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# Professional Exam Online Workshop 2024



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# FORMAT OF THE WORKSHOP






- Format and content of the examination
- Exit Level Outcome (ELO)
- Preparing for the Applied Pharmacy Practice in a Legal Framework paper
- Preparing for the Applied Pharmaceutics and Pharmaceutical Chemistry paper
- Preparing for the Applied Pharmacology and Toxicology paper
- Remote online examination/assessment
- Examination results
- Appeal process
- Q &A





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# FORMAT OF THE PROFESSIONAL EXAMINATION

Professional Examinations	Applied Pharmacy Practice in a Legal Framework	Applied Pharmaceutics and Pharmaceutical Chemistry	Applied Pharmacology and Toxicology
<p>Open book online examination</p> <p>3 examination papers</p> <p> multiple choice questions (MCQs)</p> <p> 3 days</p> <p>Pass mark 50%</p> <p>No negative marking</p>	<p><u>Integrated exam</u></p> <ul style="list-style-type: none"><li>• Pharmacy Administration</li><li>• Professional Pharmacy Practice and Ethics</li><li>• Legislation case study</li><li>• Practice scenario questions</li></ul> <p>120 MCQ</p> <p> Four (4) hours.</p> <p>Subminimum of 40% Overall pass mark 50%</p>	<p><u>Two parts</u></p> <ul style="list-style-type: none"><li>• Pharmaceutics</li><li>• Pharmaceutical Chemistry</li></ul> <p> Three (3) hours</p> <p>90 MCQ</p> <p>Subminimum of 40%</p> <p>Overall pass mark 50%</p>	<p>Basic Principles of Pharmacology and Toxicology</p> <p> Three (3) hours</p> <p>90 MCQ</p> <p>Pass mark 50%</p>





# WEIGHT PER EXIT LEVEL OUTCOME (ELO) PER SUBJECT

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ELOs	Weight (%)					
	Total	PHARMACOLOGY	APPLIED PHARMACY PRACTICE IN A LEGAL FRAMEWORK		APPLIED PHARMACEUTICS AND PHARMACEUTICAL CHEMISTRY	
			PHARMACY PRACTICE	LAW AND ETHICS	PHARMACEUTICS	PHARMACEUTICAL CHEMISTRY
1	12.33%	1.50%	1%	0.33%	2.50%	7%
2	9%	0	0	0	5%	4%
3	5.50%	0	0	2%	3.50%	0
4	9%	0	0	1%	6%	2%
5	4%	0	3%	1%	0	0
6	17%	9%	4%	4%	0	0
7	16.17%	9.50%	6.67%	0	0	0
8	13%	6%	5%	2%	0	0
9	9%	4%	4%	1%	0	0
10	5%	0	3%	2%	0	0
11	0	0	0	0	0	0
TOTAL	100%	30%	26.67%	13.33%	17.00%	13%
	100%	30%	40%		30%	
Number of questions	300	90	120		90	



# EXAM CONTENT: EXIT LEVEL OUTCOMES

## ELO 1

Integrate and apply foundational scientific principles and knowledge to pharmaceutical sciences.

## ELO 2

Apply integrated knowledge of product development and formulation in the compounding, manufacturing, distribution, and dispensing of pharmaceutical products.

## ELO 3

Compound, manipulate, and prepare medication in compliance with Good Pharmacy Practice (GPP) rules, Good Manufacturing Practice (GMP) and/or Good Clinical Practice (GCP) guidelines.

## ELO 4

Manage the manufacturing, packaging, and registration of pharmaceutical products in compliance with GMP and GCP.



# EXAM CONTENT: EXIT LEVEL OUTCOMES

## ELO 5

Manage the logistics of the selection, procurement, storage, distribution, and disposal of pharmaceutical products.

## ELO 6

Dispense medication and ensure optimal pharmaceutical care for the patient in compliance with GPP and, where applicable, GCP.

## ELO 7

Apply a pharmaceutical care management approach to ensure rational medicine use.

## ELO 8

Initiate and/or modify therapy, where appropriate, within the scope of practice of a pharmacist and in accordance with GPP and GCP, where applicable.



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# EXAM CONTENT: EXIT LEVEL OUTCOMES

**ELO 9**

Promote public health.

**ELO 10**

Integrate and apply management principles in the practice of pharmacy.

**ELO 11**

Participate in research.



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# ELO 1

## 12.33%

- Physical, chemical, and biological principles are integrated and applied in the development, formulation, compounding, manufacturing, drug supply management, and dispensing of pharmaceutical products.
  - Demonstrate ethical and professional conduct related to the relevant scope of practice in the provision of pharmaceutical technical support services
- Anatomical, physiological, biochemical, and pathophysiological principles and knowledge are integrated and applied in the initiation and/or modification of therapy and provision of pharmaceutical care.
  - Apply basic scientific principles and perform basic scientific calculations
- Social and behavioural principles and knowledge are integrated and applied in the initiation of therapy and provision of pharmaceutical care.





# ELO 2

## 9%

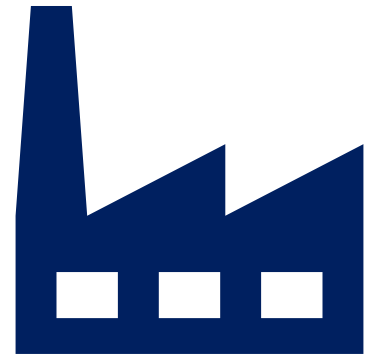
- Physicochemical and biopharmaceutical principles are applied in the formulation and development of pharmaceutical products. Pick, pack, and secure orders for medicines or scheduled substances according to all requirements and check that orders are dispatched according to SOPs.
- Physical, chemical, and biological principles are applied in the manufacturing, compounding, and quality assurance of pharmaceutical products.
- Physicochemical and biopharmaceutical principles are applied in the compounding and dispensing of pharmaceutical products.
- Pharmaceutical product integrity is maintained during storage and distribution according to GPP.



# ELO 3

## 5.5%

- Standard Operating Procedures (SOPs) are generated and implemented in compliance with GPP.
- Pharmaceutical preparations are compounded in accordance with GMP. Participate in manufacturing processes for non-sterile medicines and scheduled substances.
- Sterile admixtures are produced in accordance with aseptic techniques and principles of GMP and GPP.
- Records are generated for each of the preparations produced according to organisational procedures and legal requirements.





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# ELO 4

## 9%

- Medicines registration dossiers for pharmaceutical products using the supplied data and documentation are compiled in accordance with the current relevant legislation.
- Master production documentation for the manufacture of pharmaceutical products is interpreted in terms of GMP.
- The GMP requirements for the generation and reconciliation of batch manufacturing documents are described.
- Dosage forms are manufactured on a laboratory scale according to plan and standard operating procedures.
- Packaging, labelling, and package inserts are contextualised according to the product, GMP, and the current relevant legislation.
- A Quality Management System (QMS) is critically evaluated in accordance with GMP.





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# ELO 5

## 4%

- The selection of medicines and related products is managed according to rational, scientific and evidence-based principles and patient needs.
- The quantity of medicines needed is identified according to standard methods.
- The procurement of medicines and related products is managed according to organisational policies and procedures.
- Pharmaco-economic knowledge, principles, models and theories are applied in the provision of cost-effective therapy and pharmaceutical services.
- The storage and distribution of medicines and related products is managed according to Good Pharmacy Practice (GPP), Good Distribution Practice (GDP) and Good Wholesaling Practice (GWP).
- Disposal of expired and unwanted pharmaceutical products is managed according to current relevant legislation and guidelines.





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# ELO 6

## 17%

- ❖ The prescription is evaluated in terms of the appropriateness of the prescribed medication according to GPP.
- ❖ Medicines are prepared and labelled in accordance with GPP and current legislative requirements.
- ❖ Appropriate drug information sources and information systems are accessed, and the relevant information is communicated to the patient and/or carer in order to optimise therapeutic outcomes.
- ❖ A pharmaceutical care plan, including design, implementation and monitoring, is developed in collaboration with other healthcare professionals and the patient.
- ❖ Records are kept in accordance with the GPP and current legislative requirements.





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# ELO 7

## 16.17%

- The philosophy and principles of pharmaceutical care are demonstrated in terms of optimising therapeutic outcomes for a specific patient.
- A pharmaceutical care management approach is applied in collaboration with other healthcare professionals and the patient.
- Rational drug use is facilitated by applying pharmaceutical care, medicine utilisation reviews and the principles of pharmaco-economics.
- Pharmacovigilance is practised and Adverse Drug Events are reported.





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# ELO 8

## 13%

- Relevant clinical information and history are obtained from the patient.
- Appropriate advice, including referral, and/or medicines are supplied for specific symptoms according to GPP and principles of pharmaceutical care.
- In the case of possible medicine interactions, or any other possible contraindications, appropriate modification of therapy is suggested in consultation with the prescriber.
- Appropriate records are kept, and therapeutic outcomes are monitored in accordance with GPP and principles of pharmaceutical care.





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# ELO 9

## 9%

- Disease prevention and disease management are provided in terms of the use of medicinal and non-medicinal options.
- Tools are designed to inform the public on health care and lifestyle, in health promotion, disease prevention, disease management and medicine usage, in addition to enabling the recognition and management of risk factors.
- Promotive health services are offered in terms of current health policy, epidemiological information and current legislative requirements.
- The public is assisted in recognising and managing health risk factors in terms of medication and disease states.
- Screening tests are used to assist in counselling, therapeutic intervention, referral and early detection of disease.
- Appropriate records are kept, and therapeutic outcomes are monitored in accordance with GPP and pharmaceutical care principles.







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# ELO 10

## 5%

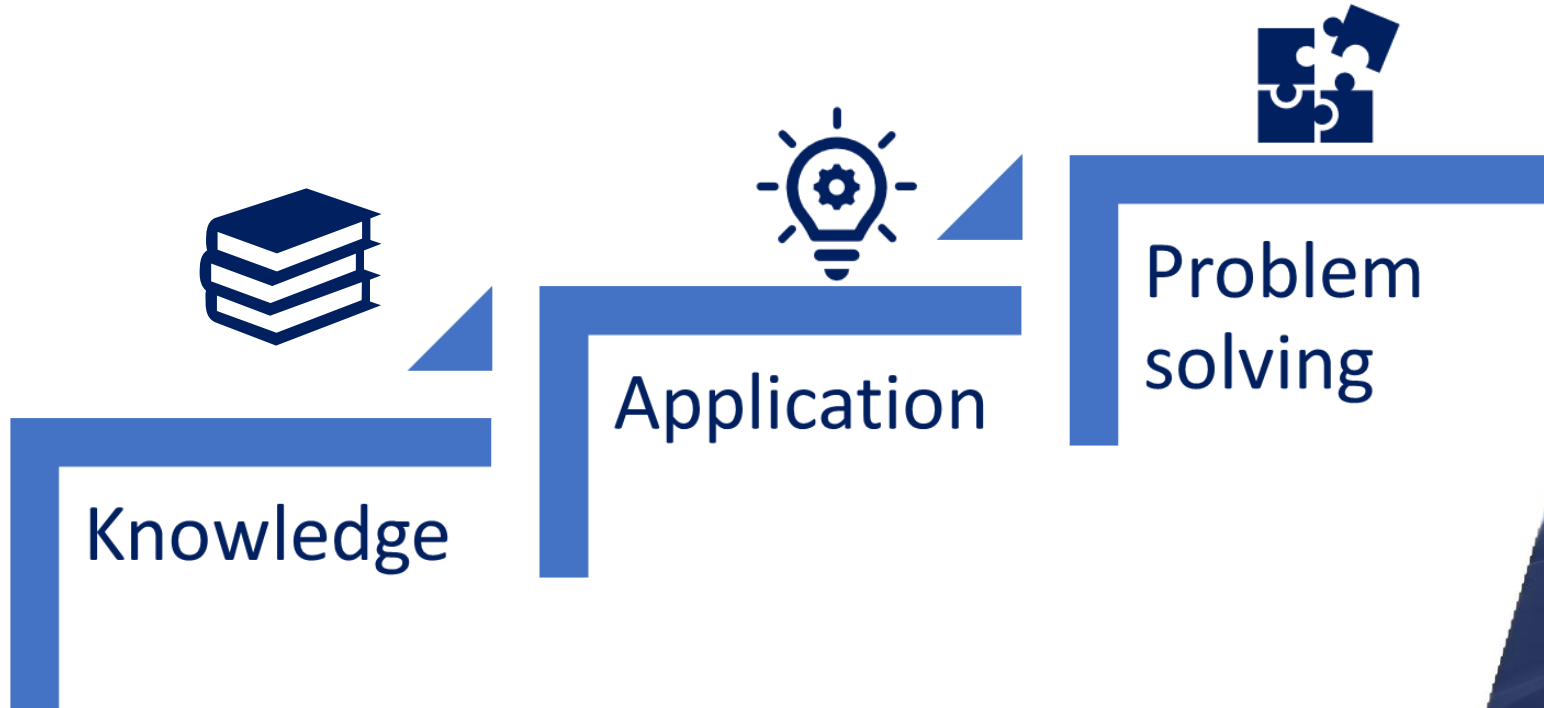
- Basic financial management principles are applied in the practice of pharmacy.
- Human resource management principles are applied in the practice of pharmacy.
- Strategic management principles are applied in the practice of pharmacy.
- Marketing management and change management principles are applied in the practice of pharmacy.
- Logistics management principles are applied throughout the medicines supply chain.
- Relationships with patients, caregivers and other healthcare professionals and workers are managed in accordance with professional practice standards.
- Risk management principles are applied in the practice of pharmacy.
- Quality improvement principles and strategies are continuously applied.





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# TYPES OF QUESTIONS





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# PREPARATIONS

## Admin

- When (date and time) is the exam?
- Where (venue/remote) is the exam?
- What resources do I need?

## Prepare

- How can I prepare?
- Which references do I need?
- How do I use the references?

## Exam

- What do I need to bring?
- How does the online exam work?
- How long is the exam?



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2	9%	0	0	0	5%	4%
3	5.50%	0	0	2%	3.50%	0
4	9%	0	0	1%	6%	2%
5	4%	0	3%	1%	0	0
6	17%	9%	4%	4%	0	0
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9	9%	4%	4%	1%	0	0
10	5%	0	3%	2%	0	0
11	0	0	0	0	0	0
TOTAL	100%	30%	26.67%	13.33%	17.00%	13%
	100%	30%	40%		30%	
Number of questions	300	90	120		90	

# Types of questions: Pharmacy Practice and Law & Ethics

- 120 questions in total:
  - 80 – Pharmacy Practice (PP) and
  - 40 - Law and Ethics (L&E)
- Level of cognition
  - Knowledge  $\leq$  10%;
  - Application  $\geq$  60% (case study based and scenarios);
  - Problem Solving  $\leq$  30%



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# REFERENCE MATERIAL: APPLIED PHARMACY PRACTICE IN A LEGAL FRAMEWORK

- The pharmacist is required to be cognisant of all legislation relating to pharmacy practice including the Pharmacy Act, 53 of 1974, the Medicines and Related Substances Act, 101 of 1965 and other relevant acts.
- **PSSA Pharmacy Law Compendium, Volumes 1 and 2, published by LexisNexis. The most recent service issue must be accessed.** The Compendium is available from LexisNexis Customer Services at Tel: 0860-765-432 or e-mail address: [customercare@lexisnexis.co.za](mailto:customercare@lexisnexis.co.za) or from the Pharmaceutical Society of South Africa (PSSA)
- **South African Medicines Formulary.** Latest edition
- **Standard Treatment Guidelines** (Department of Health South Africa)  
<http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/285-phc?download=2392:primary-healthcare-level-2014>
- **Community Pharmacy: Symptoms, diagnosis and treatment.** 4th edition. Rutter Paul.
- **Pharmacy Management,** Any Edition., Alston, G., Desselle, S., & Zgarrick, D.
- **Communication Skills in Pharmacy Practice**
- A selection has been made from texts that are readily available and will provide useful background reading for candidates:
  - **The Merck Manual of Diagnosis and Therapy.** Latest Edition. Merck & Co. Inc. Rathway.
  - **Daily Drug Use.** Talmud, J., Latest Edition. Tincture Press. Cape Town;
  - **Symptoms in Pharmacy,** A. Blenkinsop.



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# Managing time



Maximising your time – 240 minutes

120 MCQs

4 options per MCQ

Approximately 2 minutes per question

No negative marking

Do not leave anything blank





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6	17%	9%	4%	4%	0	0
7	16.17%	9.50%	6.67%	0	0	0
8	13%	6%	5%	2%	0	0
9	9%	4%	4%	1%	0	0
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5	4%	0	3%	1%	0	0
6	17%	9%	4%	4%	0	0
7	16.17%	9.50%	6.67%	0	0	0
8	13%	6%	5%	2%	0	0
9	9%	4%	4%	1%	0	0
10	5%	0	3%	2%	0	0
11	0	0	0	0	0	0
TOTAL	100%	30%	26.67%	13.33%	17.00%	13%
	100%	30%	40%		30%	
Number of questions	300	90	120		90	

# Types of questions: Pharmaceuticals

- 50 questions in total:
- Level of cognition
  - Knowledge  $\leq$  10%;
  - Application  $\geq$  50% (case study based and scenarios);
  - Problem Solving  $\leq$  40%



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# ELO 1

## 2.5%

- Physical, chemical, and biological principles are integrated and applied in the development, formulation, compounding, manufacturing, drug supply management, and dispensing of pharmaceutical products.
  - Integrating the physical pharmacy aspects such as unit operations, rheology, micrometrics, thermodynamics, solubility, dissolution, stability, etc.
  - References:
    - **Martin's Physical Pharmacy and Pharmaceutical Sciences.** Sinko PJ. Latest edition
    - **The Design and Manufacture of Medicines.** Aulton, M.E. Latest Edition





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# Pharmaceutics questions Examples

**Question:** The highly soluble amorphous material formed due to quench-cooling of the crystalline drug showed a glass transition temperature of  $4^{\circ}\text{C}$ . Which of the following would negatively impact the solubility of the amorphous form?

- a. Storing at  $40^{\circ}\text{C}$
- b. Storing at  $25^{\circ}\text{C}$**
- c. Storing it as an amorphous solid dispersion
- d. Mixing with Polyvinylpyrrolidone





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# Pharmaceutics questions Examples

**Question:** In the case of water-soluble dyes added to granules prepared with wet granulation technique, which of the following drying equipment would best suit to prevent migration of the colour?

- a) Tray dryer
- b) Spray dryer
- c) Fluidized bed dryer**
- d) Microwave Drier



# ELO 2

## 5%

- **Physicochemical and biopharmaceutical principles** are applied in the **formulation and development** of pharmaceutical products.
- Physical, chemical and biological principles are applied in the manufacturing, compounding and quality assurance of pharmaceutical products.
- Physicochemical and biopharmaceutical principles are applied in **compounding and dispensing** of pharmaceutical products.
  - Biopharmaceutical factors in formulation design, its effect on the drug bioavailability.
  - Application of pharmacokinetics in clinical situations.
  - Novel drug delivery systems (GRDDS, Colon, Nasal, including the vesicular drug delivery systems)
  - References:
    - **Applied Biopharmaceutics and Pharmacokinetics**: Shargel L and Yu S.A. Latest edition.
    - **Drug Delivery & Targeting**. Perrie Y and Rades T. Latest edition





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# Pharmaceutics questions Examples

**Question:** Which of the following age-related factors can significantly affect pharmacokinetics among elderly patients that would lead to dose adjustments?

- a) Increase in total body water
- b) Decrease in body fat
- c) Decrease in serum albumin concentrations
- d) Decrease in creatinine clearance



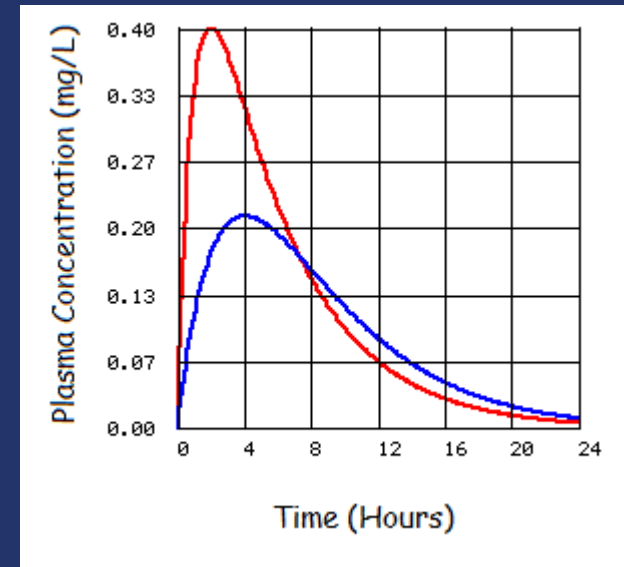


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# Pharmaceutics questions Examples

**Question:** The figure below shows the plasma concentration time profiles of the weakly acidic drug X (pKa of 4.0), administered orally as a tablet under fasting (pH 1.2) and fed conditions (pH = 4). Which of the following statement is correct pertaining to the absorption of the drug?

