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Online delivery of problem sheets

Dr John Mills
Foundation Year
Southampton University

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background to ...

- programme of study
- particular module - *old structure*

case for adding an e-learning element to module

new structure of module

evaluation of first year

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background to ...

- programme of study

- particular module - *old structure*

- Designed for students that wish to study *Engineering*, *Computer Science*, *Physics* or *Geophysics*
- ... without traditional HE qualifications for these disciplines
- a mixture of international, UK, EU, mature students
- First year of a 4 year Bachelor or 5 year Master degree

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background to ...

- programme of study

- particular module - *old structure*

- Electricity and Electronics – 2 semesters
- 111/142 students - 2009/10
- Lecture; **workshop**; support class – (plus lab)
- Course notes; **problem sheets**; lab notes; text book ...
- 3 tests; 1 exam

Q: Why introduce an e-(teaching and) learning element to the module ?

A: The student body is becoming increasingly diverse ...

Q: Why introduce an e-(teaching and) learning element to the module ?

A: The student body is becoming increasingly diverse ...

- International students
- Widening participation
- Mature students

Traditional teaching methods not necessarily taking into consideration all learning styles of diverse student body

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Some feasible benefits of an e-learning element ...

... as an enhancement to a module

choice

independence

time management

accommodate wider range of *learner* and *learning style*

feedback more immediate

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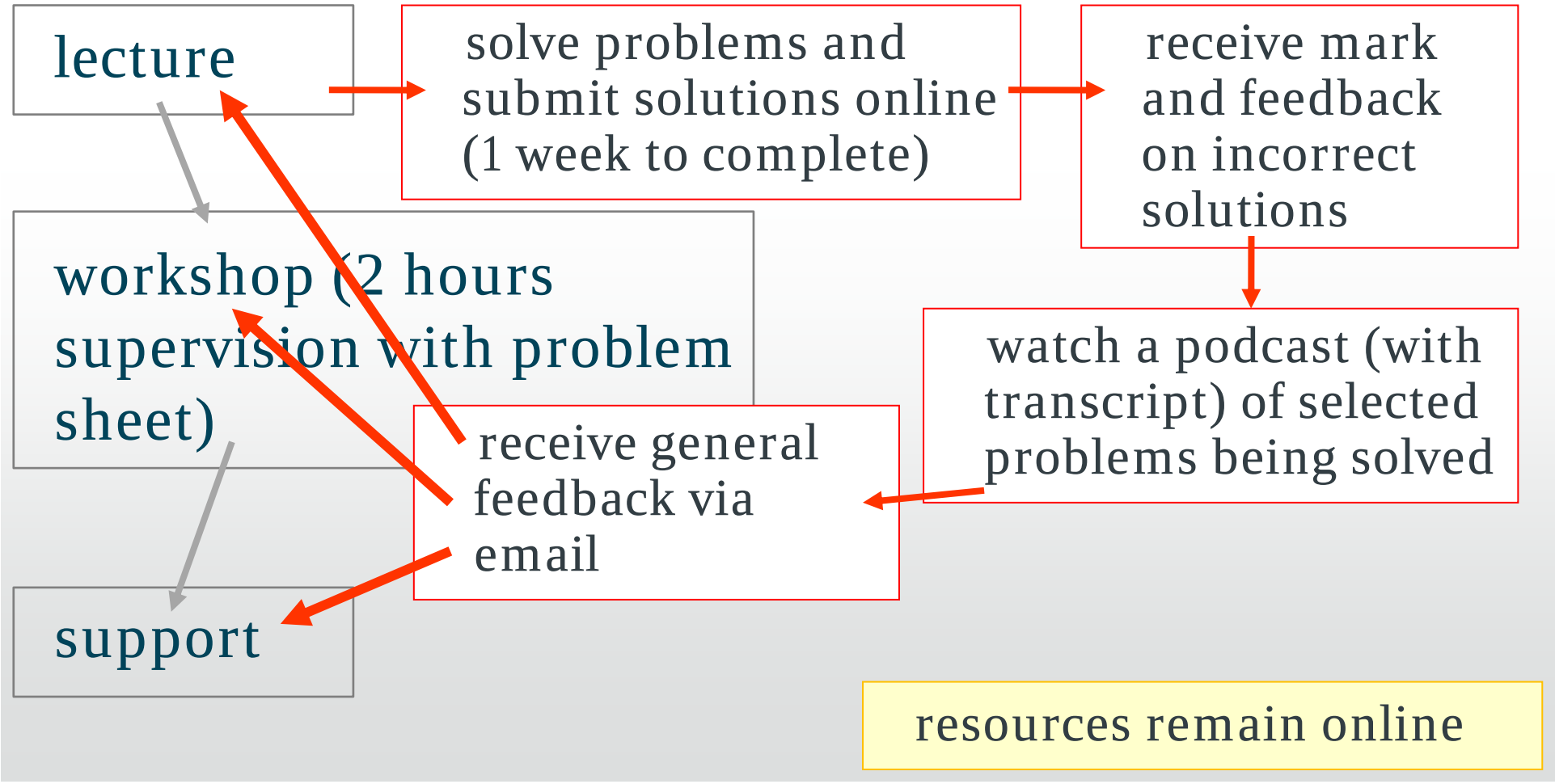
Implementation of weekly online problems



