



Example study checklist and assessment questions:
Certificate in Advanced Hair Formulations

Pace yourself! Set a due date of 2 weeks on each unit if studying 10-15hrs/wk or adjust accordingly	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
<i>Only start the first unit when you have made a study timetable for both 'ideal' and 'busy' weeks and completed the administrative documents required above</i>		
[insert your planned due dates]		Watch Welcome video for Certificate in Advanced Hair Formulations
		Watch Evaluate Ingredients lecture 1
		Read all of section 1 of text and complete all activities in text + compare to our answers in the Appendix
		Work on Assessment Questions: Complete the table in Q1.1 except the philosophy section at the top; complete Q1.2.
		Read section 2 of the text and practice with the Activities/examples provided.
		Work on Assessment Questions: Complete the Philosophy section of the table in Q1.1.
		Read section 3 of the text and practice with the Activities/examples provided – practicing reading the different formats and trying this for yourself is important practice before the assessment question, so make sure you work through these examples and activities for yourself!
		Work on Assessment Questions: complete Q1.3 and 1.4
		Watch Evaluate Ingredients lecture 4
		Read section 4 of the text and work through the examples and activities – make sure you can follow our calculations in practice for the assessment question!
		Work on Assessment Questions: Complete Q1.5
<i>Only continue to the next unit once you have completed all items in order</i>		



Some Example Assessment questions

1.4 Complete the tables for each product – use information provided in dropdown and processing information provided in the text to answer this question.

Lamesoft PO65		
Starting Material/s	Processing involved	N/NDM/NDS/S
		=

Incroquat Behenyl		
Starting Material/s	Processing involved	N/NDM/NDS/S
		=

1.5 How much of each component of each material would be present if it were used at 5% in a finished product?

Lamesoft PO65		
Component	% present in material	% present when used at 5% in a finished product

Incroquat Behenyl		
Component	% present in material	% present when used at 5% in a finished product



Pace yourself! Set your due dates	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Listen to Compliance lecture 1 and complete activities as instructed.
		Read Chapter 3 of the Cosmetic Science: Advanced Guide text on Cosmetic Compliance.
		Watch Microbiology lecture 1
		Read all of section 1 and complete the activities.
		Work on Assessment Questions: Complete Q2.1, 2.2, 2.5, 2.6
		Watch Microbiology lecture 2
		Read all of section 2 and follow our worked example. Also revisit section 1.1.6 of the text. Then practice with Activity 2.3 and check your answers against ours to practice for the assessment.
		Work on Assessment Questions: Complete Q2.9.1, 2.9.2, 2.10.1, 2.10.2 and 2.11
		Watch Microbiology lecture 3
		Read all of sections 3, 4 & 5 of text in detail and complete all activities. Practice with Q3.1 to get ready for the assessment.
		Work on Assessment Questions: Complete Q2.3, 2.4, 2.7, 2.8.1, 2.8.2 and 2.8.3
<i>Only continue to the next unit once you have completed all items in order</i>		



Some Example Assessment questions

2.2 Complete the following table:

Org.	Product Type	Microbial Limits
TGA	Application on skin	
EU	Eye area, mucous membranes & children <3yrs	
EU	Other products	
TGA/EU	Raw materials	

2.3 How would you sample raw materials and finished products? Include details of the equipment, types of agar and methods you would use.

2.4 What items need to be sampled **and** what documents are required as part of a GMP program? In your answer, consider also the testing of product at various stages.

2.5 When, during manufacture, should product be tested? What are the limits for it to be released to the next stage, and then for sale?

2.6 How should packaging/lids be checked, and what are the limits to be accepted?



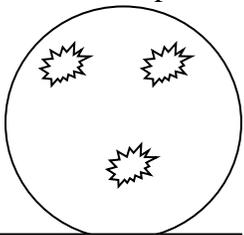
2.8 Provide 'ideal' systems and specifications to reduce microbial introduction in respect of:

2.8.1 the water system

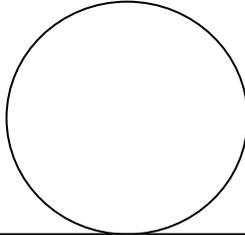
2.8.2 the air system

2.8.3 a sanitising system for equipment

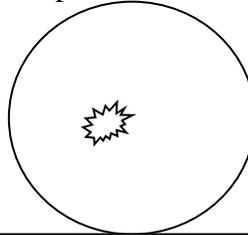
2.9 Imagine you are in charge of testing Quality of finished product. These are the results from the last batch of product made, and were consistent for all samples taken from finished product.