- The rate of absorption is always faster in the fasting conditions compared to the fed conditions
  - The drug taken under fasting condition resulted 100% ionisation, leading to greater C<sub>max</sub>
  - The change in pH of fed conditions resulting in 50% of unionized form the drug, leading less C<sub>max</sub>
  - The extent of absorption is same under both fasting and fed conditions
- Henderson–Hasselbalch equation







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# Pharmaceutics questions Examples

**Question:** If the bioavailability of sildenafil citrate in a 50 mg tablet is 0.25 compared to the bioavailability of 0.75 in a sildenafil citrate simple syrup (1 mg/mL), calculate the dose of the syrup equivalent to the tablet.

- a) 3 ml
- b) 16.7 ml
- c) 26.6 ml
- d) 66.6 ml





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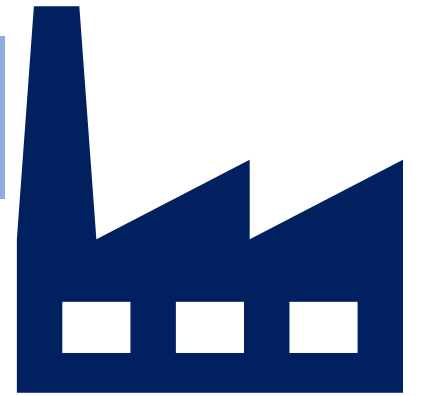
# Pharmaceutics questions Examples

- Amount of sildenafil citrate bioavailable from the tablet =  $50 \text{ mg} \times 0.25 = 12.5 \text{ mg}$ ,
- Amount of sildenafil citrate bioavailable from the syrup =  $0.75 \times 1 \text{ mg/ml} = 0.75 \text{ mg/ml}$
- Quantity of syrup that will provide 12.5 mg of “bioavailable” sildenafil citrate =
- $12.5 \text{ mg} / 0.75 \text{ mg} = 16.7 \text{ ml}$



# ELO 3

## 3.5%



- Pharmaceutical preparations are compounded in accordance with GMP.
- Sterile admixtures are produced in accordance with aseptic techniques and principles of GMP and GPP.
  - Application of GMP principles in compounding and manufacturing (The 5P's, validation & qualification, cross-contamination, audits, product recalls).
  - Look at the sterilization techniques, formulation of sterile pharmaceutical products such as small and large volume parenteral, ophthalmic, nasal sterile formulations and Isotonicity adjustments. Also, clean room requirements.
  - References:
    - **The Design and Manufacture of Medicines.** Aulton, M.E. Latest Edition,
    - **Pharmaceutical Practice:** Winfield AJ and Richards RME. Latest edition.
    - **GMP guidelines (SA Guide to GMP)**



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# Pharmaceuticals questions Examples

**Question:** According to Good Manufacturing Practice, sliding doors may be undesirable in clean room because they:

- a. are difficult to open and close under pressure
- b. are very expensive to maintain
- c. may have uncleanable recesses
- d. cannot handle pressure differentials





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# Pharmaceuticals questions Examples

**Question:** Good manufacturing practice (GMP) requires that materials and products, should be stored accordingly to avoid contamination, mix-ups and instability. Which of the following statement(s) is/ are TRUE pertaining to storage conditions used?

- a) Intermediates of effervescent product should be stored at 25°C and 50% RH
- b) Rejected materials should be stored in a lockable cage**
- c) Starting materials can be stored with intermediate products if the temperature and humidity conditions are maintained
- d) Finished products can be stored in passage if they are shrink wrapped to avoid mix-ups





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# Pharmaceutics questions Examples

**Question:** Which of the following parameters needs to be optimized during the process validation of a tablet dosage form manufactured by wet granulation?

- a) Quantity of the diluent
- b) Storage conditions of the finished product
- c) Container and closure system
- d) Loss on drying





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# Pharmaceutics questions Examples

Which of the following excipients is not advised to use in the formulation of large volume parenteral products?

- a. Cyclodextrin
- b. Benzethonium chloride
- c. Dextrose
- d. Sodium acetate





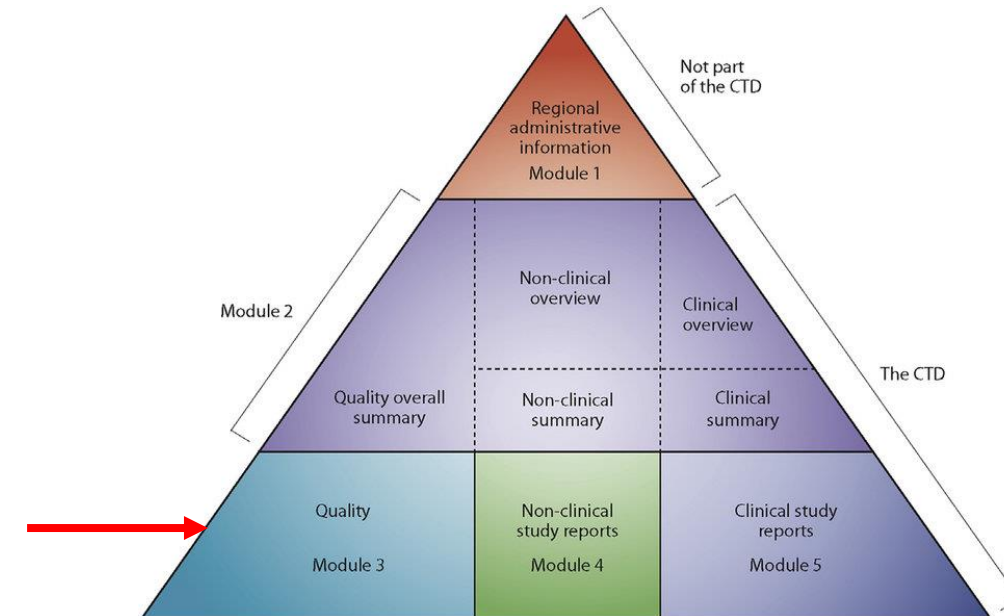
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# ELO 4

## 6%



- Medicines registration dossiers for pharmaceutical products using the supplied data and documentation are compiled in accordance with the current relevant legislation.
- Understand CTD with emphasis on Quality aspects of API and FPP guidelines such as:
  - stability
  - dissolution
  - post-registration amendments
  - impurity profiles







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# Pharmaceutics questions Examples

**Question:** How many pilot scale batches should be considered for the stability testing of codeine tablets?

a) At least 2

b) At least 1

c) At least 3

d) At least 4



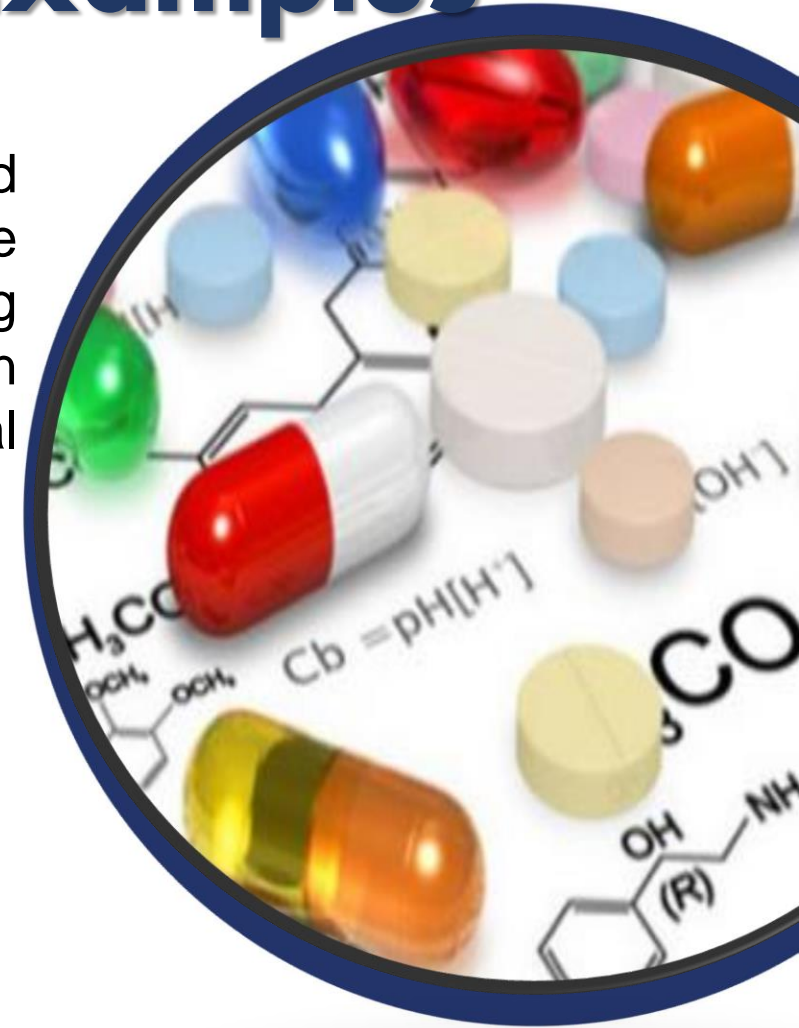


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# Pharmaceutics questions Examples

**Question:** PTA Pharmaceuticals decided to use a fluidized bed dryer as the tray dryer method was taking too long to complete the manufacturing of paracetamol tablets. Which of the following minimum data is required for submission to the South African Health Products Regulatory Authority (SAHPRA) for the approval of post-registration changes?

- a) Moisture content and Type A dissolution
- b) Moisture content, Type A dissolution and stability
- c) Type A dissolution, stability, and process validation
- d) Type A dissolution and stability



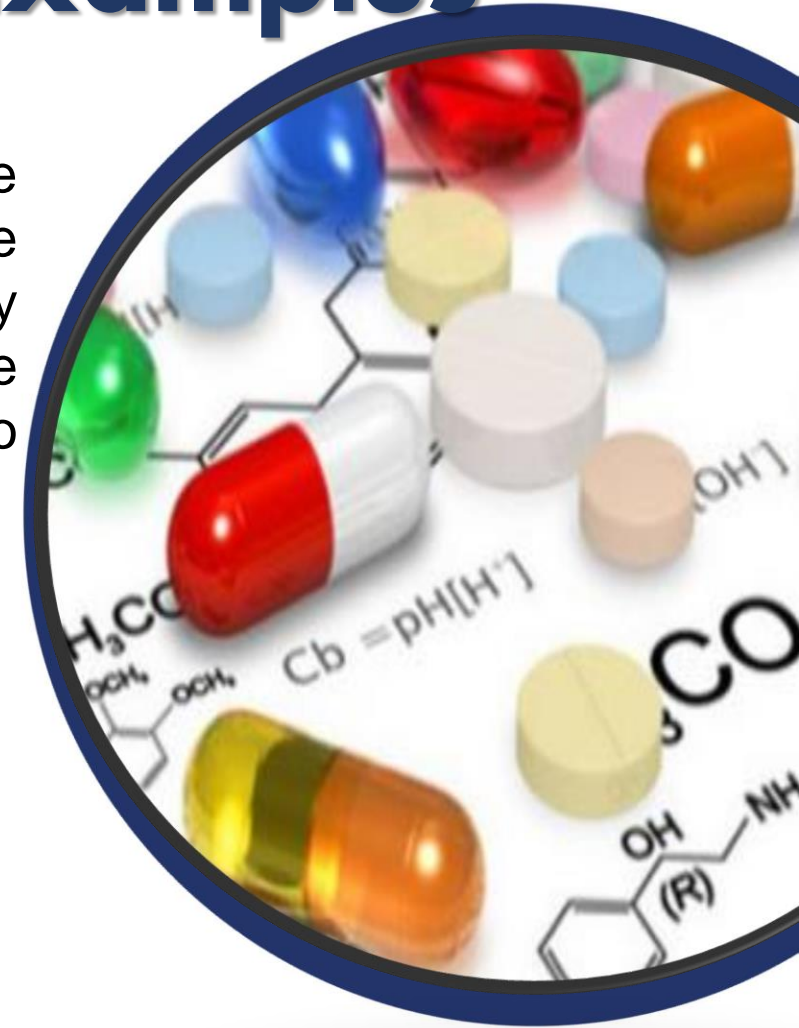


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# Pharmaceutics questions Examples

**Question:** PTA pharmaceuticals decided to substitute an Active Pharmaceutical Ingredient (API) of a multi-active tablet dosage form by a different salt from the API, where the efficacy/safety characteristics are not significantly different. Which of the following variation type allocation should be submitted to regulatory authorities prior to marketing?

- a) Type IA variation
- b) Type IB variation
- c) Type II variation
- d) Extension applications

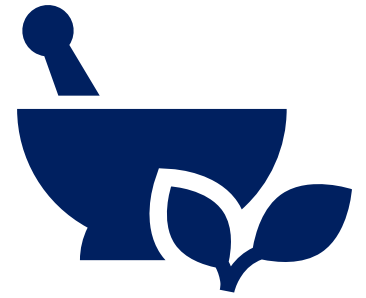




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# ELO 4

## 6%



- Master production documentation for the manufacture of pharmaceutical products is interpreted in terms of GMP.
- The GMP requirements for the generation and reconciliation of batch manufacturing documents are described.
  - Understand the importance and elements of SOPs, COA, Specifications, Site master file, Validation master plan, logbooks, Batch manufacturing, and packing documents.
  - Ref: **SA guide to GMP guidelines**, available from <https://www.sahpra.org.za>

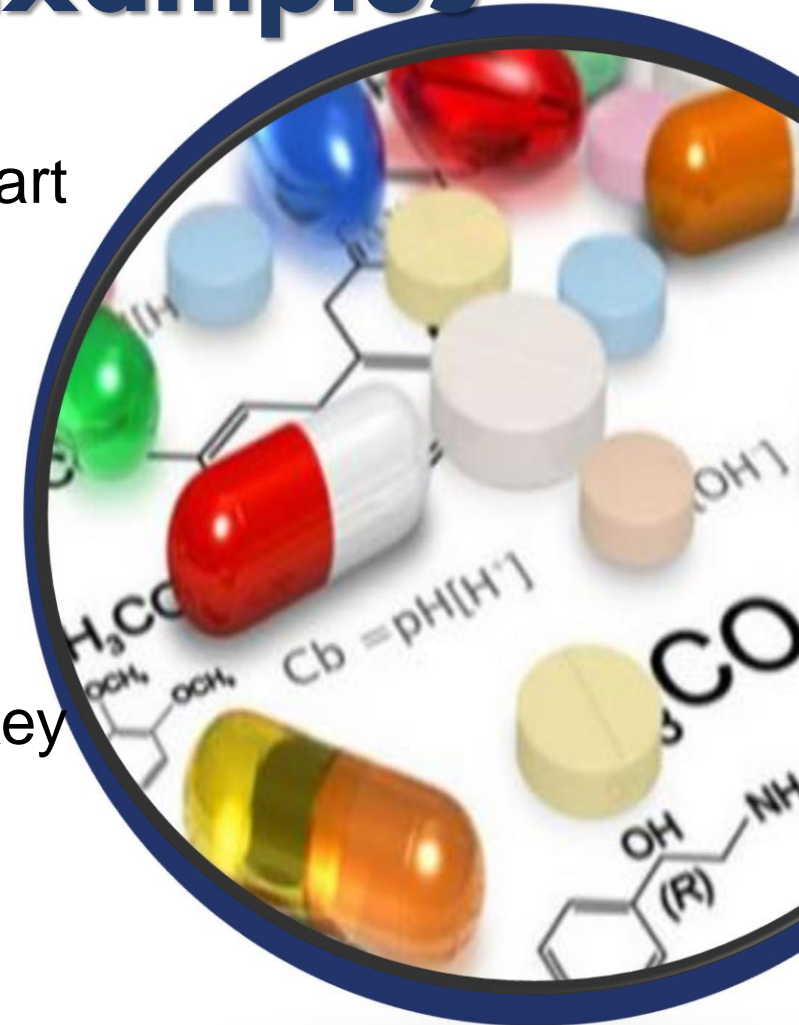


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# Pharmaceuticals questions Examples

**Question:** Which of the following would **NOT** form part of a Site Master File for a specific manufacturing site?

- a) Organizational charts
- b) Reports of finished product analysis
- c) Details of starting material suppliers
- d) Qualifications, experience, and responsibilities of key personnel



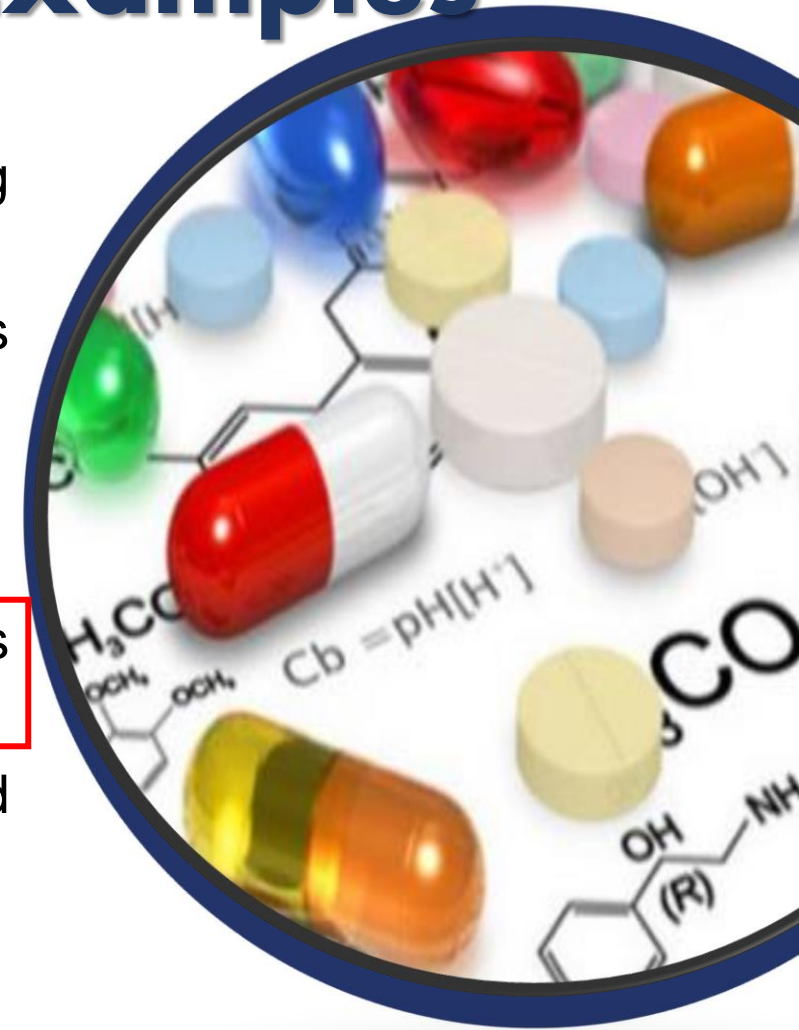


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# Pharmaceutics questions Examples

**Question:** Which statement is **true** of the following regarding documentation in pharmaceutical manufacturing facilities?

- a) Batch records give direction for performing certain operations e.g. cleaning
- b) Can be completed after the manufacturing process is completed
- c) Packaging instructions should include details of in-process controls with instructions for sampling and acceptance limits
- d) Logbooks are not needed when products are manufactured using dedicated equipment



# ELO 4

6%



- Dosage forms are manufactured on a laboratory scale according to plan and standard operating procedures.
  - Understand the dosage form design and formulation aspects, with emphasis on the functions of excipients, manufacturing methods, equipment used and quality control procedures.
  - References:
    - **The Design and Manufacture of Medicines.** Aulton, M.E. Latest Edition,
    - **Pharmaceutical Practice:** Winfield AJ and Richards RME. Latest edition.

