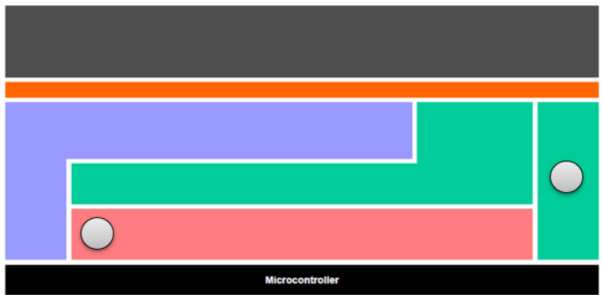
Please choose a correct option :

Which AUTOSAR Architecture layer are marked by the grey cirlces in the following picture?




- ECU Abstraction Layer and Operating System
- ✔ Micro-controller Abstraction Layer and Complex Device Drivers
- Operating System and Micro-controller Abstraction Layer
- Complex Device Drivers and ECU Abstraction Layer

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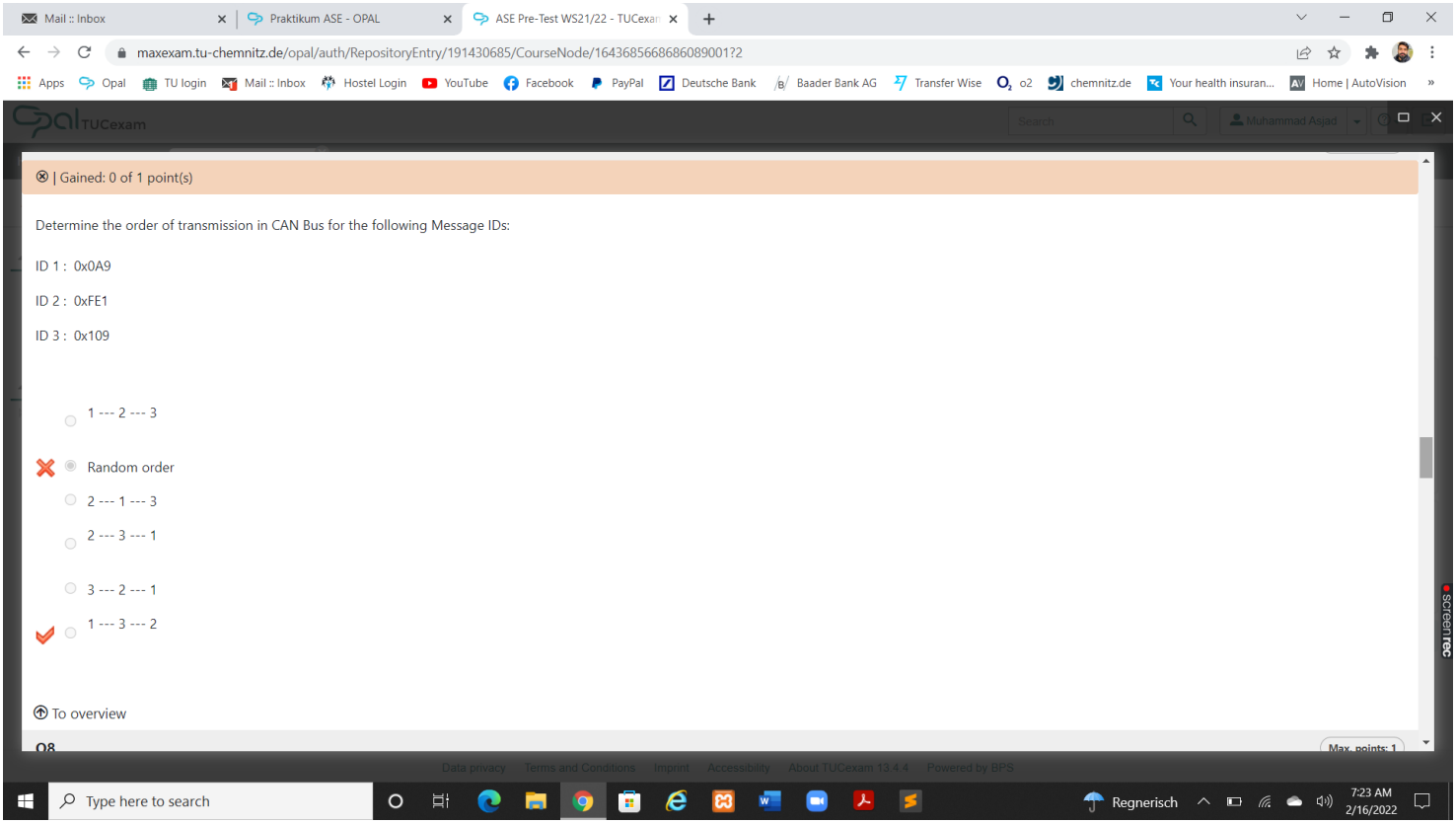
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| Gained: 0 of 1 point(s)
Determine the order of transmission in CAN Bus for the following Message IDs:
ID 1 : 0x0A9
ID 2 : 0xFE1
ID 3 : 0x109
1 --- 2 --- 3
Random order
2 --- 1 --- 3
2 --- 3 --- 1
3 --- 2 --- 1
1 --- 3 --- 2
To overview
Q8
Max. points: 1
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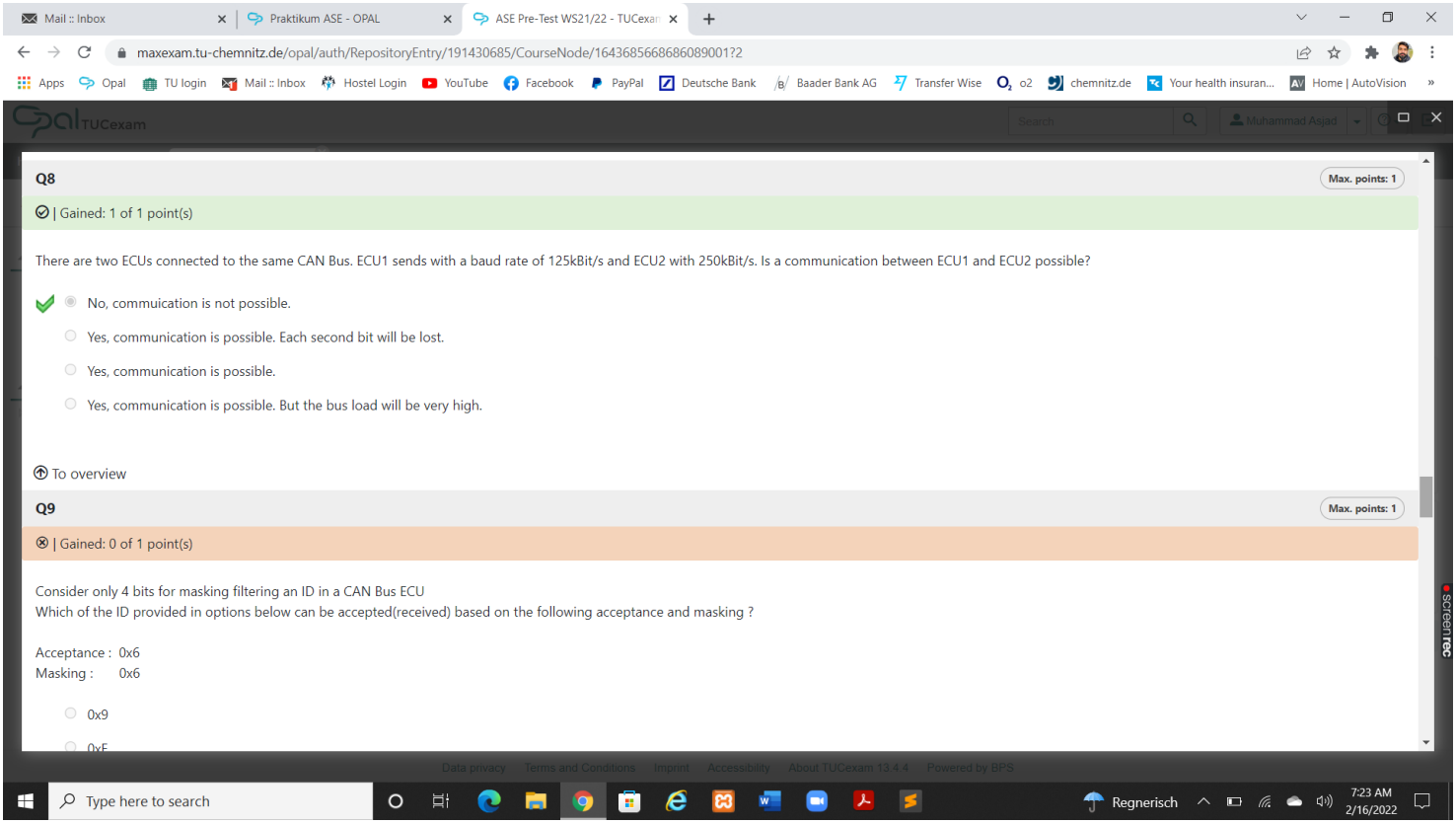
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Muhammad Asjad
Q8
Max. points: 1
| Gained: 1 of 1 point(s)
There are two ECUs connected to the same CAN Bus. ECU1 sends with a baud rate of 125kBit/s and ECU2 with 250kBit/s. Is a communication between ECU1 and ECU2 possible?
No, commuication is not possible.
Yes, communication is possible. Each second bit will be lost.
Yes, communication is possible.
Yes, communication is possible. But the bus load will be very high.
To overview
Q9
Max. points: 1
| Gained: 0 of 1 point(s)
Consider only 4 bits for masking filtering an ID in a CAN Bus ECU
Which of the ID provided in options below can be accepted(received) based on the following acceptance and masking ?
Acceptance : 0x6
Masking : 0x6
0x9
0xF
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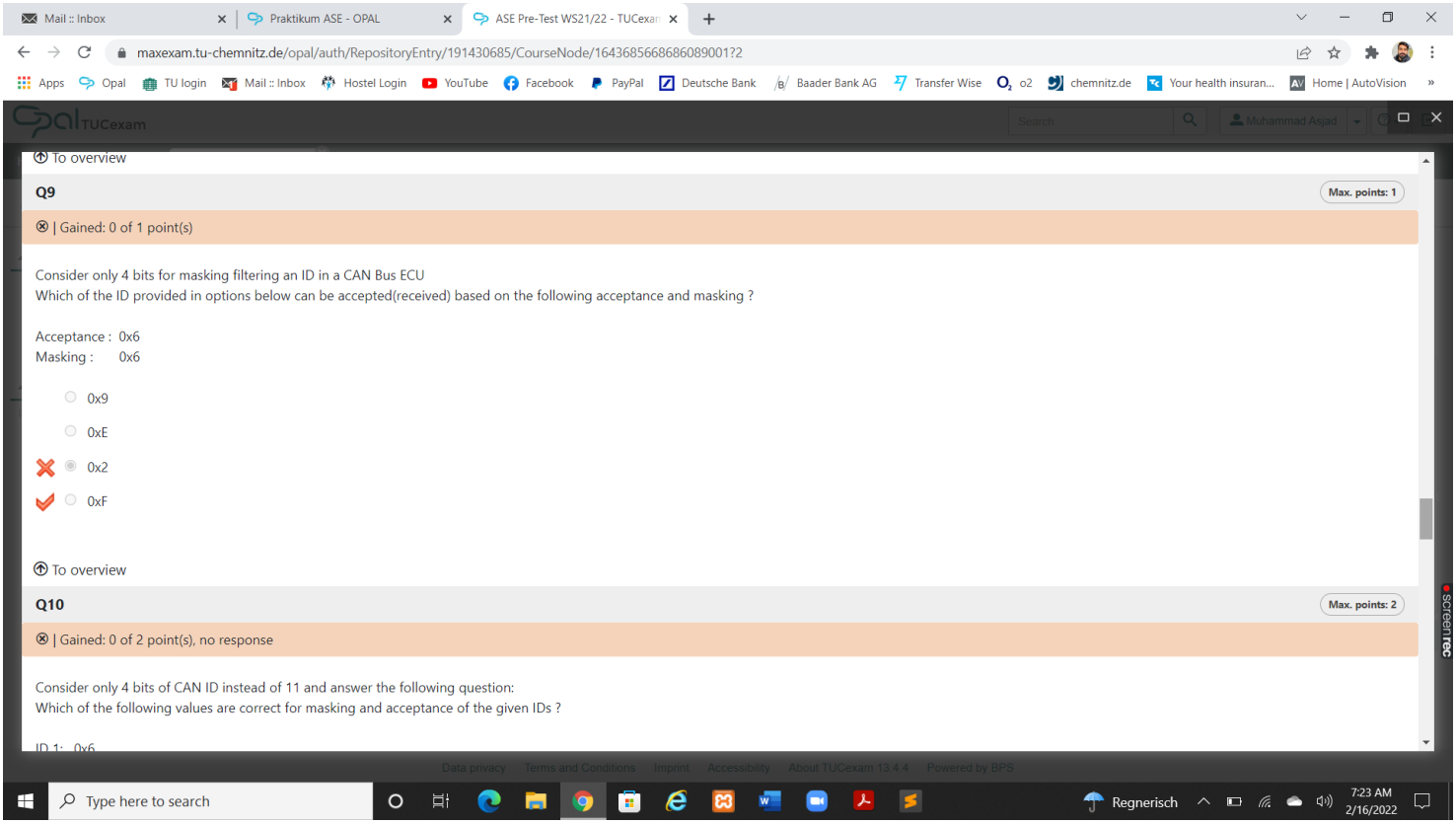
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To overview
Q9
Max. points: 1
| Gained: 0 of 1 point(s)
Consider only 4 bits for masking filtering an ID in a CAN Bus ECU
Which of the ID provided in options below can be accepted(received) based on the following acceptance and masking ?
Acceptance : 0x6
Masking : 0x6
0x9
0xE
0x2
0xF
To overview
Q10
Max. points: 2
| Gained: 0 of 2 point(s), no response