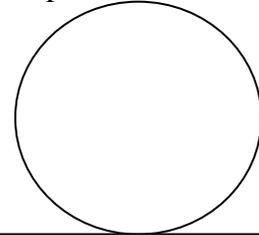
Tryptic soy agar



Sabouraud Dextrose Agar



Cetrimide Agar



Mannitol Salt Agar

2.9.1 Interpret the results

Result	Presence
TAMC	
<i>Pseudomonas aeruginosa</i>	
<i>Staphylococcus</i> species	
TYMC	
<i>Candida albicans</i>	

2.9.2 What should you do with this batch?



Pace yourself! Set a due date	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Watch Preservative lecture 1
		Read all of sections 1 and 2. Go through all worked examples and complete all activities.
		Work on Assessment Questions: Complete all parts of section 3.1
		Watch Preservative lecture 2
		Read all of section 3. Go through all worked examples and complete all activities.
		Work on Assessment Questions: Complete Q3.2 and 3.3
		Watch Preservative lecture 3
		Read all of section 4. Go through all worked activities and complete all activities.
		Work on Assessment Questions: Complete all parts of Q3.4 and 3.5.
<i>Only continue to the next unit once you have completed all items in order</i>		

Some Example Assessment questions

3.1 Discuss how the following factors may affect preservative performance:

3.1.1 raw material microbial control

3.1.2 final product packaging

3.1.3 poor GMP



3.2 Interpret the PET results below to BP requirements for a preservative used in a shampoo product.

Test Level	Organisms	48 hours	7 days	14 days	21 days	28 days
0.30%	<i>P. aeruginosa</i>	10 ³	10	<10	<10	<10
	<i>S. aureus</i>	10 ³	10	<10	<10	<10
	<i>E. coli</i>	10 ²	<10	<10	<10	<10
	<i>C. albicans</i>	10 ²	<10	<10	<10	10 ²
	<i>A. niger</i>	10 ²	10 ³	10 ⁶	10 ⁶	10 ⁷
0.40%	<i>P. aeruginosa</i>	10 ²	<10	<10	<10	<10
	<i>S. aureus</i>	10 ³	10	<10	<10	<10
	<i>E. coli</i>	10 ²	<10	<10	<10	<10
	<i>C. albicans</i>	10 ²	<10	<10	<10	<10
	<i>A. niger</i>	10 ²	10	<10	<10	<10
0.50%	<i>P. aeruginosa</i>	<10	<10	<10	<10	<10
	<i>S. aureus</i>	<10	<10	<10	<10	<10
	<i>E. coli</i>	<10	<10	<10	<10	<10
	<i>C. albicans</i>	10	<10	<10	<10	<10
	<i>A. niger</i>	<10	<10	<10	<10	<10
Inoculum Concentration	Organism	0 hours	21 days			
	<i>P. aeruginosa</i>	2.0 x 10 ⁶	6.3 x 10 ⁶			
	<i>S. aureus</i>	2.3 x 10 ⁶	3.7 x 10 ⁶			
	<i>E. coli</i>	1.3 x 10 ⁶	4.6 x 10 ⁶			
	<i>C. albicans</i>	1.0 x 10 ⁶	9.0 x 10 ⁶			
	<i>A. niger</i>	6.0 x 10 ⁵	1.8 x 10 ⁶			



3.4 Complete the following formulas, showing the preservatives and ancillary agents you would use to protect each formula. Use **TRADE NAMES** for your preservative selection/s and provide the amount you would use.

3.4.3 Shampoo; client wants it to be PEG, Propylene Glycol and Paraben free; finished product = 5.5 – 6

Phase	%w/w	Material function	Role
A	3.0	Tegosoft PC31 (Polyglyceryl-3 Caprate) (superfating agent)	Functional, supportive
A	0.5	Fresh floral fragrance	Added extra
B	21.0	Medialan LD (Sodium lauroyl sarcosinate 30%) (anionic surfactant)	Functional
B	21.0	Genagen CAB (Cocamidopropyl betaine 30%) (amphoteric surfactant)	Functional
B	5.0	Plantacare 2000 UP (Decyl glucoside 52%) (non-ionic surfactant)	Functional, added extra
C	To 100.0	Water (solvent)	Functional, structural
D	5.0	Glycerin	Functional, supportive
D	0.8	Xanthan gum (Cosphaderm XSoft)	Structural, supportive
E		Make your preservative selection here	Supportive
E		Additional preservative selection if required	Supportive
E		Ancillary agent if required	Supportive
E		Additional ancillary agent if required	Supportive
E	q.s.	pH adjuster to pH 5.5 - 6	Supportive

Method:

1. Combine phase A.
2. Combine phase B.
3. Add phase A and B to phase C and stir through under low shear until homogenous.
4. Combine phase D to form a slurry.
5. Add phase D to phase A/B/C under low shear and stir through until homogenous – gel won't form properly until pH is dropped.
6. Add phase E and stir through under low shear until homogenous.
7. Adjust pH to 5.5 – 6 under low shear, gel will form.