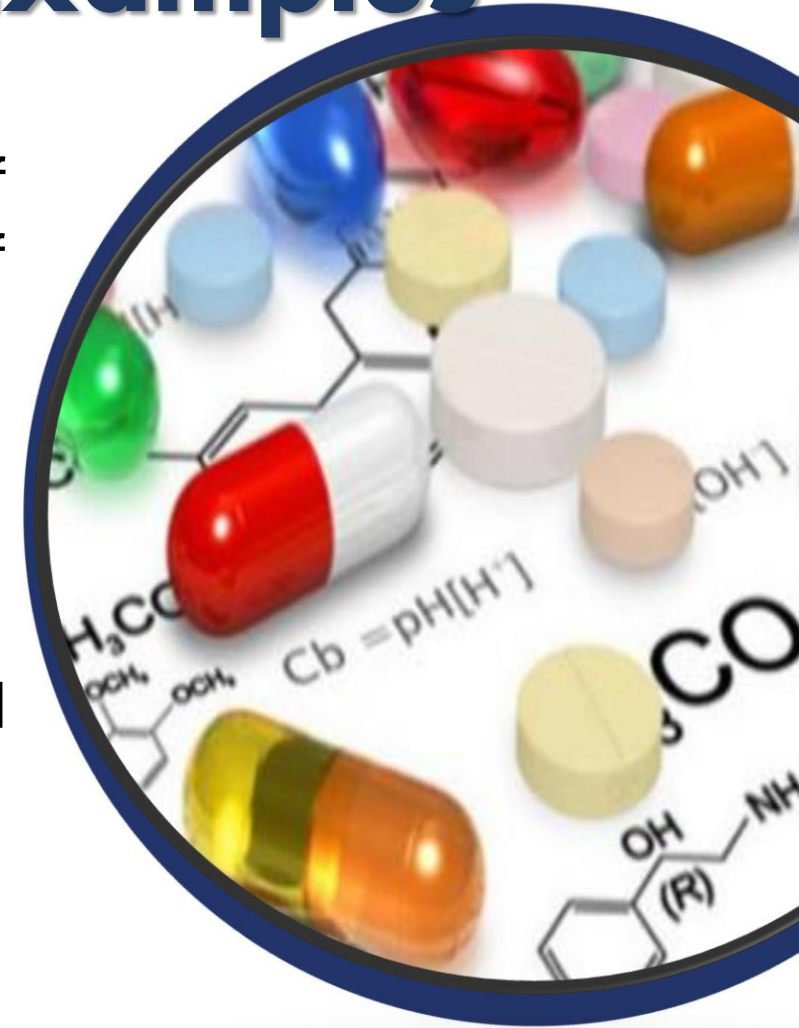


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# Pharmaceutics questions Examples

**Question:** Which of the following is a disadvantage of glycerol-gelatin base when used in the formulation of suppositories?

- a) Produce a laxative effect
- b) Become brittle when cooled rapidly
- c) Produce different polymorphic forms when cooled rapidly
- d) Has got poor water-absorbing ability







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# Pharmaceutics questions Examples

**Question:** Capping of the tablet can be eliminated by:

- a) pre-compression
- b) increasing the final compression rate
- c) using Concave punches
- d) increasing the moisture content of granules through the addition of water





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# Pharmaceutics questions Examples

**Question:** The durability of a tablet to combined effects of shock & abrasion is evaluated by using:

- a) Hardness tester
- b) Disintegration test apparatus
- c) Friabilator**
- d) Screw gauge



# Pharmaceutical calculations



- Dilutions – Alligation method
- Concentrations - Percentage, Ratio Strength etc.
- Upscaling, downscaling of master Formula.
- Yield calculations
- Potency calculations
- Density / Specific gravity
- Displacement Values – e.g., Suppositories compounding
- Molecular Weights and Moles
- [Parenteral Solutions / Isotonicity](#) –NaCl equivalent and Freezing point depression
- Dosage calculations
- [Shelf-life calculations](#) – orders of reaction
- HLB calculations

Reference: **Pharmaceutical Calculations**. Ansel HC and Stockton SJ. Latest edition

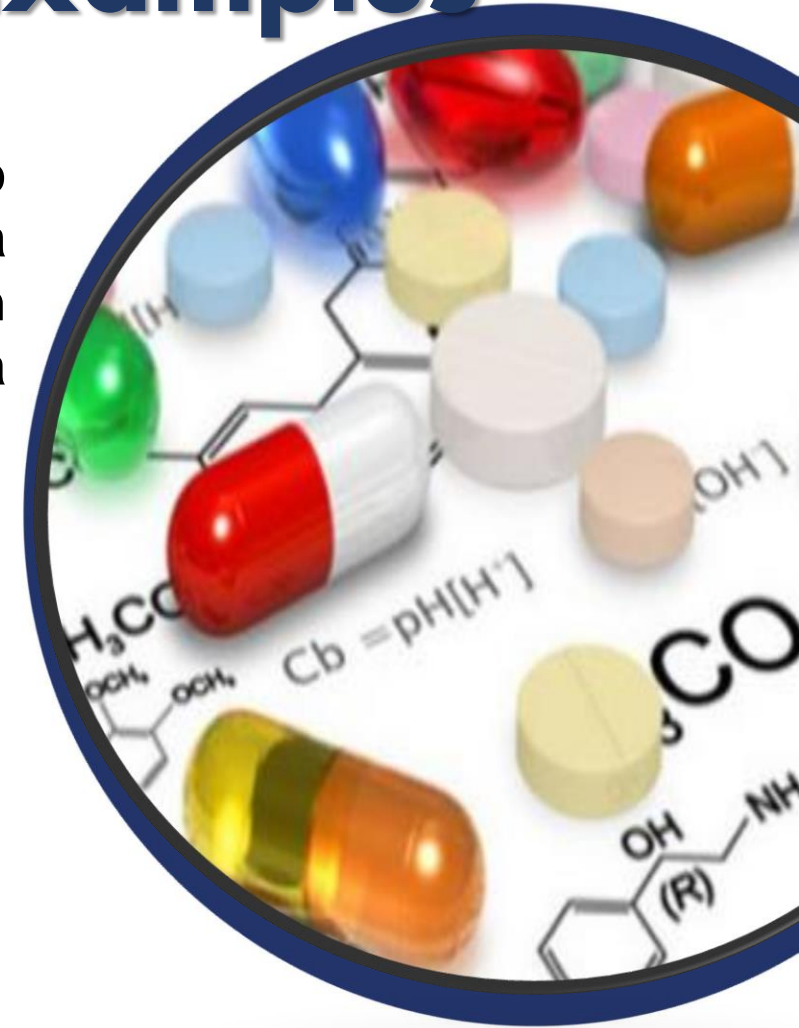


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# Pharmaceutics questions Examples

Calculate how many grams of sodium chloride should be added to 50 ml of a 0.5% w/v solution of lignocaine hydrochloride to make a solution iso-osmotic with blood serum. Freezing point depression of Sodium chloride and Lignocaine hydrochloride at a concentration of 0.5% w/v are 0.288 and 0.0625, respectively.

- a) 0.397 g
- b) 0.794 g
- c) 0.849 g
- d) 1.697 g





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# Pharmaceutics questions Examples

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

$$= 0.52 - (0.5 \times 0.125)/0.576$$

$$= 0.794 \% \text{ w/v}$$

0.794 g in 100 ml

X g in 50 ml

$$X = (0.794 \times 50)/100$$

$$X = 0.397$$

0.397 g of sodium chloride required

**Understand Colligative properties. Also check the other methods such as sodium chloride equivalent method.**





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# Pharmaceutics questions Examples

The following data represents the decomposition of a drug XYZ. If the rate of reaction is independent of the concentration, determine the rate constant at which the drug is decomposing.

- a)  $0.000067 \text{ mg}\cdot\text{sec}^{-1}$
- b)  $0.001500 \text{ sec}^{-1}$
- c)  $0.031746 \text{ mg}^{-1}\cdot\text{sec}^{-1}$
- d)  $0.031746 \text{ mg}\cdot\text{sec}^{-1}$

TIME (sec)	Concentration (mg)
0	0.050
60	0.046
120	0.042
180	0.038
300	0.030
420	0.022





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# Pharmaceutics questions Examples

**Note: Use one of the following equations to calculate the rate constant to six decimal points.**

- $C = -k_0 t + C_0$
- $\ln C = \ln C_0 - kt$  or  $\text{Log } C = -\frac{kt}{2.303} + \log C_0$
- $\frac{1}{C} = \frac{1}{C_0} + kt$
- $t_{90} = \frac{0.1 C_0}{k_0}$





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# Pharmaceutics questions Examples

- $C = -kt + C_0$
- $0.042 = -k \times 120 + 0.050$
- $k = 0.050 - 0.042 / 120 = 0.000067 \text{ mol.L}^{-1}.\text{sec}^{-1}$







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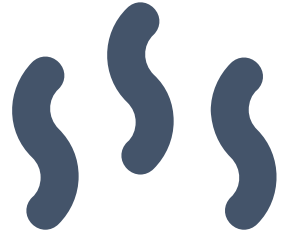
# REFERENCE MATERIAL: PHARMACEUTICS

- **Martin's Physical Pharmacy and Pharmaceutical Sciences:** Sinko PJ. Latest edition
- **Pharmaceutics: The Design and Manufacture of Medicines:** Aulton, M.E. Latest Edition
- **Pharmaceutical Calculations:** Ansel HC and Stockton SJ. Latest edition
- **Pharmaceutical Practice:** Winfield AJ and Richards RME. Latest edition.
- **Applied Biopharmaceutics and Pharmacokinetics:** Shargel L and Yu S.A. Latest edition.
- **Hugo and Russels Pharmaceutical Microbiology:** Denyer S.P., Hodges N, Gorman S.P. Latest edition.
- **GMP guidelines, P & A guidelines – e.g. Stability guidelines, and Bioavailability guidelines available from <https://www.sahpra.org.za>**
- **Pharmaceutics: Drug Delivery & Targeting.** Perrie Y and Rades T. Latest edition



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# Time for a 5 minutes break





# WEIGHT PER EXIT LEVEL OUTCOME (ELO) PER SUBJECT

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ELOs	Weight (%)					
	Total	PHARMACOLOGY	APPLIED PHARMACY PRACTICE IN A LEGAL FRAMEWORK		APPLIED PHARMACEUTICS AND PHARMACEUTICAL CHEMISTRY	
			PHARMACY PRACTICE	LAW AND ETHICS	PHARMACEUTICS	PHARMACEUTICAL CHEMISTRY
1	12.33%	1.50%	1%	0.33%	2.50%	7%
2	9%	0	0	0	5%	4%
3	5.50%	0	0	2%	3.50%	0
4	9%	0	0	1%	6%	2%
5	4%	0	3%	1%	0	0
6	17%	9%	4%	4%	0	0
7	16.17%	9.50%	6.67%	0	0	0
8	13%	6%	5%	2%	0	0
9	9%	4%	4%	1%	0	0
10	5%	0	3%	2%	0	0
11	0	0	0	0	0	0
TOTAL	100%	30%	26.67%	13.33%	17.00%	13%
	100%	30%	40%		30%	
Number of questions	300	90	120		90	

# Types of questions: Pharmaceutical Chemistry

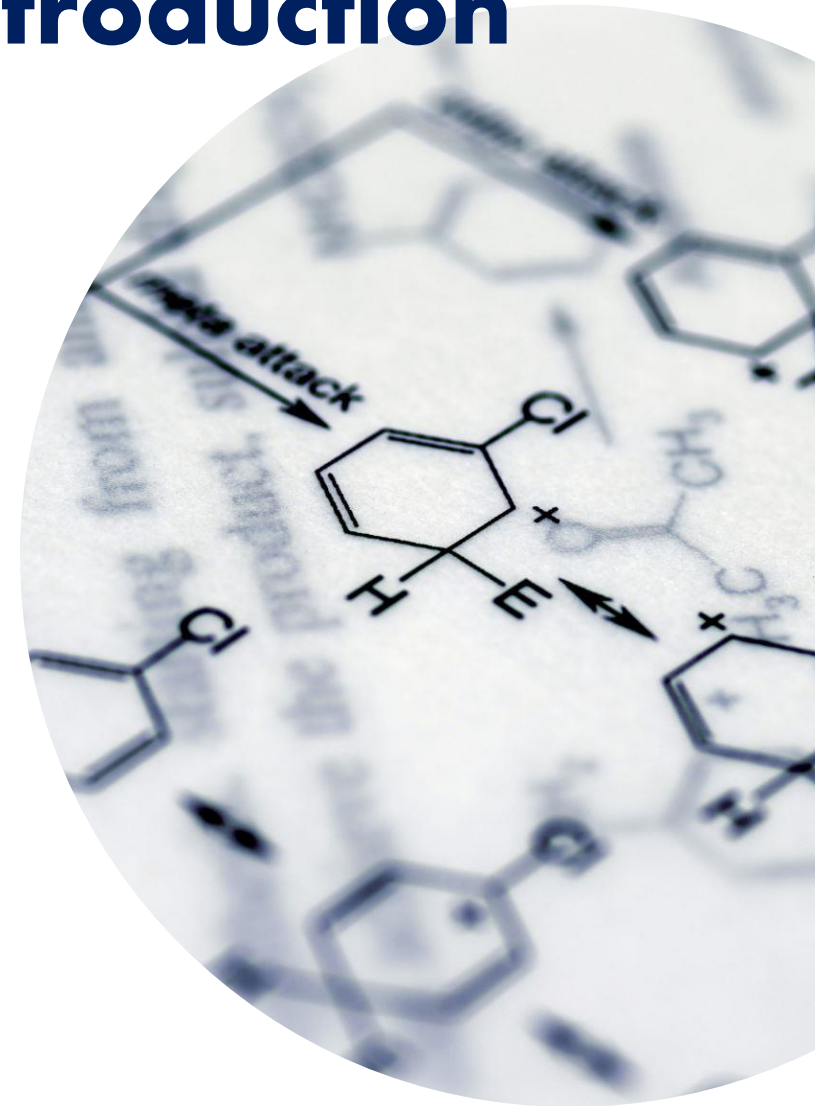
- 40 questions in total:
- Level of cognition
  - 10-15% Knowledge;
  - 50% Application;
  - 35-40% Problem solving



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# Pharmaceutical Chemistry Introduction

- Knowledge of drug actions + controlling drug delivery across biological membranes and to drug receptor sites + development of stable formulations and the design of sophisticated analytical methods – require an understanding of basic physical, biophysical and organic chemistry - equally important for the development of traditional small molecule drugs and biotechnology products.
- The importance of pharmaceutical chemistry - emphasised in the study of inorganic and organic compounds in pharmacodynamic groupings e.g. sedatives, hypnotics, narcotics, steroidal and non-steroidal anti-inflammatory agents, tranquillisers, psychotropic drugs, anaesthetics, hormones, vitamins, chemotherapeutics, antibiotics and radiopharmaceuticals.
- The synthesis, chemical reactions used for identification, biotransformation and structure relationships of these drugs - important to the pharmacist.

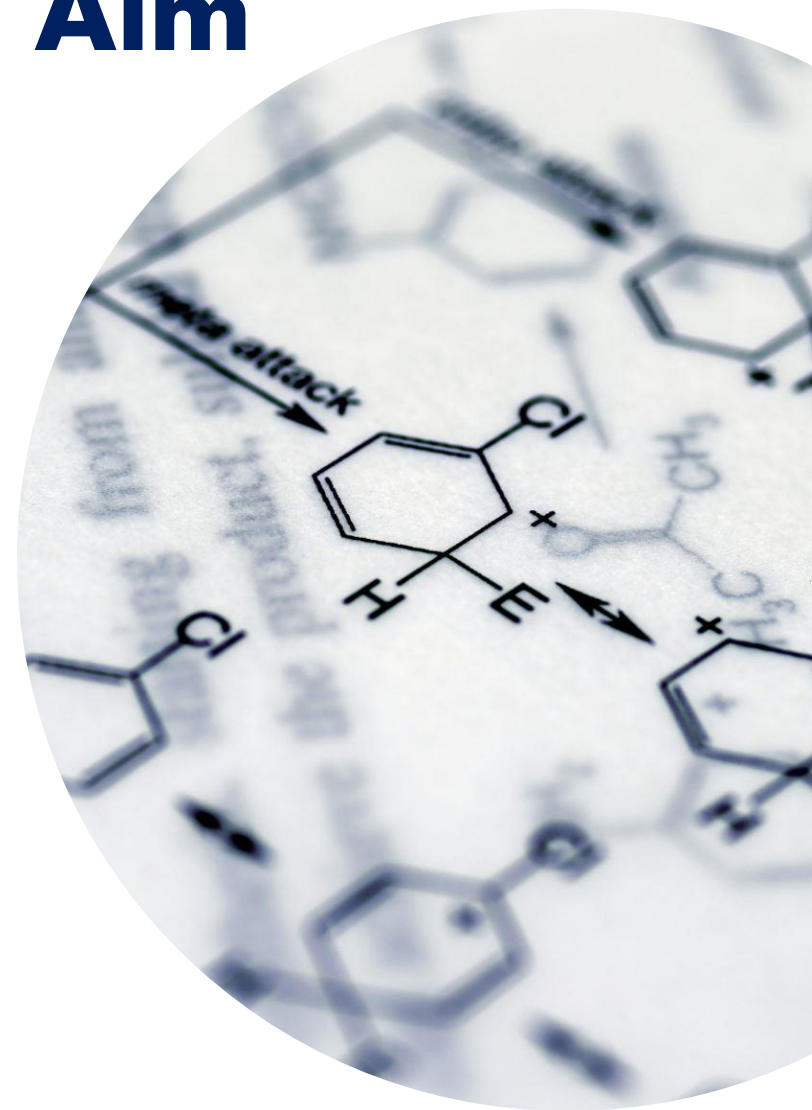




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# Pharmaceutical Chemistry Aim

- The aim of the Professional Examination in applied Pharmaceutical Chemistry is to evaluate your knowledge of candidates of basic principles of organic pharmaceutical chemistry and structure-activity relationships that influence drug actions, general principles in molecular mechanisms of drug action, analysis of substances of pharmaceutical importance, the actions of drugs in biochemical terms and pharmaceutical chemistry in drug design.





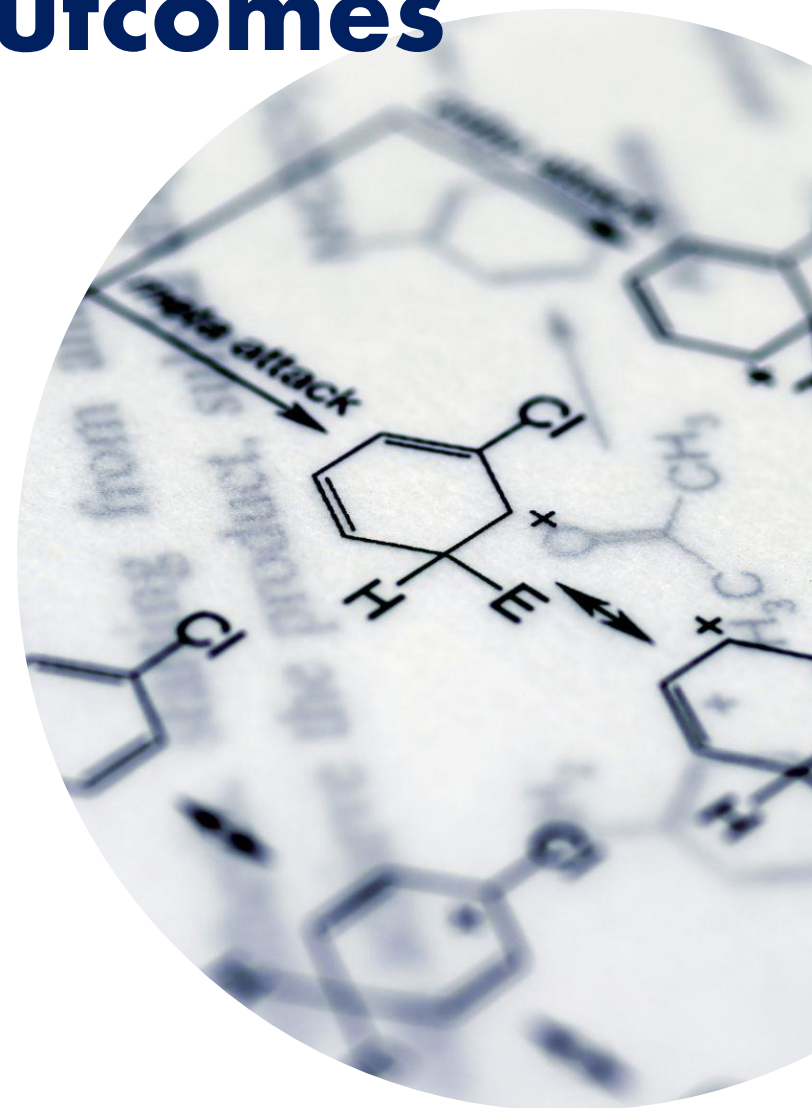
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# Pharmaceutical Specific Outcomes

## 1. The basic principles of organic pharmaceutical chemistry and structure-activity relationships that influence drug actions

You should understand:

- The principles of organic chemistry + structures of organic compounds + the reactions of organic functional groups in the synthesis of organic compounds of pharmaceutical importance and structure determination of unknown compounds;
- Principles of quantitative + qualitative chemical analysis of substances of pharmaceutical importance;
- Organic medicinal and pharmaceutical compounds - special emphasis on correlation of structural, physicochemical and chemical properties with biological activity, drug sources, mechanisms of drug action, drug design and selectivity, drug incompatibility and drug interactions;
- Drug structures and structure-activity relationships, mechanisms of action and other factors that influence drug action within specific drug classes.