Consider only 4 bits of CAN ID instead of 11 and answer the following question:
Which of the following values are correct for masking and acceptance of the given IDs ?
ID 1: 0x6
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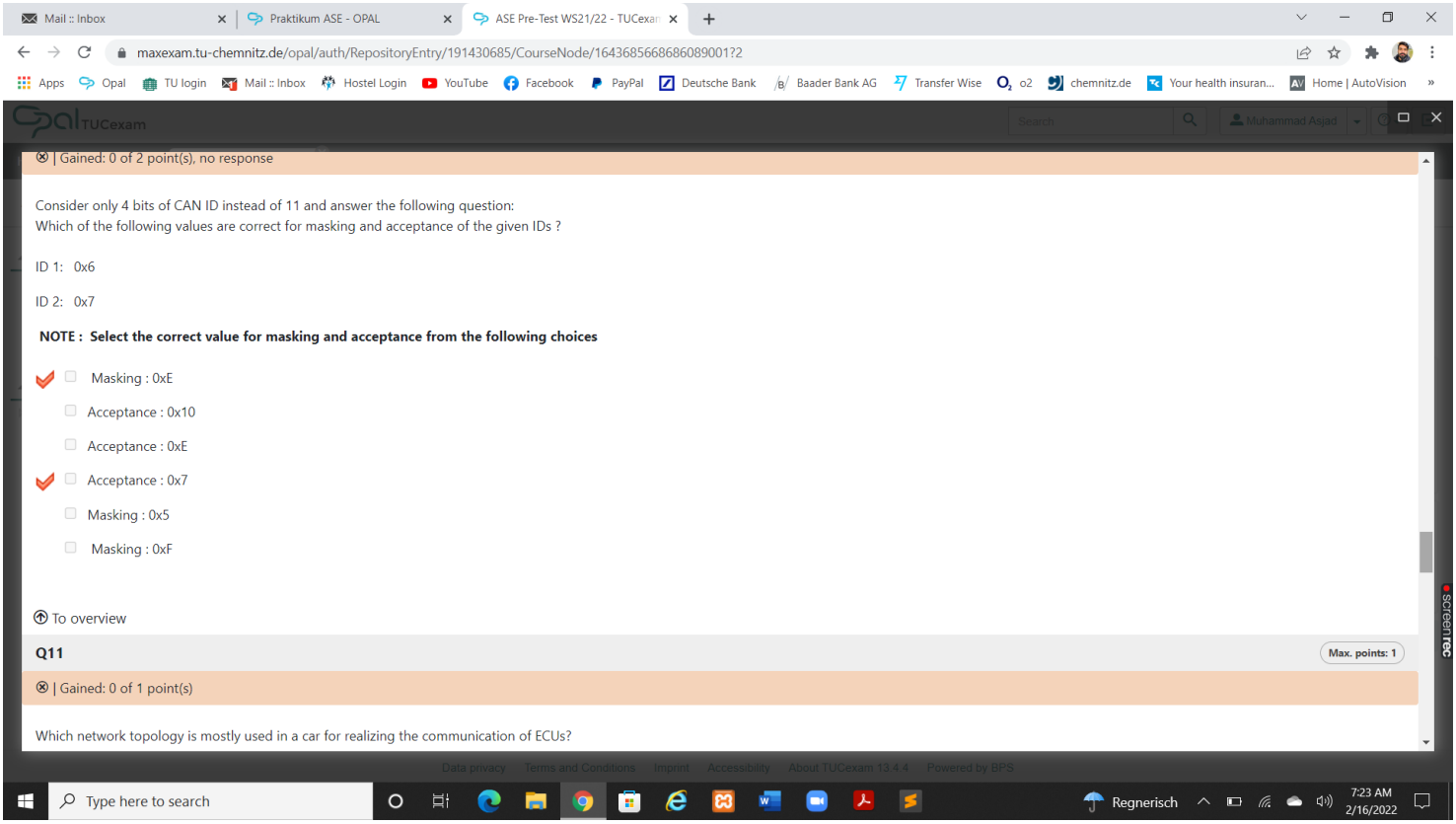
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⊗ | Gained: 0 of 2 point(s), no response
Consider only 4 bits of CAN ID instead of 11 and answer the following question:
Which of the following values are correct for masking and acceptance of the given IDs ?
ID 1: 0x6
ID 2: 0x7
NOTE : Select the correct value for masking and acceptance from the following choices
Masking : 0xE
Acceptance : 0x10
Acceptance : 0xE
Acceptance : 0x7
Masking : 0x5
Masking : 0xF
To overview
Q11
Max. points: 1
⊗ | Gained: 0 of 1 point(s)
Which network topology is mostly used in a car for realizing the communication of ECUs?
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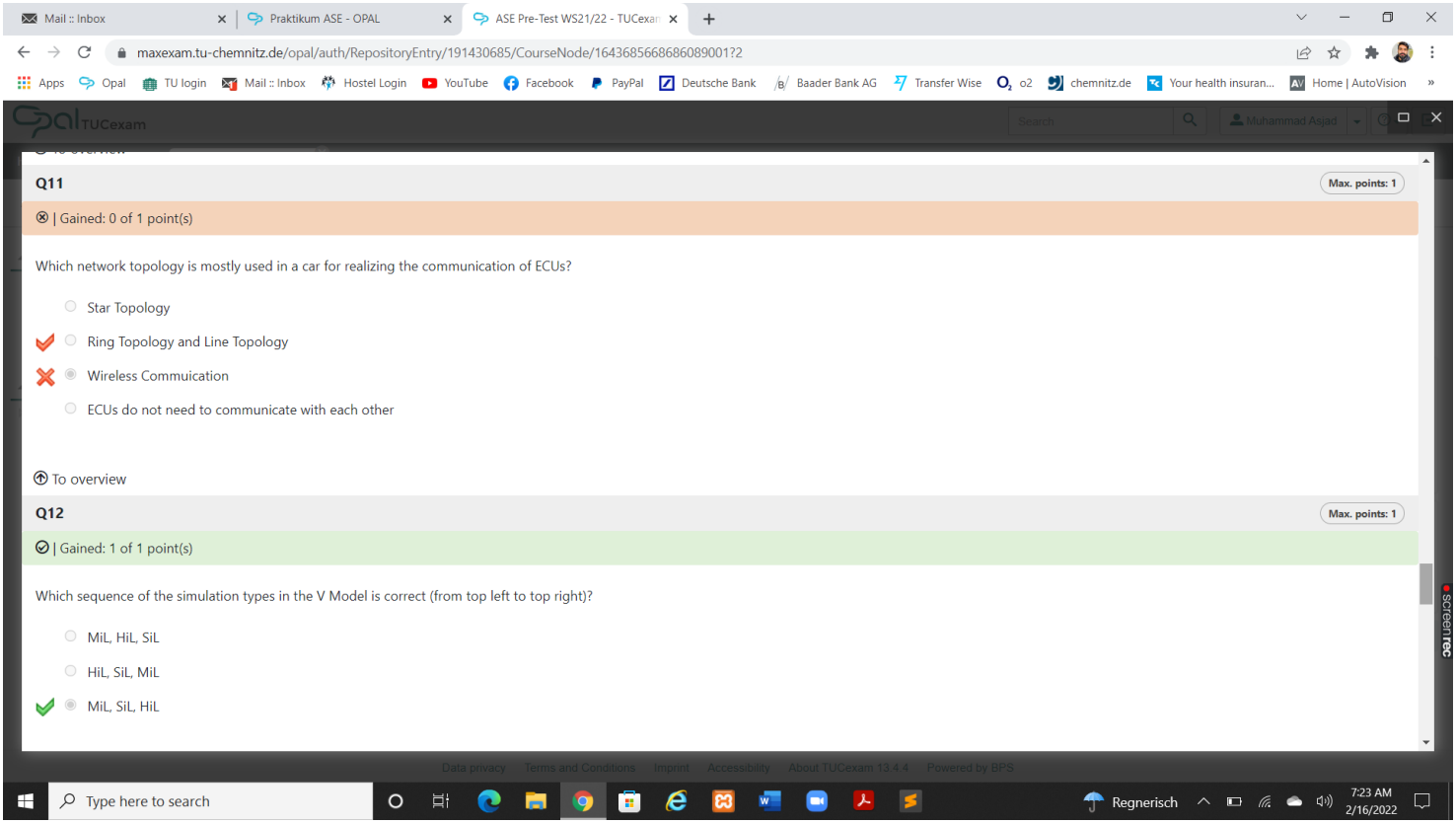
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Q11
Max. points: 1
| Gained: 0 of 1 point(s)
Which network topology is mostly used in a car for realizing the communication of ECUs?
Star Topology
Ring Topology and Line Topology
Wireless Commuication
ECUs do not need to communicate with each other
To overview
Q12
Max. points: 1
| Gained: 1 of 1 point(s)
Which sequence of the simulation types in the V Model is correct (from top left to top right)?
MiL, HiL, SiL
HiL, SiL, MiL
MiL, SiL, HiL
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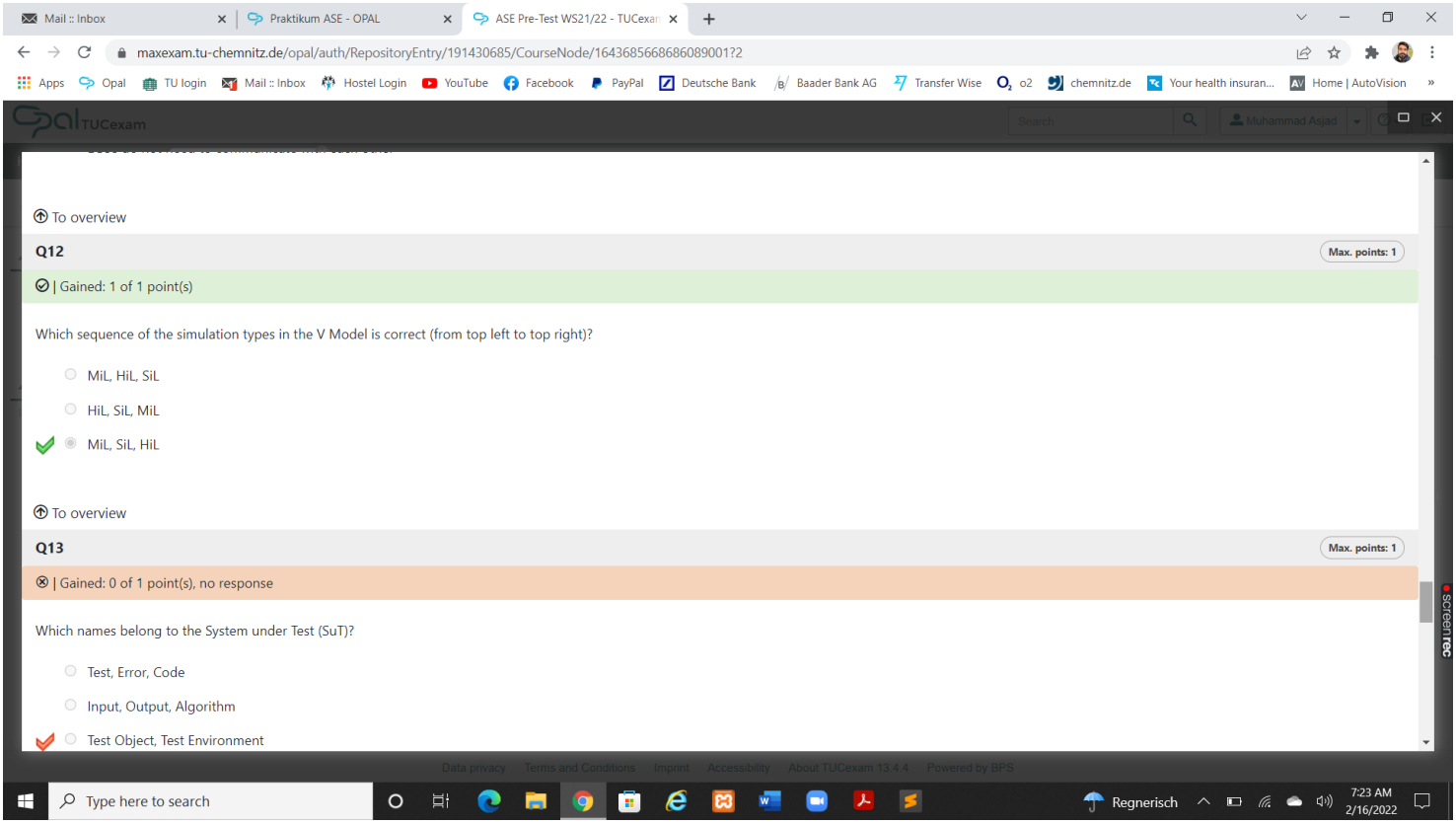
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To overview
Q12
Max. points: 1
| Gained: 1 of 1 point(s)
Which sequence of the simulation types in the V Model is correct (from top left to top right)?
MiL, HiL, SiL
HiL, SiL, MiL
MiL, SiL, HiL
To overview
Q13
Max. points: 1
| Gained: 0 of 1 point(s), no response
Which names belong to the System under Test (SuT)?
Test, Error, Code
Input, Output, Algorithm
Test Object, Test Environment
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To overview

**Q13** Max. points: 1

| Gained: 0 of 1 point(s), no response

Which names belong to the System under Test (SuT)?

