Q1 T

Tuesday 18 November 2025 6:34 pm

Question 1

Not yet answered

Marked out of 4.00

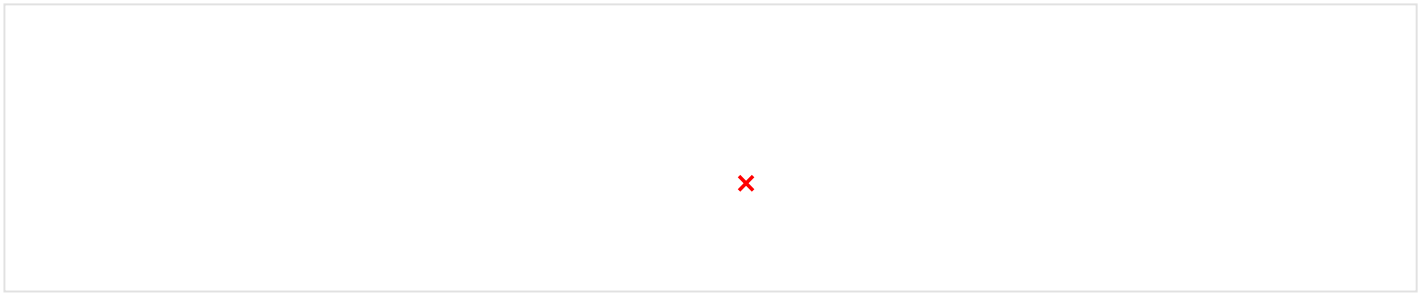
Flag question

What would be the four binary bytes of the float type value 23.5, if you were to transmit the four bytes over Ethernet. List in hexadecimal, the four bytes starting from the least significant byte.

Least Significant Byte => [ ], next byte => [ ], next byte => [ ] and Most Significant byte => [ ].

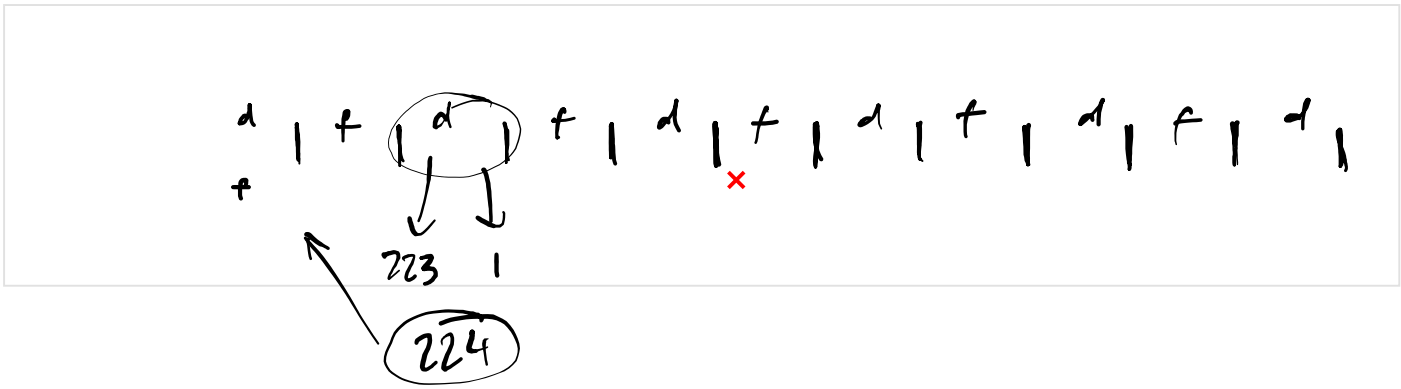
Q2

Tuesday 18 November 2025 6:34 pm



Q3 T

Tuesday 18 November 2025 6:34 pm



Q4 T

Tuesday 18 November 2025 6:34 pm

Q5 T

Tuesday 18 November 2025 6:34 pm

Question 5

Not yet answered

Marked out of 2.00

Flag question

The laser range finder attached to the weeder UGV has a starting angle of 0 degrees and a resolution of 0.5 degrees. If the 75th range data value is 960 in hexadecimal, expressed the x and y coordinates of the laser detected point in **meters** as per the coordinate frame shown in the Service Details document of Assignment 2.

Note: First data value corresponds to 0 degrees.

x coordinate

y coordinate

$9 \times 16^2 = 2304 + 96 = 2400\,mm$

0×960^1

2.4m

$x = 2400 \times \sin(74 \times 0.5)$

$= 1544.49$

$y = -2400 \times \cos(74 \times 0.5)$

$= -1836.99$

Q6

Tuesday 18 November 2025 6:34 pm

Question 6

Not yet answered

Marked out of 1.00

Flag question

To store the 112 bytes of the binary data stream received from the GNSS system on the Weeder UGV in the Mechatronics laboratory, the following structure is used. On the assumption that the currently effective packing boundary of the computer processing the data is 8 bytes, will this structure give us the correct Northing, Easting and Height?

```
struct GPS
{
  unsigned int Header;
  unsigned char Discards1[40];
  double Northing;
  double Easting;
  double Height;
  unsigned char Discards2[40];
  unsigned int Checksum;
};
```