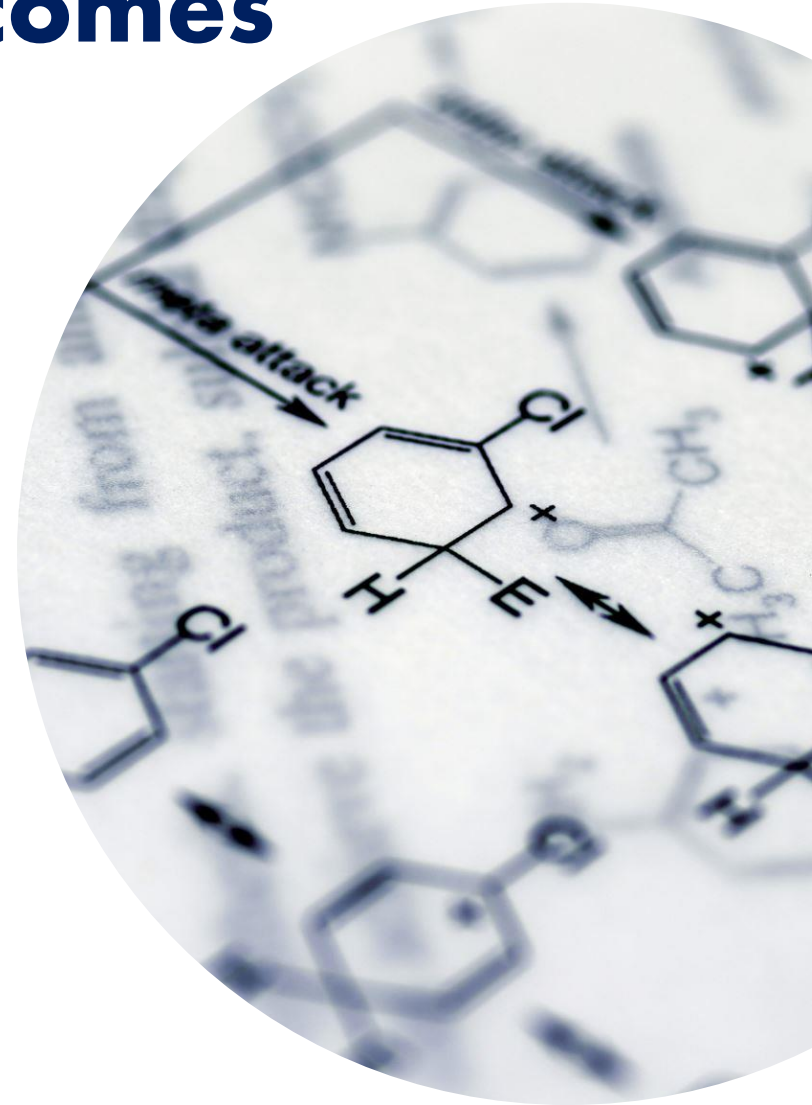
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# Pharmaceutical Specific Outcomes

## 2. General principles in molecular mechanisms of drug action

You should have an understanding of:

- (a) The general principles of drug action and the pharmacological activities of various classes of drugs with a major focus on the molecular mechanisms of drug action.







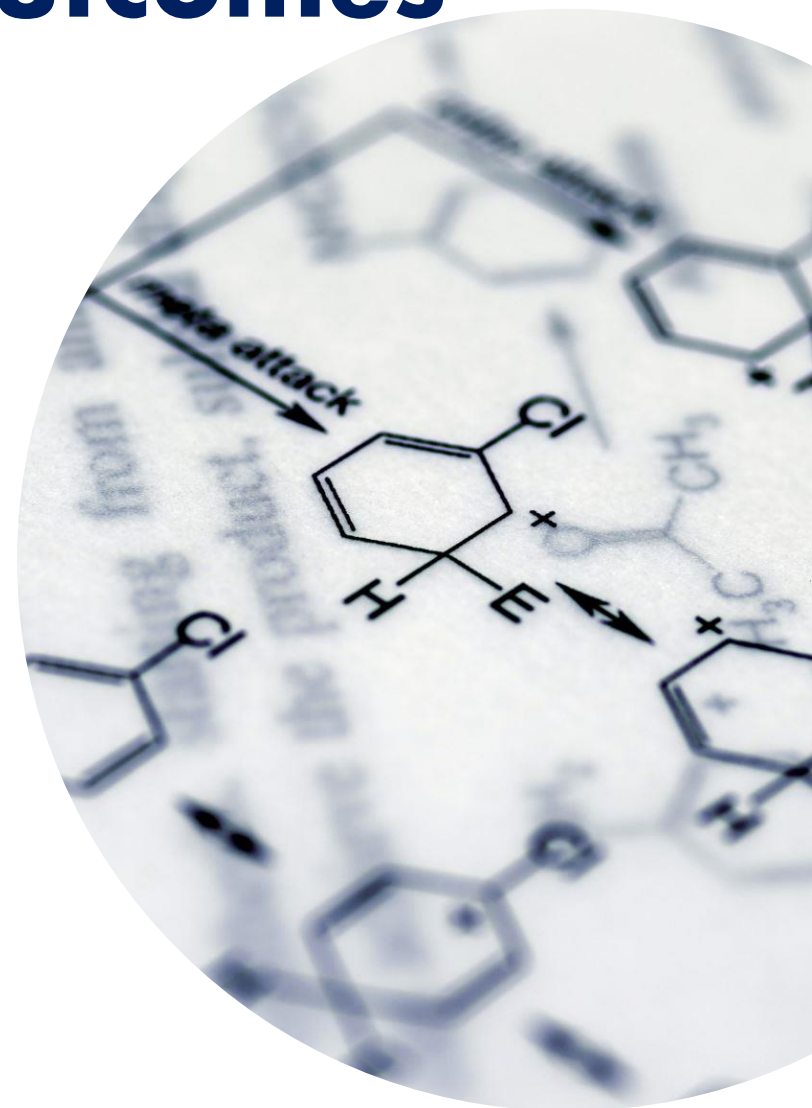
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# Pharmaceutical Specific Outcomes

## 3. Analysis of substances of pharmaceutical importance

You should be able to describe the application of physical methods used in the identification, separation and structure determination of organic compounds, i.e.:

- Weight and volumetric analysis, including neutralisation, precipitation analysis and complexometry;
- Mass spectrometry;
- Thin-layer, column, and gas-liquid chromatography;
- Infrared, ultraviolet and nuclear magnetic resonance spectroscopy.
- Calculation and interpretation of properties of chemical solutions, e.g. acid-base properties, molarity, etc.





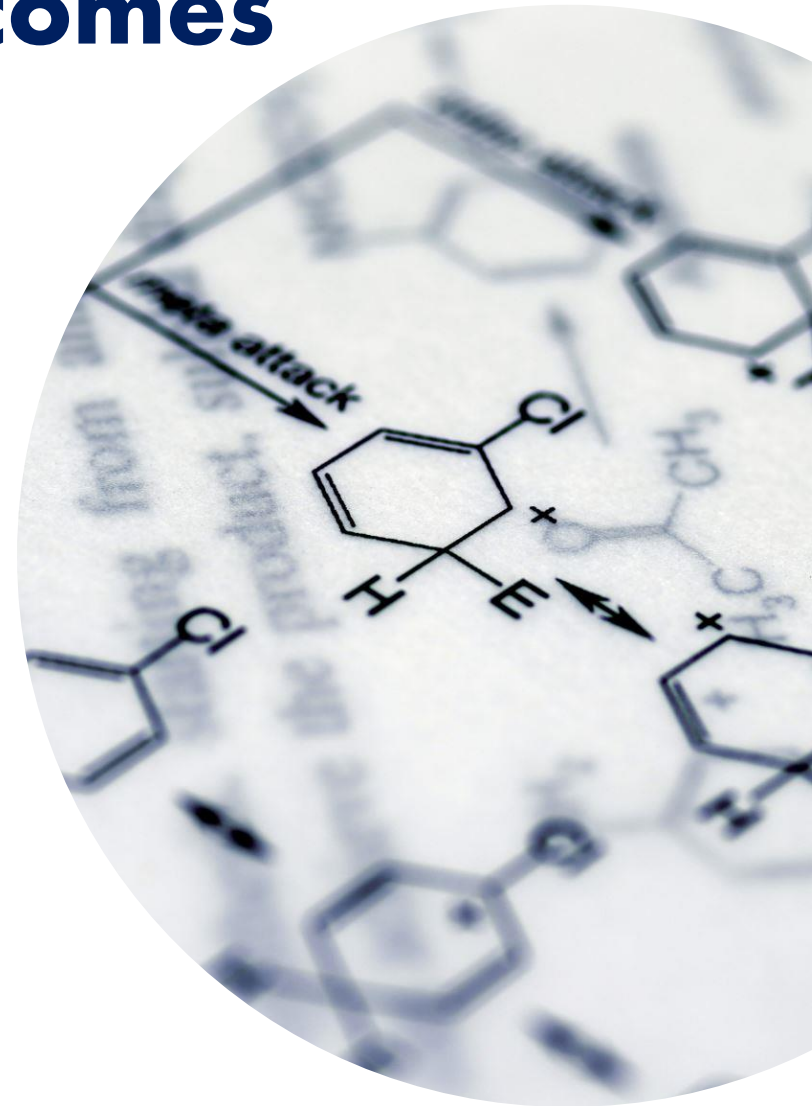
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# Pharmaceutical Specific Outcomes

## 4. The actions of drugs in biochemical terms

You should have a thorough understanding of + be able to interpret the actions of drugs in biochemical terms, including:

- The structures, functions and transformations occurring within living cells in terms of established chemical principles;
- The structures and functions of drug molecules, biopolymers, nucleic acids and proteins;
- The effect of drugs on metabolism and regulation of cellular processes.





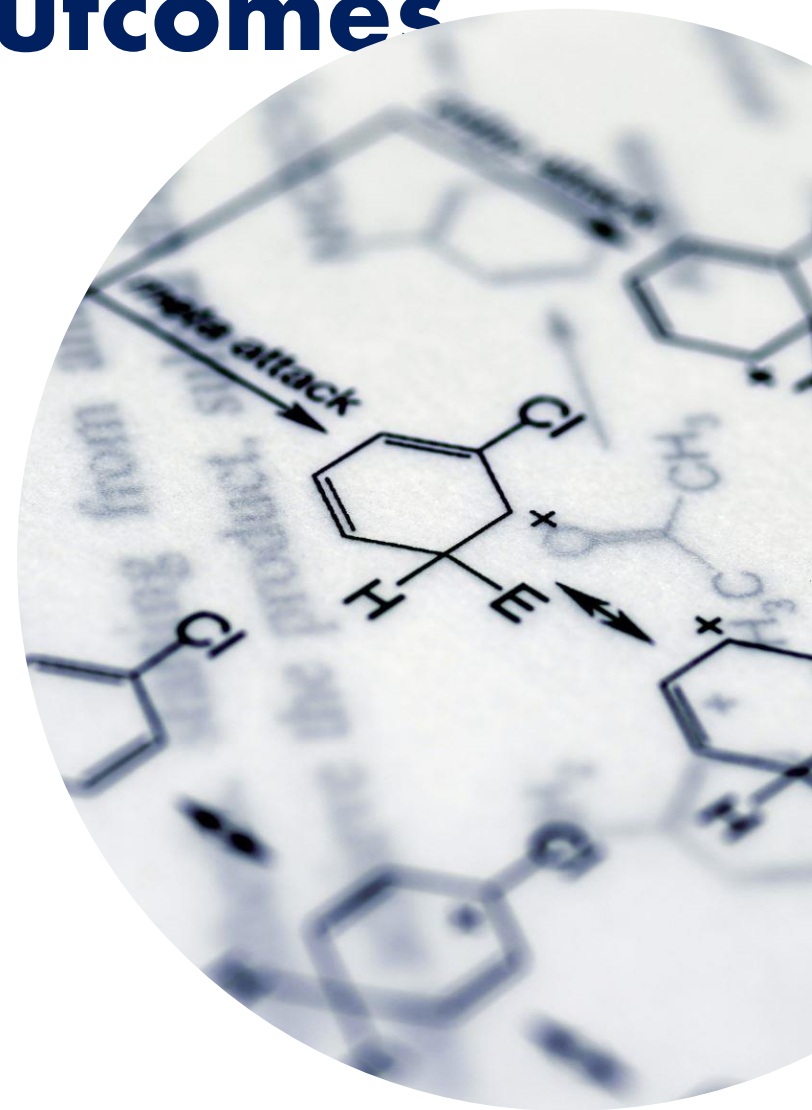
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# Pharmaceutical Specific Outcomes

## 5. Pharmaceutical chemistry in drug design

You should understand:

- (a) Molecular orbital theory in drug design;
- (b) Electronic and symmetry properties of drug molecules;
- (c) Conformation and its impact on drug action and on reaction mechanisms.



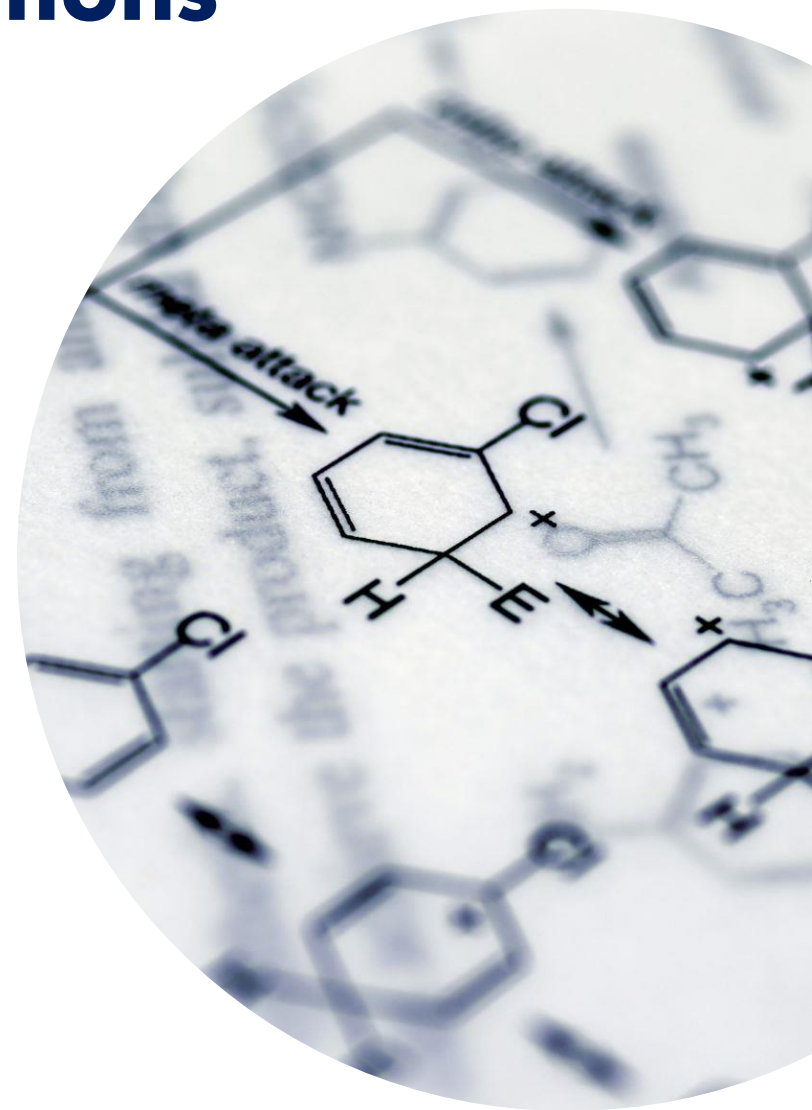


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# Pharmaceutical Chemistry Questions

The pKa of aspirin is 3.5. What is the percentage of aspirin that is unionized at a gastric pH of 1.5?

- (a) 1%
- (b) 9%
- (c) 90.9%
- (d) 99%





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# Solution Calculation

Henderson–Hasselbalch equation:

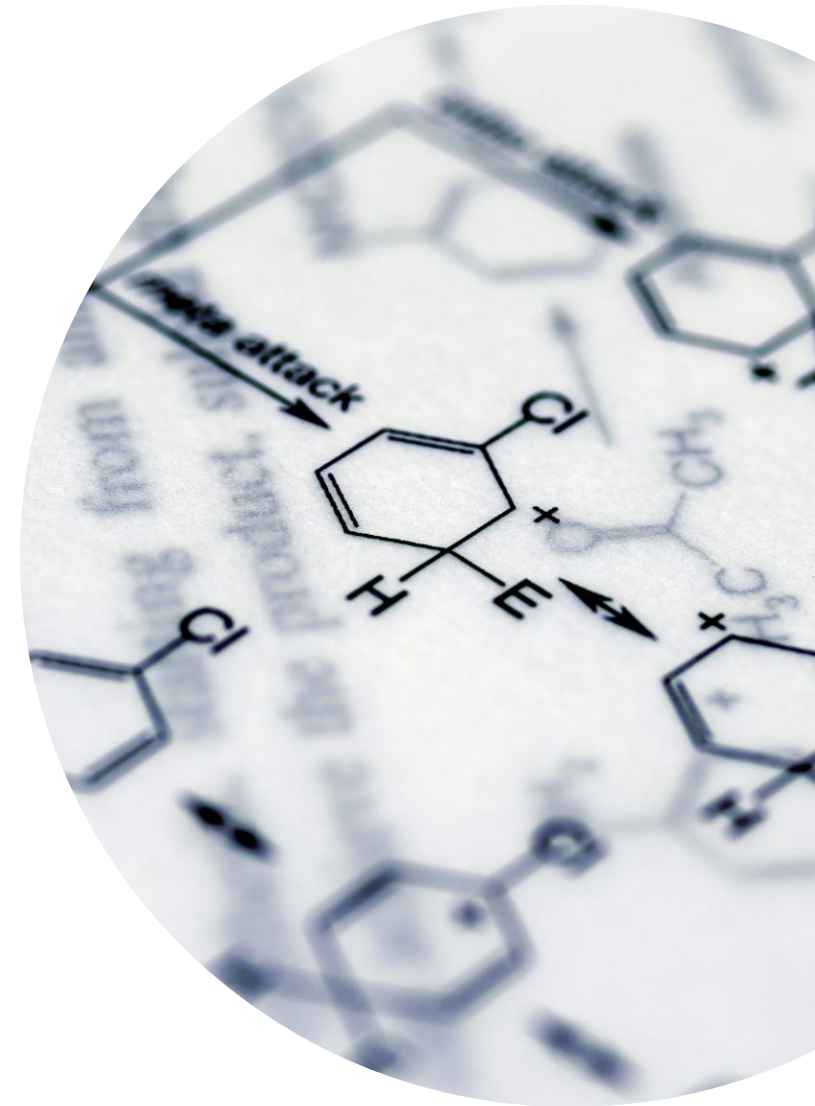
$$\text{pH} = \text{pK}_a + \log\left(\frac{[\text{A}^-]}{[\text{HA}]}\right)$$

$$1.5 = 3.5 + \log\left(\frac{[\text{A}^-]}{[\text{HA}]}\right)$$

$$\frac{[\text{A}^-]}{[\text{HA}]} = \text{antilog}(-2)$$

$$\frac{[\text{A}^-]}{[\text{HA}]} = 0.01$$

- Therefore 1% ionized and 99% unionized



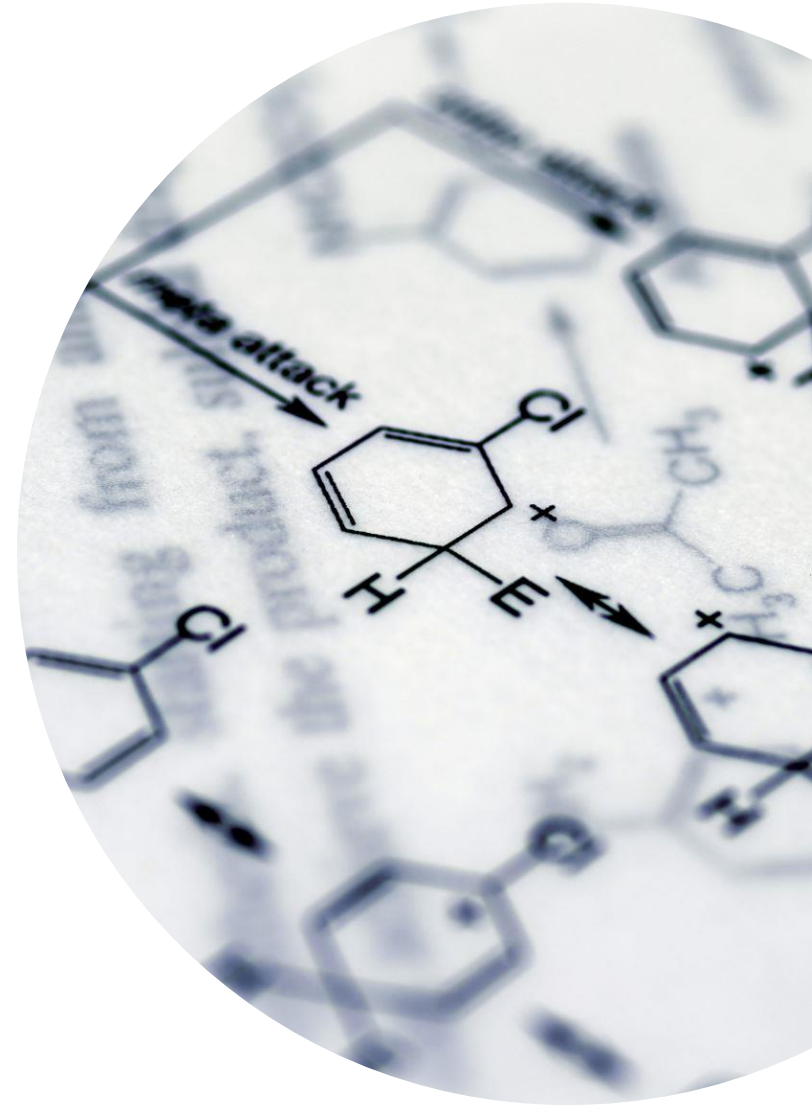


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# Answer

The pKa of aspirin is 3.5. What is the percentage of aspirin that is unionized at a gastric pH of 1.5?

