

University of Toronto
Faculty of Applied Science and Engineering
APS112 and APS113 Engineering Strategies and Practice
Quiz #2 April 11, 2017

This is a 50-minute quiz. The quiz is closed book and closed notes. The quiz has a total of 32 questions, worth 47 marks. The questions are divided between two booklets.

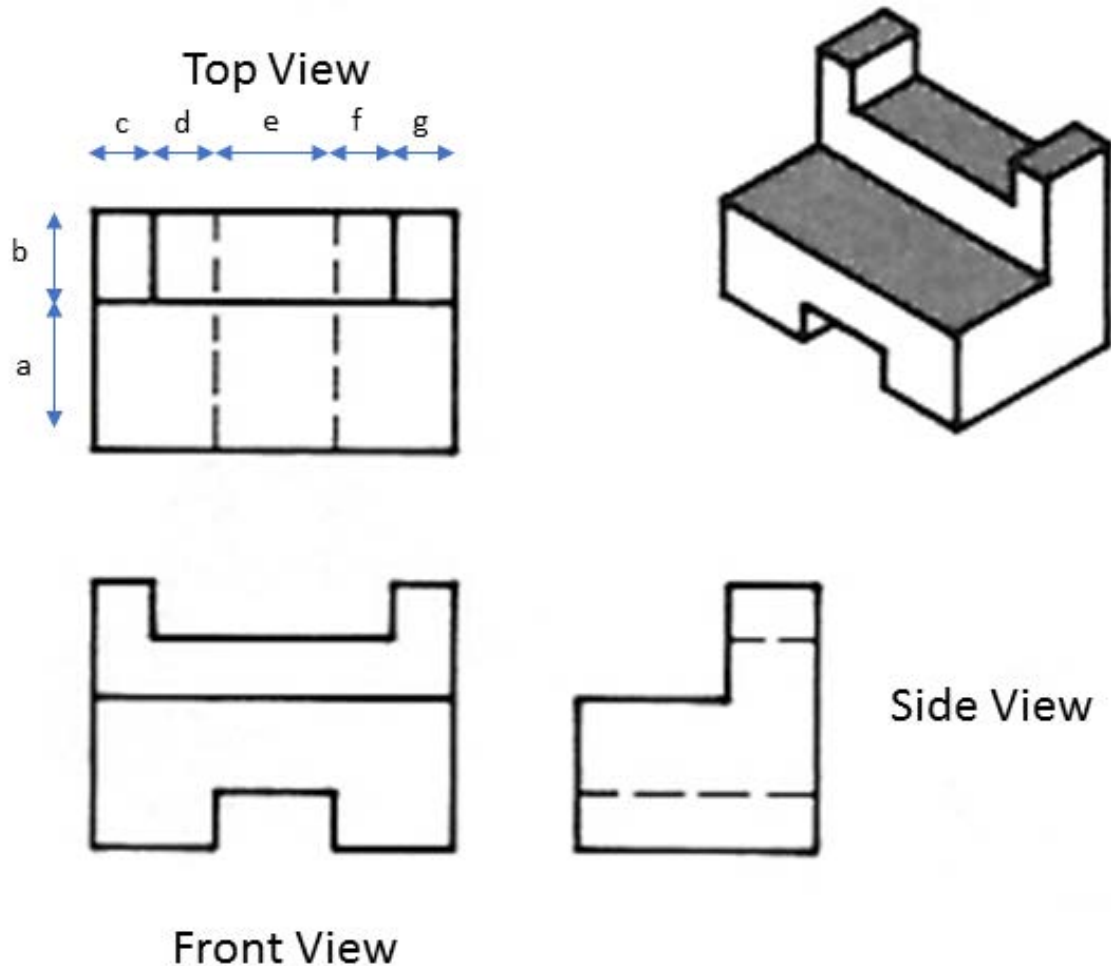
Question Booklet #2 – Short-Answer Question Booklet

[illegible]

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There are 3 short-answer questions, worth 18 marks in total. These must be answered in the spaces provided in this Short-Answer Question Booklet. This question booklet, with your name and UTOR Email filled in, must be returned with the multiple-choice answer sheet slipped inside. Do not separate any pages. Do not write on the QR code at the top of the pages. We are not looking for long paragraph answers. Use short sentences or bullet points.

30. (6 MARKS) Using appropriate line types, draw a multiview representation of the widget in Figure 1. Include dimensioning lines. Instead of actual dimensions, which you don't have, use variables (EG. X cm)



- 1 mark: top view correct
 - 0.5 missed line or other minor error
- 1 mark: front view correct
 - 0.5 missed line or other minor error
- 1 mark: side view correct
 - 0.5 missed line or other minor error
- 1 mark: All 4 hidden lines correct
 - 0.5 At least one hidden line correct
- Dimensions
 - 0 Marks: none or drastically incorrect
 - 1 mark: some dimensions missing
 - 1.5 marks: all dimension lines correct, but there more than needed
 - 2 marks: all dimensions correct (and no extras)

31. a. (4 MARKS) List and explain four criteria for a design to be eligible for a utility patent.

0.5 Marks: for each bolded word (or similar)

0.5 marks: for each reasonable explanation

Max of 4. If they give five then ignore the last bullet point.

- **Novelty**: The idea cannot have been in the public domain previously
- **Non-Obvious**: to a person of ordinary skill in the related art
- **Useful**: The idea must have some purpose.
- **Full disclosure**: required so that someone skilled could reduce the description to practice.
- Laws of nature, physical phenomena, and abstract ideas are **Not Patentable**.

b. (1 MARK) In one sentence explain how the patent system promotes innovation.

During the exclusivity period (20 years) the patent holder has an opportunity to recoup any research and development costs thereby encouraging companies to invest in research and development departments.

- If more than one sentence, ignore 2nd sentence onward.

c. (1 MARK) In one sentence explain how the patent system hinders innovation.

When a patent holder values their patent more than the individual wanting to use the patent is willing to pay, this can lead to an impasse and slows consultation.

- If more than one sentence, ignore 2nd sentence onward.

32. a. (1 MARK) What is the relationship between Consequence – Severity – Hazard – Risk?

$\text{Risk} = (\text{Severity of the Consequence}) * (\text{Probability of the Hazard})$

(or they could say this in prose as well)

b. (1 MARK) What is the relationship between Risk – Safety?

Safety is the attempt to minimize risk.

Safety is the attempt to reduce risk to an acceptable level.

c. (1 MARK) In engineering terms, what is an Accident?

Unintended exposure to a hazard.

d. (3 MARKS) In three or fewer sentences concisely describe a real world situation, then identify the Hazard and Consequence for this specific situation.

The example from Lecture (which we will allow):

1 Mark: The stage in Convocation Hall is elevated. There is a series of stairs leading from the main floor to the top of the stage. There are no rails or guarding.

Hazard	1 mark: correct example of situation where there is a possibility of damage to health, property or the environment <ul style="list-style-type: none">Falling down the stairs
Consequence	1 mark: correct example of the result of exposure to a hazard: <ul style="list-style-type: none">Personal injury to the user of the stage, potentially even death.