Q7

Tuesday 18 November 2025 6:34 pm

Question 7

Not yet answered

Marked out of 1.00

Flag question

A certain binary data record is 96 bytes long. In a situation where these data bytes are continuously streaming, and that they are first collected for post processing, to ensure a complete data record is definitely available in the date collected via a serial port, what would be the best minimum serial port data buffer size? [ ]

Q8

Tuesday 18 November 2025 6:34 pm

Question 8

Not yet answered

Marked out of 1.00

Flag question

On the assumption that a complete data record is available in the data buffer RecvData, to trap the header byte sequence of 0xaa, 0x44, 0x12, 0x1c the following code fragment can be used. Which operator would you use to replace the questions mark symbol (?) in the code fragment below? Note: Data is of type unsigned char and RecvData is a sufficiently large array of unsigned char type data containing the header byte sequence.

```
unsigned int Header = 0;
int i = 0;
int Start; //Start of data
do
{
  Data = RecvData[i++];
  Header = ((Header << 8) ? Data);
} while (Header != 0xaa44121c);
Start = i - 4;
```

Q9

Tuesday 18 November 2025 6:34 pm

Question 9

Not yet answered

Marked out of 1.00

Flag question

A certain thread manager is responsible for the maintenance of watchdog signal to an autonomous vehicle. If the thread manager crashes the watchdog signal dies and the autonomous vehicle will halt. In that case which part of the thread management tasks can be omitted.

- A. The monitoring of the thread manager heartbeats.
- B. The management of shutdown flags.
- C. The management of heartbeats/timestamps of the individual threads.
- D. All things mentioned in other answers to this question

Q10

Tuesday 18 November 2025 6:34 pm

Question 10

Not yet answered

Marked out of 1.00

Flag question

The code fragment shown below transfers data in the **RecvData** buffer to the **NovatelGNSS** structure. **Start** is the location of the **RecvData** buffer from which the data are transferred. However, the code fragment below is flawed. It can be fixed by,

```
GNSS NovatelGNSS;
unsigned char* BytePtr = nullptr;
BytePtr = (unsigned char*)NovatelGNSS;
for (int i = Start; i < Start + sizeof(GNSS); i++)
{
   *(BytePtr++) = RecvData[i];
}
```

- A. Changing GPS NovatelGPS; to GPS &NovatelGPS;
- B. Changing BytePtr = (unsigned char*)NovatelGPS; to BytePtr = (unsigned char*)&NovatelGPS;
- C. Changing sizeof(GPS); to sizeof(NovatelGPS);

Q11

Tuesday 18 November 2025 6:34 pm

Question 11

Not yet answered

Marked out of 1.00

Flag question

To process the 112 bytes of the binary data stream received from the GNSS system on the Weeder UGV in the Mechatronics laboratory, the following structure is used. As can be seen, this structure does not contain the header. Currently, #pragma pack(8) is in force.

```
struct GNSS
{
   unsigned char Discards1[40];
   double Northing;
   double Easting;
   double Height;
   unsigned char Discards2[40];
   unsigned int Checksum;
};
```

Is the following statement true or false?

If we ensure not to store the 4 bytes of the header in the structure, and then store the remaining bytes of the data stream, this structure gives us the correct Northing, Easting, Height and Checksum.

Select one:

- ◯ True
- ◯ False

Q3 T

Tuesday 18 November 2025 6:34 pm

Question 3

Not yet answered

Marked out of 1.00

Flag question

A certain binary data packet is known to have two doubles and two floats, in that order. The sender transmits each value with the least significant byte first, also known as the little-endian format where the least significant byte is transmitted first. If the values of the transmitted bytes are as follows what is the value of the second double type quantity?

0x1D, 0x5A, 0x64, 0x3B, 0xDF, 0x01, 0x82, 0x40, 0xAE, 0x47, 0xE1, 0x7A, 0x48, 0x80, 0xF3, 0x40, 0xB0, 0x32, 0x6A, 0x43, 0xFA, 0xCE, 0x76, 0x44

Q1 T

Tuesday 18 November 2025 6:34 pm

Question 1

Not yet answered

Marked out of 4.00

Flag question

What would be the four binary bytes of the float type value 23.5, if you were to transmit the four bytes over Ethernet. List in hexadecimal, the four bytes starting from the least significant byte.

Least Significant Byte => [ ], next byte => [ ], next byte => [ ] and Most Significant byte => [ ].

Q2

Tuesday 18 November 2025 6:34 pm

Question 2

Not yet answered

Marked out of 5.00

Flag question

What would be the byte stream if you were to transmit the word "Hello" in ASCII? The last byte in a string transmission is the null character which is 0x00. Give the bytes in hexadecimal excluding the null character. Type them in hexadecimal, in the spaces provided starting from the first byte that will be transmitted.