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- (c) 90.9%
- (d) **99%**



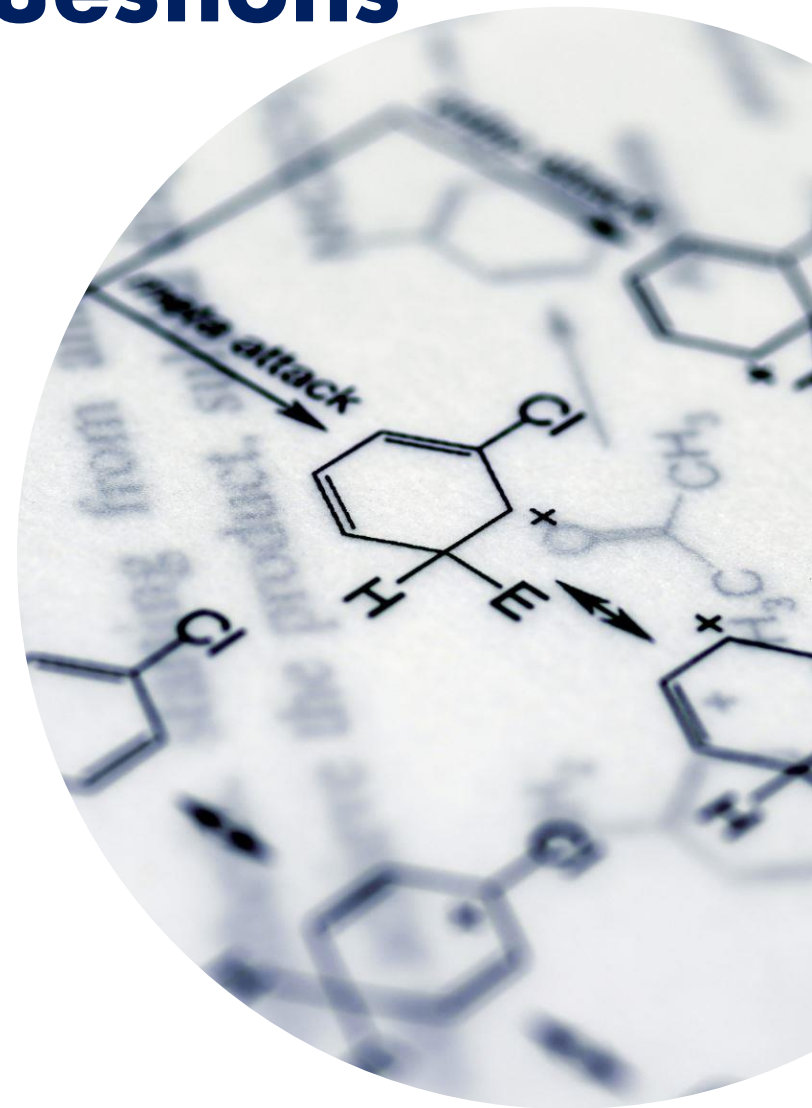


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# Pharmaceutical Chemistry Questions

An unknown amount (in grams) of the antifungal miconazole (MW = 416.129 g/mol) was dissolved in 50 mL of solvent to form a solution with a concentration of 0.001 M. Determine the mass of miconazole used to form this solution:

- (a) 0.0416 g
- (b) 0.0208 g
- (c) 0.0042 g
- (d) 0.0021 g





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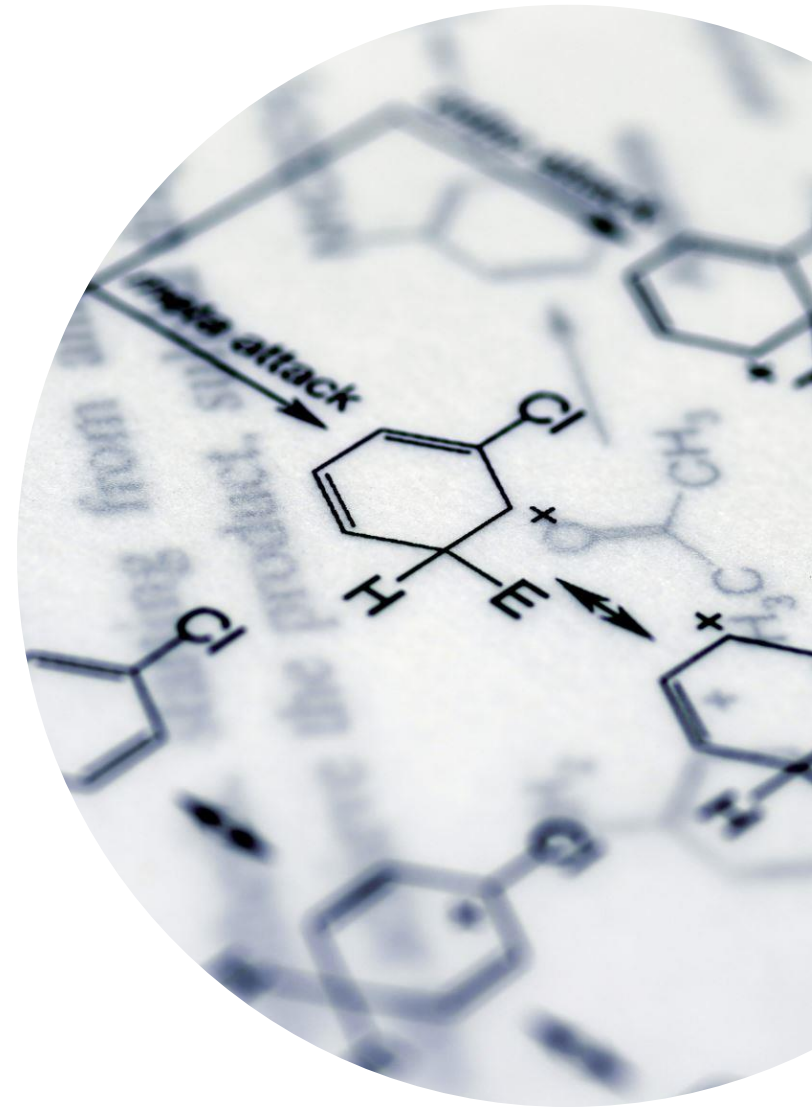
# Solution Calculation

$$c = n/V = m/MV$$

$$0.001 \text{ mol/L} = m / (416 \text{ g/mole} \times 0.05 \text{ L})$$

$$m = 0.001 \text{ mol/L} \times 416 \times 0.05$$

$$m = 0.0208 \text{ g}$$





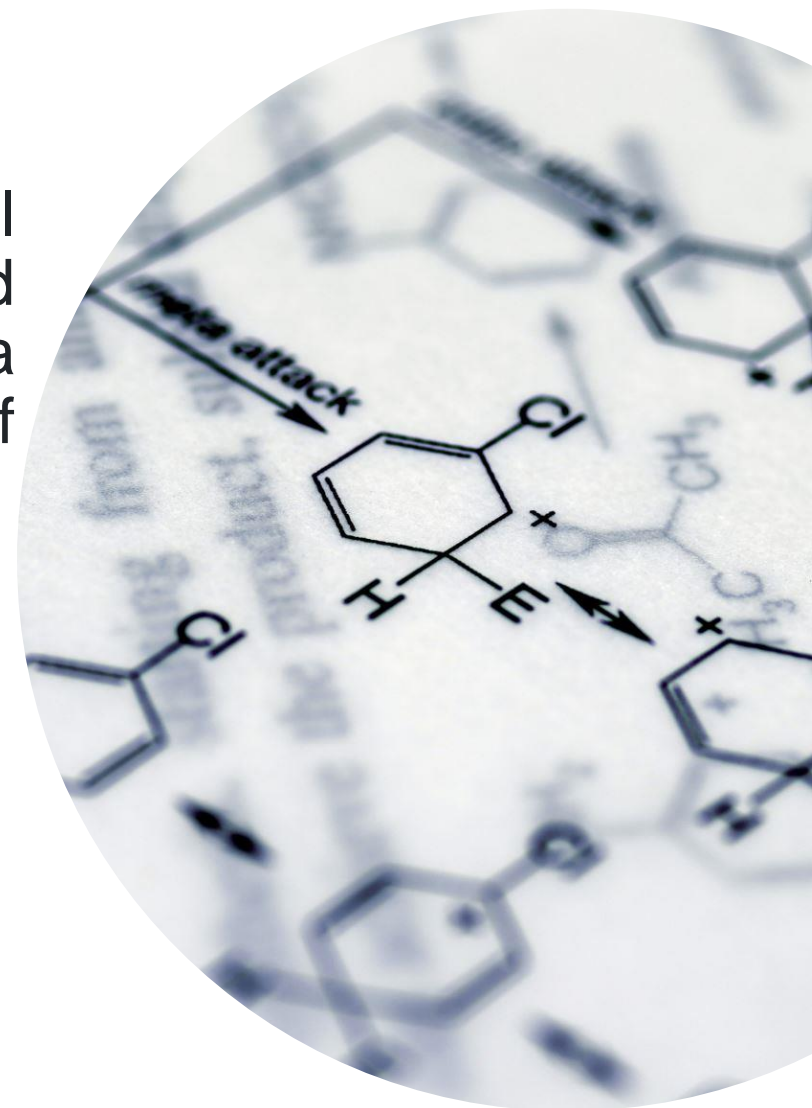


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# Answer

An unknown amount (in grams) of the antifungal miconazole (MW = 416.129 g/mol) was dissolved in 50 mL of solvent to form a solution with a concentration of 0.001 M. Determine the mass of miconazole used to form this solution:

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- (b) 0.0208 g**
- (c) 0.0042 g
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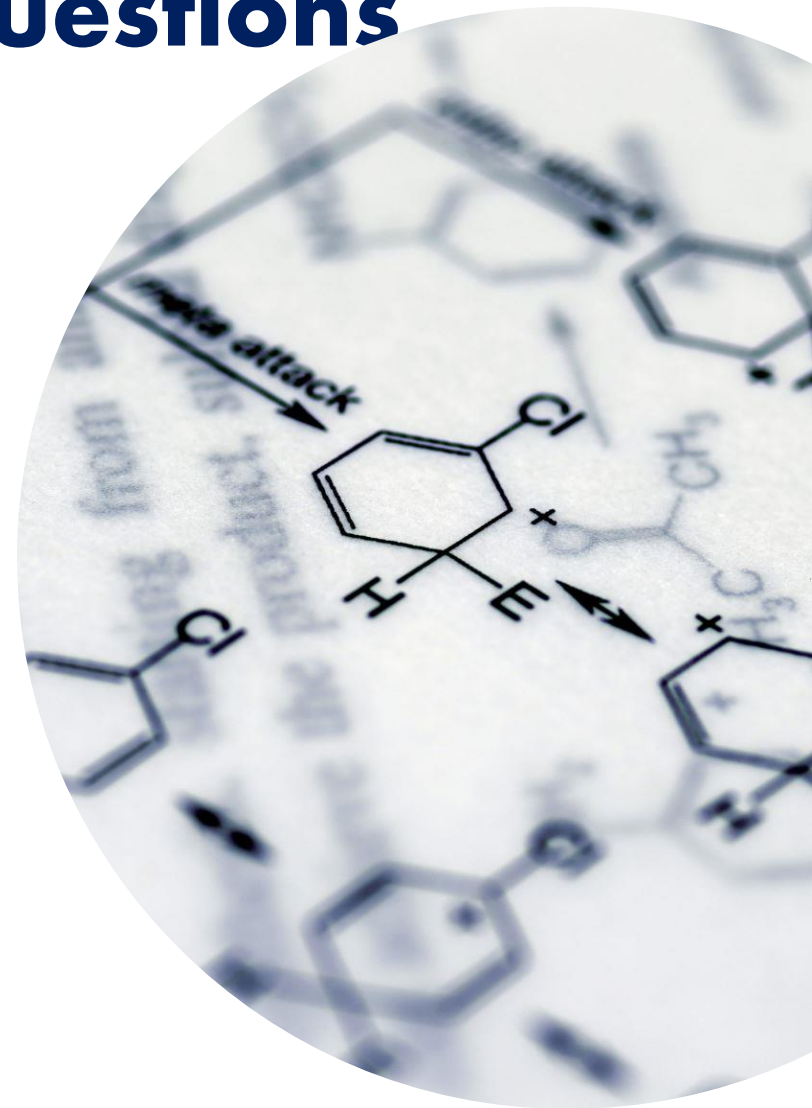
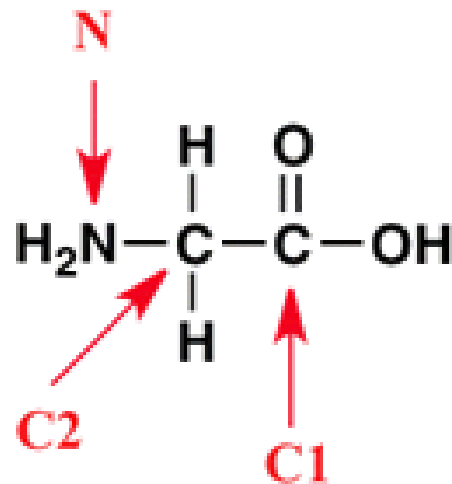


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# Pharmaceutical Chemistry Questions

What is the hybridisation of the indicated nitrogen atom?

- (a) s
- (b) sp
- (c) sp<sup>2</sup>
- (d) sp<sup>3</sup>



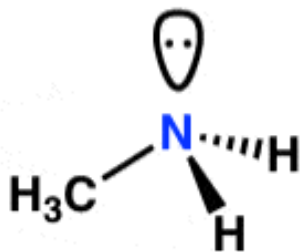


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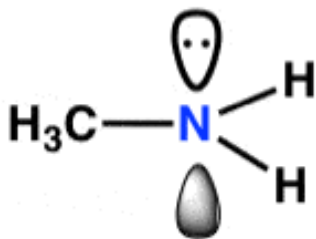
# Problem Solving

**Amines favor a tetrahedral ( $sp^3$ -hybridized) geometry due to the minimization of electron pair repulsions:**

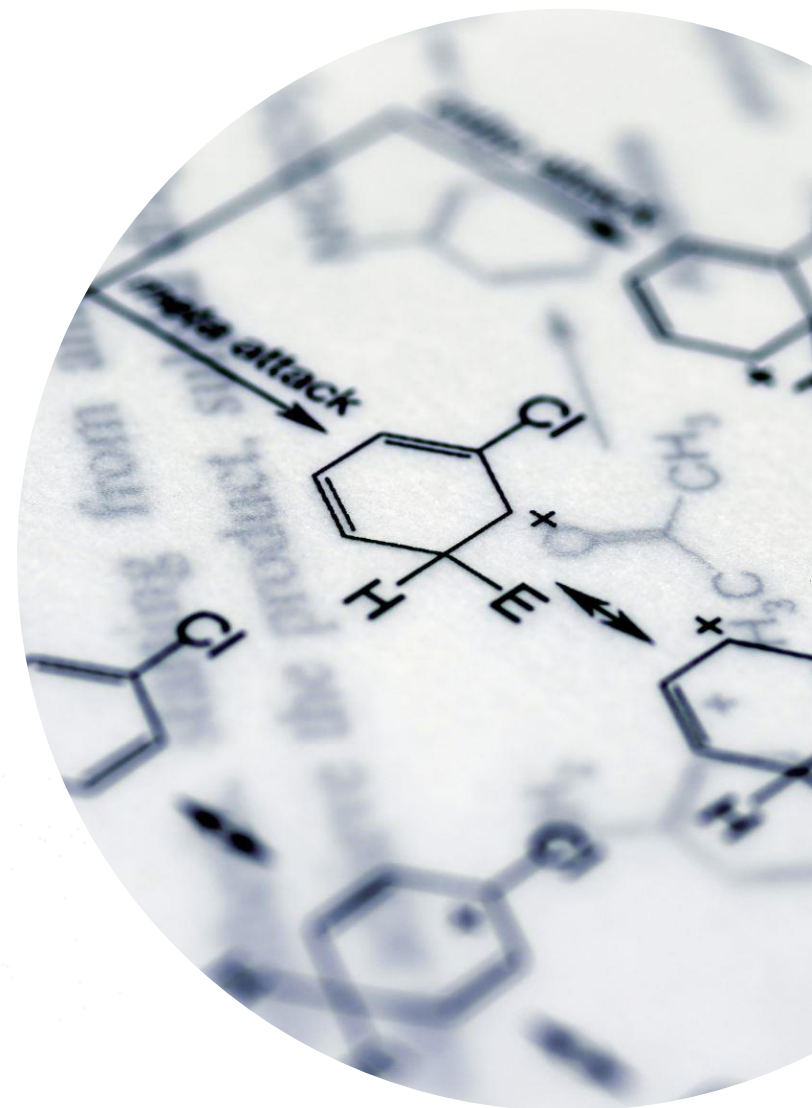
Tetrahedral ( $sp^3$ ) amine



Trigonal planar ( $sp^2$ ) amine



typical difference in energy  
for an amine is about 5 kcal/mol



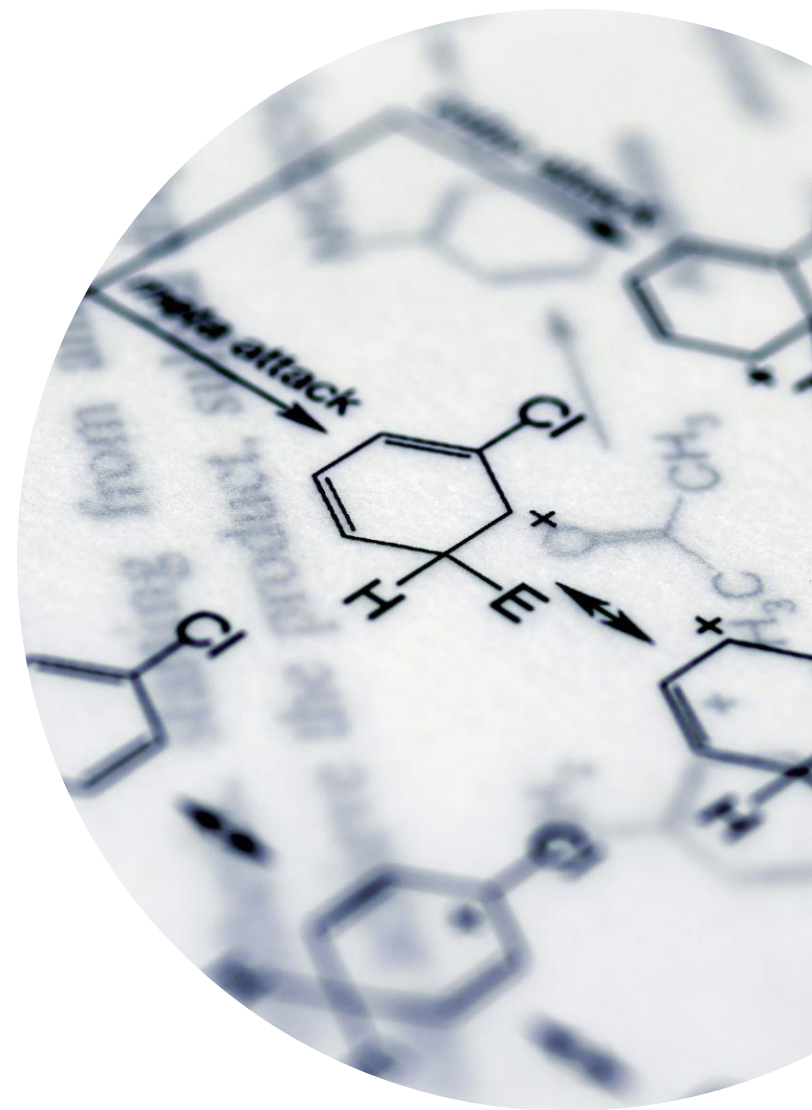
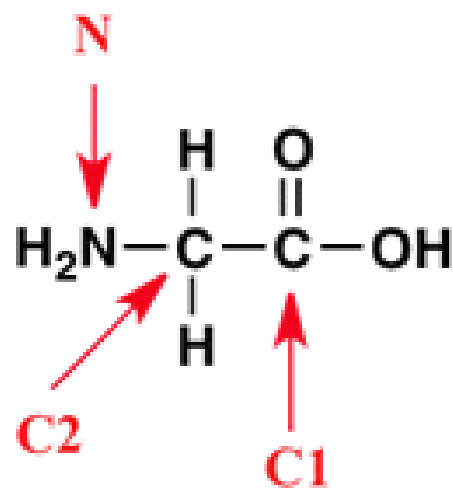


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# Answer

What is the hybridisation of the indicated nitrogen atom?