Pace yourself! Set your due dates	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Watch Rheology modifiers for hair formulations introduction video
		Watch Select rheology modifiers lecture1
		Read all of sections 1 and 2 of the Rheology modifiers unit text, completing all activities in the text.
		Work on Assessment Questions: Complete Q4.1, 4.2 and 4.3
		Watch Select rheology modifiers lecture 2
		Watch Rheology Practical video
		Read all of section 3 and 3.1 of the Gums unit text including completing all activities that are part of section 3.1.
		Thoroughly investigate all the water compatible thickener brochures that I showed in the lectures to be aware of the different grades of materials available and their trade names/suppliers and how they differ.
		Conduct the Practical Activities in the IPCS Guides & Builds document for the rheology unit.
		Work on Assessment Questions: Complete Q4.4.1, 4.4.2, 4.4.3 and 4.5
		Watch Select rheology modifiers lecture 3
		Read all of section 3.2, 3.3 and all of section 4 including all worked examples and complete all activities that are part of the Rheology modifiers text.
		Thoroughly investigate all the oil compatible thickener brochures that I showed in the lectures to be aware of the different grades of materials available and their trade names/suppliers and how they differ. Investigate all brochures in dropbox to cover any new ones that may have been added since the lectures!
		Work on Assessment Questions: Complete Q4.4.3
		Optional extra but recommended: conduct the Practical Extension Exercises for the Rheology unit as found in the IPCS Guides & Builds document for the Rheology unit.
<i>Only continue to the next unit once you have completed all items in order</i>		



Some Example Assessment questions

4.1 Provide an example of mixer, and speeds they turn (rpm) for:

	Example mixer	Typical RPM	Ideal for mixing...
Low shear			
High shear			

4.4 Complete the following formulas by selecting a suitable rheology modifier, preservative/s and ancillary agents and provide the method required to ensure proper processing.

4.4.1 Clear, strong hold hair gel

Phase	% w/w	Trade Name (<i>INCI name</i>)	Function
	To 100.0	Water (<i>Aqua</i>)	Solvent
	18.0	Ethanol SD40	Fast drying solvent
	1.0	Vitamin B5 Panthenol (<i>Panthenol</i>)	Vitamin/active
			Preservative/s
			Styling polymer
			Rheology modifier (if required)
	2.0	Tween 20 (Polysorbate 20)	Solubiliser
	0.2	Ocean fresh fragrance	Fragrance
			Antioxidant (if required)
			Acidifier/neutraliser (if required)
		pH adjuster	pH adjuster (if required)

METHOD:



4.4.2 Hair Repair Serum (emulsifier free serum)

Phase	% w/w	Trade Name (<i>INCI name</i>)	Function
	To 100.0	Water (<i>Aqua</i>)	Solvent
	5.0	Crodasone W PF (<i>Aqua, Hydrolyzed Wheat Protein PG-Propyl Silanetriol</i>)	Active
	1.0	Vitamin B5 Panthenol (<i>Panthenol</i>)	Vitamin/active
			Humectant for slurry (if required)
			Rheology modifier
			Acidifier/neutraliser (if required)
	1.5	Serasense SA32 (<i>Aminopropyl dimethicone</i>)	Lipid/emollient
	0.2	Argan oil	Lipid/emollient/marketing story
			Chelating agent (if required)
			Preservative/s
			Antioxidant (if required)
		pH adjuster	pH adjuster (if required)

METHOD:



Pace yourself!	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Watch Select lipids lecture 1
		Read all of sections 1, 2 and 3 of the Lipids unit, completing all activities in the text. Make sure you investigate Dropbox and the brochures highlighted in the lecture.
		Complete Practical activities in lipids section of Guides & Builds document.
		Watch Select lipids lecture 2
		Read all of sections 4, 5 and 6 of the Lipids unit text and complete all activities. Make sure you investigate Dropbox and the brochures highlighted in the lecture.
<i>Only continue to the next unit once you have completed all items in order</i>		
		Emulsifier Learning
		Watch Emulsions lecture 1 <i>Note: there are no assessment questions in this program for you to answer</i>
		Read text up to section 2.2.3
		Watch Emulsions lecture 2
		Read remaining text and make sure you understand how to extract important information from supplier brochures.
		Investigate Dropbox brochures and look for brochures providing you with the level of information to make good selections.
		Work on all practical activities for the emulsifier unit.
<i>Only continue to the next unit once you have completed all items in order</i>		