[ ], [ ], [ ], [ ], [ ].

Q3 T

Tuesday 18 November 2025 6:34 pm

Question 3

Not yet answered

Marked out of 1.00

Flag question

A certain binary data packet is known to have two doubles and two floats, in that order. The sender transmits each value with the least significant byte first, also known as the little-endian format where the least significant byte is transmitted first. If the values of the transmitted bytes are as follows what is the value of the second double type quantity?

0x1D, 0x5A, 0x64, 0x3B, 0xDF, 0x01, 0x82, 0x40, 0xAE, 0x47, 0xE1, 0x7A, 0x48, 0x80, 0xF3, 0x40, 0xB0, 0x32, 0x6A, 0x43, 0xFA, 0xCE, 0x76, 0x44

Q4 T

Tuesday 18 November 2025 6:34 pm

Question 4

Not yet answered

Marked out of 3.00

Flag question

A partial data record from the a laser range finder used in the laboratory classes is given below.

What is the angular resolution of laser range data, that is the angle between two consecutive range measurements? Enter your answer in degrees expressed as a decimal number (as opposed to hexadecimal) here [ ].

What is the starting angle of the range measurements? Enter your answer in degrees expressed as a decimal number (as opposed to hexadecimal) here [ ].

What would be the angle that corresponds to the final range measurement that will be made available in a data packet? Enter your answer in degrees expressed as a decimal number (as opposed to hexadecimal) here [ ].

sRA LMDscandata 0 1 9BF210 0 0 25E6 25EA 5B855C7F 5B85621E 0 0 7 0 0 1388 168 0 1 DIST1 3F800000 00000000 0 1388 169 152A 14A0 146E 1529 ...

Q5 T

Tuesday 18 November 2025 6:34 pm

Question 5

Not yet answered

Marked out of 2.00

Flag question

The laser range finder attached to the weeder UGV has a starting angle of 0 degrees and a resolution of 0.5 degrees. If the 75th range data value is 960 in hexadecimal, expressed the x and y coordinates of the laser detected point in **meters** as per the coordinate frame shown in the Service Details document of Assignment 2.
Note: First data value corresponds to 0 degrees.

x coordinate

y coordinate

Q6

Tuesday 18 November 2025 6:34 pm

Question 6

Not yet answered

Marked out of 1.00

Flag question

To store the 112 bytes of the binary data stream received from the GNSS system on the Weeder UGV in the Mechatronics laboratory, the following structure is used. On the assumption that the currently effective packing boundary of the computer processing the data is 8 bytes, will this structure give us the correct Northing, Easting and Height?

```
struct GPS
{
  unsigned int Header;
  unsigned char Discards1[40];
  double Northing;
  double Easting;
  double Height;
  unsigned char Discards2[40];
  unsigned int Checksum;
};
```

Q7

Tuesday 18 November 2025 6:34 pm

Question 7

Not yet answered

Marked out of 1.00

Flag question

A certain binary data record is 96 bytes long. In a situation where these data bytes are continuously streaming, and that they are first collected for post processing, to ensure a complete data record is definitely available in the date collected via a serial port, what would be the best minimum serial port data buffer size? [ ]

Q8

Tuesday 18 November 2025 6:34 pm

Question 8

Not yet answered

Marked out of 1.00

Flag question

On the assumption that a complete data record is available in the data buffer RecvData, to trap the header byte sequence of 0xaa, 0x44, 0x12, 0x1c the following code fragment can be used. Which operator would you use to replace the questions mark symbol (?) in the code fragment below? Note: Data is of type unsigned char and RecvData is a sufficiently large array of unsigned char type data containing the header byte sequence.

```
unsigned int Header = 0;
int i = 0;
int Start; //Start of data
do
{
  Data = RecvData[i++];
  Header = ((Header << 8) ? Data);
} while (Header != 0xaa44121c);
Start = i - 4;
```

Q9

Tuesday 18 November 2025 6:34 pm

Question 9

Not yet answered

Marked out of 1.00

Flag question

A certain thread manager is responsible for the maintenance of watchdog signal to an autonomous vehicle. If the thread manager crashes the watchdog signal dies and the autonomous vehicle will halt. In that case which part of the thread management tasks can be omitted.

- A. The monitoring of the thread manager heartbeats.
- B. The management of shutdown flags.
- C. The management of heartbeats/timestamps of the individual threads.
- D. All things mentioned in other answers to this question

Q10

Tuesday 18 November 2025 6:34 pm

Question 10

Not yet answered

Marked out of 1.00

Flag question

The code fragment shown below transfers data in the **RecvData** buffer to the **NovatelGNSS** structure. **Start** is the location of the **RecvData** buffer from which the data are transferred. However, the code fragment below is flawed. It can be fixed by,

```
GNSS NovatelGNSS;
unsigned char* BytePtr = nullptr;
BytePtr = (unsigned char*)NovatelGNSS;
for (int i = Start; i < Start + sizeof(GNSS); i++)
{
   *(BytePtr++) = RecvData[i];
}
```