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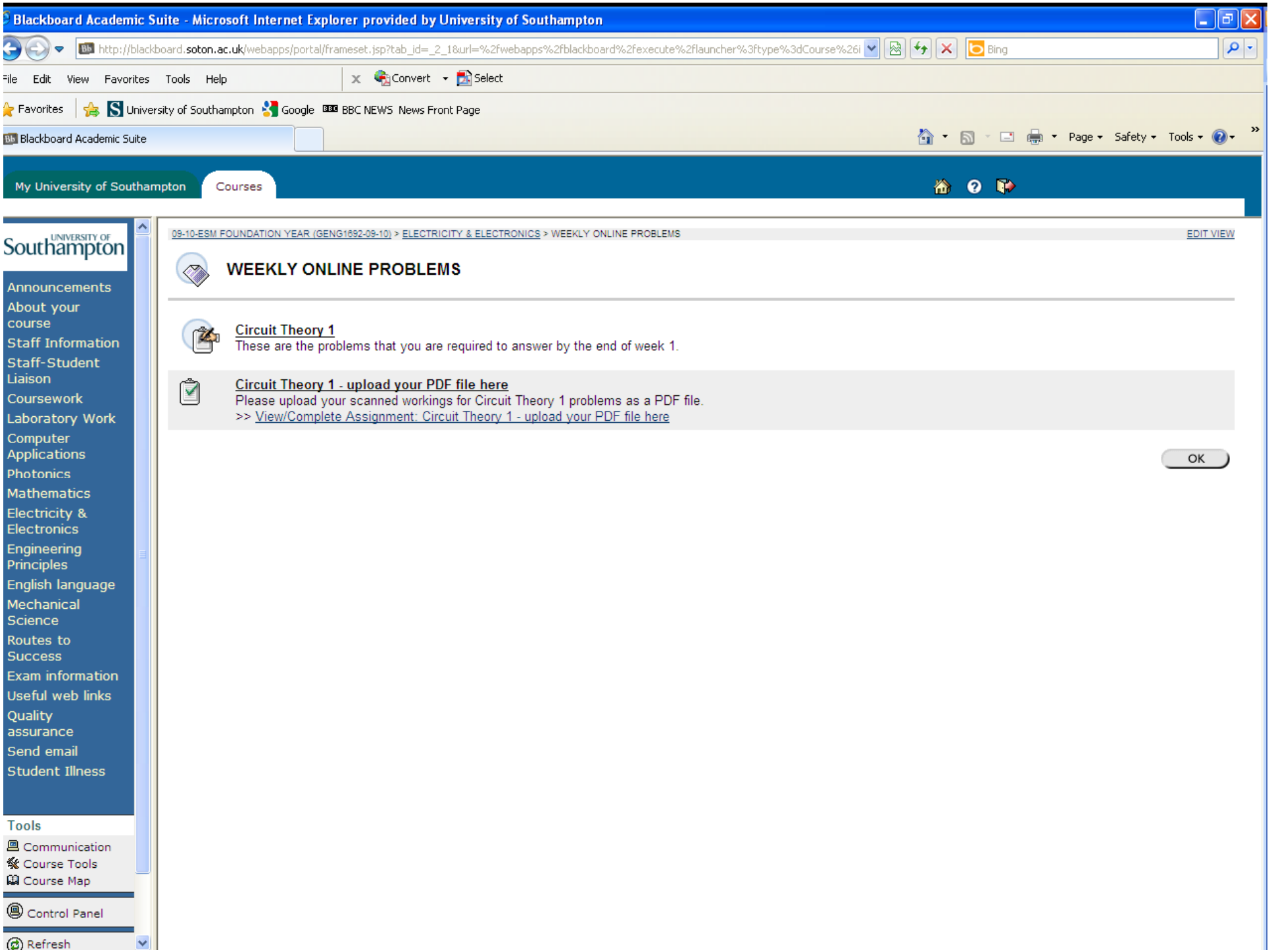
what the students see ...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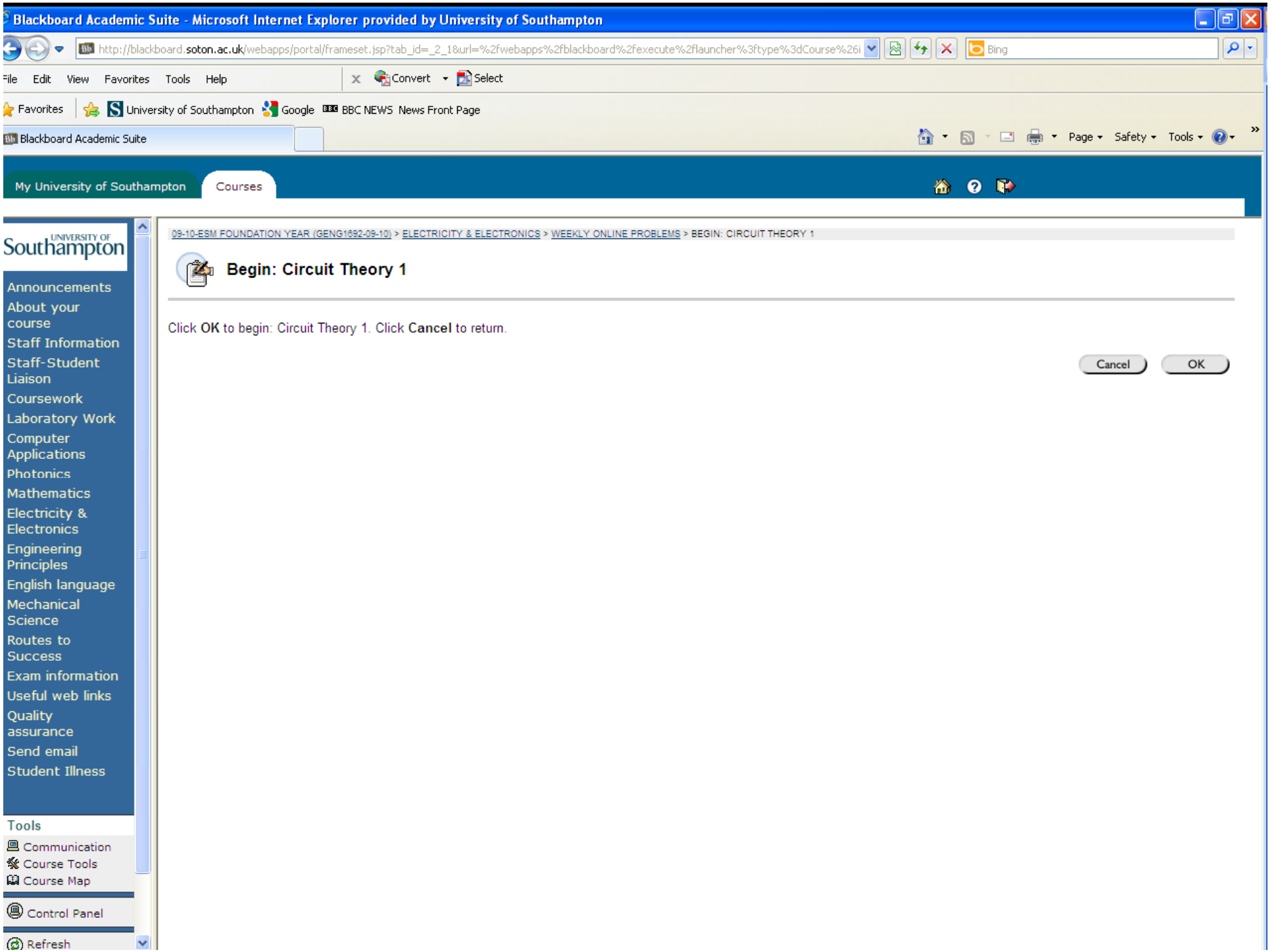
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09-10-ESM FOUNDATION YEAR (GENG1692-09-10) > ELECTRICITY & ELECTRONICS > WEEKLY ONLINE PROBLEMS > BEGIN: CIRCUIT THEORY 1
Begin: Circuit Theory 1
Click OK to begin: Circuit Theory 1. Click Cancel to return.
Cancel
OK

Name	Circuit Theory 1
Instructions	Please attempt all questions.
Multiple Attempts	Not allowed. This Test can only be taken once.
Force Completion	This Test can be saved and resumed later.