Pace yourself! Set your due dates	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Surfactant Learning
		Watch Surfactants lecture 1
		Read section 1, 2.3 and 2.4 <i>Note: there are no assessment questions in this program for you to answer</i>
		Watch Surfactants lecture 2
		Read section 2, 2.1, 2.2 including the polyquaternium examples + section 6
		Complete Practical Activities from Guides & Build document
		Watch Surfactants lecture 3
		Read all section 5 and section 7 including worked examples + practice searching through Dropbox and practice using the Formulation Build
<i>Only continue to the next unit once you have completed all items in order</i>		
		Watch Aerosols lecture 1
		Read all of section 1
		Watch Aerosols lecture 2
		Read all of section 2
		Work on Assessment Questions: Complete Q5.1
		Watch Aerosols lecture 3
		Read all of section 3
		Work on Assessment Questions: Complete Q5.2
<i>Only continue to the next unit once you have completed all items in order</i>		



Some Example Assessment questions

5.1 Create an aerosol mousse formulation and method. Double check your formula to make sure it is within the required VOC limits.

PHASE	ADDED %w/w	Trade name (INCI)	FUNCTION
			Water
			Ethanol (optional)
			Cationic and/or amphoteric surfactant
			Non-ionic very high HLB emulsifiers/blend (waxy)
			Resin/styling polymer
			Gum/thickener (optional)
			Conditioning polymer (optional)
			Neutralising agent (if required)
			Added extras (optional)
			Fragrance
			Preservative
			Propellant

METHOD



Pace yourself! Set a due date of 2-3 weeks on each unit if studying 10-15hrs/wk or adjust accordingly	Tick when each time completed; make sure to complete in order.	Item/Unit
		Do not proceed to the next item until previous item is ticked off/completed
		Watch Hair Care & Styling formulas lecture 1
		Read all of section 1 text
		Work on Assessment Questions: Complete Q6.1
		Watch Hair Care & Styling formulas lecture 2
		Read section 2.1 and 2.2 of text
		Work on Assessment Questions: Complete Q4.2, 4.3
		Watch Hair Care & Styling formulas lecture 3
		Read section 2.3 of text
		Investigate styling polymer brochures in dropbox
		Work on Assessment Questions: Complete Q4.4, 4.5
<i>Only continue to the next unit once you have completed all items in order</i>		

Some Example Assessment questions

6.1 Complete the following table, identifying key ingredient needs of the different hair types/products specified.

Shampoo for type 1 hair (undamaged)	
Repair treatment for damaged type 2 hair	
Conditioner for type 3 hair (undamaged)	
Repair treatment for damaged type 4 hair	



Pace yourself! Set your due dates	Tick when each time completed; make sure to complete in order.	Item/Unit Do not proceed to the next item until previous item is ticked off/completed
		Watch Hair specialty lecture 1
		Read Section 1 of text
		Watch Hair specialty lecture 2
		Read Section 2 of text
		Sign up to UL Prospector – details in Dropbox
		Join our Cosmetic Raw Materials for Small Brands facebook group: https://www.facebook.com/groups/1734896293290235/
		Watch Hair specialty lecture 3
<i>Only continue to the next unit once you have completed all items in order</i>		
		Watch Stability testing lecture 1
		Read all of section 1 of the Stability unit. Make sure you complete all activities along the way.
		Work on Assessment Questions: Complete Q7.1 and 7.2
		Watch Stability testing lecture 2
		Watch Testing Video in lecture system
		Read sections 2, 2.1 and 2.2 of the Stability unit.
		Work on Assessment Questions: Complete Q7.3.1 and 7.3.2
		Watch Stability testing lecture 3
		Read section 2.3, all of section 3 and 4. Complete all remaining activities.
		Work on Assessment Questions: Complete Q7.4, 7.5, 7.6, 7.7
<i>Finalise all parts of your assessment and send in for marking.</i> <i>Good luck! 😊</i>		



Some Example Assessment questions

7.1 Explain the concept of ‘shelf life’ and purpose of stability testing.

7.2 Complete the following table of what would be UNSUITABLE to a consumer for the specified product types:

Product Type	Unsuitable changes (to a consumer)
Repair serum in a clear bottle	
Hair conditioner in a jar	

