Started on	Monday, 26 February 2018, 08:09
State	Finished
Completed on	Monday, 26 February 2018, 08:36
Time taken	27 mins 43 secs
Grade	**4.00** out of 6.00 (**67**%)

Question 1

Partially correct

Mark 0.50 out of 1.00

🏳 Flag question

Two devices that communication with each other using UART are powered independently. It is necessary to include a series resistor on the communications lines because... (select all options that apply)

Twee toestelle wat met mekaar kommunikeer deur 'n UART kanaal word onafhanklik van krag voorsien. Dit is noodsaaklik om 'n serie weerstand op die kommunikasie lyne te hê omdat...(kies al die geldige opsies)

Select one or more:

- ☑ a. one or both devices may be damaged due to parasitic current.
  een of beide toestelle kan beskadig word as gevolg van parasitiese stroom. ✓

- ☐ b. it pulls up the line to Vcc in case the transmitting device does not have internal pull-up resistors.
  dit die lyn op trek na Vcc ingeval die sender toestel nie interne optrekweerstande het nie.

- ☐ c. it translates voltage levels from one device to the other.
  dit transleer spanningsvlakke van een toestel na die ander.

- ☐ d. it results in improved signal quality.
  dit veroorsaak verbeterde sein kwaliteit.

- ☐ e. if one device is on and the other off, current may flow from the powered device to the other, causing it to switch on (with unexpected behaviour).
  as een toestel aan is en die ander af, kan stroom vloei van die aangedrewe toestel na die ander, wat veroorsaak dat dit aanskakel (met onverwagte gedrag).

Your answer is partially correct.

You have correctly selected 1.
The correct answers are: one or both devices may be damaged due to parasitic current.
een of beide toestelle kan beskadig word as gevolg van parasitiese stroom., if one device is on and the other off, current may flow from the powered device to the other, causing it to switch on (with unexpected behaviour).
as een toestel aan is en die ander af, kan stroom vloei van die aangedrewe toestel na die ander, wat veroorsaak dat dit aanskakel (met onverwagte gedrag).

Question 2

Correct

Mark 2.00 out of 2.00

🏳 Flag question

[2 marks / 2 *punte*]

A UART port is configured to operate at 38400 baud, with 8-bit data, one start bit and one stop bit, and no parity bit. What is the maximum data transfer rate on the channel, in bytes per second?

'n UART poort word opgestel vir dataoordrag teen 38400 baud, met 8 databisse, een begin- en een stop-bis en geen pariteitsbisse. Wat is die maksimum dataoordragtempo op die kanaal, in grepe per sekonde?

Answer: 3840 ✓

The correct answer is: 3840

Question 3

Partially correct

Mark 0.50 out of 2.00

🏳 Flag question

Given the datasheet of the 7805 regulator (as found on the SunLearn EDesign page), an input voltage range of 10 to 15V, and a load resistance of 25 ohm, what is the minimum and maximum power that is dissipated by the device?

Gegee die datavel van die 7805 reguleerder (soos gevind op die SunLearn Ontwerp webblad), 'n intree spanningsbereik van 10 tot 15V, en 'n lasweerstand van 25 ohm, wat is die minimum en maksimum krag wat deur die reguleerder verkwis word?

Minimum [1] ✓ W

Partially correct
Ma: The correct answer is: 0.9975
Mark 0.50 out of 1.00

Question 3

Partially correct

Mark 0.50 out of 2.00

🏴 Flag question

Given the datasheet of the 7805 regulator (as found on the SunLearn EDesign page), an input voltage range of 10 to 15V, and a load resistance of 25 ohm, what is the minimum and maximum power that is dissipated by the device?

Gegee die datavel van die 7805 reguleerder (soos gevind op die SunLearn Ontwerp webblad), 'n intree spanningsbereik van 10 tot 15V, en 'n lasweerstand van 25 ohm, wat is die minimum en maksimum krag wat deur die reguleerder verkwis word?

Minimum | 1 | ✔ W

Max

Incorrect
The correct answer is: 2.0475
Mark 0.00 out of 1.00
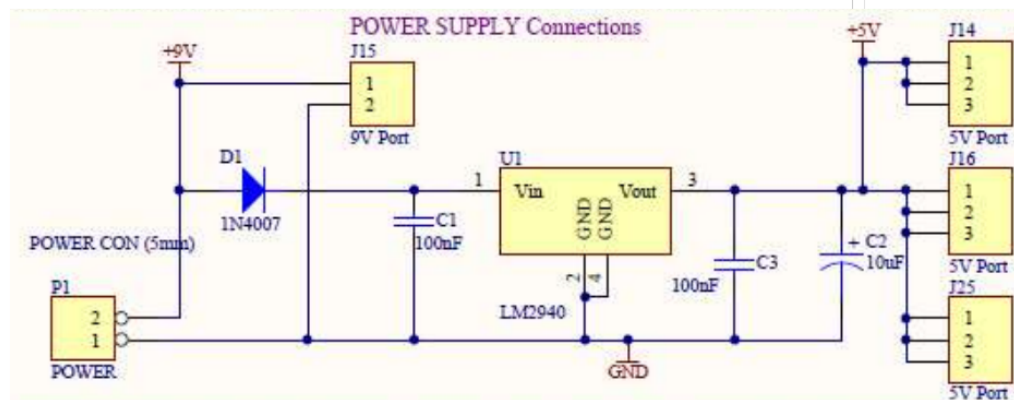

Question 4

Correct

Mark 1.00 out of 1.00

🏴 Flag question

Given the schematic of the power supply section of the EDesign project, what is the purpose of the diode D1?