Question Completion Status:

Question 1 — **2 points** — Save

A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.

Determine the value of supply voltage.

Give you answer in Volts to 1 decimal place (e.g. 3.0)

Question 2 — **2 points** — Save

A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.

Determine the power consumed.

Give your answer in milliwatts to 1 decimal place (e.g. 6.4)

Question 3 — **2 points** — Save

A 2.5Ω resistor dissipates 10W of power when connected to a dc supply.

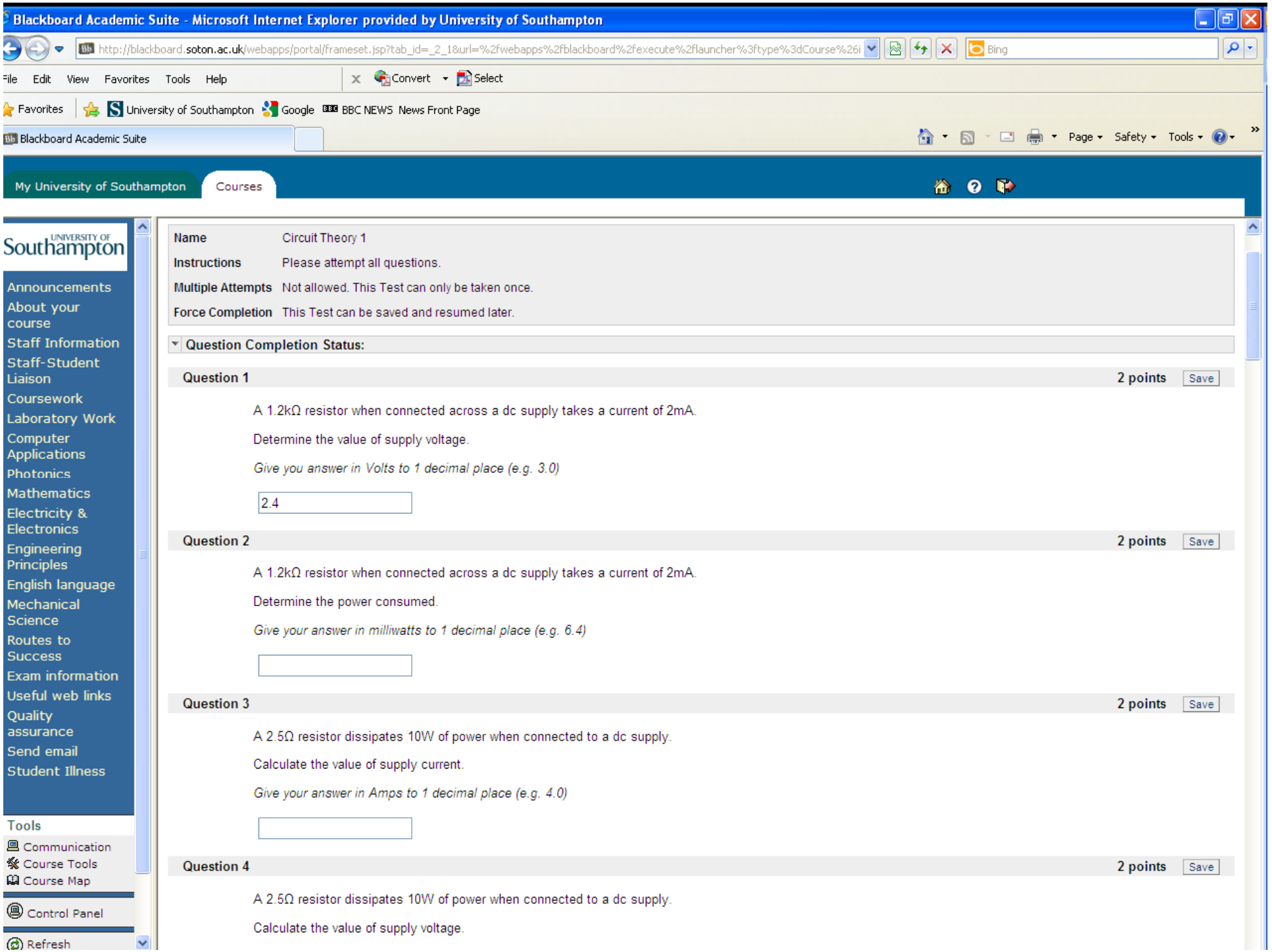
Calculate the value of supply current.

Give your answer in Amps to 1 decimal place (e.g. 4.0)

Question 4 — **2 points** — Save

A 2.5Ω resistor dissipates 10W of power when connected to a dc supply.

Calculate the value of supply voltage.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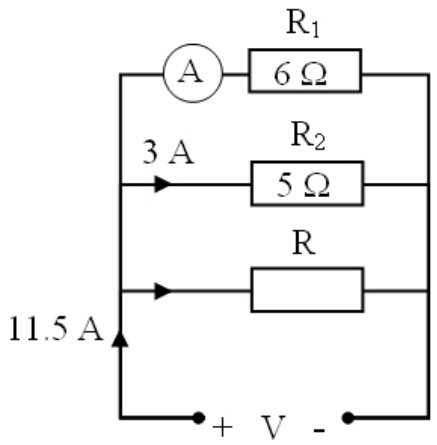
Question Completion Status:
Question 1
2 points
Save
A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.
Determine the value of supply voltage.
Give you answer in Volts to 1 decimal place (e.g. 3.0)
2.4
Question 2
2 points
Save
A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.
Determine the power consumed.
Give your answer in milliwatts to 1 decimal place (e.g. 6.4)
Question 3
2 points
Save
A 2.5Ω resistor dissipates 10W of power when connected to a dc supply.
Calculate the value of supply current.
Give your answer in Amps to 1 decimal place (e.g. 4.0)
Question 4
2 points
Save
A 2.5Ω resistor dissipates 10W of power when connected to a dc supply.
Calculate the value of supply voltage.

Give your answer in Amps to 1 decimal place (e.g. 3.1)

Question 20 **4 points** Save

For the circuit shown below, determine the ammeter reading A.