- A. Changing GPS NovatelGPS; to GPS &NovatelGPS;
- B. Changing BytePtr = (unsigned char*)NovatelGPS; to BytePtr = (unsigned char*)&NovatelGPS;
- C. Changing sizeof(GPS); to sizeof(NovatelGPS);

Q11

Tuesday 18 November 2025 6:34 pm

Question 11

Not yet answered

Marked out of 1.00

Flag question

To process the 112 bytes of the binary data stream received from the GNSS system on the Weeder UGV in the Mechatronics laboratory, the following structure is used. As can be seen, this structure does not contain the header. Currently, #pragma pack(8) is in force.

```
struct GNSS
{
   unsigned char Discards1[40];
   double Northing;
   double Easting;
   double Height;
   unsigned char Discards2[40];
   unsigned int Checksum;
};
```

Is the following statement true or false?

If we ensure not to store the 4 bytes of the header in the structure, and then store the remaining bytes of the data stream, this structure gives us the correct Northing, Easting, Height and Checksum.

Select one:

- ◯ True
- ◯ False

Q1 /

Tuesday 18 November 2025 6:35 pm

Question 1

Not yet answered

Marked out of 1.00

Flag question

A class definition is given below:

```
#pragma pack(push,1)
class Sensor
{
private:
        char D; // 1 bytes
        double A; // 8 bytes
        int C; // 4 bytes
        float B; // 4 bytes
public:
        Sensor()
        {
                A = 43.5;
                B = 24.7;
                C = 26;
                D = 'B';
        };
        virtual ~Sensor() {};
};
#pragma pack(pop,1)
```

1+8+4+4 = 17 bytes

17

An object of type **Sensor** is instantiated as follows: **Sensor PressureSensor;** The following set of bytes is also given 0x41, 0x66, 0x66, 0x66, 0x66, 0x66, 0x66, 0x2D, 0x40, 0x00, 0x00, 0xBC, 0x41, 0x10, 0x00, 0x00, 0x00. If we store these bytes, starting from the 4th byte location of **PressureSensor** (that is leaving byte locations 0, 1, 2 and 3 unchanged) what will be the value of the private data **PressureSensor.B**? Enter your answer as a decimal number accurate to one decimal place in the space provided 23.5

Question 1

Correct

Mark 1.00 out of 1.00

Flag question

A class definition is given below:

```
#pragma pack(push,1)
class Sensor
{
private:
      char D;
      double A;
      int C;
      float B;
public:
      Sensor()
      {
            A = 43.5;
            B = 24.7;
            C = 26;
            D = 'B';
      };
      virtual ~Sensor() {};
};
#pragma pack(pop,1)
```

An object of type `Sensor` is instantiated as follows: `Sensor PressureSensor;` The following set of bytes is also given 0x41, 0x66, 0x66, 0x66, 0x66, 0x66, 0x66, 0x2D, 0x40, 0x00, 0x00, 0xBC, 0x41, 0x10, 0x00, 0x00, 0x00. If we store these bytes, starting from the 4th byte location of `PressureSensor` (that is leaving byte locations 0, 1, 2 and 3 unchanged) what will be the value of the private data `PressureSensor.B`? Enter your answer as a decimal number accurate to one decimal place in the space provided 23.5 ✓

Q2 /

Tuesday 18 November 2025 6:57 pm

Question 2
Not yet answered
Marked out of 3.00
Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      int A;
      double B;
      char C;
};
#pragma pack(pop,4)
```

4 9 12 16

4 8 1 4+8+1 = 13

3 bytes unused

An object of type `Data` is instantiated as follows:

```
Data myData;
```

DEP ?

If the memory address of **myData** is hexadecimal AB00E22857998DE0, give the memory addresses of the **unused bytes** of **myData**. Enter your answers as 16 digit hexadecimal numbers without 0x. Enter the smallest address here => [ ], next address here => [ ] and the highest address here => [ ]

15 + 16

Question 2
Correct
Mark 3.00 out of 3.00
Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      int A;
      double B;
      char C;
};
#pragma pack(pop,4)
```

An object of type `Data` is instantiated as follows:

```
Data myData;
```

If the memory address of **myData** is hexadecimal AB00E22857998DE0, give the memory addresses of the **unused bytes** of **myData**. Enter your answers as 16 digit hexadecimal numbers without 0x. Enter the smallest address here => AB00E22857998DED ✓, next address here => AB00E22857998DEE ✓ and the highest address here => AB00E22857998DEF ✓

Q3 /

Tuesday 18 November 2025 6:57 pm

Question 3
Not yet answered
Marked out of 2.00
Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      double A;  8
        int B;   4
      char C;    1
};
#pragma pack(pop,4)
```

What will be the size of this structure? Enter your answer as a decimal integer here [16] and how many bytes will be unused in this structure? Enter your answer as a decimal integer here [3].

Question 3
Correct
Mark 2.00 out of 2.00
Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      double A;
        int B;
      char C;
};
#pragma pack(pop,4)
```

What will be the size of this structure? Enter your answer as a decimal integer here [16] ✓ and how many bytes will be unused in this structure? Enter your answer as a decimal integer here [3] ✓.

