



Moving to Pharmacy 2030
*Plugged-in, Engaged,
Be a catalyst for change*
3rd National Pharmacy Conference
3-6 October 2019
Sun City, @3NPCSAPC

Pre-registration Examination Workshop 2018 (Part 2)



**South African
Pharmacy Council**
www.sapc.za.org

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Admin

- 2018 Intern Manual
- Date of exam
- Venue of exam
- Booking of exam
- CPD entries to be submitted before exam
- Where will I get my resources?

Prepare

- Past papers
- Practice questions
- Theoretical questions
- Which references
- Get to know reference books

Admin

Exam

- What to bring?
- Exam technique
- Time management

Examination

Preparation



2018/05/21
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Prepare

Exam

▶ Types of questions

▶ Resources

▶ Equipment

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► Types of questions:

- Dosage calculations
- Concentration
- Formulations (compounding & manufacturing)
- Parenteral solutions and Isotonicity
- Dilutions
- Molecular weight
- Miscellaneous



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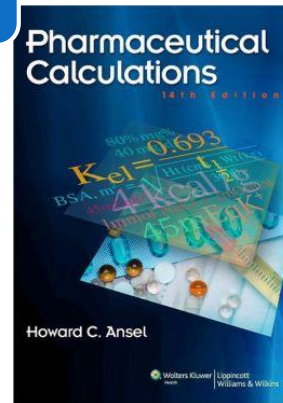
Prepare

Exam

▶ Resources Textbooks

- Highly recommended
- Pharmaceutical Calculations

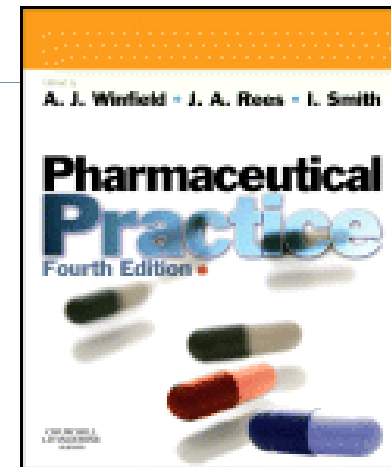
H. C. Ansel, 14th Edition, Lippincott & Wilkins, 2012



▶ Alternate resources

- Pharmaceutical Practice

A. J. Winfield, J.A. Rees & I. Smith, 4th Edition



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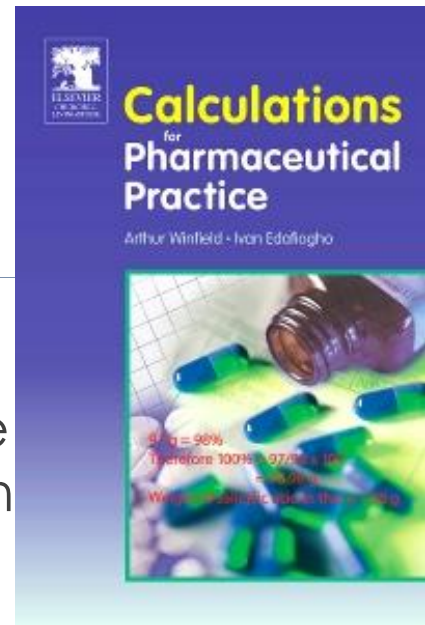


▶ Alternate resources (cont.)

- Calculations for Pharmaceutical Practice

A. J. Winfield & I.O. Edafiogho 4th Edition

- SAMF– Theory behind calculations
- Websites
- Numerous available – beware that these are often not always applicable to South African setting



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▶ Other resources

- Past Papers (Available on the SAPC Website)
 - March 2014
 - April 2017

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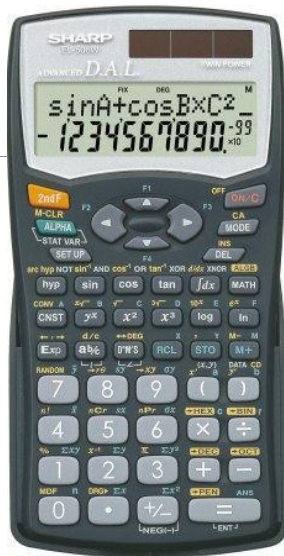
Exam

▶ Equipment

• Calculator:

- Scientific calculator.
- Use same one to practice as you will use in the exam.
- Check batteries.
- Know the settings of your calculator.
- No access to any websites during exam

NO!!!!!!
iPads
Laptops
Cellphones



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Exam

TEXTBOOKS

▶ Identifying calculations:

- Often grouped (i.e. the same type of calculations follow one another) – Know how to identify calculations.
- Find out which calculations YOU battle with and PRACTICE these more.