Give your answer in Amps to 1 decimal place (e.g. 3.2)

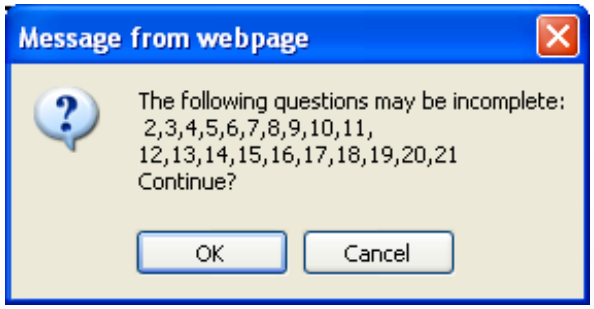


Question 21 **4 points** Save

For the circuit shown above in question 20, determine the value of the resistor R.

Give your answer in Ohms to 1 decimal place (e.g. 3.2)

Save Submit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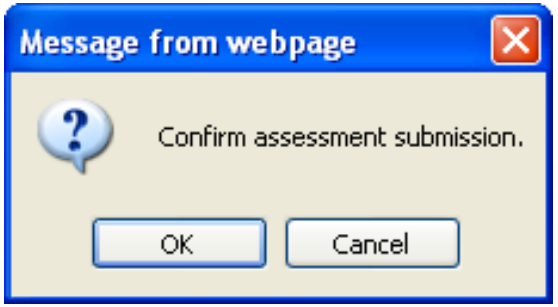
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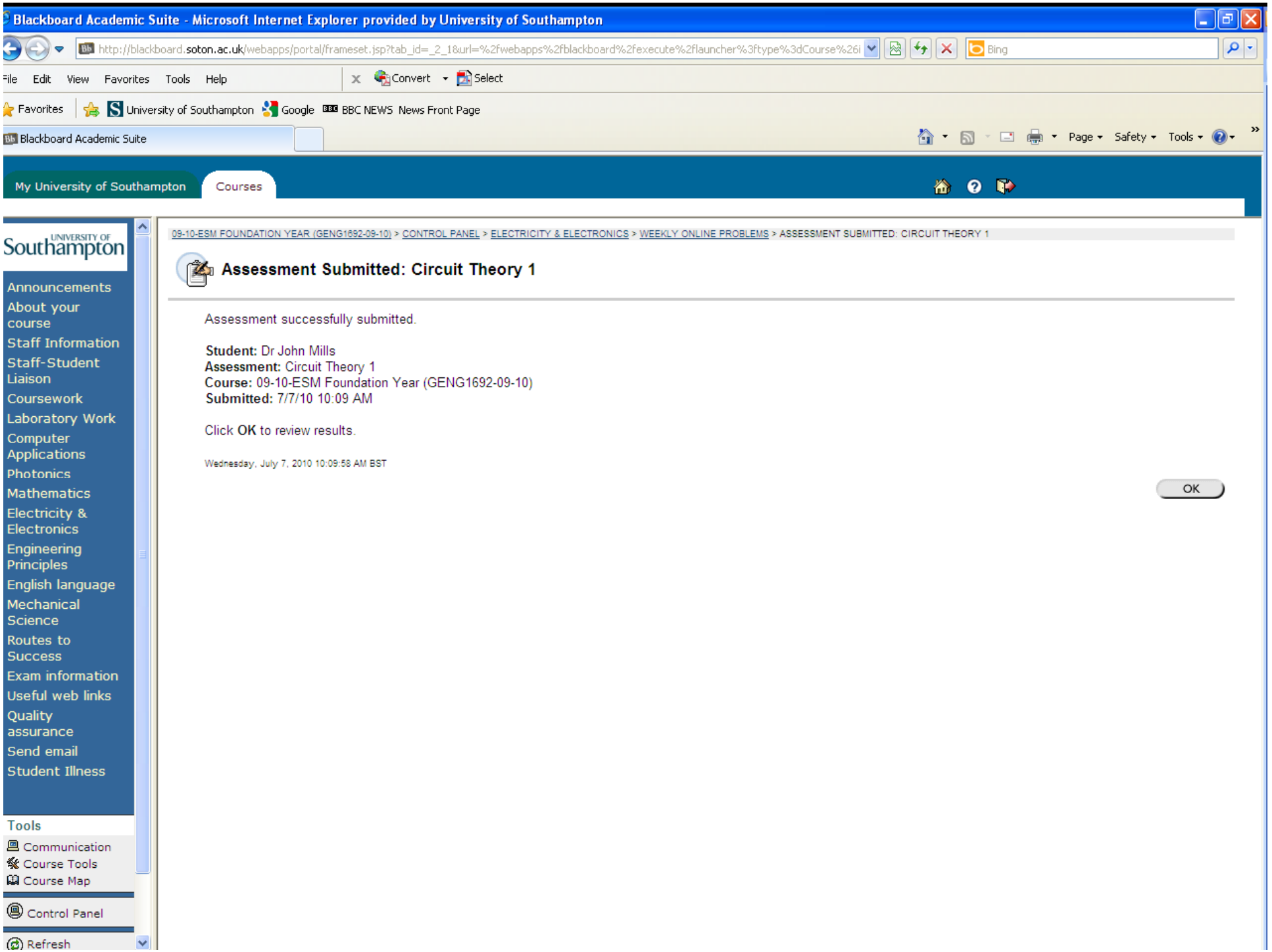
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Assessment Submitted: Circuit Theory 1
Assessment successfully submitted.
Student: Dr John Mills
Assessment: Circuit Theory 1
Course: 09-10-ESM Foundation Year (GENG1692-09-10)
Submitted: 7/7/10 10:09 AM
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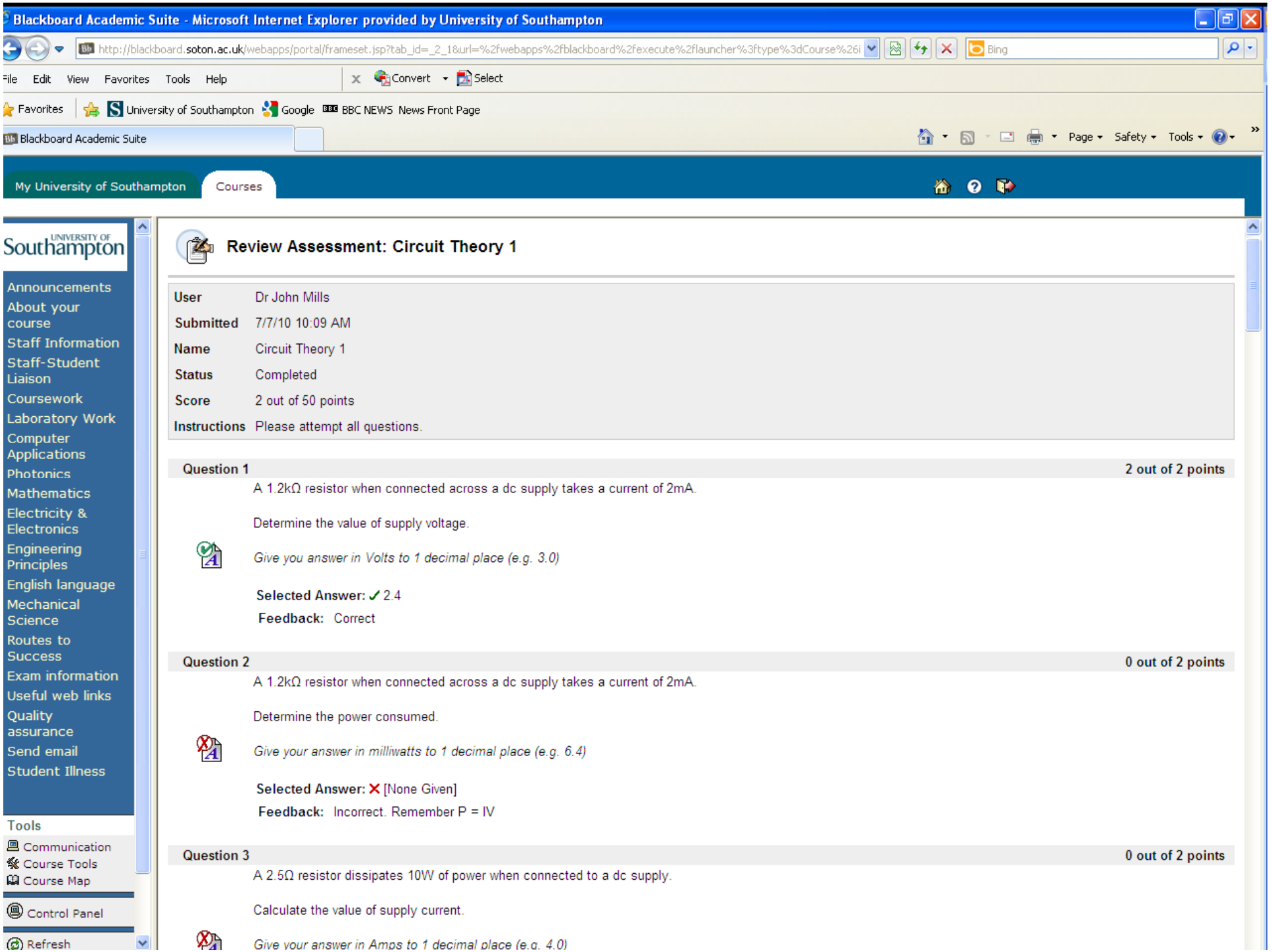
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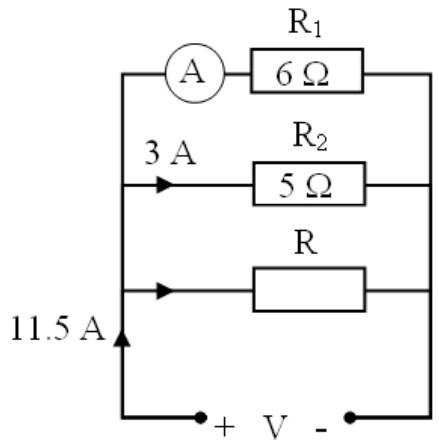
Review Assessment: Circuit Theory 1
User Dr John Mills
Submitted 7/7/10 10:09 AM
Name Circuit Theory 1
Status Completed
Score 2 out of 50 points
Instructions Please attempt all questions.
Question 1 2 out of 2 points
A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.
Determine the value of supply voltage.
Give you answer in Volts to 1 decimal place (e.g. 3.0)
Selected Answer: ✓ 2.4
Feedback: Correct
Question 2 0 out of 2 points
A 1.2kΩ resistor when connected across a dc supply takes a current of 2mA.
Determine the power consumed.
Give your answer in milliwatts to 1 decimal place (e.g. 6.4)
Selected Answer: ✗ [None Given]
Feedback: Incorrect. Remember P = IV
Question 3 0 out of 2 points
A 2.5Ω resistor dissipates 10W of power when connected to a dc supply.
Calculate the value of supply current.
Give your answer in Amps to 1 decimal place (e.g. 4.0)