Q4 /

Tuesday 18 November 2025 6:57 pm

Question 4
Not yet answered
Marked out of 4.00
Flag question

A data structure is given below:

```
#pragma pack(push,8)
struct Data
{
      char A;   1
      double B; 8
      int C;    4
};
#pragma pack(pad,8)
```

24

What will be the size of this structure? Enter your answer as a decimal integer here 32 and how many bytes will be unused in this structure? Enter your answer as a decimal integer here 11 . How many bytes near member **A** will be unused? 7 and how many bytes near member **C** will be unused? 4

Question 4
Correct
Mark 4.00 out of 4.00
Flag question

A data structure is given below:

```
#pragma pack(push,8)
struct Data
{
      char A;
      double B;
      int C;
};
#pragma pack(pop,8)
```

What will be the size of this structure? Enter your answer as a decimal integer here 24 ✓ and how many bytes will be unused in this structure? Enter your answer as a decimal integer here 11 ✓ . How many bytes near member **A** will be unused? 7 ✓ and how many bytes near member **C** will be unused? 4 ✓

Q5

Tuesday 18 November 2025 6:57 pm

34.009

Question 5

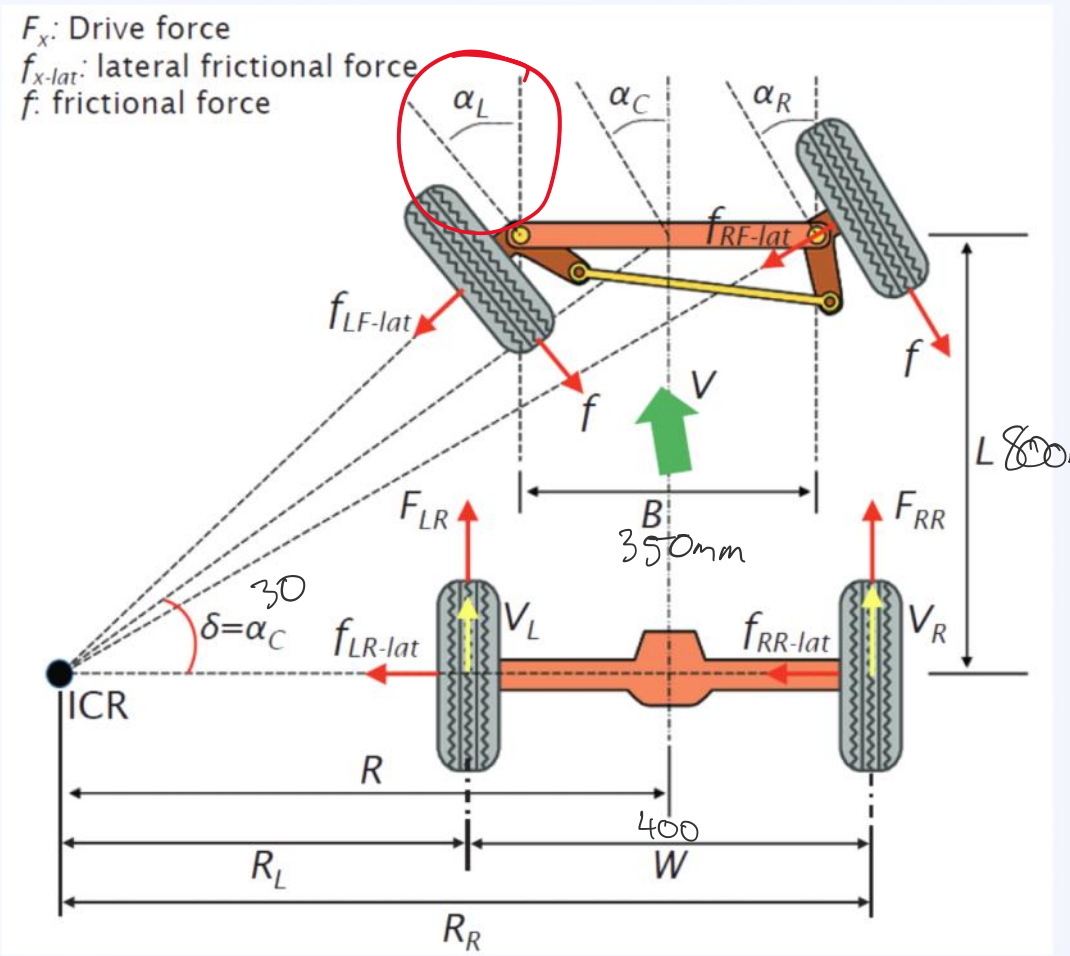
Not yet answered

Marked out of 1.00

Flag question

For a vehicle that has the Ackermann steering mechanism, the front wheels are steered using a steering controller. Considering the figure below, if $L = 800$ mm, $B = 350$ mm, and $W = 400$ mm, and if the commanded steering $\delta = 30^{\circ}$, what would be the angle α_L in degrees.