PAST PAPERS

▶ Complete the paper under exam conditions.

- March 2014 & April 2017 paper – complete within 2 hours.
- Compare answers with colleagues.
- Do not assume you got the question correct.

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Exam

► Tips:

- Units
 - What are the SI units?
 - » Example: % w/v = g/100ml
- Conversion
 - Practice converting between units
 - » Example: 10 ppm can be expressed as 0.001%
 - If you battle with this, prepare a conversion sheet to use in the exam.
- Equations
 - Identify the equations you have used while practicing.
 - » Example: $C_1V_1 = C_2V_2$
 - Create an equation sheet which you can take into the exam. Be familiar with these equations.



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Prepare

Exam

- ▶ Exam technique
- ▶ Using your reference material
- ▶ Maximizing your time
- ▶ Completing the online answer sheet

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Exam

▶ Exam technique

- Write the calculation clearly and legibly.
- Transferring data → double check what you have written down.
- Write down every step.
- Do not take short cuts.
- Try not being totally dependent on your calculator.
- Always double check your calculation.



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Exam

▶ Maximising your time 120 minutes

- 40 MCQs
- 3 minutes per calculation
- Be conscious of time.

While practicing time how long it takes you to complete a calculation.

No negative marking – do not leave anything blank.



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Prepare

Exam

▶ Using your reference material

- Haven't got time to look up how to complete the calculation for each question.
- Have the following on hand:
 - List of equations.
 - Conversion sheets
 - List of SI units
- If you can't complete the question, carry on and when you have time towards the end of the exam, use the reference books you brought to help you work it out.



PAPER 1

Past Paper (April 2017)

DOSAGES

Q5: In acute hypersensitivity reactions 0.5 ml of a 1:1000 w/v solution of adrenaline may be administered SC or IM. What quantity of adrenaline will be administered in a single dose?

- (a) 0.50 mg
- (b) 0.65 mg
- (c) 0.75 mg
- (d) 0.95 mg
- (e) 0.85 mg



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Past Paper (April 2017)

1:1000 w/v= 0.1% w/v

Therefore:

$$(X \text{ g}) / (0.1 \text{ g}) = (0.5 \text{ ml}) / (100 \text{ ml})$$

$$X = 0.0005 \text{ g}$$

0.5 ml contains 0.0005 g = 0.5 mg



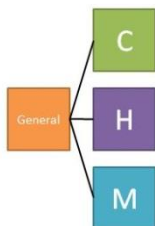
PAPER 1

Past Paper (April 2017)

CONCENTRATIONS

Q10: Fertilizer residues are sometimes found in drinking water in rural areas. For compound Z, the safe limit in drinking water is 9 ppm. The analytical results for drinking water of different villages reveal the following levels of compound Z. Which of the villages has safe drinking water?

- (a) Village A – 24.6 $\mu\text{g}/\text{ml}$
- (b) Village B – 0.3 mg/l
- (c) Village C – 0.009 % w/v
- (d) Village D – 0.041 % w/v
- (e) Village E – 1 in 100 000



PAPER 1

Past Paper (April 2017)

1 part per million (1 ppm) means that there is one part in one million parts i.e. 1.0 g in 1000 000 ml.

This is equivalent to 1000 mg in 1000 000 ml, or 1000 mg in 1000 l, or 1 mg/l.

It can also be expressed as 1000 micrograms/l or 1 microgram/ml. Alternatively, it can be written as 0.0001% w/v or 1 in 1000 000.

Considering each of the villages in turn:

Village A: $24.6 \mu\text{g} / \text{ml} = 24.6 \text{ mg} / 1000 \text{ ml} = 24.6 \text{ g} / 1000\ 000 \text{ ml}$ or 24.6 ppm, 24.6 ppm > 9 ppm, so the water is not drinkable

Village B: $0.3 \text{ mg} / \text{l} = 0.3 \text{ mg} / 1000 \text{ ml} = 0.3 \text{ g} / 1000\ 000 \text{ ml}$ or 0.3 ppm < 9 ppm, thus safe.