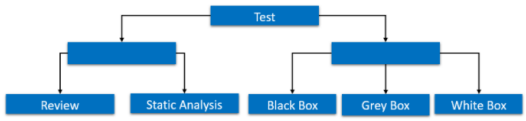
- Test, Error, Code
- Input, Output, Algorithm
- ✓ Test Object, Test Environment

To overview

**Q14** Max. points: 3

| Gained: 0 of 3 point(s), no response

The given picture represent and abstract ovveriew about the test methodologies in the software area.

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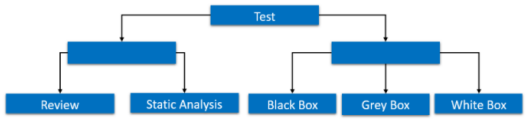
TUCexam

Search | Muhammad Asjad

| Gained: 0 of 3 point(s), no response

The given picture represent and abstract ovveriew about the test methodologies in the software area.




**Question a:**
Which two test methodologies are missing in the given pictures?

**Question b:**
Explain shortly the main difference between the two test methodologies from Question a.

Word count: 0

To overview

**Q15**

Max. points: 2

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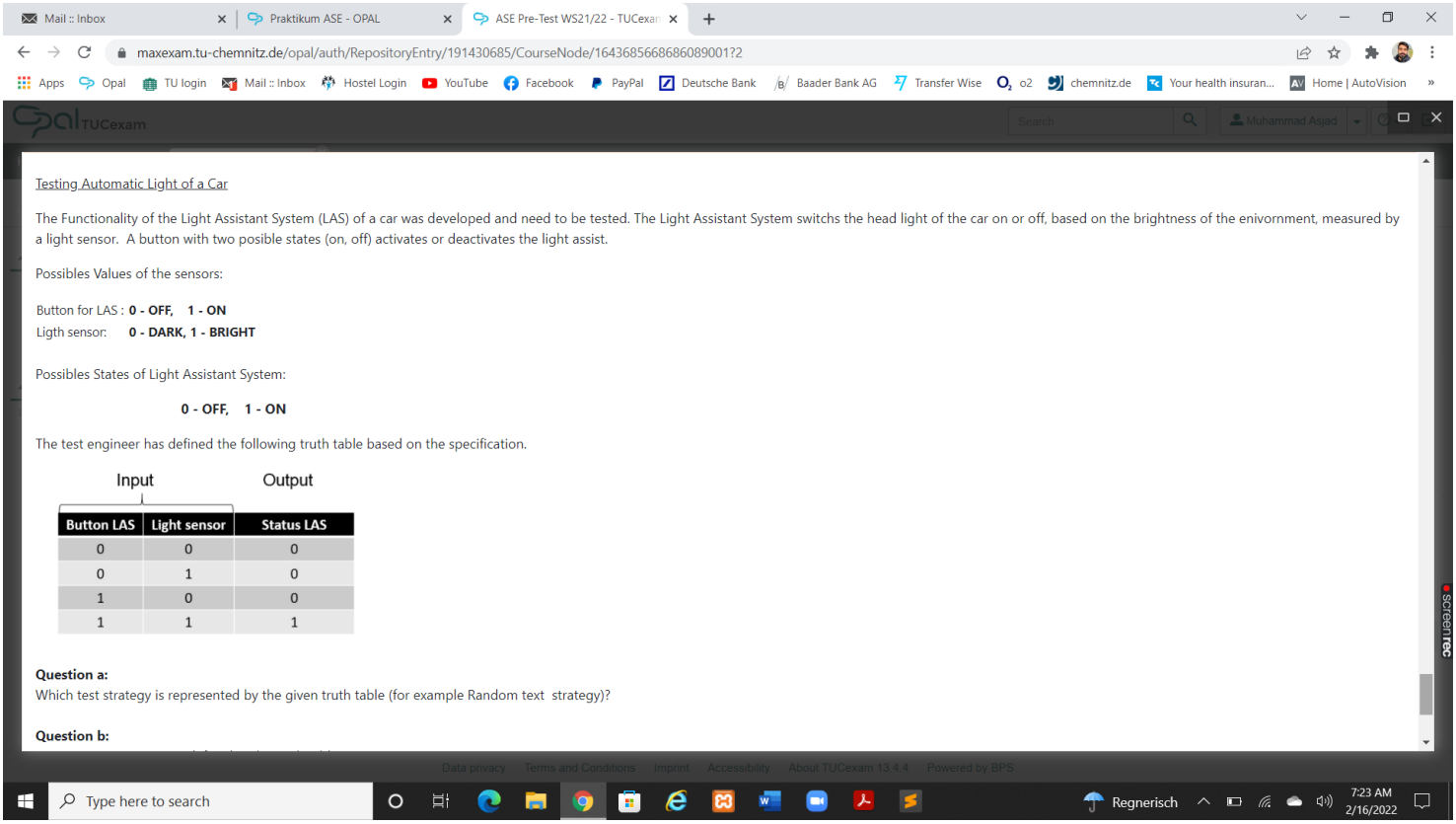
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Muhammad Asjad
Testing Automatic Light of a Car
The Functionality of the Light Assistant System (LAS) of a car was developed and need to be tested. The Light Assistant System switchs the head light of the car on or off, based on the brightness of the enivornment, measured by a light sensor. A button with two posible states (on, off) activates or deactivates the light assist.
Possibles Values of the sensors:
Button for LAS : 0 - OFF, 1 - ON
Ligth sensor: 0 - DARK, 1 - BRIGHT
Possibles States of Light Assistant System:
0 - OFF, 1 - ON
The test engineer has defined the following truth table based on the specification.
Input
Output
Button LAS
Light sensor
Status LAS
0 0 0
0 1 0
1 0 0
1 1 1
Question a:
Which test strategy is represented by the given truth table (for example Random text strategy)?
Question b:
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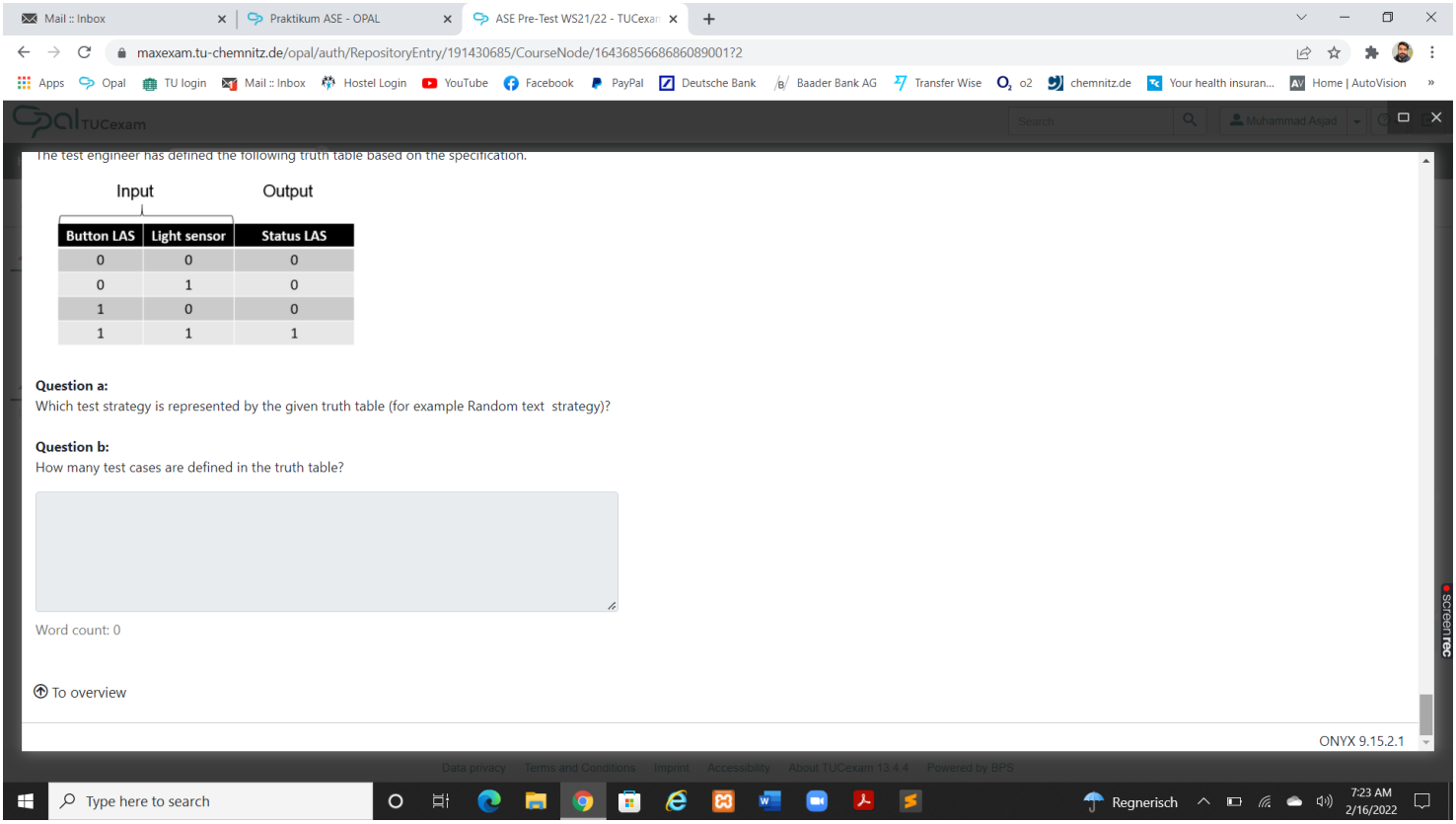
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Muhammad Asjad
The test engineer has defined the following truth table based on the specification.
Input
Output
Button LAS
Light sensor
Status LAS
0 0 0
0 1 0
1 0 0
1 1 1
Question a:
Which test strategy is represented by the given truth table (for example Random text strategy)?
Question b:
How many test cases are defined in the truth table?
Word count: 0
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| Gained: 1 of 1 point(s)

Which names belong to the System under Test (SuT)?

- [x] Test Object, Test Environment
- [ ] Test, Error, Code
- [ ] Input, Output, Algorithm

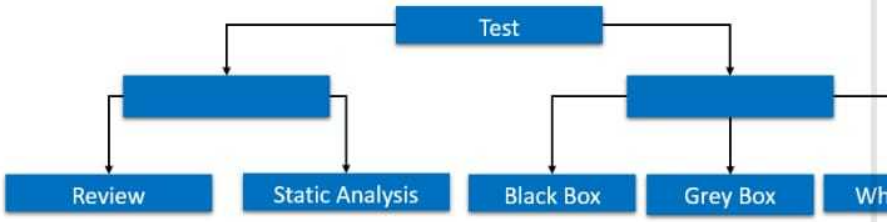
To overview

## Q14

Max. points: 3

| Gained: 3 of 3 point(s) (evaluated by: Norbert Englisch)

The given picture represent and abstract ovveriew about the test methodologies in the software area.




**Question a:**
Which two test methodologies are missing in the given pictures?

**Question b:**
Explain shortly the main difference between the two test methodologies from Question a.

a)static, dynamic

b)Static- the test object is not executed,but analysed
dynamic-Test object is executed.