- (a) s
- (b) sp
- (c) sp<sup>2</sup>
- (d) sp<sup>3</sup>**



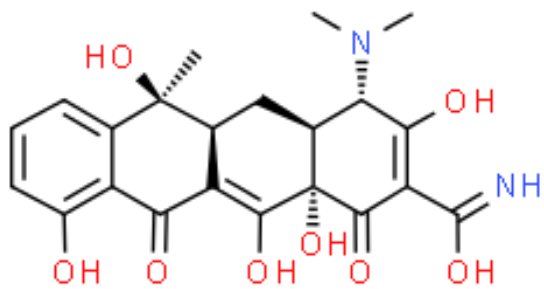


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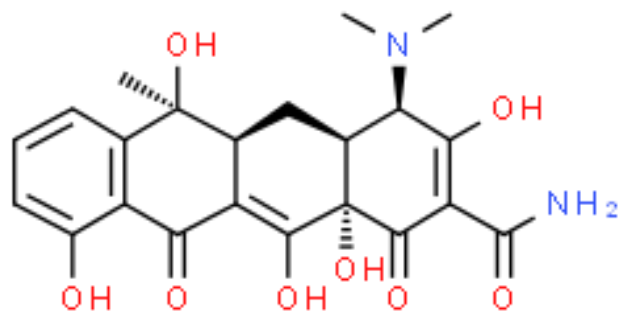
# Pharmaceutical Chemistry Questions

The molecules, tetracycline and epi-tetracycline, can be considered to be:

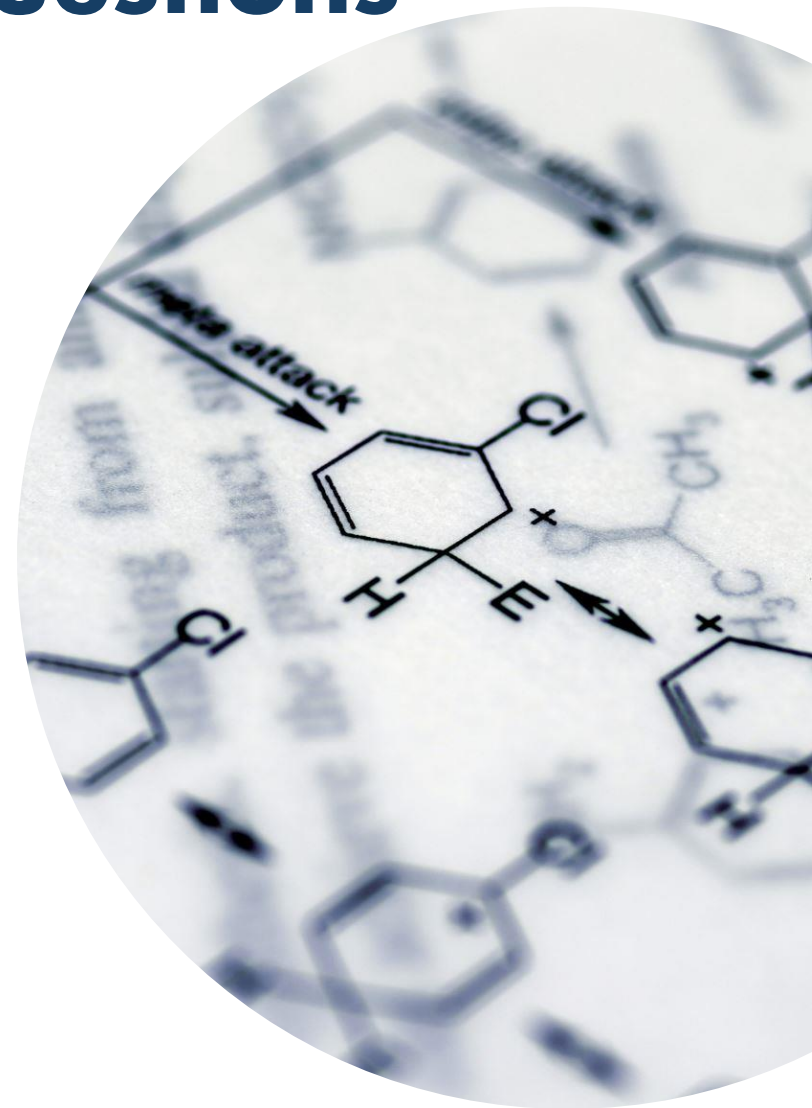
- (a) Diastereomers
- (b) Drug and pro-drug, respectively
- (c) Regioisomers
- (d) Equally active



Tetracycline



Epi-tetracycline

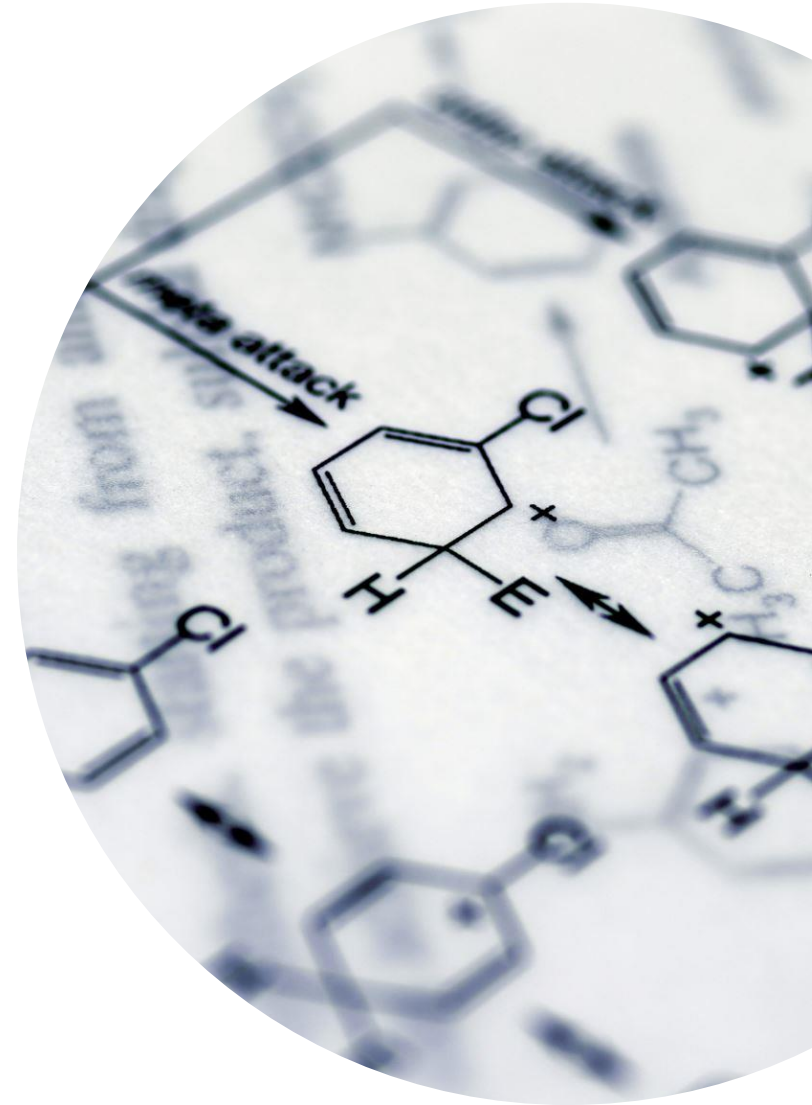




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# Problem Solving

- Diastereomers are defined as compounds which have the same molecular formula and sequence of bonded elements but which are non-superimposable, non-mirror images.
- Epimerisation is a process in stereochemistry in which there is a change in the configuration of only one chiral center. As a result, a **diastereomer** is formed. In acidic conditions around pH 4, **tetracycline readily undergoes epimerization at position 4**, and an **inactive 4-epi tetracycline** is produced.
- Regioisomers are constitutional isomers that have the same functional groups attached at different positions of the molecular backbone.
- Epi-tetracycline is not a pro-drug of tetracycline



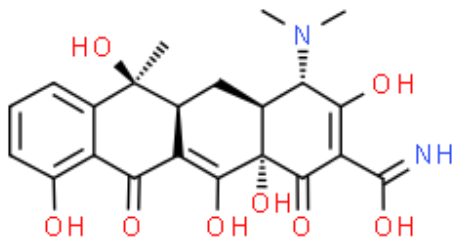


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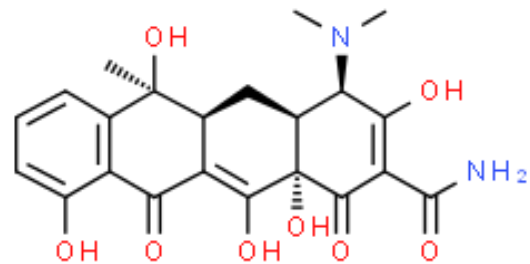
# Answer

The molecules, tetracycline and epi-tetracycline, can be considered to be:

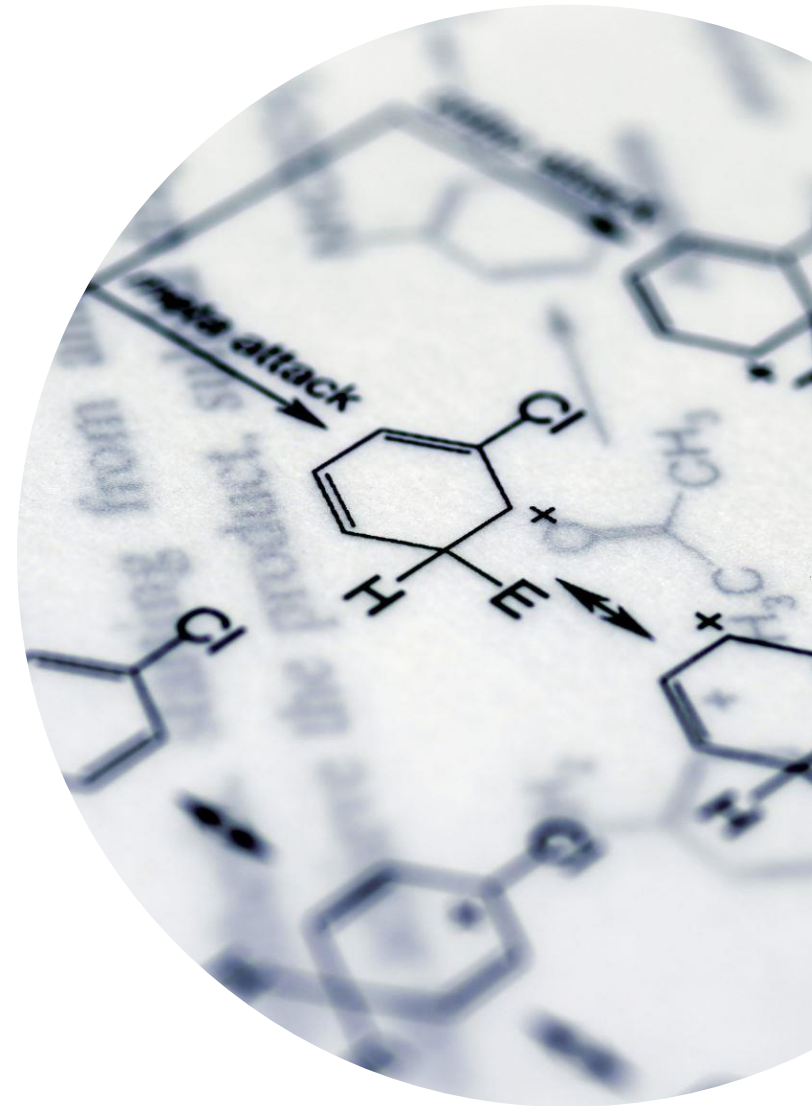
- (a) **Diastereomers**
- (b) Drug and pro-drug, respectively
- (c) Regioisomers
- (d) Equally active



Tetracycline



Epi-tetracycline



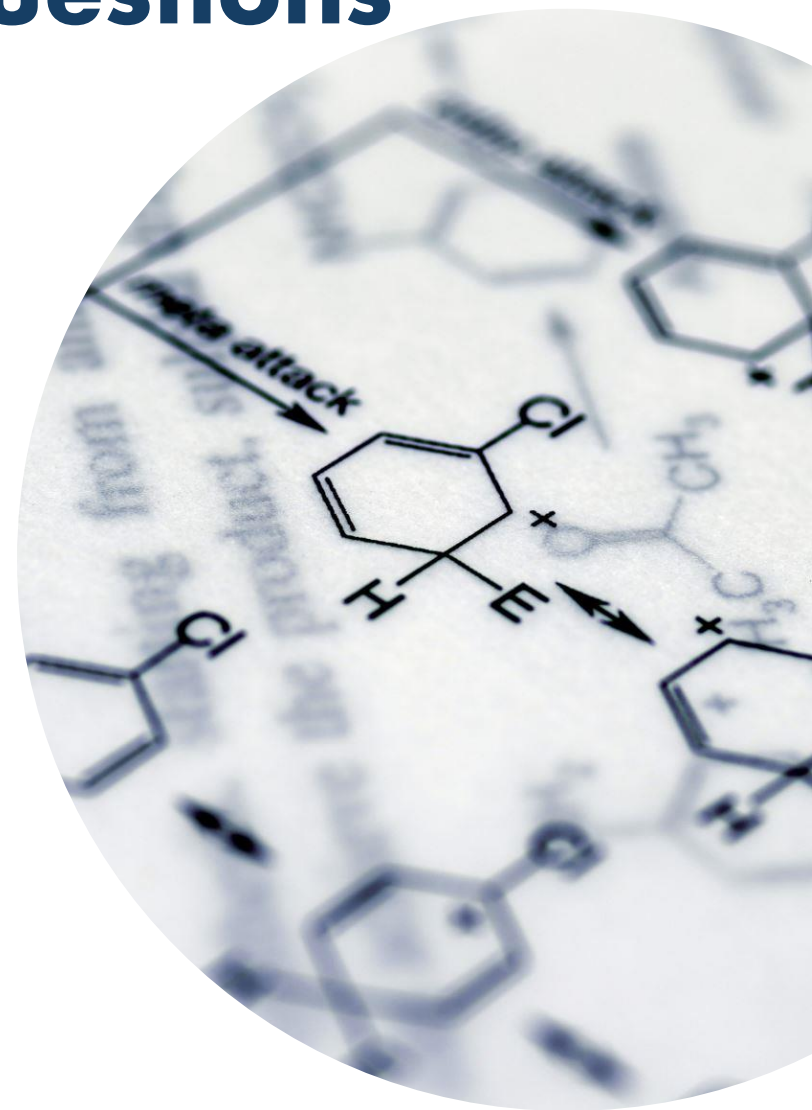
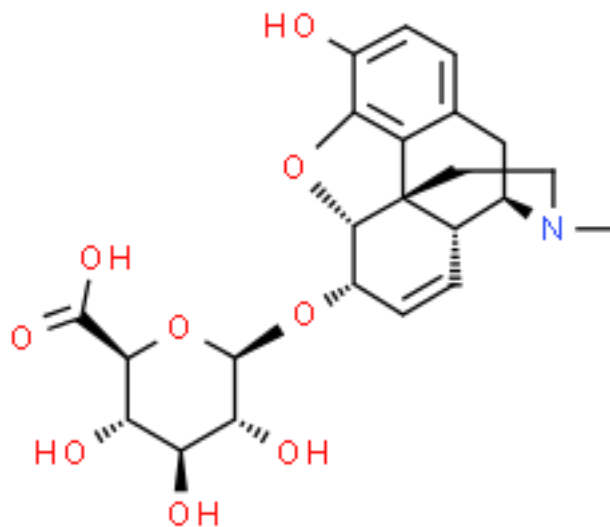


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# Pharmaceutical Chemistry Questions

The opioid derivative below is the product of:

- (a) Glucuronidation of codeine at position 3
- (b) Glucuronidation of morphine at position 3
- (c) Glucuronidation of codeine at position 6
- (d) Glucuronidation of morphine at position 6





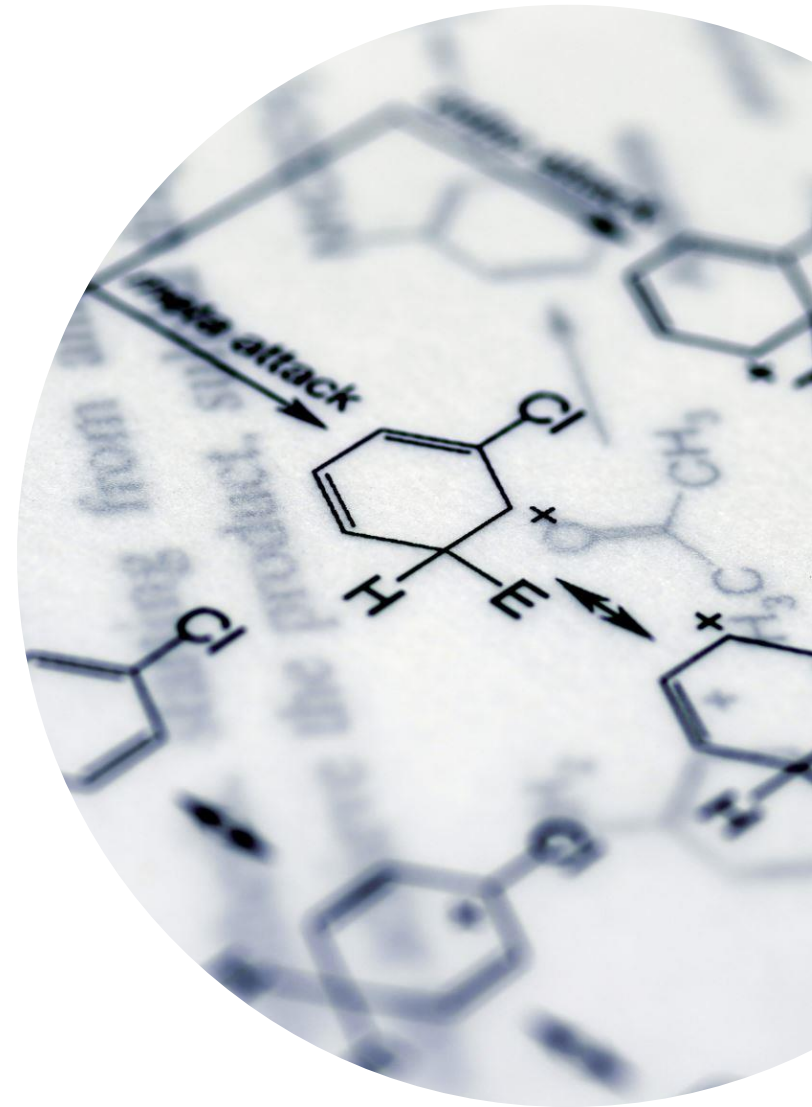
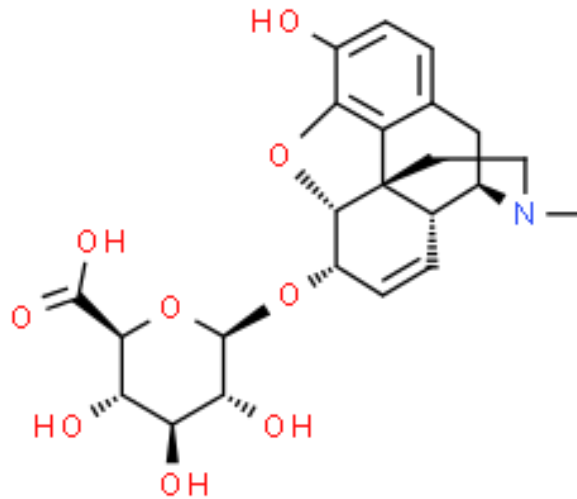