Village C: $0.009 \text{ \% w/v} = 0.009 \text{ g} / 100 \text{ ml} = 90.0 \text{ g} / 1000\ 000 \text{ ml}$ or 90 ppm > 9 ppm, not safe

Village D: $0.041 \text{ \% w/v} = 0.041 \text{ g} / 100 \text{ ml} = 410.0 \text{ g} / 1000\ 000 \text{ ml}$ or 410 ppm > 9 ppm, not safe

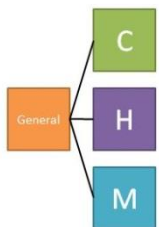
Village E: 1 in 100 000 is the same as 10 ppm > 9 ppm, thus not safe

Past Paper (April 2017)

FORMULATIONS

Q20: A manufacturing pharmacist mixes four equal amounts of Belladonna extract each containing 1.15 % w/v, 1.30 % w/v, 1.35 % w/v and 1.20 % w/v of the alkaloid, respectively. What is the final strength of the alkaloids in the mixture?

- (a) 0.80 % w/v
- (b) 1.15 % w/v
- (c) 1.25 % w/v
- (d) 2.00 % w/v
- (e) 5.00 % w/v



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Past Paper (April 2017)

Use any amount of Belladonna extract e.g.100 ml

This means that:

1.15% w/v=1.15 g per 100 ml

1.20% w/v=1.20 g per 100 ml

1.30% w/v=1.30 g per 100 ml

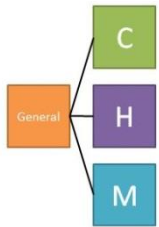
1.35% w/v=1.35 g per 100 ml

The total quantity of the Belladonna extract in the final mixture is=5 g

The total volume of the final mixture is=400 ml

The % strength (w/v)= $(5 \text{ g}) / (100 \text{ ml}) \times 100$

The % strength (w/v)= 1.25% w/v



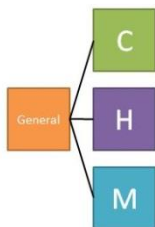
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Past Paper (April 2017)

FORMULATIONS

Q21: You need to prepare a sufficient volume of 1 M hydrochloric acid (HCl) to be used to produce a buffer solution. Calculate the volume of 32 % w/w HCl that is required to make 75 ml of a 1M HCl solution. The molecular weight of HCl is 36.46 g/mol. The density of the HCl solution is 1.16 g/ml.

- (a) 7.4 ml
- (b) 8.6 ml
- (c) 17.5 ml
- (d) 28.2 ml
- (e) 35.0 ml



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Past Paper (April 2017)

A concentration of 1 M = 1 mol/l, thus 1 mole of HCl per 1000 ml of solution,
1 mole of HCl=36.5 g

The quantity of HCl needed for 75 ml is:

$$(X \text{ g HCl}) / (36.5 \text{ g HCl}) = (75 \text{ ml}) / (1000 \text{ ml})$$

$$X = 2.734 \text{ g of HCl}$$

A quantity of 2.734 g of HCl is needed and it is to be obtained from a 32% w/w solution of HCl

32% w/w = 32 g of HCl in 100 g of solution, therefore:

$$(2.734 \text{ g HCl}) / (32 \text{ g HCl}) = (X \text{ g}) / (100 \text{ g})$$

$$X = 8.544 \text{ g}$$

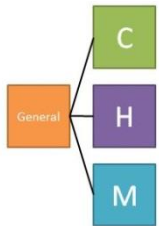
You need 8.544 g of the 32% w/w HCl solution to obtain 2.734 g of HCl

The corresponding volume of the 32% w/w HCl solution that is required is therefore:

Volume = Weight / Density

$$\text{Volume} = (8.544 \text{ g}) / (1.16 \text{ g/ml})$$

$$\text{Volume} = 7.4 \text{ ml}$$



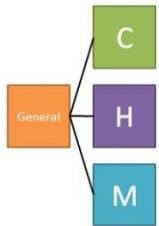
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Past Paper (April 2017)

PARENTERAL SOLUTIONS & ISOTONICITY

Q24: Medicine X is administered at a recommended flow rate of 3 ml/min when used at a concentration of 5 mg/ml. Medicine X is only available in 500 mg vials for dilution in a 5 % w/v glucose solution. The IV administration set is calibrated at 20 drops/ml. How long will it take for the total volume of fluid to be administered?