Word count: 14

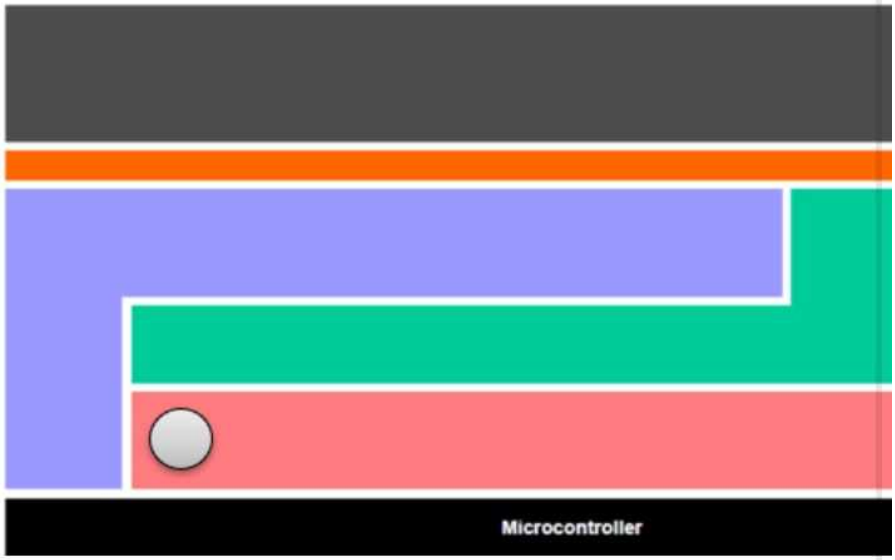
To overview

**Q6** Max. points: 1

| Gained: 1 of 1 point(s)

Please choose a correct option :

Which AUTOSAR Architecture layer are marked by the grey cirlces in the following picture?




- [x] Micro-controller Abstraction Layer and Complex Device Drivers
- [ ] Operating System and Micro-controller Abstraction Layer
- [ ] ECU Abstraction Layer and Operating System
- [ ] Complex Device Drivers and ECU Abstraction Layer

To overview

**Q7** Max. points: 1

| Gained: 1 of 1 point(s)

Determine the order of transmission in CAN Bus for the following Message

| Gained: 1 of 2 point(s) (evaluated by: Norbert Englisch)

Testing Automatic Light of a Car

The Functionality of the Light Assistant System (LAS) of a car was developed and need to be tested. The Light Assistant System switchs the head light of the car on or off, based on the brightness of the enivornment, measured by a light sensor. A button with two posible states (on, off) activates or deactivates the light assist.

Possibles Values of the sensors:

Button for LAS : **0 - OFF, 1 - ON**
Ligth sensor: **0 - DARK, 1 - BRIGHT**

Possibles States of Light Assistant System:

**0 - OFF, 1 - ON**

The test engineer has defined the following truth table based on the specification.

| Input | | Output |
|---|---|---|
| **Button LAS** | **Light sensor** | **Status LAS** |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

**Question a:**
Which test strategy is represented by the given truth table (for example Random text strategy)?

**Question b:**
How many test cases are defined in the truth table?

a)Functional Test
b)4

**Answer**

The correct transmission order is : 2 ---- 1 ---- 3

To overview

## Q8

⊗ | Gained: 0 of 1 point(s)

There are two ECUs connected to the same CAN Bus. E
baud rate of 125kBit/s and ECU2 with 250kBit/s. Is a cc
between ECU1 and ECU2 possible?

- ✓ No, commuication is not possible.
- Yes, communication is possible. But the bus lo
- Yes, communication is possible. Each second l
- ✗ Yes, communication is possible.

To overview

## Q9

✓ | Gained: 1 of 1 point(s)

## Q1

Max. points: 2

| Gained: 2 of 2 point(s) (evaluated by: Norbert Englisch)

A modern car contains more than 50 Electronic Control Units (ECUs). The development of these ECUs in the automotive domains requires a process model.

**Question a:**
Which process modell is mostly used in the automotive domain for software projects of embedded system?

**Question b:**
Exlpain briefly the structure of this process model.

a) V model.
b) In the V model left side is specification , bottom part is implementation and right side is testing.

Word count: 22

To overview

## Q2

Max. points: 1

| Gained: 0 of 1 point(s)

Select the correct option:
Which of the following are topics/goals in AUTOSAR ?

- ✓ Architecture, Mehtodology, Standardisation
- Reusability, Standardisation, Reliability
- ✗ Interfaces, Ports, Components
- Architecture, Components, Availibility

| Gained: 0 of 1 point(s)

What is the purpose of VFB in AUTOSAR?

- [x] Abstraction of communication between Software components
- [ ] Realisation of Intra/Inter ECU communication
- [ ] Abstraction of communication between Basic Software modules
- [x] VFB is the same as RTE

To overview

## Q4

Max. points: 1

| Gained: 1 of 1 point(s)

Which elements are used to create a software architecture (application) in AUTOSAR?

- ( ) Function, Classes, , Registers, Interrupts
- ( ) Software components, Database, Registers
- ( ) Container, Constructor, Loops
- ( ) Webservice, FIBEX, SVN
- ( ) Micro Services, Kubernetes, Cloud
- ( ) AI, Machine Learning, SVM
- (•) Software components, Ports, Interfaces, Runnables

To overview

## Q5

Max. points: 1

| Gained: 1 of 1 point(s)

What is the name of the AUTOSAR architecture module that is marked by a

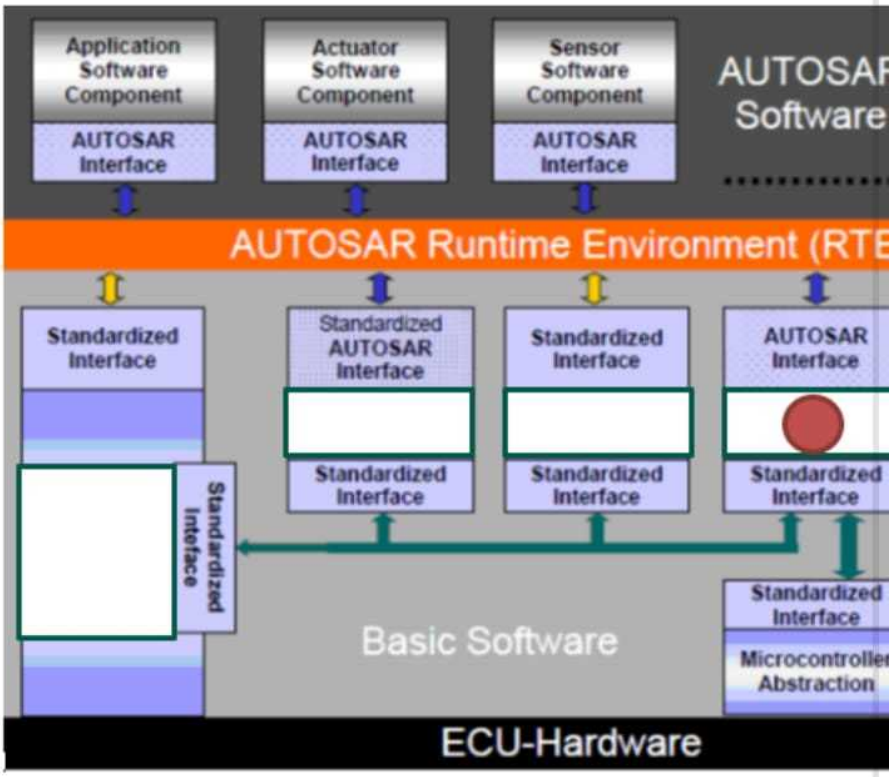
To overview

## Q5

Max. points: 1

| Gained: 1 of 1 point(s)

What is the name of the AUTOSAR architecture module that is marked by a cirle in the below picture :




- [x] ECU Abstraction
- [ ] Communication
- [ ] Operating System
- [ ] Services

To overview

## Q6

Max. points: 1

Reusability, Standardisation, Reliability

Interfaces, Ports, Components

Architecture, Components, Availibility

To overview

## Q3

| Gained: 0 of 1 point(s)

What is the purpose of VFB in AUTOSAR?

Abstraction of communication between Softwa

Realisation of Intra/Inter ECU communication

Abstraction of communication between Basic S

VFB is the same as RTE

To overview

## Q4

| Gained: 1 of 1 point(s)

Which elements are used to create a software architect

Word count: 22

To overview

## Q2

⊗ | Gained: 0 of 1 point(s)

Select the correct option:
Which of the following are topics/goals in AUTOSAR ?

- ✓ Architecture, Mehtodology, Standardisation
- Reusability, Standardisation, Reliability
- ✗ Interfaces, Ports, Components
- Architecture, Components, Availibility

To overview

## Q3

⊗ | Gained: 0 of 1 point(s)

What is the purpose of VFB in AUTOSAR?

To overview

**Q7** Max. points: 1

| Gained: 1 of 1 point(s)

Determine the order of transmission in CAN Bus for the following Message IDs:

ID 1 : 0x0A9

ID 2 : 0xFE1

ID 3 : 0x109

- Random order
- 3 --- 2 --- 1
- ✓ 1 --- 3 --- 2
- 1 --- 2 --- 3
- 2 --- 1 --- 3
- 2 --- 3 --- 1

**Answer**

The correct transmission order is : 2 ---- 1 ---- 3

To overview

**Q8** Max. points: 1

| Gained: 0 of 1 point(s)

To overview

**Q8** Max. points: 1

⊗ | Gained: 0 of 1 point(s)

There are two ECUs connected to the same CAN Bus. ECU1 sends with a baud rate of 125kBit/s and ECU2 with 250kBit/s. Is a communication between ECU1 and ECU2 possible?

- ✓ No, commuication is not possible.
- Yes, communication is possible. But the bus load will be very high.
- Yes, communication is possible. Each second bit will be lost.
- ✗ Yes, communication is possible.

To overview

**Q9** Max. points: 1

⊘ | Gained: 1 of 1 point(s)

Consider only 4 bits for masking filtering an ID in a CAN Bus ECU
Which of the ID provided in options below can be accepted(received) based on the following acceptance and masking ?

Acceptance : 0x6
Masking : 0x6

- ✓ 0xF
- 0x2
- 0x9
- 0xE

**Answer**

The correct value 0x2

- 0x2
- 0x9
- 0xE

**Answer**

The correct value 0x2

To overview

**Q10** Max. points: 2

| Gained: 2 of 2 point(s)

Consider only 4 bits of CAN ID instead of 11 and answer the following question:
Which of the following values are correct for masking and acceptance of the given IDs ?

ID 1: 0x6

ID 2: 0x7

**NOTE : Select the correct value for masking and acceptance from the following choices**

- [x] Masking : 0xE
- [ ] Acceptance : 0xE
- [x] Acceptance : 0x7
- [ ] Acceptance : 0x10
- [ ] Masking : 0x5
- [ ] Masking : 0xF

To overview

**Q11** Max. points: 1

| Gained: 1 of 1 point(s)

Which network topology is mostly used in a car for realizing the communication of ECUs?

- [x] Ring Topology and Line Topology
- [ ] ECUs do not need to communicate with each other
- [ ] Wireless Commuication
- [ ] Star Topology

To overview

**Q12** Max. points: 1

| Gained: 1 of 1 point(s)

Which sequence of the simulation types in the V Model is correct (from top left to top right)?