Gegee die stroombaandiagram van die kragbron gedeelte van die EDesign projek, wat is die doel van die diode D1?

Select one:

○ a. To provide visual feedback that the circuit is powered / *om visuele terugvoer te gee dat die stroombaan krag het*

○ b. To smooth out noise on the input / *om geraas op die intree te verminder*

◉ c. To protect the rest of the circuit in case of reverse polarity power connection / *om die res van die stroombaan te beskerm teen omgekeerde krag polariteit verbinding* ✔

○ d. To cause a voltage drop before the regulator / *Om 'n spanningsval voor die reguleerder te bewerkstellig*

○ e. To rectify the signal / *om die sein gelyk te rig*

Your answer is correct.

The correct answer is: To protect the rest of the circuit in case of reverse polarity power connection / *om die res van die stroombaan te beskerm teen omgekeerde krag polariteit verbinding*

PROGRAMMING DEEL:

Started on	Monday, 26 February 2018, 08:37
State	Finished
Completed on	Monday, 26 February 2018, 08:50
Time taken	12 mins 57 secs
Grade	**0.00** out of 4.00 (**0%**)

Question 1

Incorrect

Mark 0.00 out of 4.00

🚩 Flag question

Write a function that will convert a number, stored in an ASCII string, to a 16-bit signed integer. The function should have the following declaration:

```
uint8_t String2Int(char* input_string, int16_t* ptr_output_integer)
{
    *ptr_output_integer = ...
    return ...
}
```

The return value of the function should be 0 if the input string is not in the correct format (i.e. it contains characters that are not numeric digits or a negative '-' sign), and return 1 for a successful conversion. *input_string* will be a null-terminated ASCII string. Your function should return the computed integer value in the memory location pointed to by the *output_integer* parameter. If the computed integer value falls outside of the range that can be represented using a 16-bit signed integer, the function should also return a 0 (error).

Skryf 'n funksie wat 'n ASCII string na 'n 16-bis heelgetal veranderlike sal omskakel. Die funksie moet die volgende vorm aanneem:

```
uint8_t String2Int(char* input_string, int16_t* ptr_output_integer)
{
    *ptr_output_integer = ...
    return ...
}
```

Die waarde wat deur die funksie teruggevoer word moet 0 wees as die invoer string ongeldige karakters bevat (dit mag slegs numeriese of '-' karakters bevat). Indien die string wel geldige karakters bevat en na heelgetal omgeskakel kan word moet dit 'n 1 terugvoer. input_string is 'n C ASCII string wat deur 'n nul greep beeindig word. Jou funksie moet die berekende heelgetal terugvoer deur dit na die adres in die ptr_output_integer parameter te skryf. Indien die berekende heelgetal buite die bereik van 'n 16-bis heelgetal gaan, moet die funksie ook 'n 0 terugvoer om die fout aan te dui.

Answer: (penalty regime: 0 %)

Answer: (penalty regime: 0 %)

[Reset answer]

```
 1  uint8_t String2Int(char* input_string, int16_t* ptr_output_integer)
 2  {
 3      *ptr_output_integer = input_string;
 4      int16_t ascii[16];
 5      char vrbl;
 6
 7
 8
 9
10      for(int i = 0; i<16; i++) {
11          ascii[i] = *ptr_output_integer[i];
12
13          while(ascii[i] > 0 || ascii[i] >= 'a' && ascii[i] <= 'z') || (asc >= 'A' && vrb
14
15
16      }
17
18
19
```

Syntax Error(s)

```
prog.c: In function 'String2Int':
prog.c:19:25: error: assignment makes integer from pointer without a cast [-Werror]
     *ptr_output_integer = input_string;
                         ^
prog.c:27:20: error: invalid type argument of unary '*' (have 'int')
        ascii[i] = *ptr_output_integer[i];
                   ^
prog.c:29:47: error: suggest parentheses around '&&' within '||' [-Werror=parentheses]
        while(ascii[i] > 0 || ascii[i] >= 'a' && ascii[i] <= 'z') || (asc >= 'A' && vrbl <= 'Z')
)
                                              ^
prog.c:29:67: error: expected expression before '||' token
        while(ascii[i] > 0 || ascii[i] >= 'a' && ascii[i] <= 'z') || (asc >= 'A' && vrbl <= 'Z')
)
                                                                  ^
prog.c:29:100: error: expected statement before ')' token
        while(ascii[i] > 0 || ascii[i] >= 'a' && ascii[i] <= 'z') || (asc >= 'A' && vrbl <= 'Z')
)

^
prog.c:36:1: error: expected expression before '}' token
 }
 ^
prog.c:21:10: error: unused variable 'vrbl' [-Werror=unused-variable]
    char vrbl;
         ^
prog.c:36:1: error: control reaches end of non-void function [-Werror=return-type]
 }
 ^
cc1: all warnings being treated as errors
```

Question author's solution:

```c
uint8_t String2Int(char* input_string, int16_t* output_integer)
{
    int retval = 0;

    if (*input_string == '\0')
        return 0;

    int sign = 1;
    if (*input_string == '-')
    {
        sign = -1;
        input_string++;
    }

    while (*input_string != '\0')
    {
        retval *= 10;
        if ((*input_string >= '0') && (*input_string <= '9'))
            retval += (*input_string - 48);
        else
        {
            //*output_integer = *input_string;
            return 0;
        }

        if (((sign == 1) && (retval >= 32768)) ||
            ((sign == -1) && (retval >= 32769)))
            return 0;

        input_string++;
    }
    *output_integer = (int16_t)(sign * retval);
    return 1;
}
```

Incorrect

Marks for this submission: 0.00/4.00.