- (a) 3.3 min
- (b) 12.0 min
- (c) 33.3 min
- (d) 64.0 min
- (e) 66.6 min



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Past Paper (April 2017)

A strength of 5mg/ml is to be administered

Therefore, 500 mg vial should be diluted to:

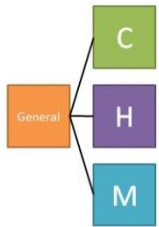
$$(500 \text{ mg}) / (5 \text{ mg}) = (X \text{ ml}) / (1 \text{ ml})$$

$$X = 100 \text{ ml}$$

A volume of 100 ml should be administered at a rate of 3 mg/ml, thus:

$$(100 \text{ ml}) / (3 \text{ ml}) = (X \text{ min}) / (1 \text{ min})$$

$$X = 33.33 \text{ min}$$



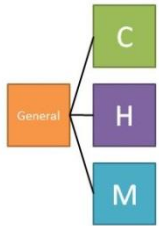
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Past Paper (April 2017)

PARENTERAL SOLUTIONS & ISOTONICITY

Q25: How much anhydrous dextrose should be used to prepare one litre of 0.5 % w/v isotonic ephedrine sulfate nasal spray? A 1 % w/v solution of ephedrine sulfate depresses the freezing point of water by 0.132 °C and a 1 % w/v solution of anhydrous dextrose depresses the freezing point of water by 0.090 °C. An isotonic solution freezes at -0.52 °C.

- (a) 3.43 g
- (b) 5.04 g
- (c) 34.30 g
- (d) 50.44 g
- (e) 100.88 g



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Past Paper (April 2017)

This is a freezing point depression calculation, therefore:

$$w = (0.52 - a) / b$$

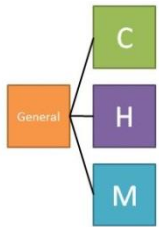
$$w = (0.52 - (0.5 \times 0.132 \text{ } ^\circ\text{C})) / (0.090 \text{ } ^\circ\text{C})$$

$$w = 5.044\% \text{ w/v}$$

To make the solution of ephedrine isotonic, you require 5.044 g of dextrose anhydrous per 100 ml of solution, therefore for 1 litre:

$$(X \text{ g}) / (5.044 \text{ g}) = (1000 \text{ ml}) / (100 \text{ ml})$$

$$X = 50.44 \text{ g of dextrose anhydrous}$$



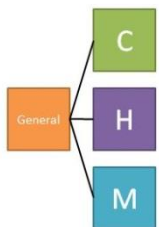
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PARENTERAL SOLUTIONS & ISOTONICITY

Q26: A dose of $4 \mu\text{g}/\text{kg}/\text{min}$ of furosemide is required to be infused over an hour to treat a hypertensive patient weighing 62.5 kg. What volume of a 0.16 % w/v furosemide infusion would be required for this patient?

- (a) 8.375 ml
- (b) 9.375 ml
- (c) 9.505 ml
- (d) 9.735 ml
- (e) 9.835 ml



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Past Paper (April 2017)

The dose required for the patient is:

$$X = 4 \mu\text{g/ml/min} [\times 62.5 \text{ kg}]:$$

$$X = 250 \mu\text{g/min}$$

$$X = 100 \text{ ml}$$

The corresponding dose per hour is:

$$X = 250 \mu\text{g/min} [\times 60 \text{ min}]$$

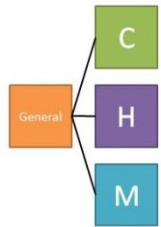
$$X = 15000 \mu\text{g} = 15 \text{ mg}$$

A dose of 15 mg per hour is to be obtained from a 0.16% w/v solution, therefore:

$$0.16\% \text{ w/v} = 0.16 \text{ g}/100 \text{ ml} = 160 \text{ mg}/100 \text{ ml}$$

$$(15 \text{ mg}) / (160 \text{ mg}) = (X \text{ ml}) / (100 \text{ ml})$$

$$X = 9.375 \text{ ml}$$



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Past Paper (April 2017)

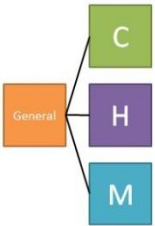
DILUTIONS

Q30: You receive the following prescription:

Phenobarbitone	800 mg
Ethanol (90 % v/v)	40 % v/v
Compound Orange Spirit	2.5 % v/v
Glycerol	80 ml
Amaranth solution	1% v/v
Water to	200 ml

The patient requires 500 ml of the phenobarbitone elixir. You only have 96 % v/v ethanol in your pharmacy. What volume of 96 % v/v ethanol will be required to prepare 500 ml of the phenobarbitone elixir?