- [ ] MiL, HiL, SiL
- [x] MiL, SiL, HiL
- [ ] HiL, SiL, MiL

To overview

**Q13** Max. points: 1

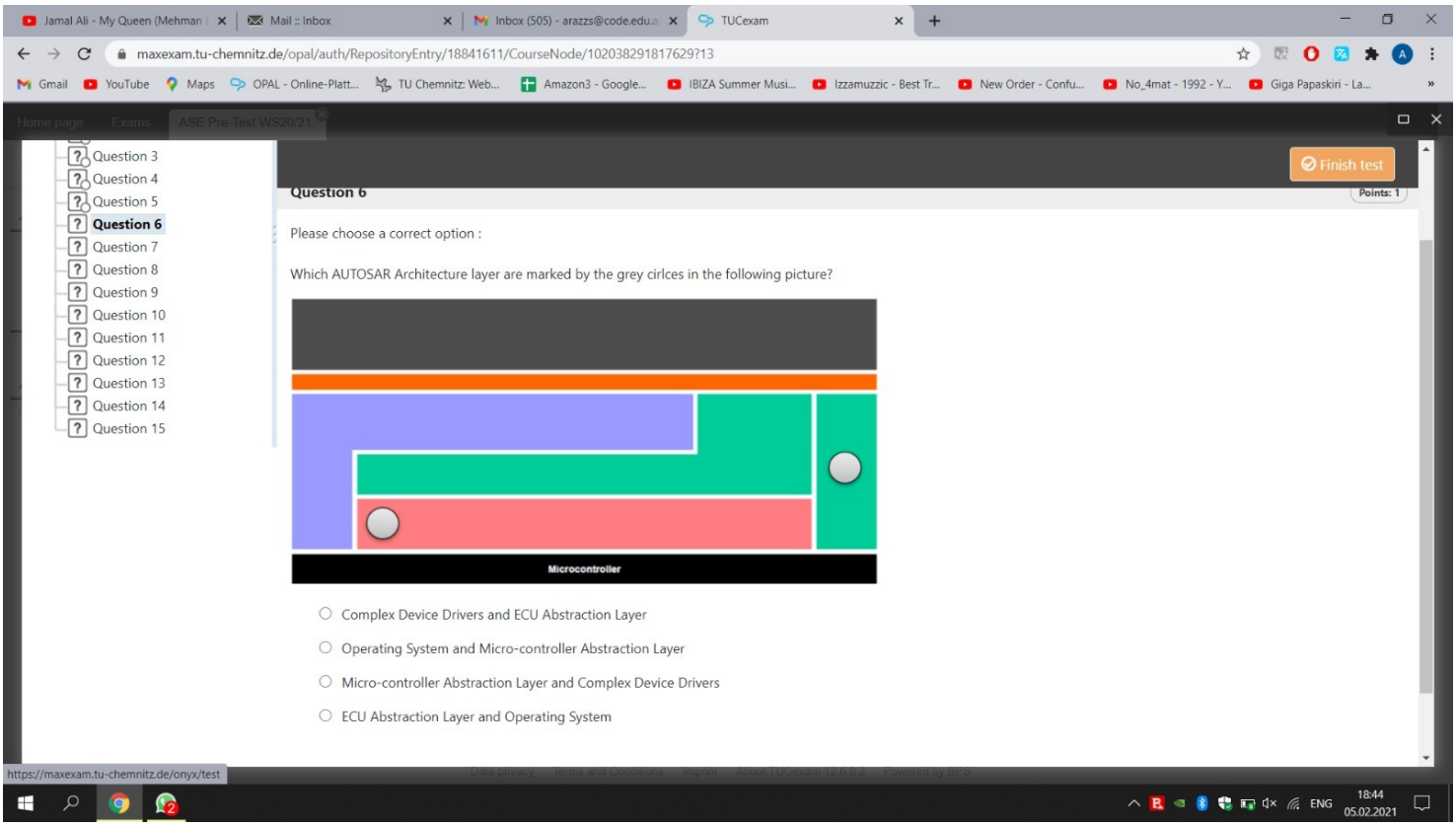
| Gained: 1 of 1 point(s)

Which names belong to the System under Test (SuT)?

- [x] Test Object, Test Environment

```
43  signal s1,s2 : STD_LOGIC;
44
45
46
47  begin
48
49   t : process (a,b,s1,s2)
50        variable v1,v2 : STD_LOGIC;
51        begin
52
53        if(a ='1') then s1 <= '1'; v2 := '1'; else s1 <= '0'; v2 := '0'; end if;
54        if(b ='1') then s2 <= '1'; v1 := '1'; else s2 <= '0'; v1 := '0'; end if;
55        y1 <= '0'; y2 <= '0';
56        y3 <= '0'; y4 <= '1';
57        if(s1 = '1') then y1 <= '1'; end if;
58        if(v1 = '1') then y3 <= '1'; end if;
59        if(s2 = '1') then y2 <= '1'; end if;
60        if(v2 = '1') then y4 <= '0'; end if;
61        end process;
62
63  end Behavioral;
64
```