Enter your answer in degrees with three decimal places



Q6

Tuesday 18 November 2025 6:57 pm

Question 6

Not yet answered

Marked out of 1.00

Flag question

In the UGV assignment, which of these were servers and which of these were clients and which of these were neither?

XBox controller: neither ✓

LiDAR: client ✗ server ✓

GNSS: client ✗ server ✓

Vehicle: client ✗

External Laptop: Server ✗

Q7

Tuesday 18 November 2025 6:57 pm

Question 7

Not yet answered

Marked out of 2.00

Flag question

From the Weeder UGVs built-in computers point of view, the Galil motion controller is Server ✓ client ✗ and the external laptop is Server ✗ client ✓

Q8

Tuesday 18 November 2025 6:57 pm

Question 8

Not yet answered

Marked out of 2.00

Flag question

To make a connection with the Galil motion controller, the weeder UGV's internal computer will instantiate a TcpClient. To make a connection with the external laptop, the Weeder UGV's internal computer will instantiate a TcpListener.

Q9

Tuesday 18 November 2025 6:57 pm

Question 9

Not yet answered

Marked out of 1.00

Flag question

Considering the hardware and software implementations we discussed for the Weeder UGV, if the external laptop crashes,

- A. The Weeder UGV will halt and the steering will be set to zero.
- B. The Weeder UGV will stop and the steering will be according to the last steering command executed by the internal Galil motion controller.
- C. The Weeder UGV will keep moving with the last velocity commanded to the UGV and with zero steering.
- D. The Weeder UGV will keep moving with the last velocity commanded to the UGV and the last steering commanded to the UGV.

Q10

Tuesday 18 November 2025 6:57 pm

Question 10

Not yet answered

Marked out of 1.00

Flag question

Considering only the hardware and software implementations we discussed in the lectures for the Weeder UGV, if the internal laptop crashes,

- A. The Weeder UGV will keep moving with the last steering and speed commanded to the internal Galil motion controller.
- B. The Weeder UGV will keep moving with the last speed commanded to the internal Galil motion controller with its steering set to 0.
- C. The weeder UGV will halt leaving the steering at the last value commanded to the internal Galil.
- D. The Weeder UGV will halt and it's steering will be set to 0.

Q11

Tuesday 18 November 2025 6:57 pm

Question 11

Not yet answered

Marked out of 1.00

Flag question

If the message sent to the Weeder UGV's internal computer is of the following form, with '<spc>' standing for a single space, with the values for <steer> limited to ±40 degrees, with the speeds limited to ±2 m/s, and with all speeds and steering angles expressed with a maximum of three decimal places. What is the maximum number of bytes you can expect in a message? The <flag> is always a single character 0 or 1. Enter your answer as a decimal integer in the space provided. [ ].

#<spc><steer><spc><speed><spc><flag><spc>#

Q12

Tuesday 18 November 2025 6:57 pm

Question 12

Not yet answered

Marked out of 1.00

Flag question

What do we consider as the **`IncomingClient`** in the Weeder UGV's internal computer's software?

- A. A connection request from the external laptop
- B. A connection request from the internal Galil motion controller.
- C. A connection request from the GNSS
- D. A connection request from the LiDAR.

Q13

Tuesday 18 November 2025 6:57 pm

Question 13

Not yet answered

Marked out of 1.00

Flag question

If gravity compensation is excluded, when a positive roll motion is achieved, the quadcopter will,

- A. Move rightwards (looking at the quadcopter from behind) horizontally.
- B. Move leftwards (looking at the quadcopter from behind) horizontally.
- C. Move leftwards (looking at the quadcopter from behind) and descend.
- D. Move rightwards (looking at the quadcopter from behind) and descend.

Q14

Tuesday 18 November 2025 6:57 pm

Question 14

Not yet answered

Marked out of 4.00

Flag question

Complete the following sentence by choosing the correct answers.

The height controller contributes to a force ✓, the roll controller contributes to a force ✓, the pitch controller contributes to a force ✗ and the yaw controller contributes to a torque ✓.

Q1

Tuesday 18 November 2025 6:35 pm

Question 1

Not yet answered

Marked out of 1.00

Flag question

A class definition is given below:

```
#pragma pack(push,1)
class Sensor
{
private:
        char D;
        double A;
        int C;
        float B;
public:
        Sensor()
        {
                A = 43.5;
                B = 24.7;
                C = 26;
                D = 'B';
        };
        virtual ~Sensor() {};
};
#pragma pack(pop,1)
```

0x41, 0xBC, 0x00, 0x00

An object of type **Sensor** is instantiated as follows: **Sensor PressureSensor;** The following set of bytes is also given 0x41, 0x66, 0x66, 0x66, 0x66, 0x66, 0x66, 0x2D, 0x40, 0x00, 0x00, 0xBC, 0x41, 0x10, 0x00, 0x00, 0x00. If we store these bytes, starting from the 4th byte location of **PressureSensor** (that is leaving byte locations 0, 1, 2 and 3 unchanged) what will be the value of the private data **PressureSensor.B**? Enter your answer as a decimal number accurate to one decimal place in the space provided 23.5