Question 20 **0 out of 4 points**

For the circuit shown below, determine the ammeter reading A.

Give your answer in Amps to 1 decimal place (e.g. 3.2)



Selected Answer: ✗ [None Given]

Feedback: Incorrect. You could have found out the value of supply voltage V from the middle branch, which would have then enabled the current to be found in the top branch. In both cases, V=IR could have been used.

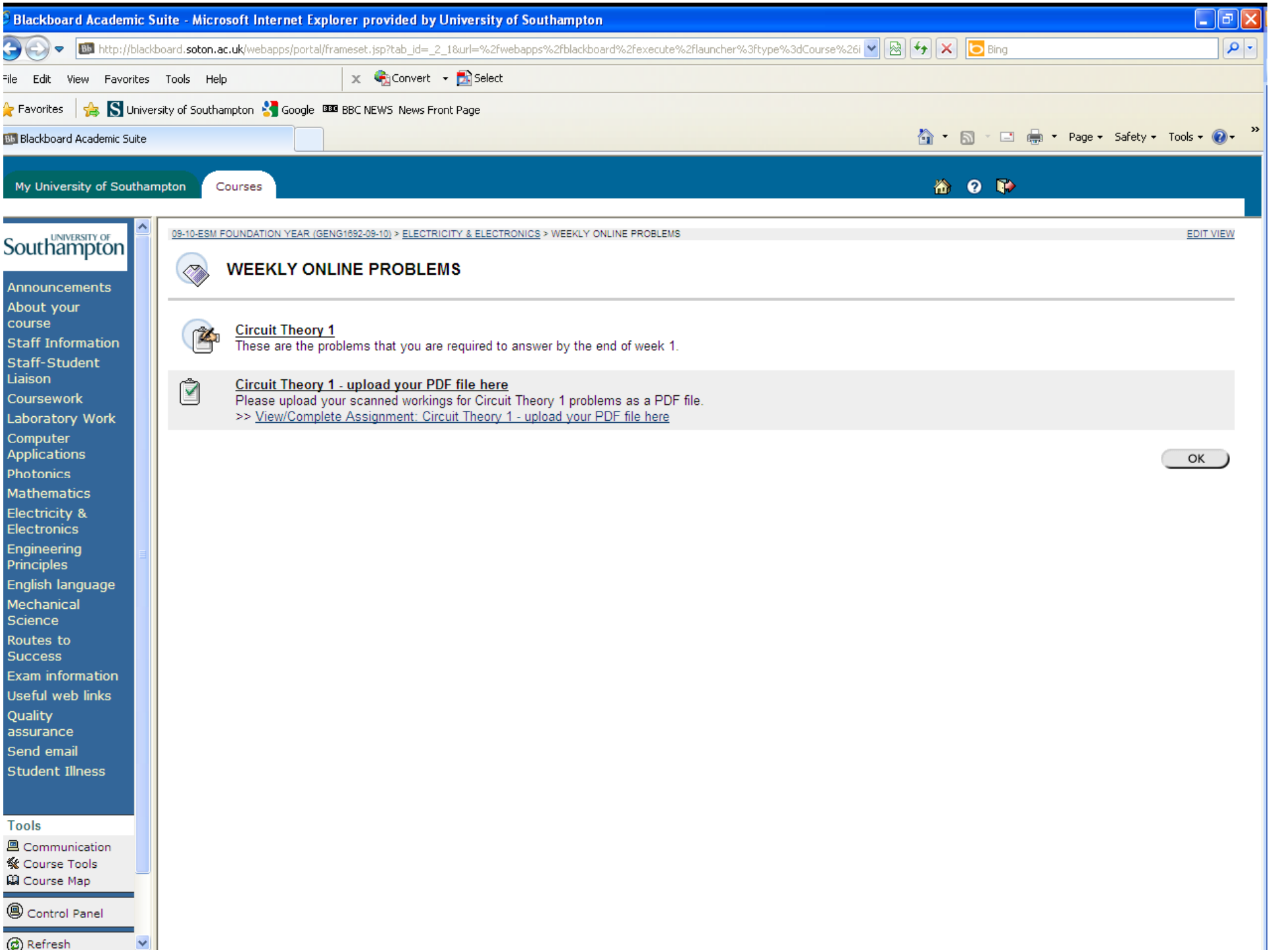
Question 21 **0 out of 4 points**

For the circuit shown above in question 20, determine the value of the resistor R.

Give your answer in Ohms to 1 decimal place (e.g. 3.2)

Selected Answer: ✗ [None Given]

Feedback: Incorrect. The way to tackle this question was to determine the value of current in the bottom branch and subsequently the unknown resistance in the bottom branch.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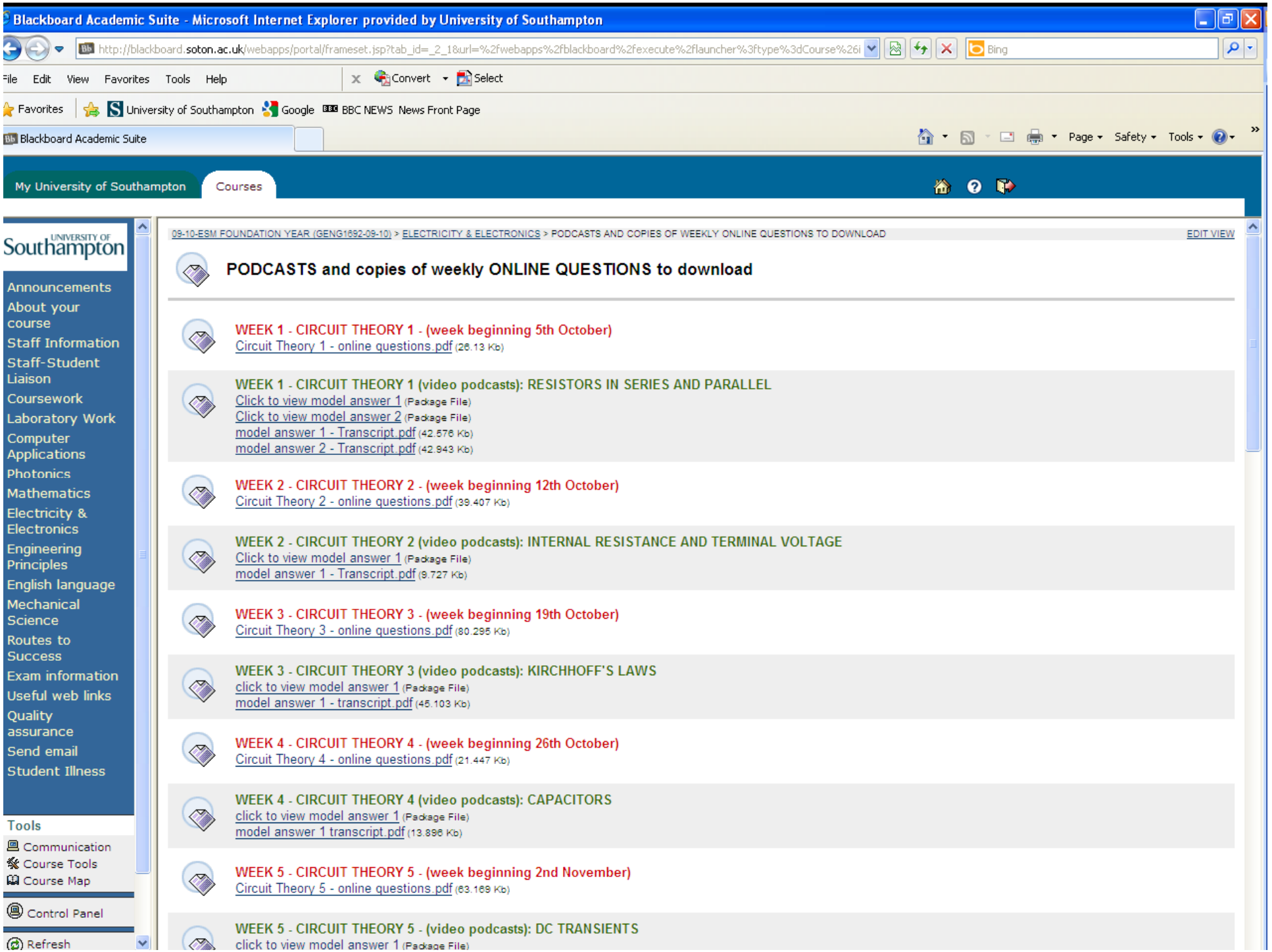
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click to view model answer 1 (Package File)

Circuit Theory 1 – Model Answer 2 - *TRANSCRIPT*

This particular example concerns question 6 of the pdf, downloadable version of the online questions for this week – Circuit Theory 1. In this question there are subsections 1-4 which I will work through here.