- (a) 96.0 ml
- (b) 100.0 ml
- (c) 180.0 ml
- (d) 187.5 ml
- (e) 188.6 ml



Past Paper (April 2017)

The volume of 90% v/v alcohol needed is:

$$\frac{X \text{ ml}}{40 \text{ ml}} = \frac{500 \text{ ml}}{100 \text{ ml}}$$

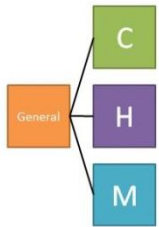
$$X = 200 \text{ ml}$$

You only have 96 %v/v alcohol at hand, the volume required is:

$$C_1V_1 = C_2V_2$$

$$90\% \times 200 \text{ ml} = 96\% \times V_2$$

$$V_2 = 187.5 \text{ ml}$$



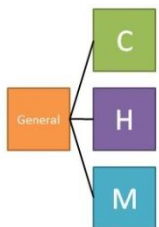
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DILUTIONS

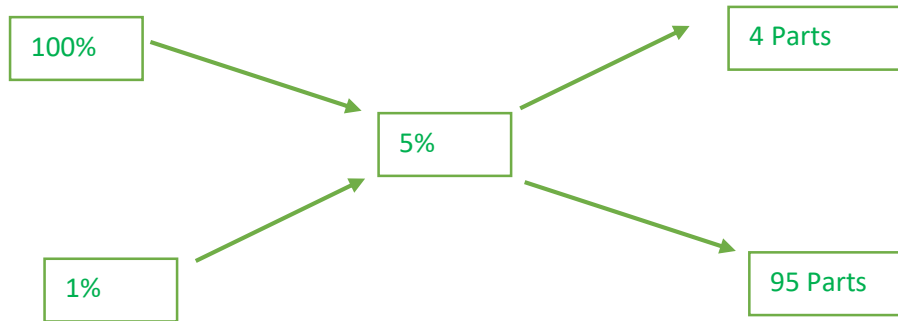
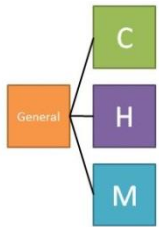
Q31: What mass of coal tar extract must be added to a 100g cream containing 1 % w/w coal tar extract to produce a 5 % w/w coal tar extract cream?

- (a) 0.50 g
- (b) 2.00 g
- (c) 2.50 g
- (d) 4.21 g
- (e) 5.00 g



PAPER 1

Past Paper (April 2017)



100 g of a 1% w/w ointment will be comprised of 95 parts, therefore:

$$(X \text{ g}) / (100 \text{ g}) = (4 \text{ parts}) / (95 \text{ parts})$$

$$X = 4.21 \text{ g}$$

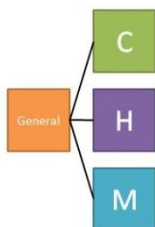
PAPER 1

Past Paper (April 2017)

MOLECULAR WEIGHT

Q35: A pharmacist needs 75 mg piperazine for the preparation of a 1 ml ampoule for injection and only piperazine citrate is available. How much piperazine citrate does the pharmacist need to weigh to produce a total of 15 x 1 ml ampoules? (MW of piperazine = 86.14, $C_4H_{10}N_2$, MW of piperazine citrate = 643.00, $(C_4H_{10}N_2)_3 \cdot 2C_6H_8O_7$).