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# Answer

The opioid derivative below is the product of:

- (a) Glucuronidation of codeine at position 3
- (b) Glucuronidation of morphine at position 3
- (c) Glucuronidation of codeine at position 6
- (d) Glucuronidation of morphine at position 6**



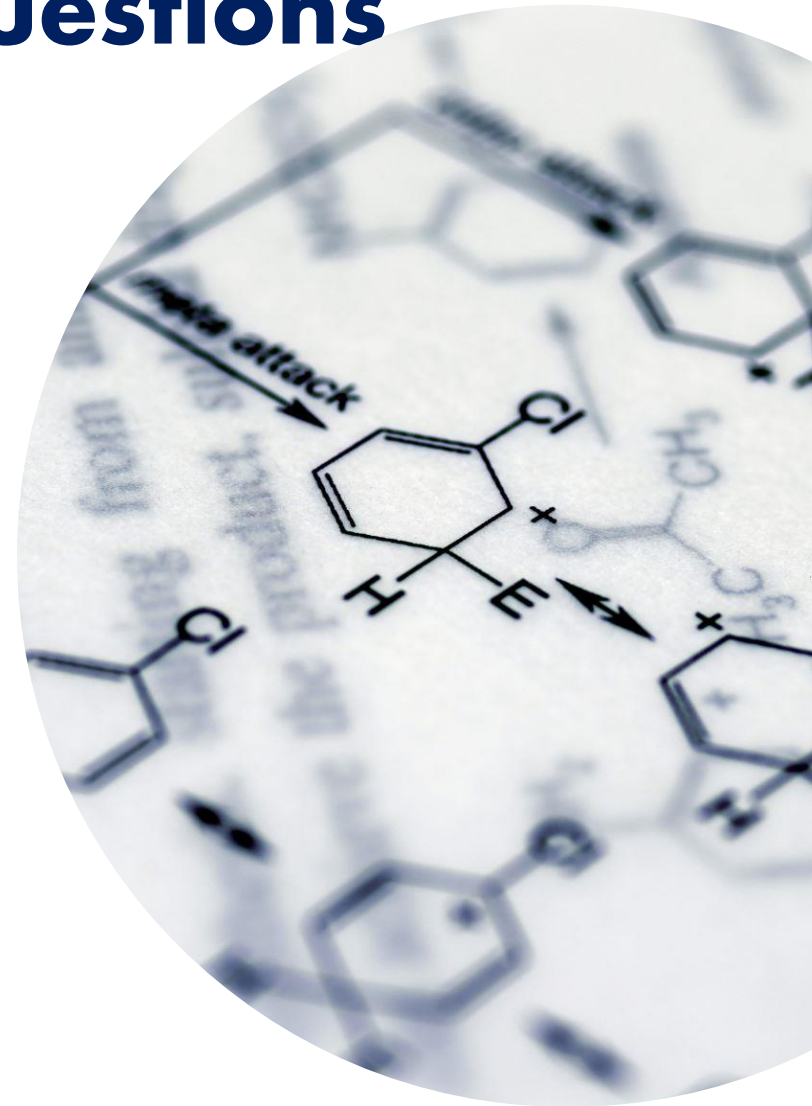
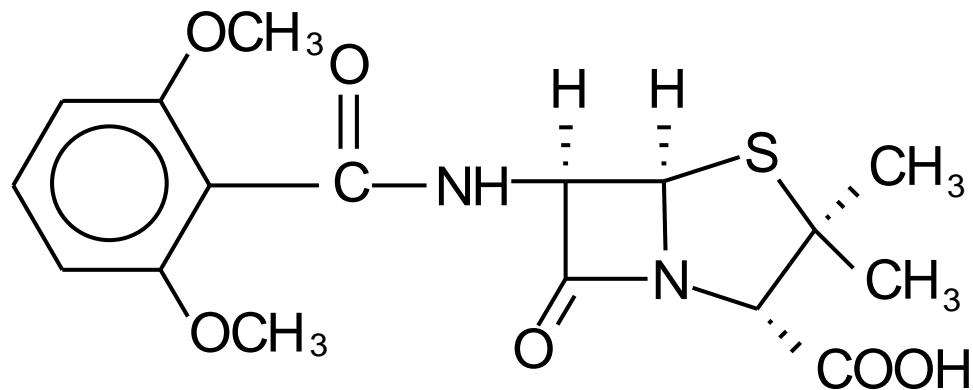


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# Pharmaceutical Chemistry Questions

To which pharmacological class does the attached structure belong?

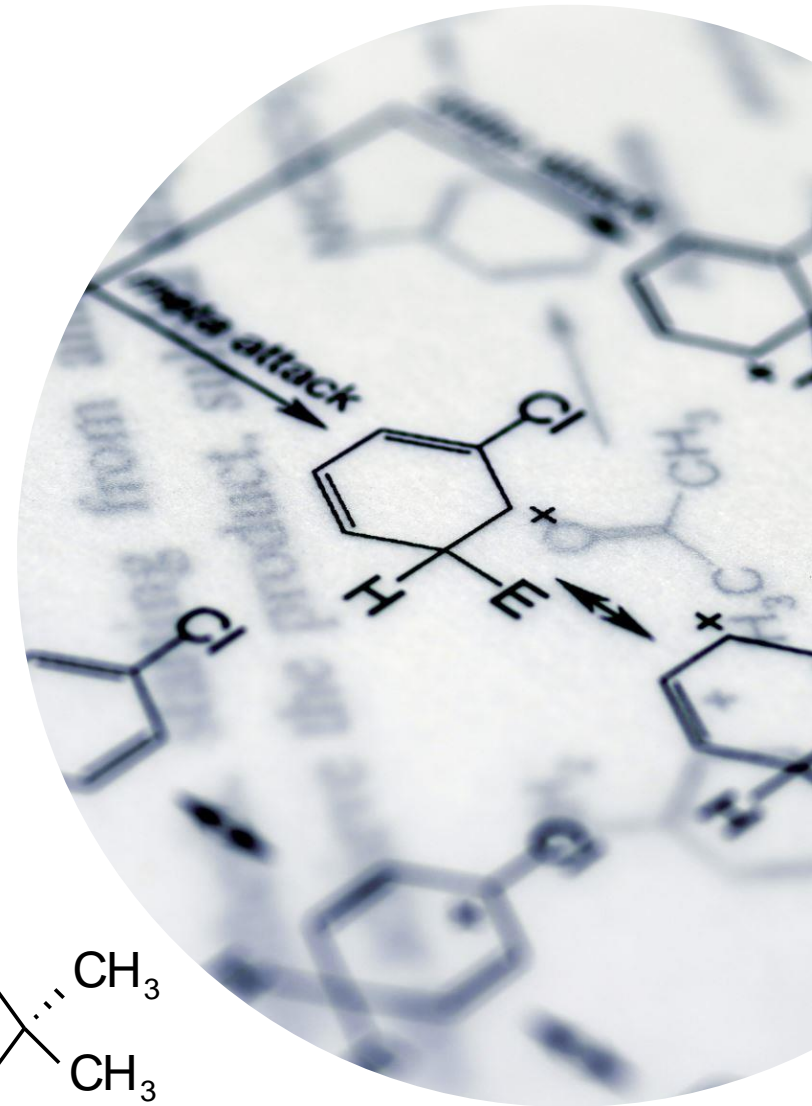
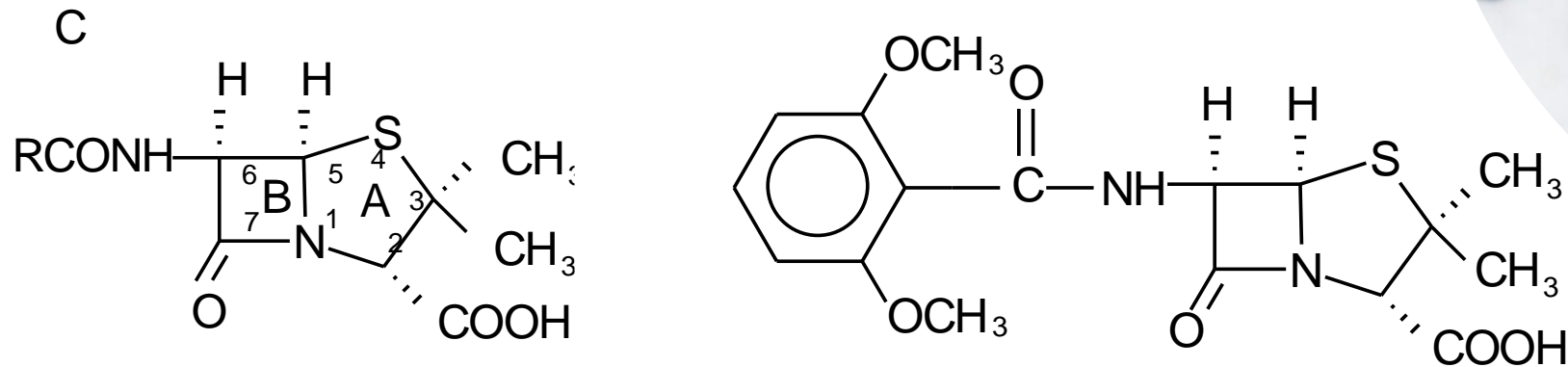
- (a) Aminoglycoside
- (b) Macrolide
- (c) Cephalosporin
- (d) Penicillin





# Problem Solving

- Structure has 4-membered  $\beta$ -lactam ring, therefore penicillin or cephalosporin
- Structure has a 5-membered thiazolidine ring, therefore cephalosporin
- The penicillin skeleton is a fusion of a  $\beta$ -lactam ring to a 6-membered thiazolidine ring
- Specific structure is methicillin



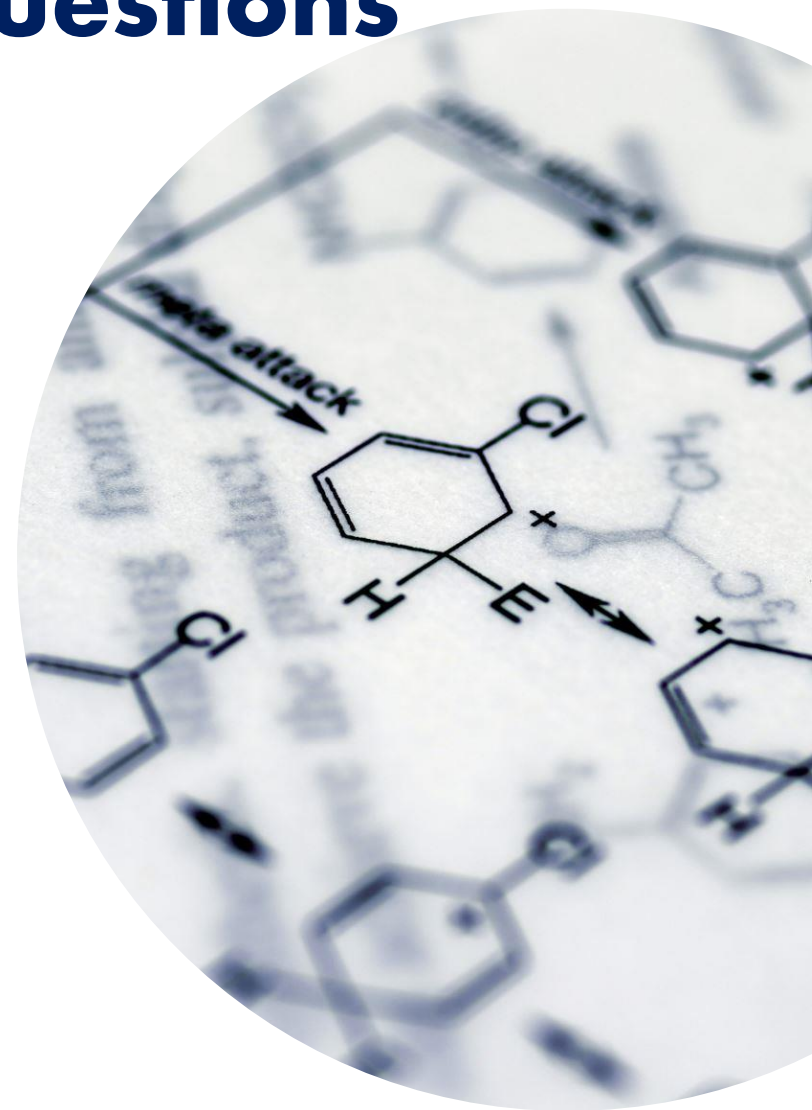
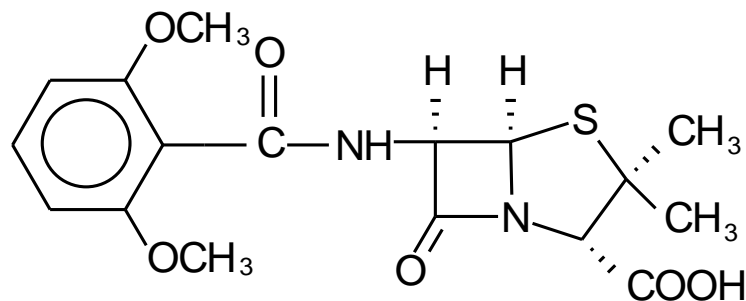


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# Pharmaceutical Chemistry Questions

To which pharmacological class does the attached structure belong?

- (a) Aminoglycoside
- (b) Macrolide
- (c) Cephalosporin
- (d) Penicillin**



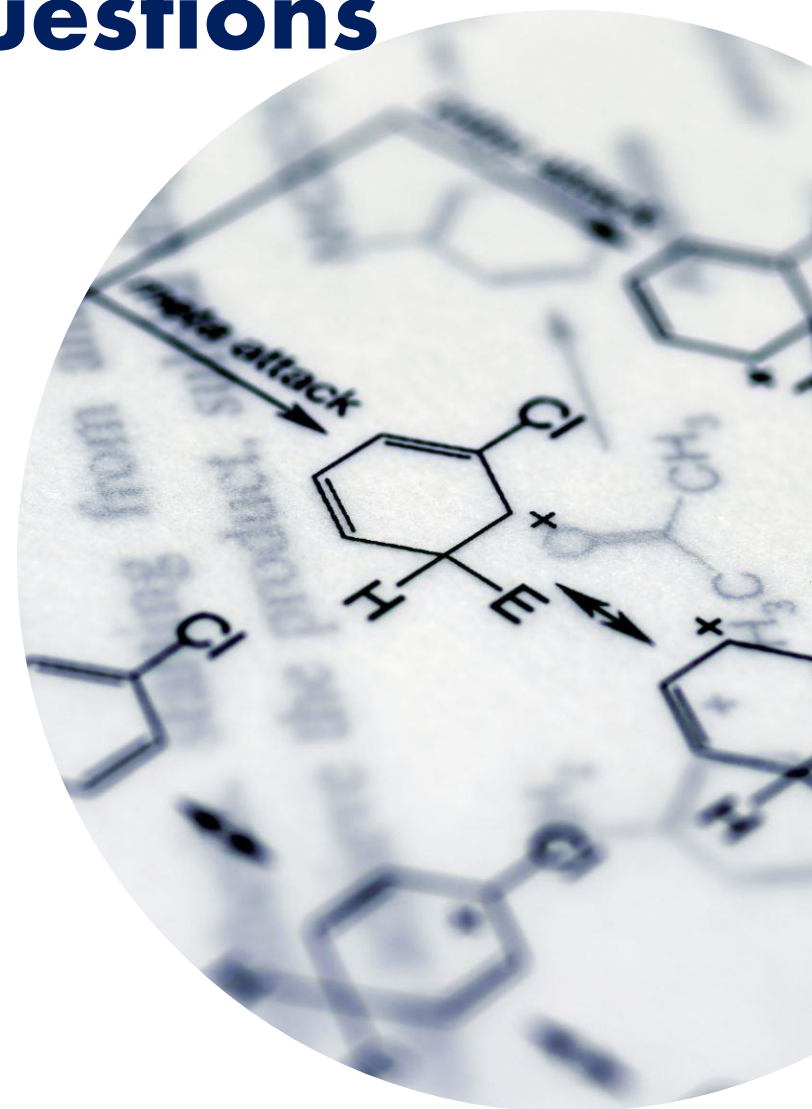
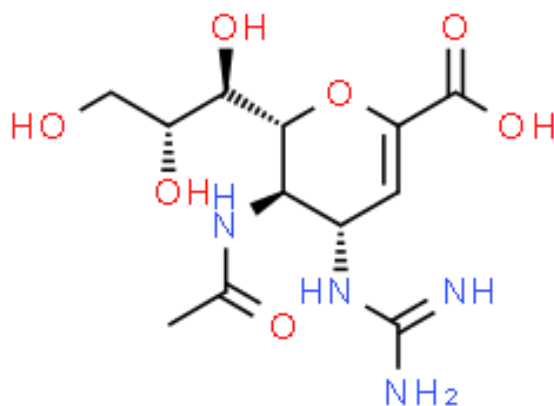


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# Pharmaceutical Chemistry questions

Zanamivir is used for the treatment of influenza A and B infections. How many stereocentres does the drug molecule possess?