At Line 59, when a =0, b =1, should the signal value of s2 still be 0 for evaluation?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Question 7
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Question 13
Question 14
Question 15
Finish test
Question 6
Points: 1
Please choose a correct option :
Which AUTOSAR Architecture layer are marked by the grey cirlces in the following picture?
Microcontroller
Complex Device Drivers and ECU Abstraction Layer
Operating System and Micro-controller Abstraction Layer
Micro-controller Abstraction Layer and Complex Device Drivers
ECU Abstraction Layer and Operating System
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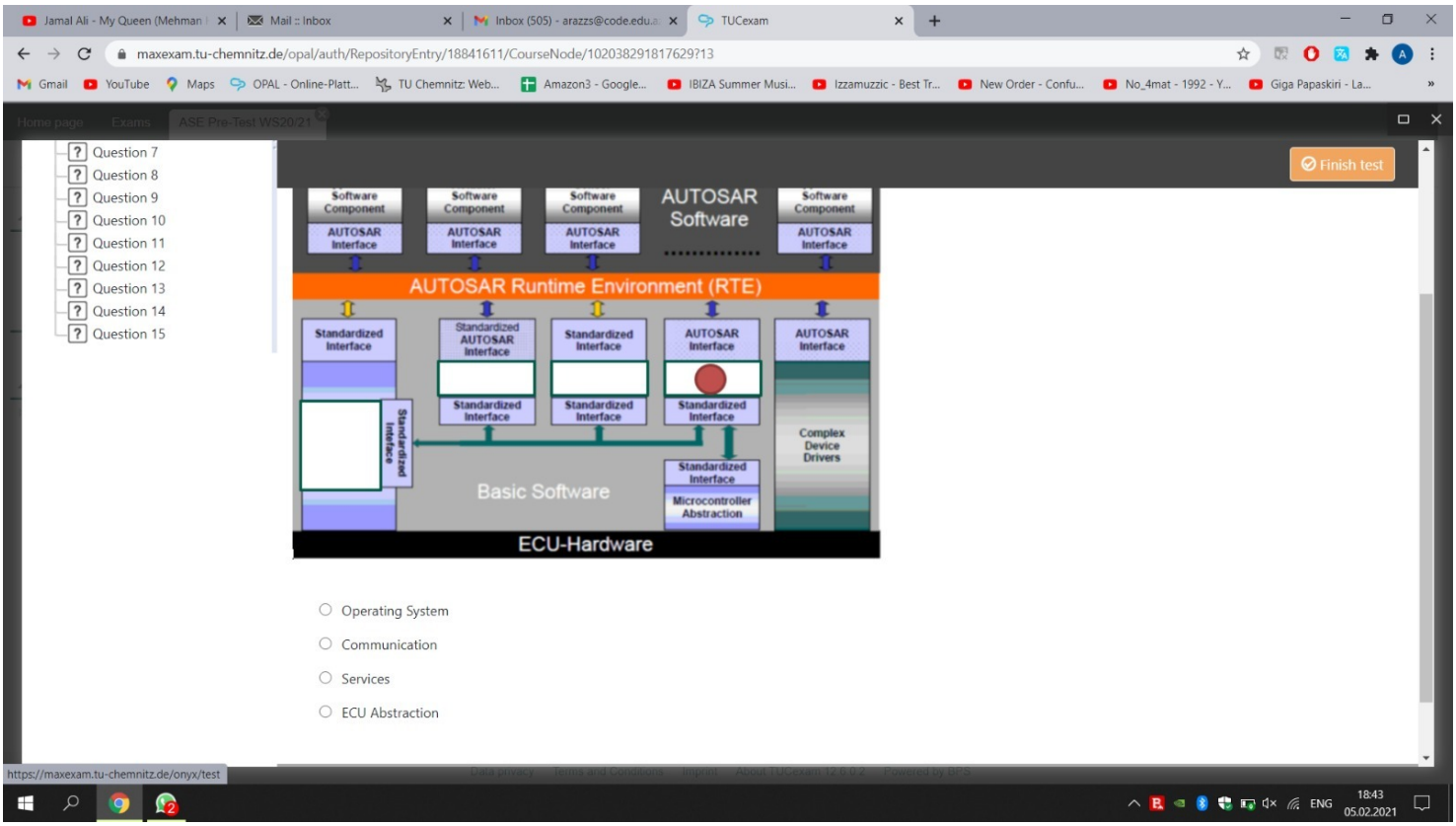
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Question 15
Software Component
AUTOSAR Interface
AUTOSAR Software
AUTOSAR Runtime Environment (RTE)
Standardized Interface
Standardized AUTOSAR Interface
AUTOSAR Interface
Complex Device Drivers
Basic Software
Microcontroller Abstraction
ECU-Hardware
Operating System
Communication
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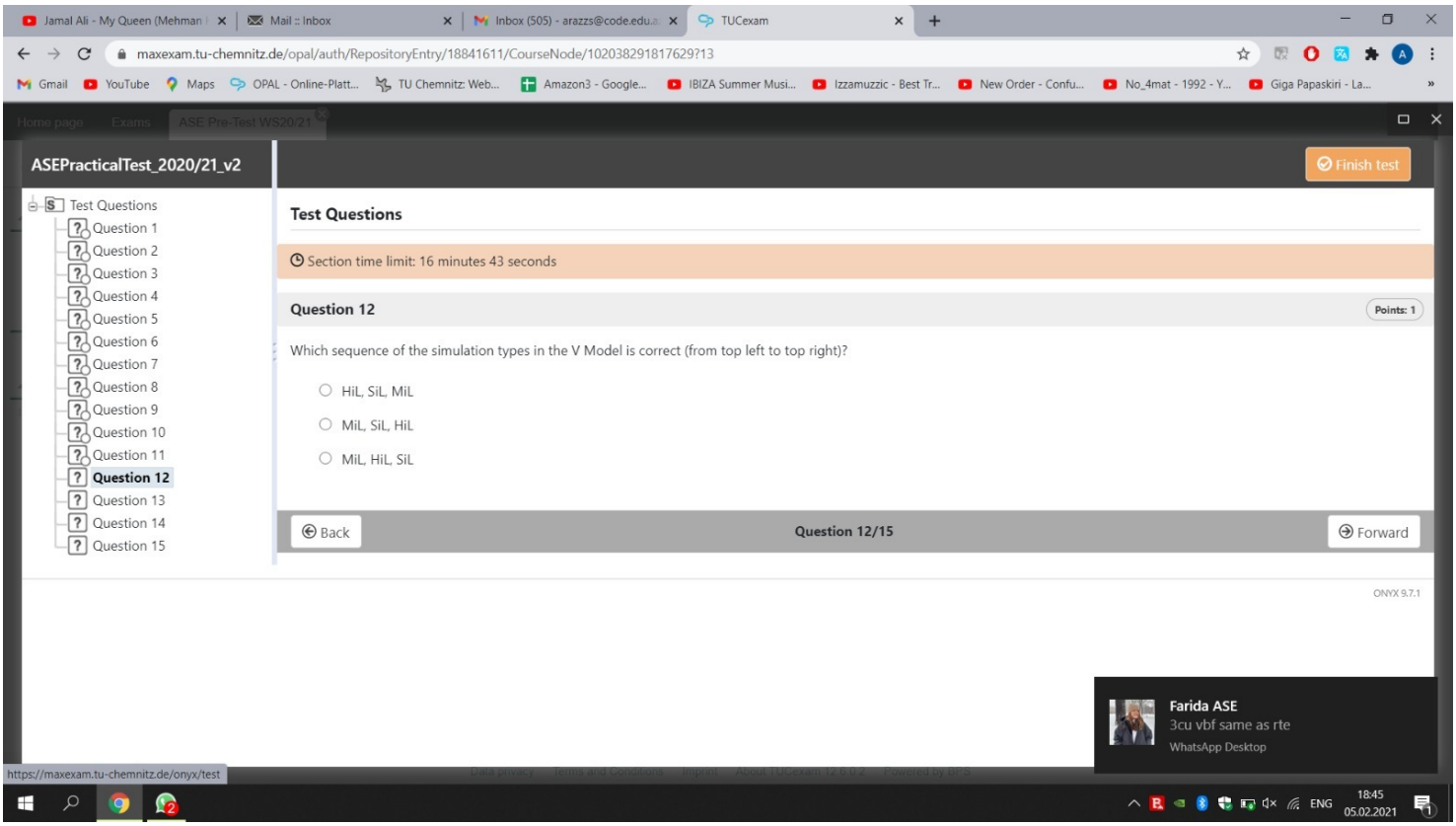
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Test Questions
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Question 6
Question 7
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Question 9
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Question 11
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Question 13
Question 14
Question 15
Test Questions
Section time limit: 16 minutes 43 seconds
Question 12
Points: 1
Which sequence of the simulation types in the V Model is correct (from top left to top right)?
HiL, SiL, MiL
MiL, SiL, HiL
MiL, HiL, SiL
Back
Question 12/15
Forward
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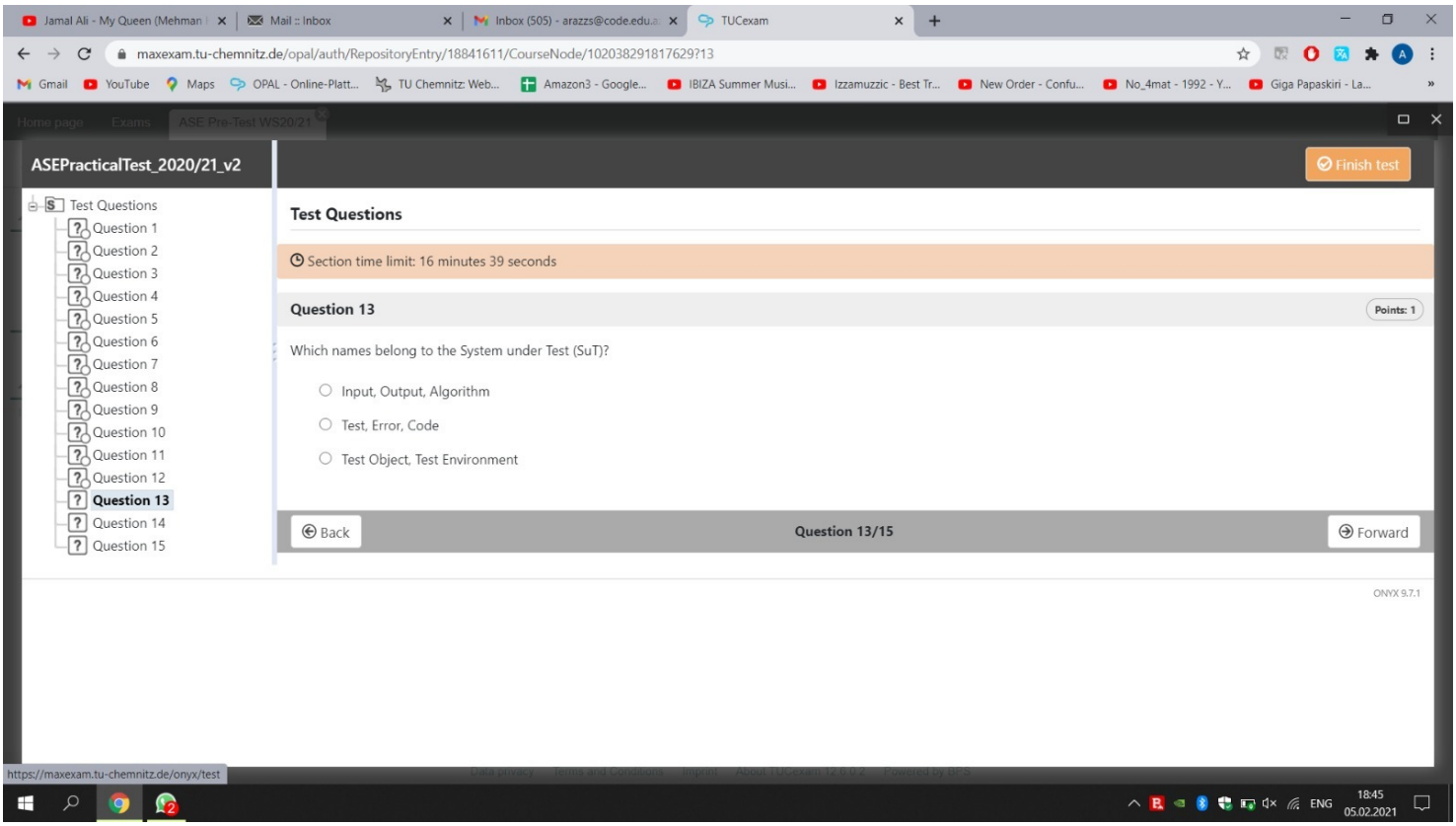
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Question 13
Question 14
Question 15
Test Questions
Section time limit: 16 minutes 39 seconds
Question 13
Points: 1
Which names belong to the System under Test (SuT)?
Input, Output, Algorithm
Test, Error, Code
Test Object, Test Environment
Back
Question 13/15
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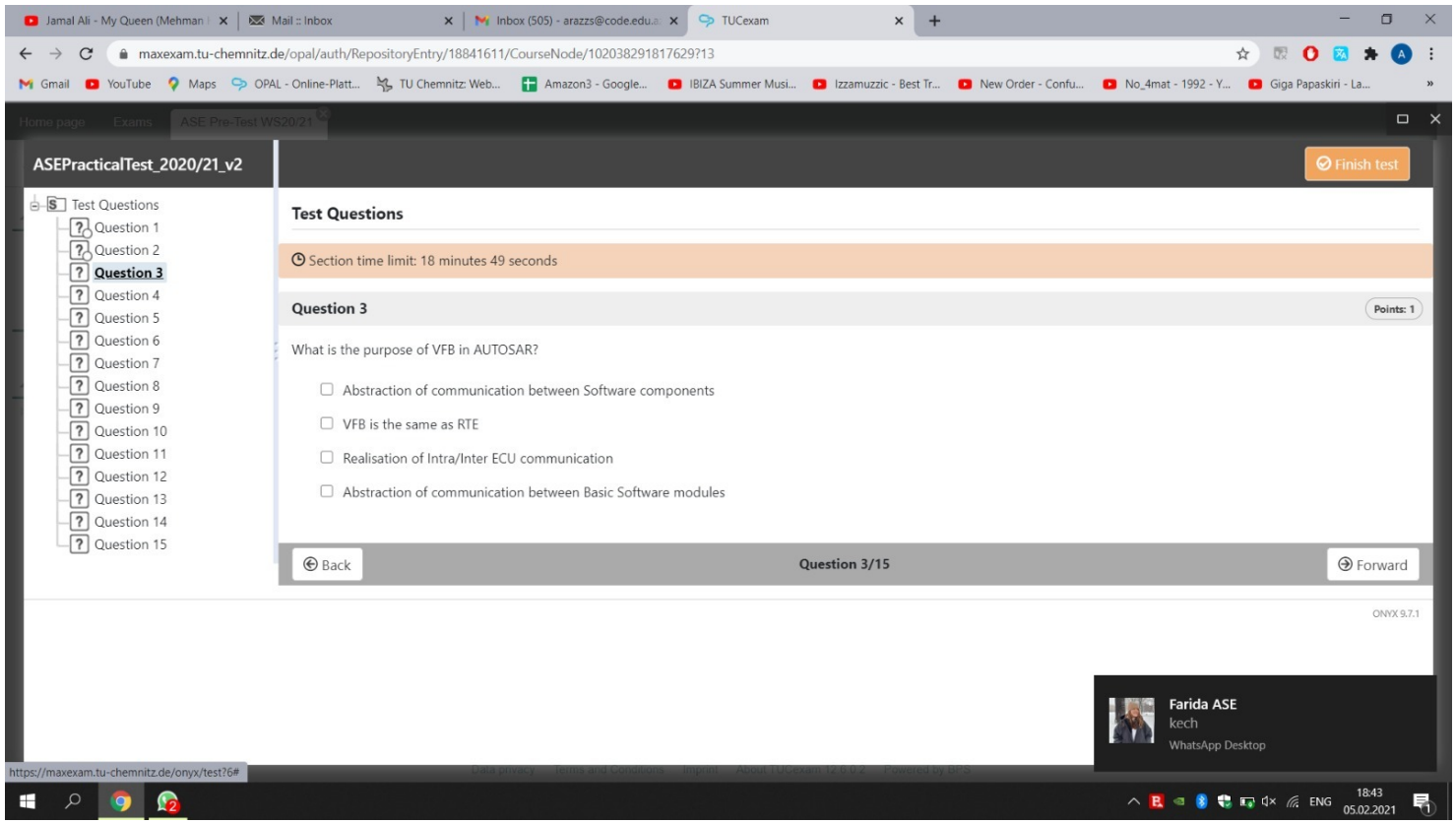
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Question 10
Question 11
Question 12
Question 13
Question 14
Question 15
Test Questions
Section time limit: 18 minutes 49 seconds
Question 3
Points: 1
What is the purpose of VFB in AUTOSAR?
Abstraction of communication between Software components
VFB is the same as RTE
Realisation of Intra/Inter ECU communication
Abstraction of communication between Basic Software modules
Back
Question 3/15
Forward
ONYX 9.7.1
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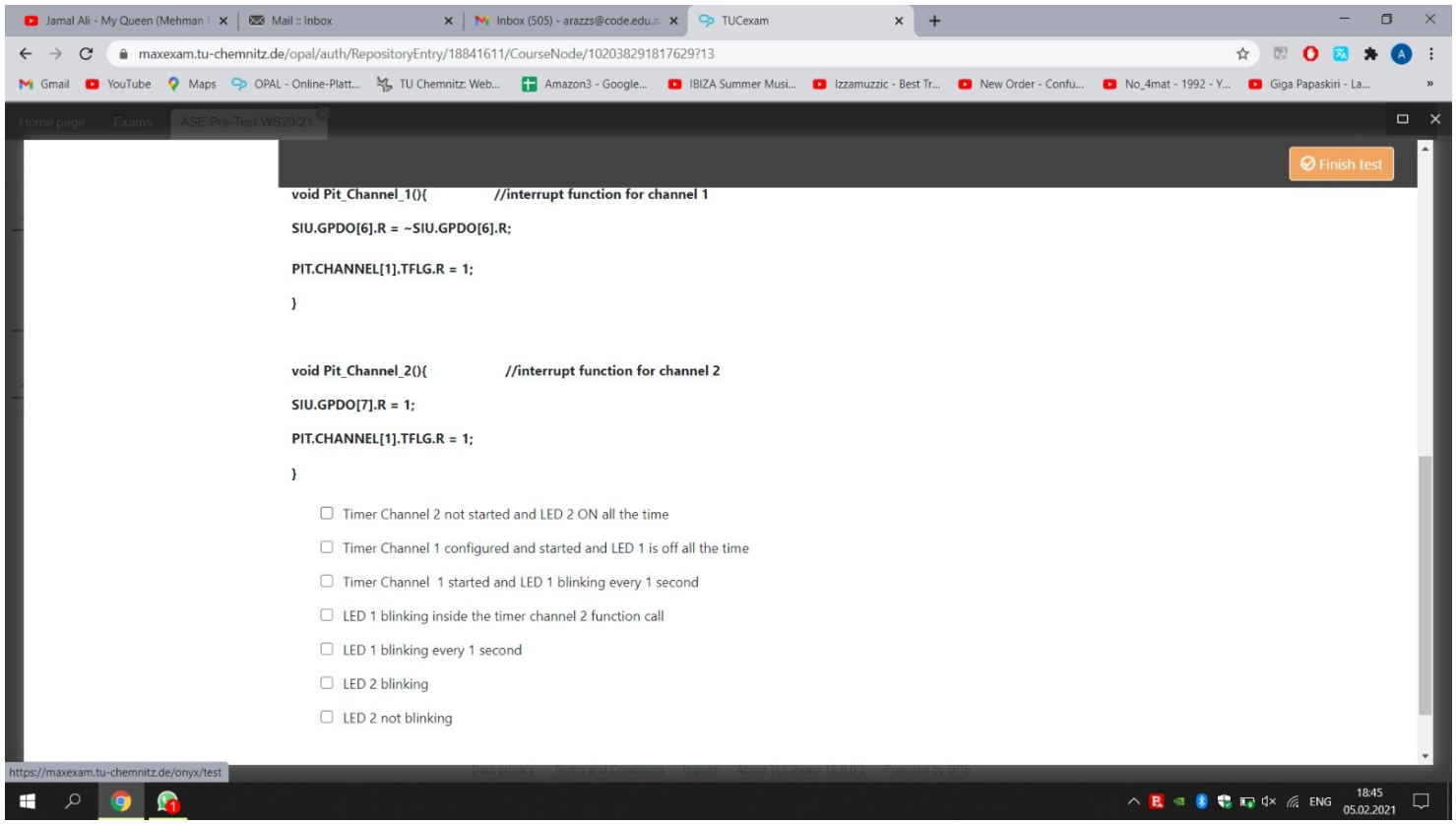