- (a) 0.19 g
- (b) 0.56 g
- (c) 1.12 g
- (d) 2.80 g
- (e) 8.40 g



PAPER 1

Past Paper (April 2017)

One molecule of piperazine citrate contains three molecules of piperazine base, therefore:

(3x 86.14 g) piperazine base in 643 g of piperazine citrate = 258.42 g piperazine base

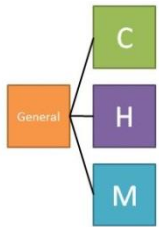
Weight of piperazine base needed for 15 x 1 ml ampoules:

Weight of piperazine base = 75 mg per ml x 15 ml = 1125 mg

A quantity of 1125 mg of piperazine base is to be obtained from piperazine citrate, thus:

$(X \text{ g piperazine citrate}) / (643 \text{ g piperazine citrate}) = (1.125 \text{ g piperazine base}) / (258.42 \text{ g piperazine base})$

X = 2.80 g



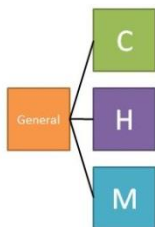
PAPER 1

Past Paper (April 2017)

MOLECULAR WEIGHT

Q37: The MW of magnesium sulfate is 246.3. Magnesium Sulfate Injection is normally supplied as a 50 % w/v solution. How many mEq/ml of magnesium does this injection contain?

- (a) 1.02 mEq
- (b) 2.03 mEq
- (c) 4.06 mEq
- (d) 6.09 mEq
- (e) 10.20 mEq



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$$mEq/mm\text{mol} = \text{Valence} \times \text{number}$$

$$mEq/mm\text{mol} = 2 \times 1$$

$$mEq/mm\text{mol} = 2$$

$$\text{Equivalent weight} = \frac{\text{Molecular weight (in } mg/mm\text{mol)}}{mEq/mm\text{mol}}$$

$$\text{Equivalent weight} = \frac{246.3 \text{ } mg/mm\text{mol}}{2 \text{ } mEq/mm\text{mol}}$$

$$\text{Equivalent weight} = 123.15 \text{ } mg/mEq$$

A weight of 123.15 mg of Magnesium sulphate contains 1 mEq of Mg^{2+} and one mEq of SO_4^{2-}

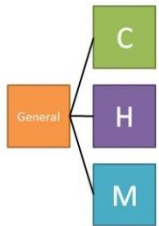
And

$$50\% \text{ w/v} = 50 \text{ } g/100 \text{ ml} = 0.5 \text{ } g/ml$$

Thus:

$$\frac{X \text{ } mEq}{1 \text{ } mEq} = \frac{500 \text{ } mg}{123.15 \text{ } mg}$$

$$X = 4.06 \text{ } mEq$$



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PAPER 2



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▶ Sections of Paper 2

▶ Resources

- Reference Material
- Past Papers

- Same as past paper slide from Paper 1.

PAPER 2

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Prepare

Exam

▶ Sections of Paper 2

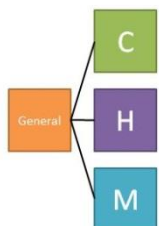
General section –
Same questions for ALL
35 QUESTIONS

C
15 QUESTIONS
Community
Pharmacy (Retail)

H
15 QUESTIONS
Institutional
Pharmacy (Private
& Public)

M
15 QUESTIONS
Manufacturing
Pharmacy

Interns must choose which paper they intend writing when booking for the exam. This affects how you will prepare as well as the reference material you need.

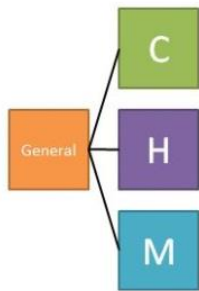


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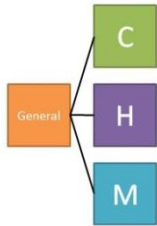
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Competence Standard		Resource
1	Organise and control the manufacturing, compounding and packaging of pharmaceutical products	
2	Organise the procurement, storage and distribution of pharmaceutical materials and products	
3	Dispense and ensure the optimal use of medicines prescribed to the patient	
4	Provide pharmacist initiated care to the patient and ensure the optimal use of medicine	
5	Provide education and information on healthcare and medicine	
6	Promote community health and provide related information and advice	
7	Participate in research to ensure the optimal use of medicines	
9	Practice pharmacy professionally and ethically	

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▶ Reference Material

- Based on CS 1, 2, 3, 4, 5, 6, 7 and 9. (CPD Entries – Intern manual)
- At least one question in each section from each of these competency standards.
 - Varies from section to section.
- Which resources would you then need to cover these CS?
- Which resources are more applicable to each sector (B, C or D)?