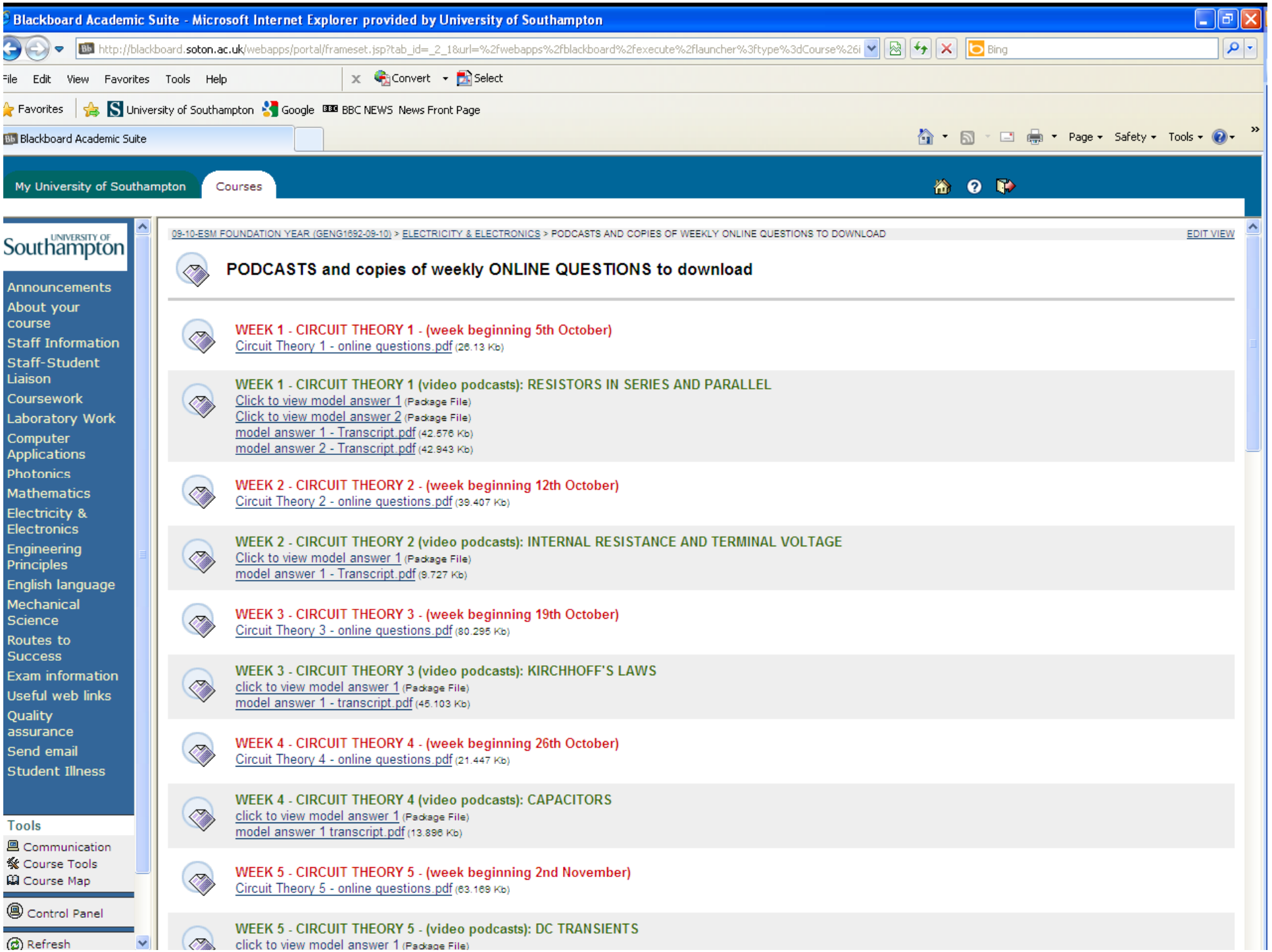
The example concerns a particular circuit having 3 resistors in series, with a 100V supply voltage, V_{Supply}. The total supply current is represented by I_{Total}, with the arrow indicating the direction of conventional current. Since all resistors are in series, the current flowing through all resistors, is equivalent to the supply current I_{Total}.

The resistors have values 10Ω, 25Ω and 15Ω and are labelled R1, R2 and R3 respectively.

Part 1 of the question requires that the total equivalent resistance of the circuit (R_{series}), be calculated. This can be achieved by utilizing the 'series resistance formula', where (R_{series}) = R1+R2+R3, or in this case, 10ohms + 25ohms +15ohms, which in turn gives a total circuit resistance of 50ohms.

We may find it helpful to draw an equivalent circuit where all resistors are replaced by the equivalent single resistor (R_{series}) – so let's do that.