7.3 Using the stability templates following this question, prepare a **real time** and **accelerated** stability testing schedule for **EACH** of the following products. Make sure to show the **expiry limits, time points and test conditions**, as we have shown in the notes and Appendix C & D:

7.3.2 a conditioner to be sold in Australia and NZ stored at 25°C with ideal specifications:

- glossy white slightly translucent high viscosity cream with characteristic vanilla aroma
- pH: 4.5
- specific gravity: 0.89
- viscosity: 60,000 cps



Accelerated Schedule

Product name:						
Formula reference:						
Specification ref:						
Supersedes:						
Storage conditions:						
Predicted expiry:						
			Conditions			
Parameter	Method	Expiry Limit				
Time points						
Appearance	Visual: SOP 122					
Form	Visual: SOP 122					
Aroma	Inspection: SOP 122					
pH	pH meter: SOP 123					
Specific gravity	Pycnometer: SOP 124					
Viscosity	Brookfield viscometer: SOP 125					
Microbial content	TGA 2008: SOP 127					



Real time schedule

Product name:										
Formula reference:										
Specification ref:										
Supersedes:										
Storage conditions:										
Predicted expiry:										
Parameter	Method	Expiry Limits								
Appearance	Visual: SOP 122									
Form	Visual: SOP 122									
Aroma	Inspection: SOP 122									
pH	pH meter: SOP 123									
Specific gravity	Pycnometer: SOP 124									
Viscosity	Brookfield viscometer: SOP 125									
Microbial content	TGA 2008: SOP 127									



7.4 For the following stability testing results:

Product name:		Sulphate free shampoo				
Formula reference:		NATFOR-002-0				
Specification ref:		NAT-002-0				
Supersedes:		new				
Storage conditions:		25°C in closed packaging; clear bottle with flip top cap				
Predicted expiry:		2 years from date of manufacture				
		Conditions				
Parameter	Method	Expiry Limit	25°C	35°C	45°C	Freeze/thaw
Time points			t = 1mth; 3 mths; 6mths; 9mths; 12mths;	t = 1mth; 3mths; 6mths;	t = 1mth; 3mths	t = 12 days (6 cycles)
Appearance	Visual: SOP 122	Translucent, off-white low viscosity foaming gel	t = complies; white powdery residue on top; white powdery residue on top + very low viscosity; white powder residue on top + water thin; separated water thin product	t = white powdery residue on top; white powdery residue on top + very low viscosity; separated water thin product	t = separated water thin product; fails	t = @ 4 days (2 cycles); white powdery residue forming on top
Form	Visual: SOP 122	Foaming gel	t = complies; complies; complies; water thin/fails	t = complies; complies; water thin/fails	t = fails	t = @ 4 days (2 cycles); gel with thin residue layer on top
Aroma	Inspection: SOP 122	Citrus, characteristic of essential oils used	t = complies; complies; complies; complies; faint off notes; distinct off notes; fail	t = complies; complies; faint off notes; distinct off notes; fail; fail	t = faint off notes; fail	t = @ 12 days (6 cycles); complies



pH	pH meter: SOP 123	5.3 (4.7 – 5.9)	t = 5.0; 4.7; 4.5; 4.4; 4.3	t = 5.0; 4.5; 4.3	t = 4.5; 4.3	t = @ 6 days (3 cycles); 4.3
Specific gravity	Pycnometer: SOP 124	1.1 (1.0 – 1.2)	t = 1.1; 1.1; 1.1; 1.1; 1.1	t = 1.1; 1.1; 1.1	t = 1.1; 1.1	t = @ 12 days (6 cycles); 1.1
Viscosity	Brookfield viscometer: SOP 125	Spindle TF96@10rpm@ 25°C; 12,000cps (10,500 – 13,500)	t = 12,000; 10,000; 2,000; 100; 100	t = 12,000; 2,000; 100	t = 100; 100	t = @ 6 days (3 cycles); 150
Microbial content	TGO77: SOP 127	TAMC NMT 100cfu/g; TYMC NMT 10cfu/g; <i>S. aureus</i> : not detected/g; <i>P. aeruginosa</i> : not detected/g.	t = complies; complies; complies; complies; complies	t = complies; complies; complies; complies	t = complies; complies	t = complies

7.4.1 prepare graphs to track changes and determine the approximate shelf life of this product.

7.4.2 what is the most likely cause of instability for this product?

7.4.3 what could be done to reduce/prevent these types of change