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Finish test
void Pit_Channel_1(){ //interrupt function for channel 1
SIU.GPDO[6].R = ~SIU.GPDO[6].R;
PIT.CHANNEL[1].TFLG.R = 1;
}
void Pit_Channel_2(){ //interrupt function for channel 2
SIU.GPDO[7].R = 1;
PIT.CHANNEL[1].TFLG.R = 1;
}
Timer Channel 2 not started and LED 2 ON all the time
Timer Channel 1 configured and started and LED 1 is off all the time
Timer Channel 1 started and LED 1 blinking every 1 second
LED 1 blinking inside the timer channel 2 function call
LED 1 blinking every 1 second
LED 2 blinking
LED 2 not blinking
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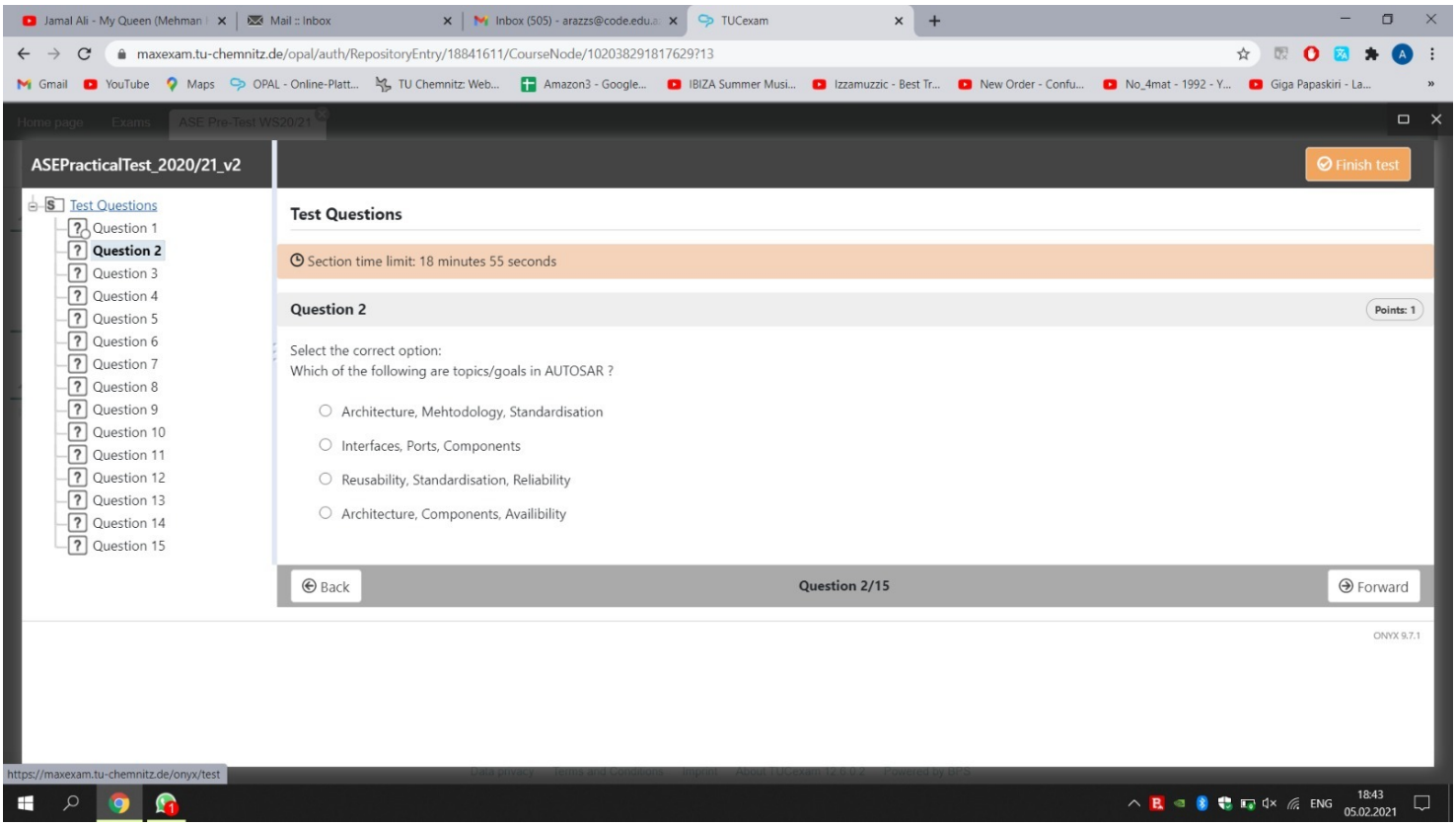
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Finish test
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Section time limit: 18 minutes 55 seconds
Question 2
Points: 1
Select the correct option:
Which of the following are topics/goals in AUTOSAR ?
Architecture, Mehtodology, Standardisation
Interfaces, Ports, Components
Reusability, Standardisation, Reliability
Architecture, Components, Availibility
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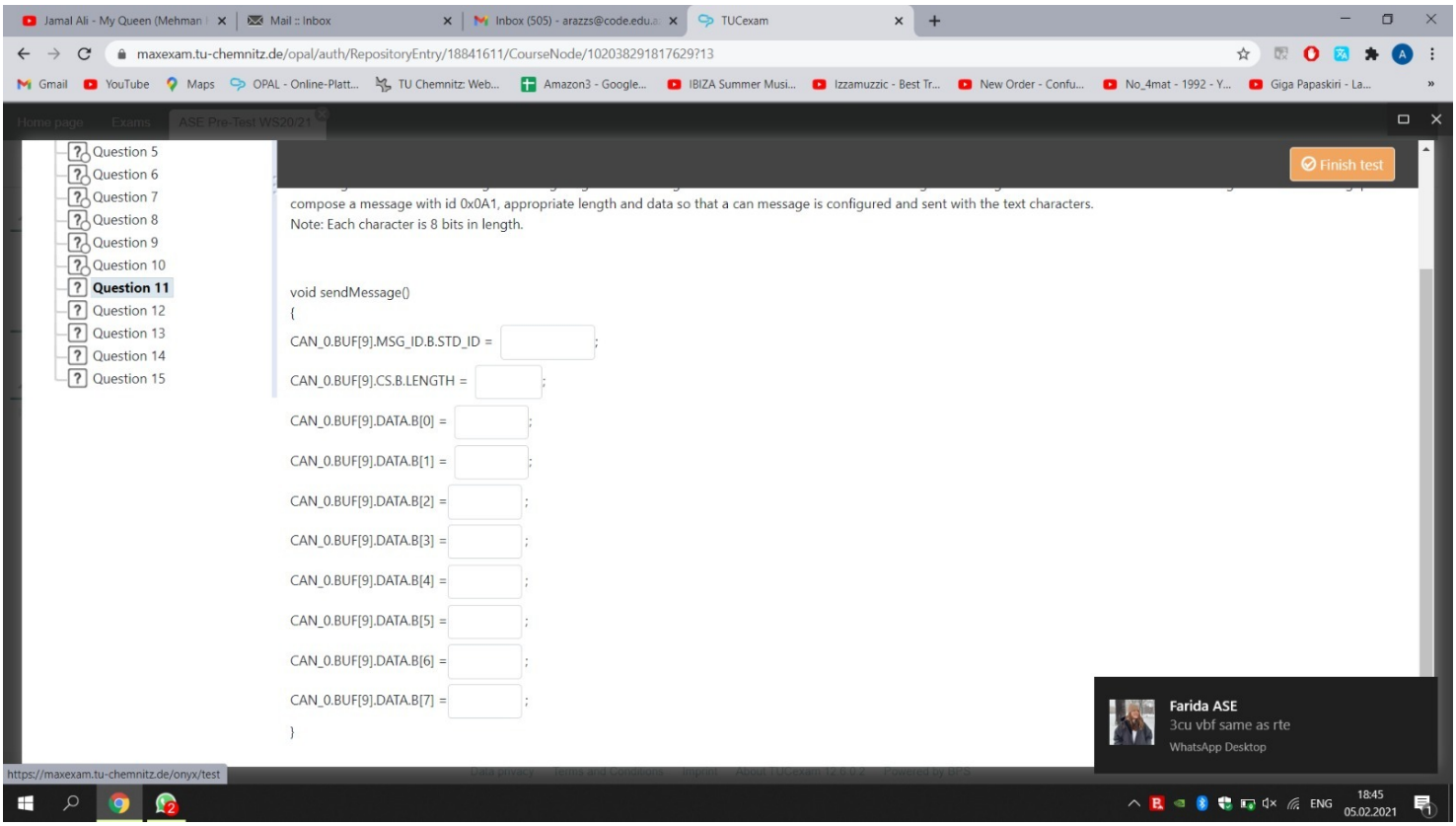
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compose a message with id 0x0A1, appropriate length and data so that a can message is configured and sent with the text characters.
Note: Each character is 8 bits in length.
void sendMessage()
{
CAN_0.BUF[9].MSG_ID.B.STD_ID =
CAN_0.BUF[9].CS.B.LENGTH =
CAN_0.BUF[9].DATA.B[0] =
CAN_0.BUF[9].DATA.B[1] =
CAN_0.BUF[9].DATA.B[2] =
CAN_0.BUF[9].DATA.B[3] =
CAN_0.BUF[9].DATA.B[4] =
CAN_0.BUF[9].DATA.B[5] =
CAN_0.BUF[9].DATA.B[6] =
CAN_0.BUF[9].DATA.B[7] =
}
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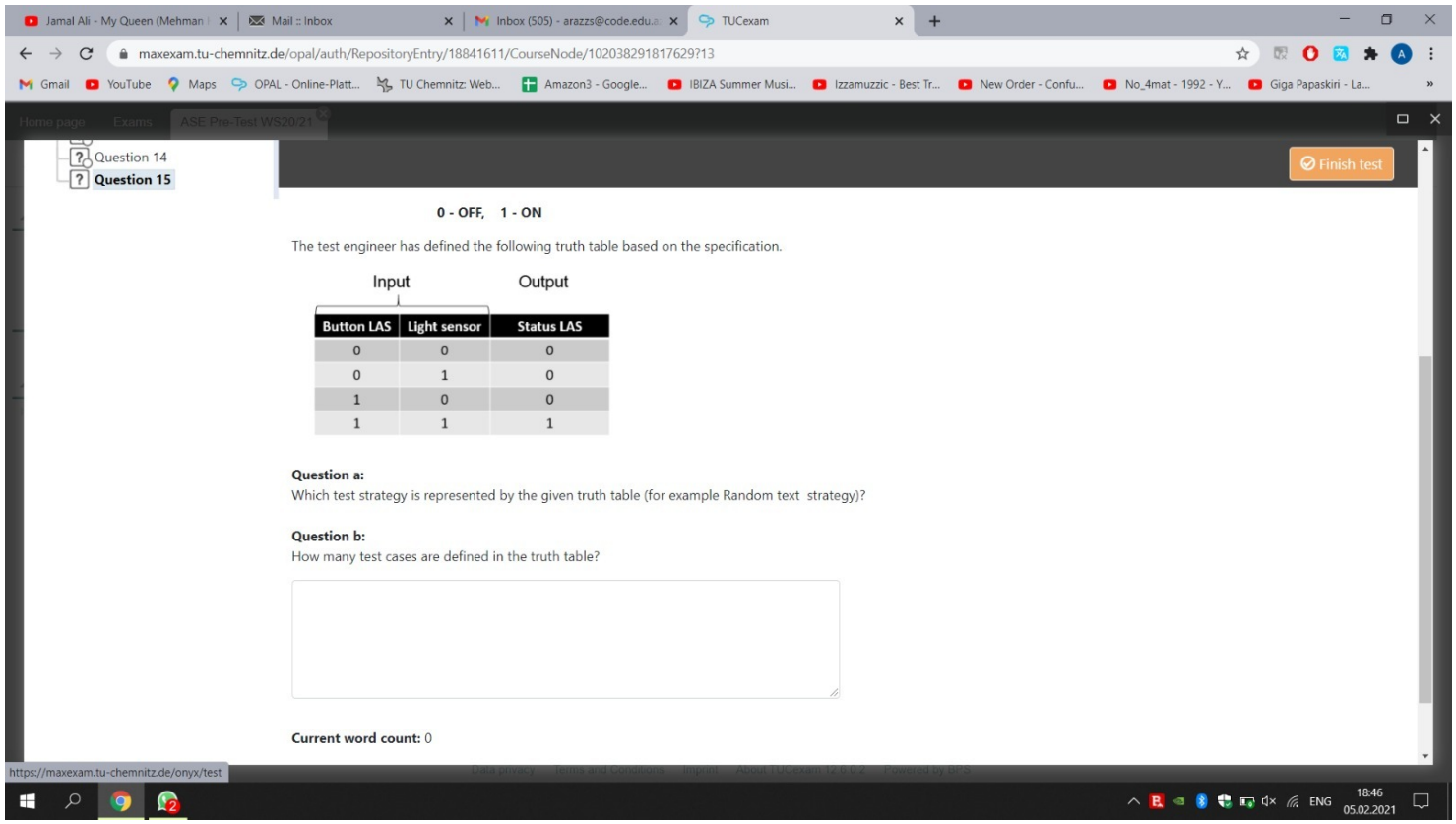
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0 - OFF, 1 - ON
The test engineer has defined the following truth table based on the specification.
Input
Output
Button LAS
Light sensor
Status LAS
0 0 0
0 1 0
1 0 0
1 1 1
Question a:
Which test strategy is represented by the given truth table (for example Random text strategy)?
Question b:
How many test cases are defined in the truth table?
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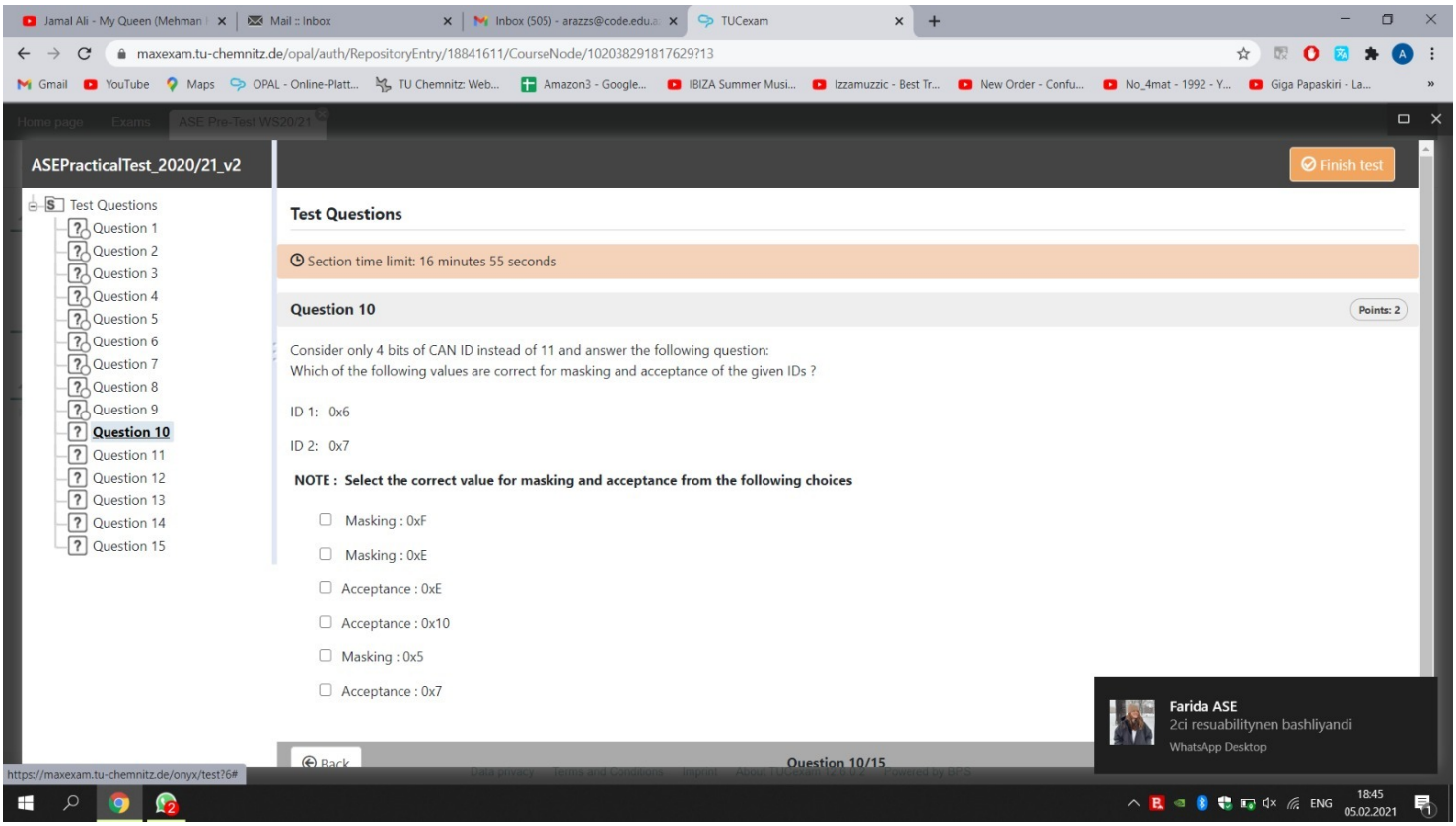
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Test Questions
Section time limit: 16 minutes 55 seconds
Question 10
Points: 2
Consider only 4 bits of CAN ID instead of 11 and answer the following question:
Which of the following values are correct for masking and acceptance of the given IDs ?
ID 1: 0x6
ID 2: 0x7
NOTE : Select the correct value for masking and acceptance from the following choices
Masking : 0xF
Masking : 0xE
Acceptance : 0xE
Acceptance : 0x10
Masking : 0x5
Acceptance : 0x7
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Finish test