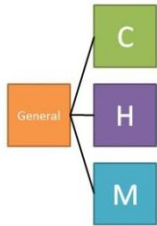
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▶ Reference Material

- Is it current? Latest Edition
 - SAMF
 - MIMS
 - Talmud / Daily Drug Use
 - Compendium of Laws and Regulations
 - Board notices
 - EDL and STG – PHC, Paediatric and Hospital
- Can I use older versions?
 - BP
 - Martindale
 - Merck Manual
 - Textbooks



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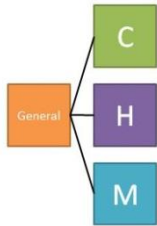
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- ▶ How do I prepare for the exam using the available resources once I have identified my resources?
 - Reference material
 - Past papers
- ▶ How else can I prepare?

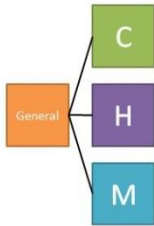
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REFERENCE MATERIAL



- ▶ Learn how to use each reference material
 - Where is the index?
 - What information can I find in each reference material?
- ▶ Tips:
 - More is not necessarily better.
 - Using notes from University may not help (information may not be valid any longer).
 - Avoid taking in a reference book you have never used before.

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PAST PAPERS

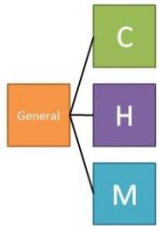
- Look at the type of questions asked.
- Would the reference material I have enable me to answer this question?
- Answer the question (be familiar with topics which arise – not enough time to look up each statement).
- MCQs – Complete the paper under exam conditions.
 - March 2014 and April 2017 paper – complete within 3 hours.
 - Compare answers with colleagues.
 - Do not assume you got the question correct.

Identify my strategy

Confirm my list of references

Learn when and how to use references

Revise each CS and see what is expected.



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▶ How else can I prepare?

Current events affecting the profession

Be present

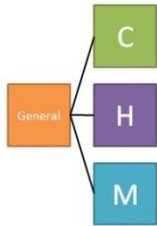
What do I do at work?

Legislation
SAPC

- SOPs
- Work environment

READ

- e-Pharmaciae (www.pharmaciae.org.za)
- SAPJ
- Attend CPD sessions



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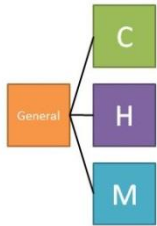
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▶ What's your strategy?

- Identify the statements you know.
- Confirm only the statements you don't know.
- If you can't complete the question, carry on and when you have time towards the end of the exam come back to it.
- NEVER leave a question blank. No negative marking. Take an educated guess.



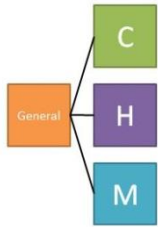
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▶ Be careful of the following:

- “true”, “correct”, “is” and “are”
- “false”, “incorrect”
- “most appropriate/correct” vs. “least”

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▶ Maximizing your time 180 minutes

- 50 MCQs
- 4 options per MCQ.
- 200 statements.
- 0.90 minutes (54 seconds) per statement to determine if it is correct.

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You do not have enough time to look up every statement in this exam. Reference material is just there to confirm the answer.



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All of us at SAPC wish you a delightful festive season and a promising 2017

PHARMACIAE

December 2016

eVolume 3 No 2



Type and hit enter ...

Season's Greetings

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- Ensure your e-mail address is correct to receive the latest e-news from council

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How Council communicates with you

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e-Pharmaciae – council’s official e-publication. Ensure your e-mail address is updated to receive the latest e-edition carrying pharmacy information and council decisions. All e-pharmaciae articles are published on www.pharmaciae.org.za.



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- **SAPC e-notes**– containing urgent council info to pharmacy professionals that requires immediate action on their part
- **Bulk Sms’s** – re application progress, exam results, exam dates, updates and other important information
- **SAPC website** – utilise SAPC website (home page) to check the latest newsflashes



**workshops,
exhibitions,
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Intern and CSP submit your application online when you receive a sms that you are released. See here how to submit your Intern/CSP/Tutor application online - no manual application will be accepted. [click here](#)

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Council Elections 2018

The Council Election 2018 are now open.

Nominations for 9 Pharmacists to be elected for Council term (21 Oct 2018 – 20 Oct 2023) are now open and close at 16h00, 17 May 2018.

Visit www.sapc.za.org for the election information and the nomination form



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Any Questions



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