Q2

Tuesday 18 November 2025 6:57 pm

Question 2

Not yet answered

Marked out of 3.00

Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      int A;
      double B;
      char C;
};
#pragma pack(pop,4)
```

An object of type **Data** is instantiated as follows:

```
Data myData;
```

If the memory address of **myData** is hexadecimal AB00E22857998DE0, give the memory addresses of the **unused bytes** of **myData**. Enter your answers as 16 digit hexadecimal numbers without 0x. Enter the smallest address here => [ ], next address here => [ ] and the highest address here => [ ]

Q3

Tuesday 18 November 2025 6:57 pm

Question 3

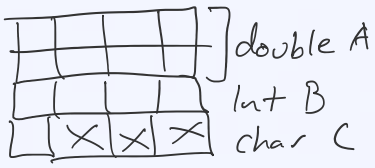
Not yet answered

Marked out of 2.00

Flag question

A data structure is given below:

```
#pragma pack(push,4)
struct Data
{
      double A;
        int B;
      char C;
};
#pragma pack(pop,4)
```



What will be the size of this structure? Enter your answer as a decimal integer here 16 and how many bytes will be unused in this structure? Enter your answer as a decimal integer here 3.

Q4

Tuesday 18 November 2025 6:57 pm

Question 4

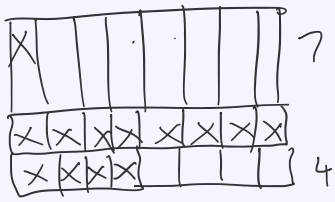
Not yet answered

Marked out of 4.00

Flag question

A data structure is given below:

```
#pragma pack(push,8)
struct Data
{
      char A;
      double B;
      int C;
};
#pragma pack(pop,8)
```



What will be the size of this structure? Enter your answer as a decimal integer here 24 and how many bytes will be unused in this structure? Enter your answer as a decimal integer here 11. How many bytes near member **A** will be unused? 7 and how many bytes near member **C** will be unused? 4

Q5

Tuesday 18 November 2025 6:57 pm

Question 5

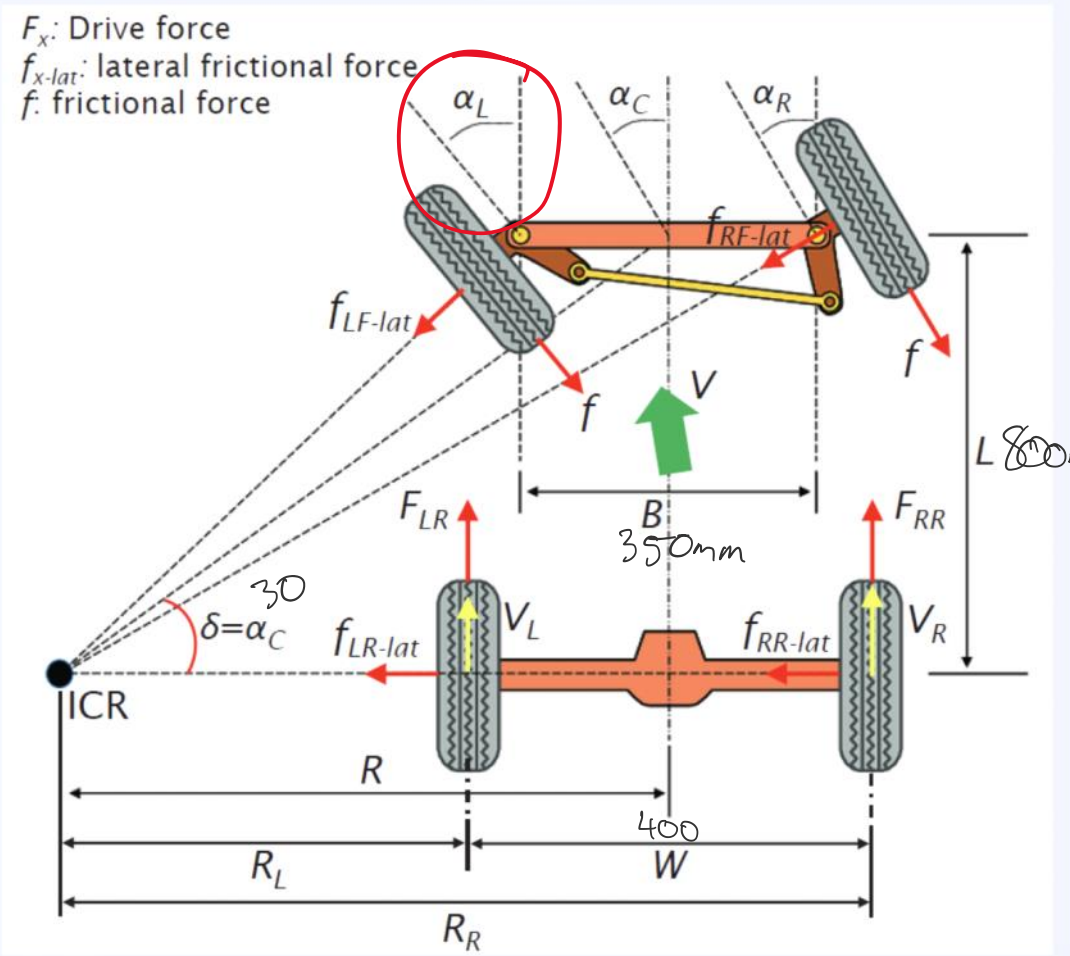
Not yet answered

Marked out of 1.00

Flag question

For a vehicle that has the Ackermann steering mechanism, the front wheels are steered using a steering controller. Considering the figure below, if $L = 800$ mm, $B = 350$ mm, and $W = 400$ mm, and if the commanded steering $\delta = 30^{\circ}$, what would be the angle α_L in degrees.

Enter your answer in degrees with three decimal places



Q6

Tuesday 18 November 2025 6:57 pm

Question 6

Not yet answered

Marked out of 1.00

Flag question

In the UGV assignment, which of these were servers and which of these were clients and which of these were neither?

XBox controller client

LiDAR Server

GNSS Server

Vehicle neither

External Laptop client

Q7

Tuesday 18 November 2025 6:57 pm

Question 7

Not yet answered

Marked out of 2.00

Flag question

From the Weeder UGVs built-in computers point of view, the Galil motion controller is [ ] and the external laptop is [ ]

Q8

Tuesday 18 November 2025 6:57 pm

Question 8

Not yet answered

Marked out of 2.00

Flag question

To make a connection with the Galil motion controller, the weeder UGV's internal computer will instantiate a [ ]. To make a connection with the external laptop, the Weeder UGV's internal computer will instantiate a [ ].

Q9

Tuesday 18 November 2025 6:57 pm

Question 9

Not yet answered

Marked out of 1.00

Flag question

Considering the hardware and software implementations we discussed for the Weeder UGV, if the external laptop crashes,

- A. The Weeder UGV will halt and the steering will be set to zero.
- B. The Weeder UGV will stop and the steering will be according to the last steering command executed by the internal Galil motion controller.
- C. The Weeder UGV will keep moving with the last velocity commanded to the UGV and with zero steering.
- D. The Weeder UGV will keep moving with the last velocity commanded to the UGV and the last steering commanded to the UGV.

Q10

Tuesday 18 November 2025 6:57 pm

Question 10

Not yet answered

Marked out of 1.00

Flag question

Considering only the hardware and software implementations we discussed in the lectures for the Weeder UGV, if the internal laptop crashes,

- A. The Weeder UGV will keep moving with the last steering and speed commanded to the internal Galil motion controller.
- B. The Weeder UGV will keep moving with the last speed commanded to the internal Galil motion controller with its steering set to 0.
- C. The weeder UGV will halt leaving the steering at the last value commanded to the internal Galil.
- D. The Weeder UGV will halt and it's steering will be set to 0.

Q11

Tuesday 18 November 2025 6:57 pm

Question 11

Not yet answered

Marked out of 1.00

Flag question

If the message sent to the Weeder UGV's internal computer is of the following form, with '<spc>' standing for a single space, with the values for <steer> limited to ±40 degrees, with the speeds limited to ±2 m/s, and with all speeds and steering angles expressed with a maximum of three decimal places. What is the maximum number of bytes you can expect in a message? The <flag> is always a single character 0 or 1. Enter your answer as a decimal integer in the space provided. [ ].

#<spc><steer><spc><speed><spc><flag><spc>#

Q12

Tuesday 18 November 2025 6:57 pm

Question 12

Not yet answered

Marked out of 1.00

Flag question

What do we consider as the **`IncomingClient`** in the Weeder UGV's internal computer's software?

- A. A connection request from the external laptop
- B. A connection request from the internal Galil motion controller.
- C. A connection request from the GNSS
- D. A connection request from the LiDAR.

Q13

Tuesday 18 November 2025 6:57 pm

Question 13

Not yet answered

Marked out of 1.00

Flag question

If gravity compensation is excluded, when a positive roll motion is achieved, the quadcopter will,

- A. Move rightwards (looking at the quadcopter from behind) horizontally.
- B. Move leftwards (looking at the quadcopter from behind) horizontally.
- C. Move leftwards (looking at the quadcopter from behind) and descend.
- D. Move rightwards (looking at the quadcopter from behind) and descend.

Q14

Tuesday 18 November 2025 6:57 pm

Question 14

Not yet answered

Marked out of 4.00

Flag question

Complete the following sentence by choosing the correct answers.

The height controller contributes to a [ ], the roll controller contributes to a [ ], the pitch controller contributes to a [ ] and the yaw controller contributes to a [ ].