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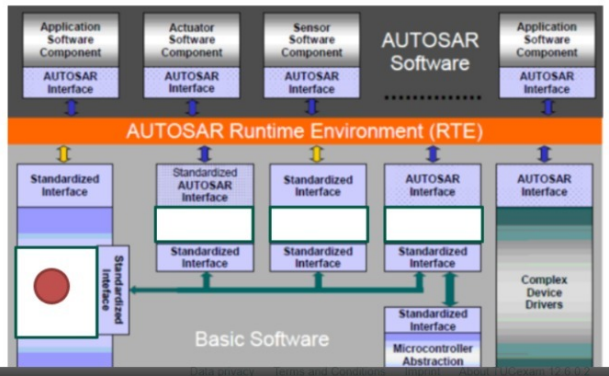
## Test Questions

Section time limit: 18 minutes 46 seconds

### Question 4

Points: 1

What is the name of the AUTOSAR architecture module that is marked by a cirle in the below picture

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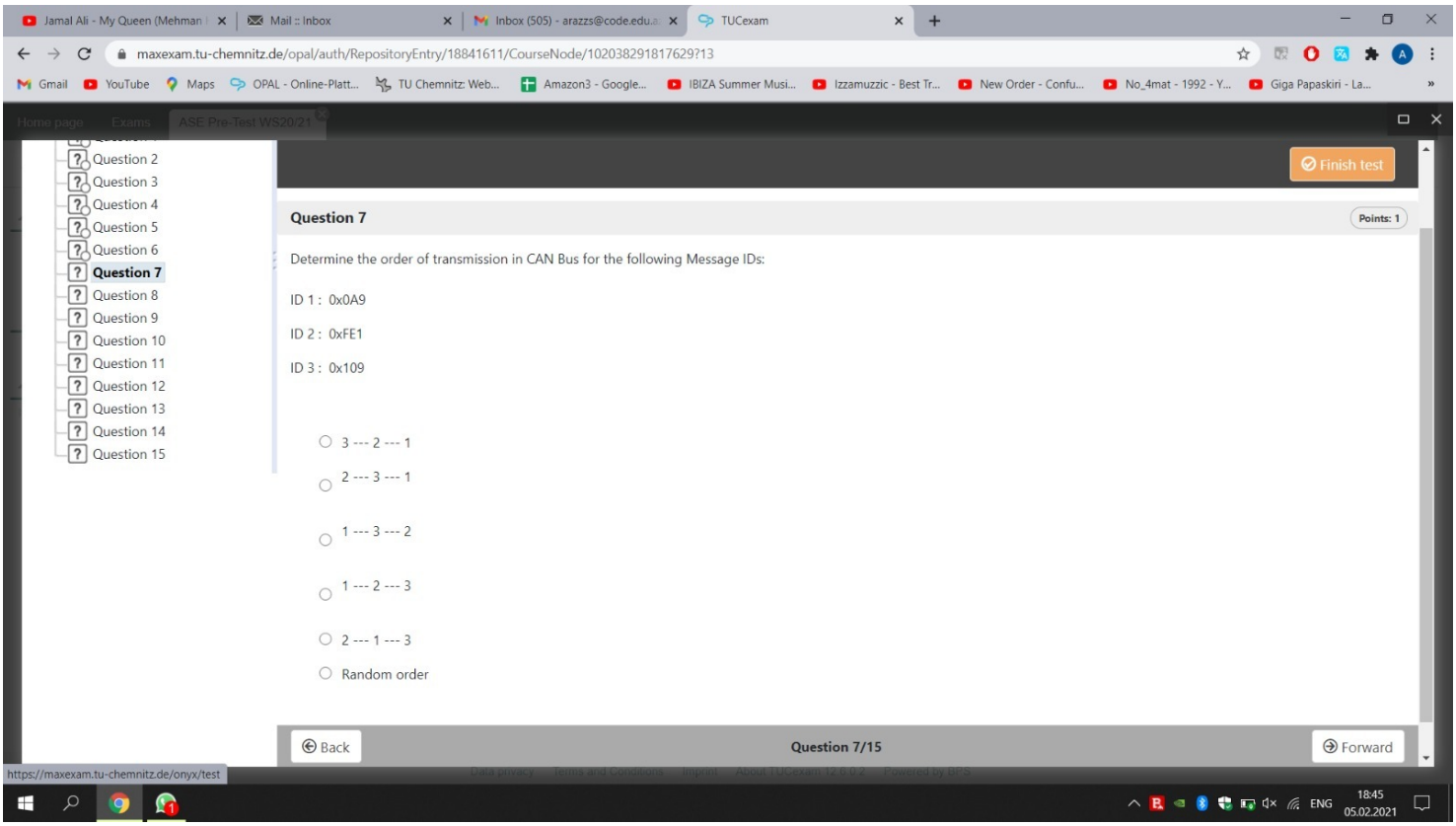
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Question 7
Points: 1
Determine the order of transmission in CAN Bus for the following Message IDs:
ID 1 : 0x0A9
ID 2 : 0xFE1
ID 3 : 0x109
3 --- 2 --- 1
2 --- 3 --- 1
1 --- 3 --- 2
1 --- 2 --- 3
2 --- 1 --- 3
Random order
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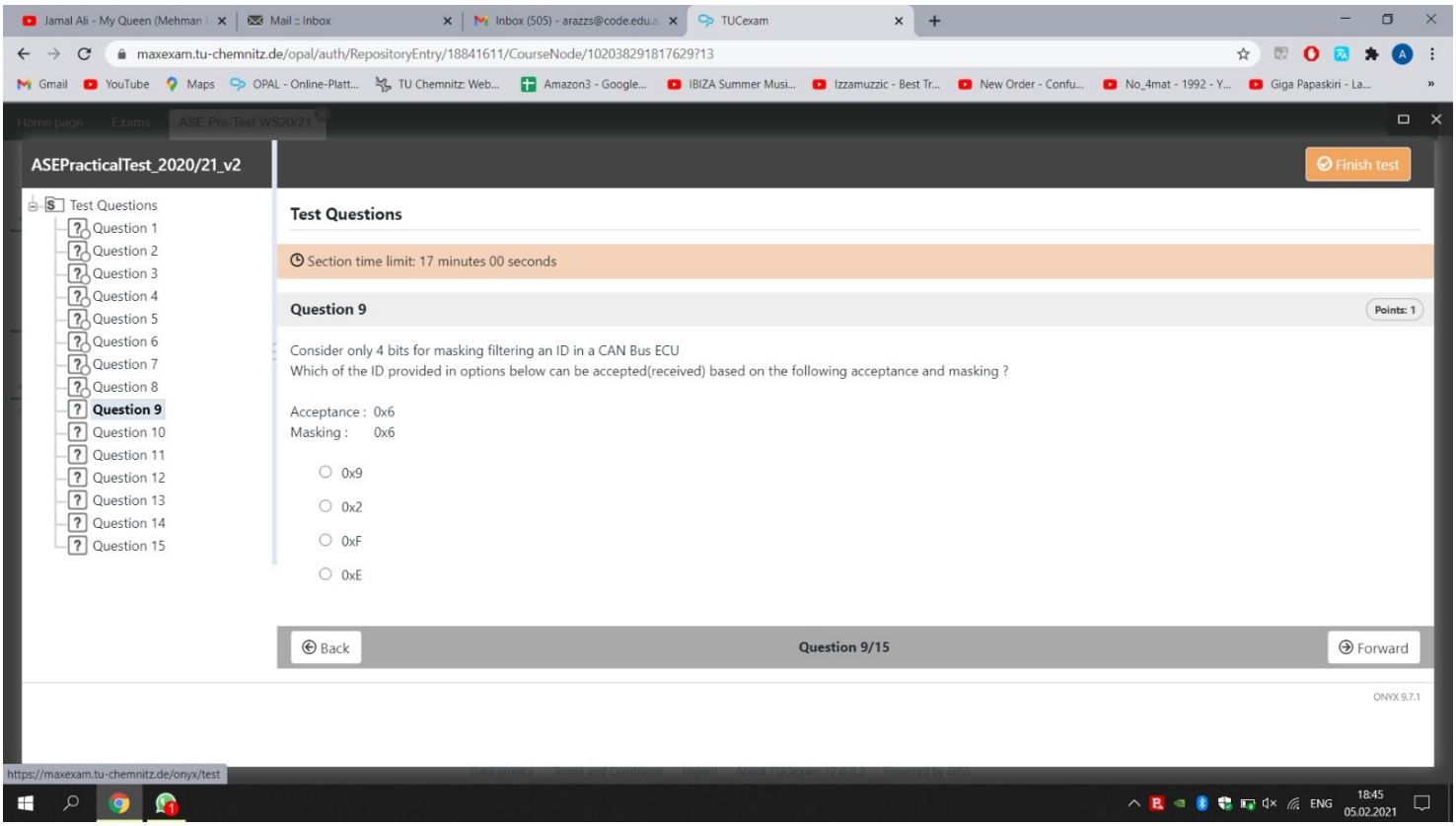
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Test Questions
Section time limit: 17 minutes 00 seconds
Question 9
Points: 1
Consider only 4 bits for masking filtering an ID in a CAN Bus ECU
Which of the ID provided in options below can be accepted(received) based on the following acceptance and masking ?
Acceptance : 0x6
Masking : 0x6
0x9
0x2
0xF
0xE
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Finish test

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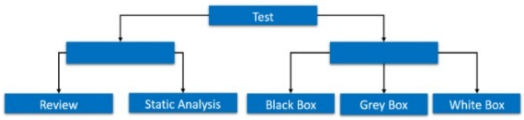
## Question 14

Points: 3

The given picture represent and abstract ovveriew about the test methodologies in the software area.




**Question a:**
Which two test methodologies are missing in the given pictures?

**Question b:**
Explain shortly the main difference between the two test methodologies from Question a.

**Current word count:** 0

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