Let's call the original circuit – circuit A and the equivalent circuit – circuit B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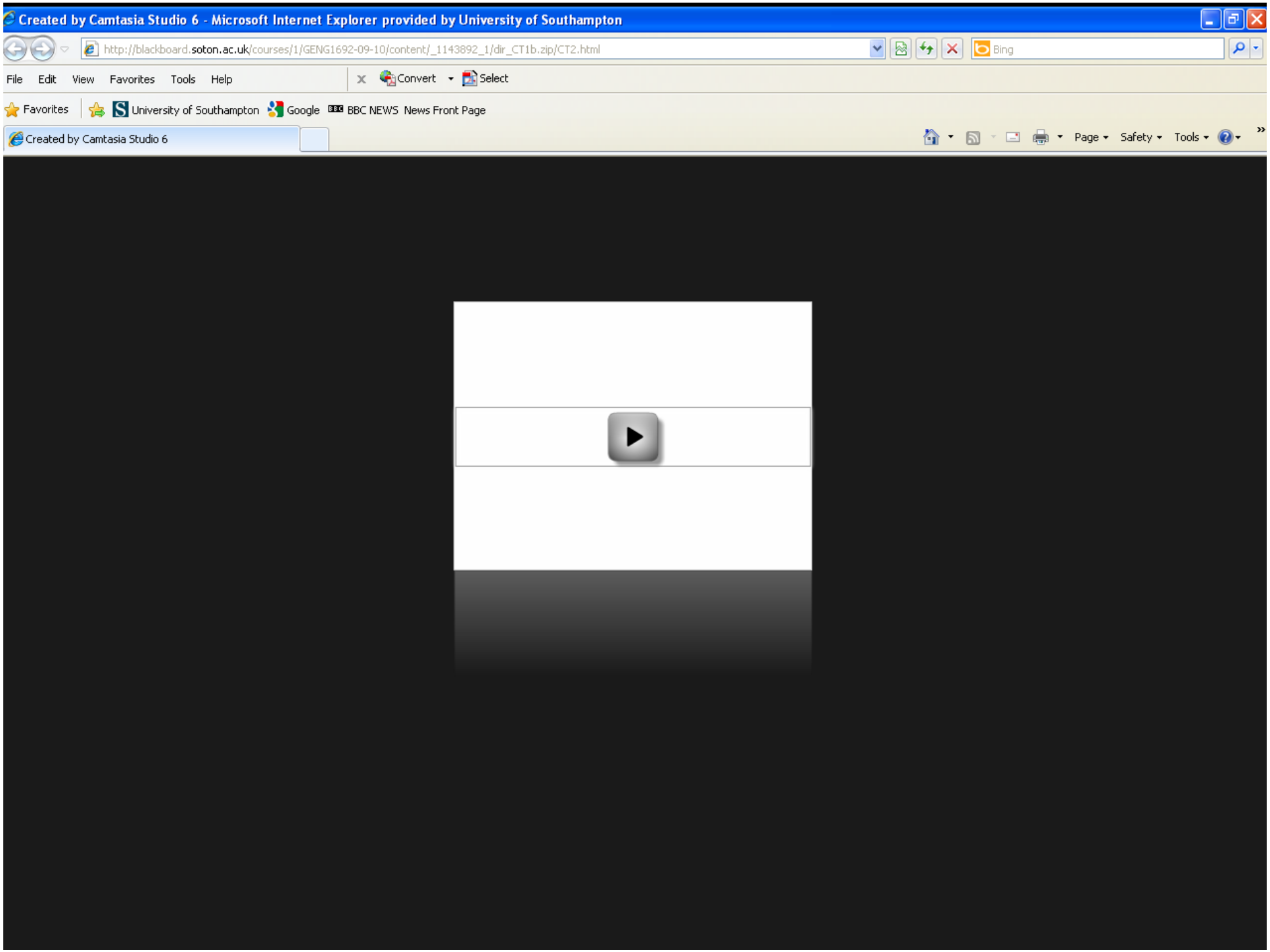
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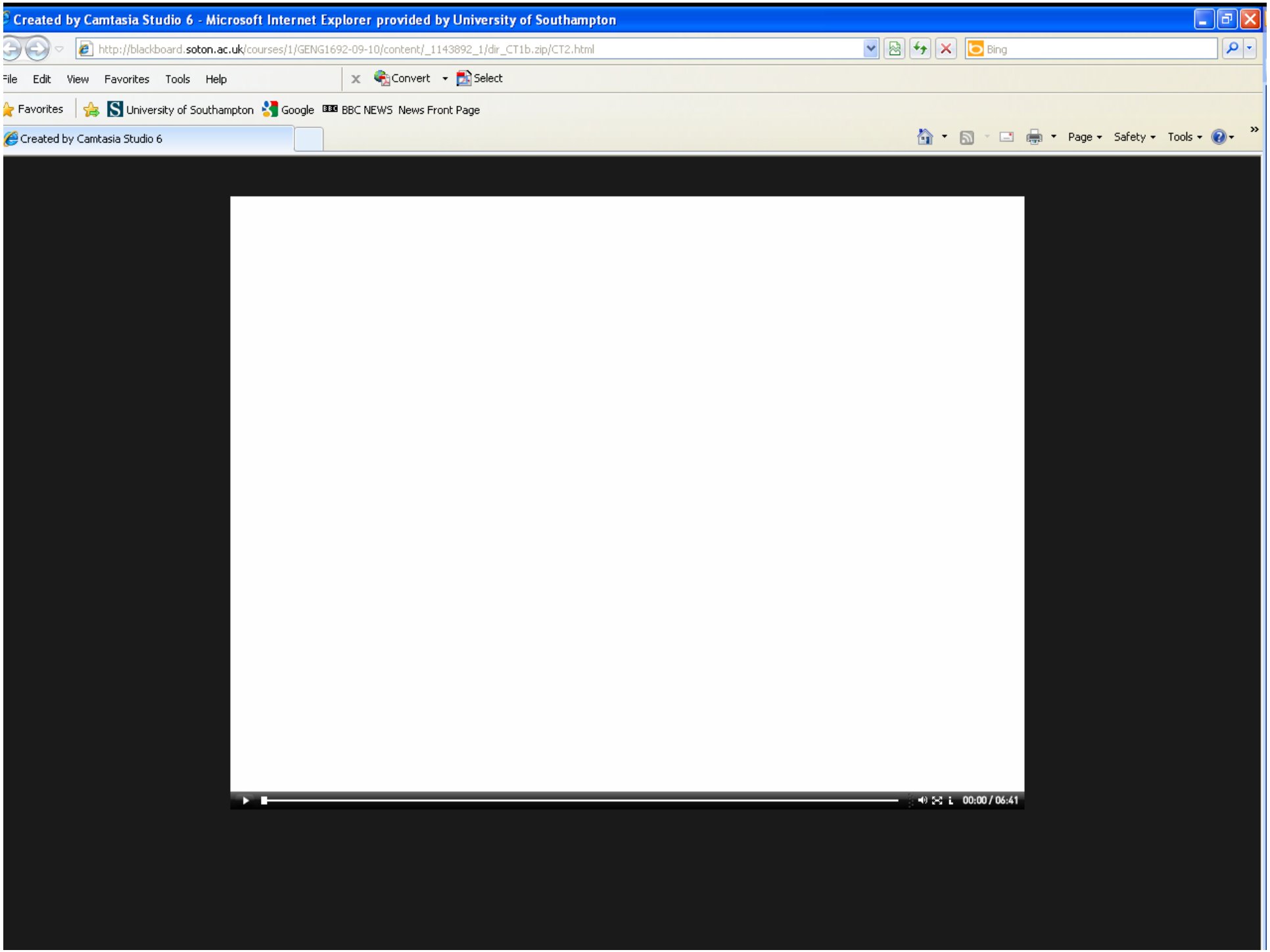
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Evaluation of the first year of implementation

– 52/111 students completed questionnaire

(during final lecture)

– 8 students attended Focus Group

(volunteers)

- dyslexic
- bi-cultural
- International
- UK / A level
- UK / mature
- EU
- 2 female, 6 male

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Moreover :

data still to analyse:

stats on podcast viewing (when, who) **vs** engagement with/mark for online problems **vs** attendance at workshop **vs** periodic test results **vs** background **vs** exam result .....

Evaluation Questionnaire

- “The steps for answering difficult questions were clearer to me when I watched the videos”
- “Haven’t checked any of the videos because I understood how to do the problems”
- “The videos helped me to slow down and go over and over again”
- “I’d like to see online problems used as part of other courses”
- “Things were explained clearer in the videos than in the course notes”
- “I hope this doesn’t mean that we won’t be getting contact with lecturers in the future ”

Focus Group

choice

independence

time management

accommodate wider range of *learner* and *learning style*

feedback more immediate

But what about the final result?

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- No significant difference in average mark or pass rate !

- But the focus group and evaluation indicate that students have developed other important skills required to succeed in HE: independent learning; awareness of learning style, with the ability to make choice; time management ...

- Moreover, comments in general show that students do not perceive this as a substitute for class but as a complement to the module