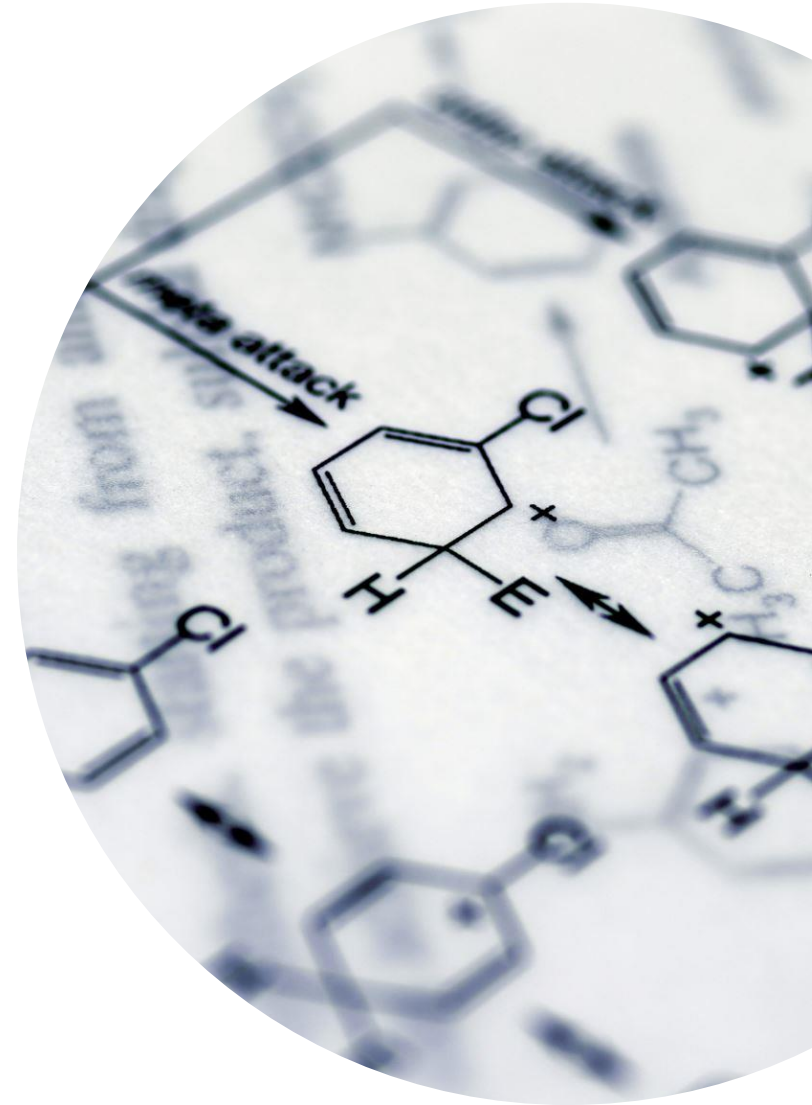
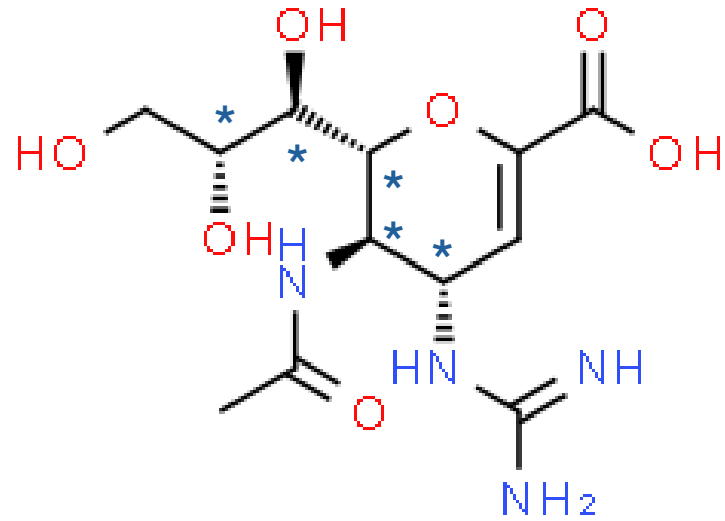
- (a) 3
- (b) 4
- (c) 5
- (d) 6





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# Problem Solving



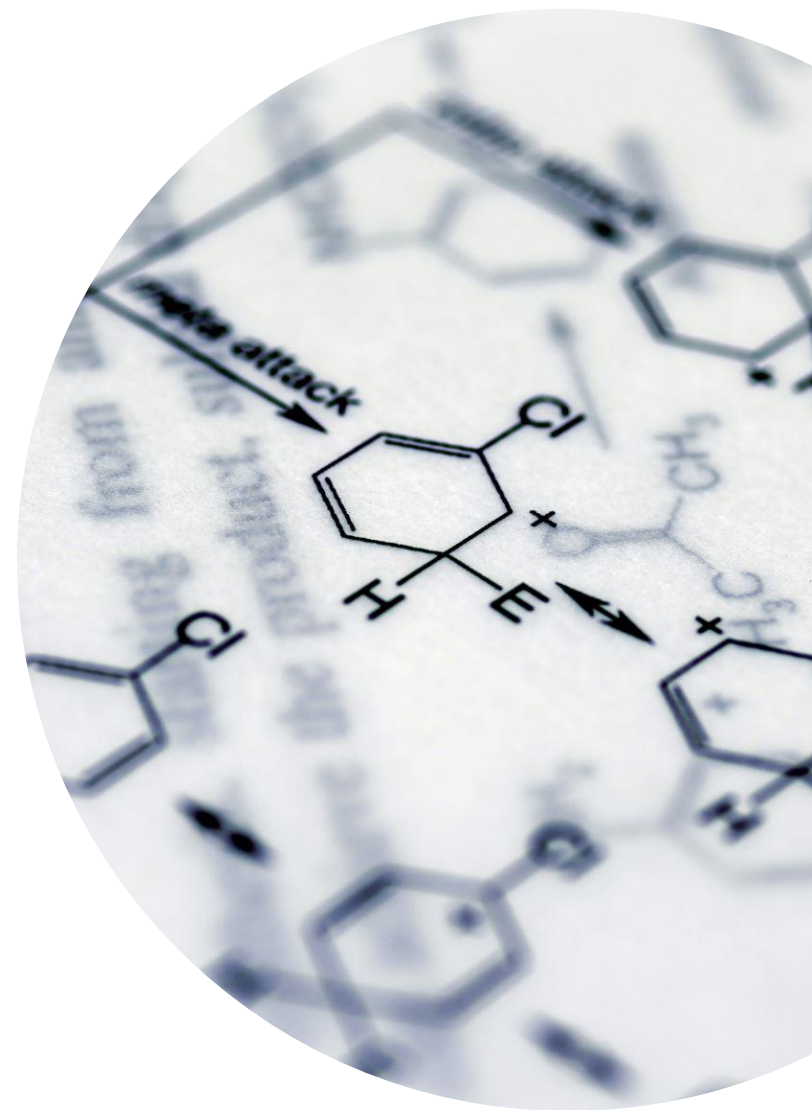
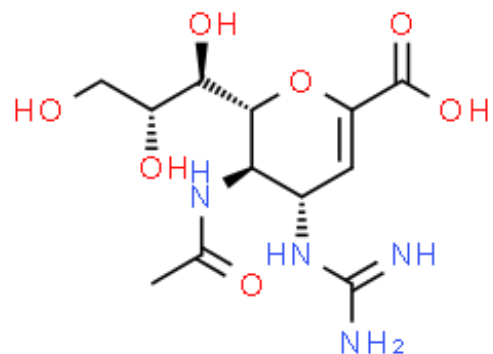


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# Answer

Zanamivir is used for the treatment of influenza A and B infections. How many stereocentres does the drug molecule possess?

- (a) 3
- (b) 4
- (c) 5**
- (d) 6



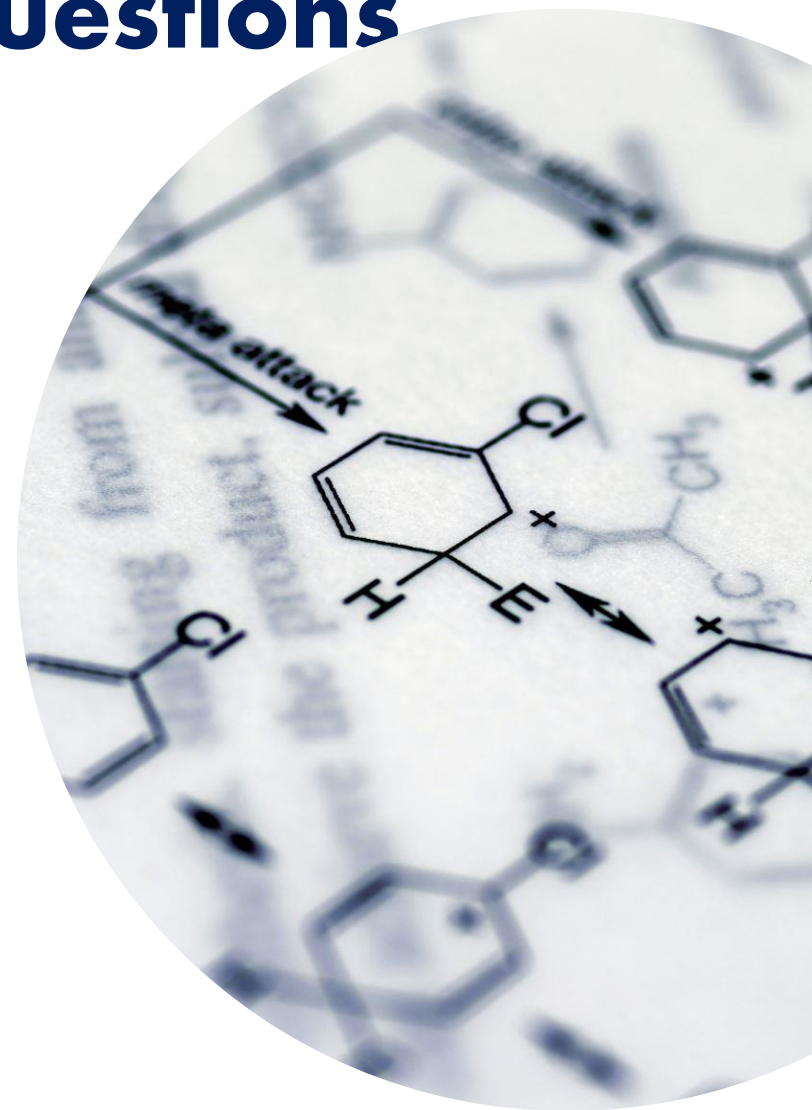


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# Pharmaceutical Chemistry Questions

The molar absorption coefficient of a compound (MW = 300 g/mol) is  $2000 \text{ M}^{-1}$  at 254 nm. What will the absorbance of a 0.006% (m/v) solution be at this wavelength?

- (a) 0.02
- (b) 0.04
- (c) 0.2
- (d) 0.4







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# Answer

Beer-Lambert's Law

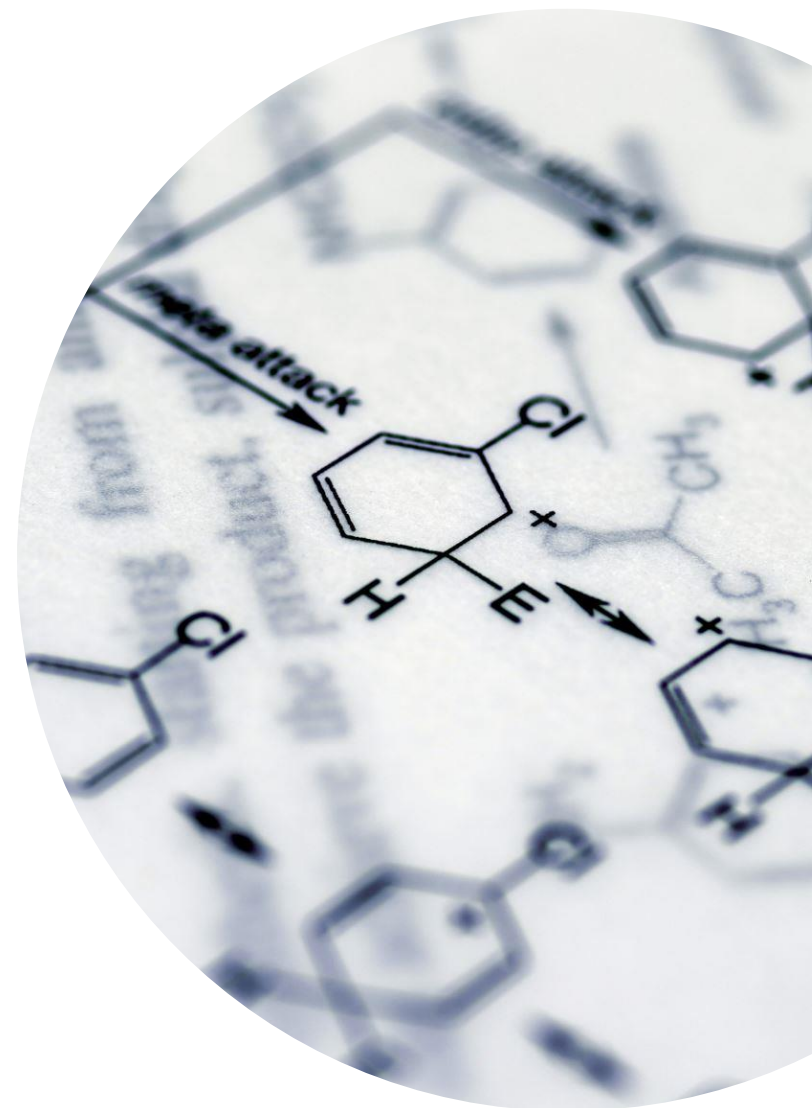
$$A = \epsilon bc$$

$$0.006\% = 0.006 \text{ g}/100\text{mL} = 0.06 \text{ g}/\text{L}$$

$$0.06/300\text{g}/\text{mol} = 0.0002\text{mol}/\text{L}$$

$$A = 2000 \times 1\text{cm} \times 0.0002$$

$$A = 0.4$$



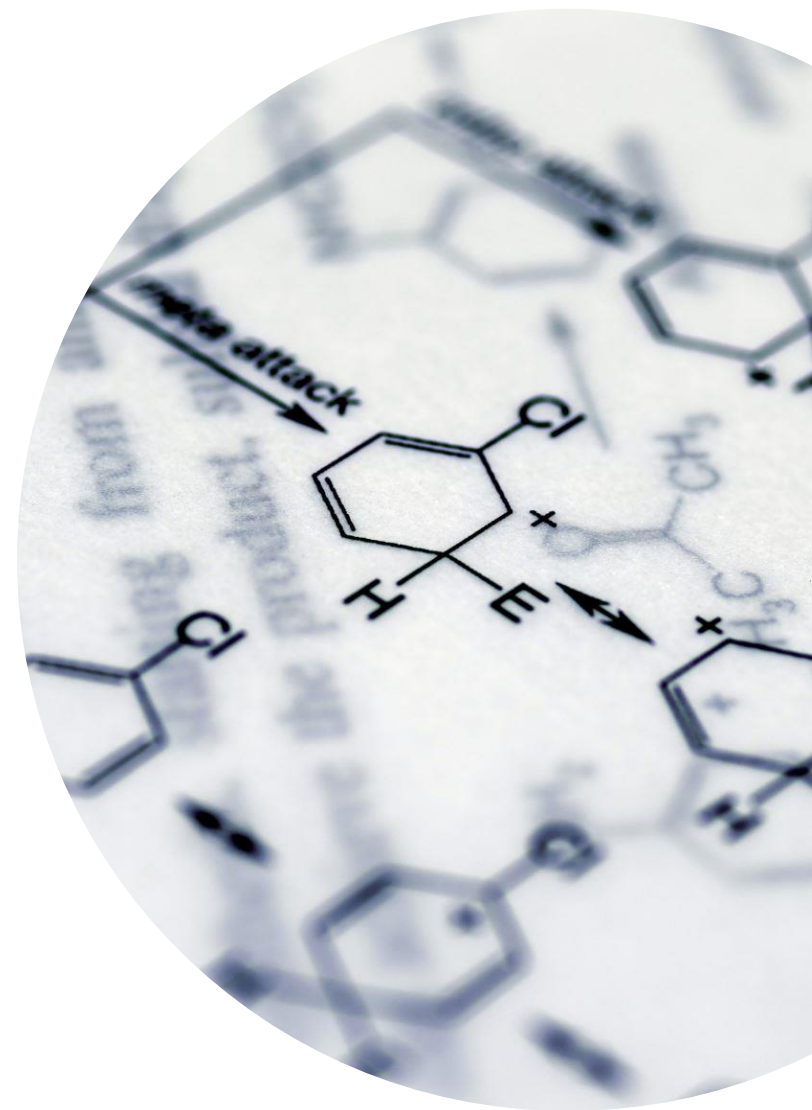


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# Answer

The molar absorption coefficient of a compound (MW = 300 g/mol) is  $10000 \text{ M}^{-1}$  at 254 nm. What will the absorbance of a 0.003% (m/v) solution be at this wavelength?

- (a) 0.02
- (b) 0.04
- (c) 0.2
- (d) 0.4**



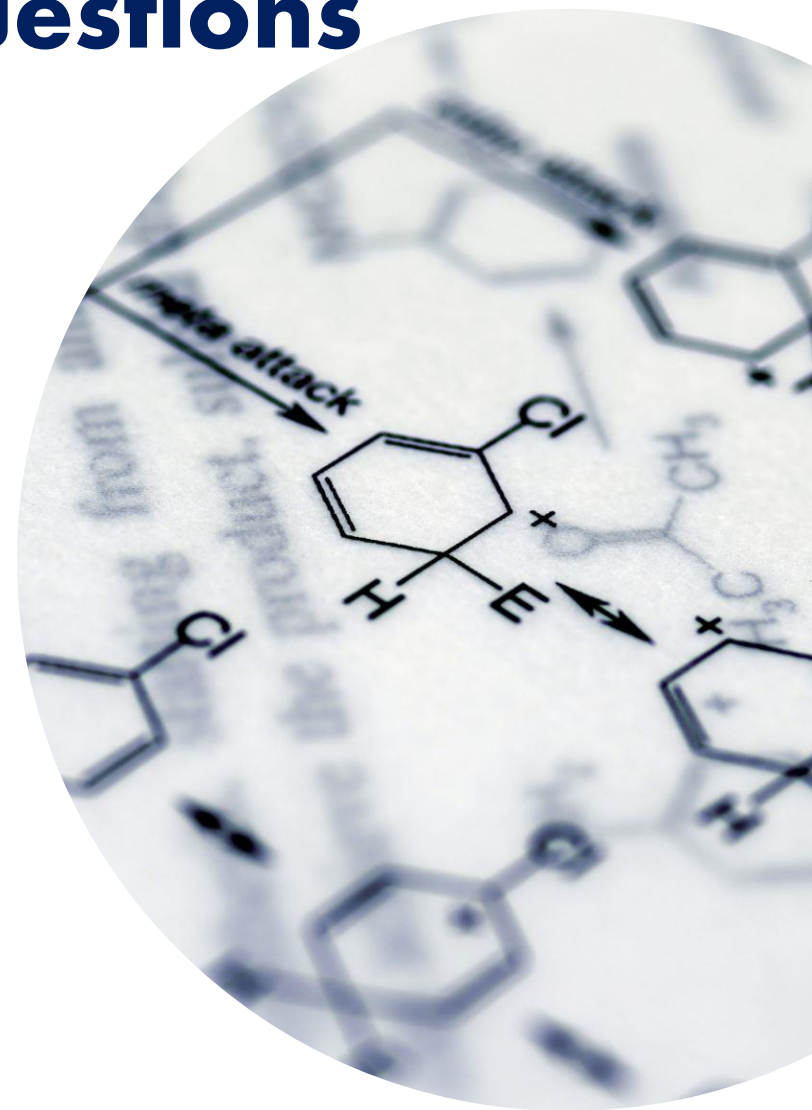


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# Pharmaceutical chemistry questions

The carbonyl stretch of  $\alpha, \beta$ -unsaturated esters results in an IR band in the region of:

- (a)  $730 \text{ cm}^{-1}$
- (b)  $1730 \text{ cm}^{-1}$
- (c)  $2530 \text{ cm}^{-1}$
- (d)  $3530 \text{ cm}^{-1}$

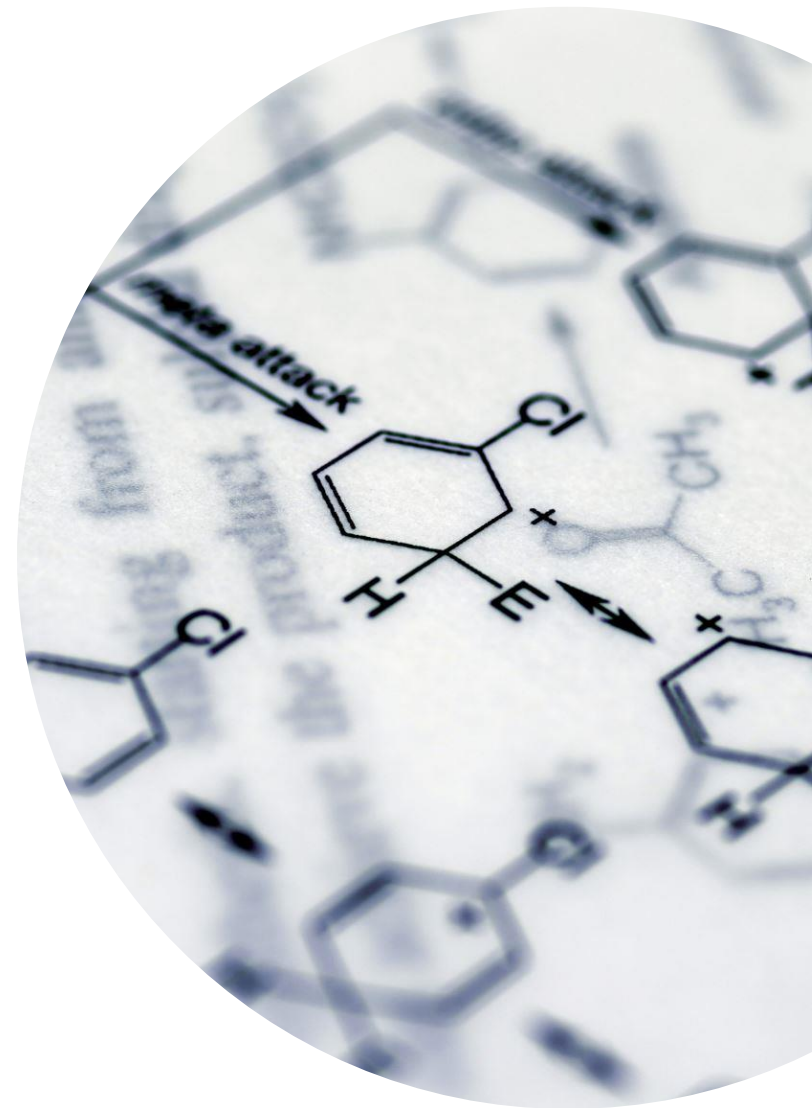




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# Problem Solving

- Carbonyl stretching peaks are strong and generally occur between  $1800$  and  $1600\text{ cm}^{-1}$
- The carbonyl stretch  $\text{C}=\text{O}$  of aliphatic esters appears from  $1750\text{-}1735\text{ cm}^{-1}$ ; that of  $\alpha, \beta$ -unsaturated esters appears from  **$1730\text{-}1715\text{ cm}^{-1}$** .



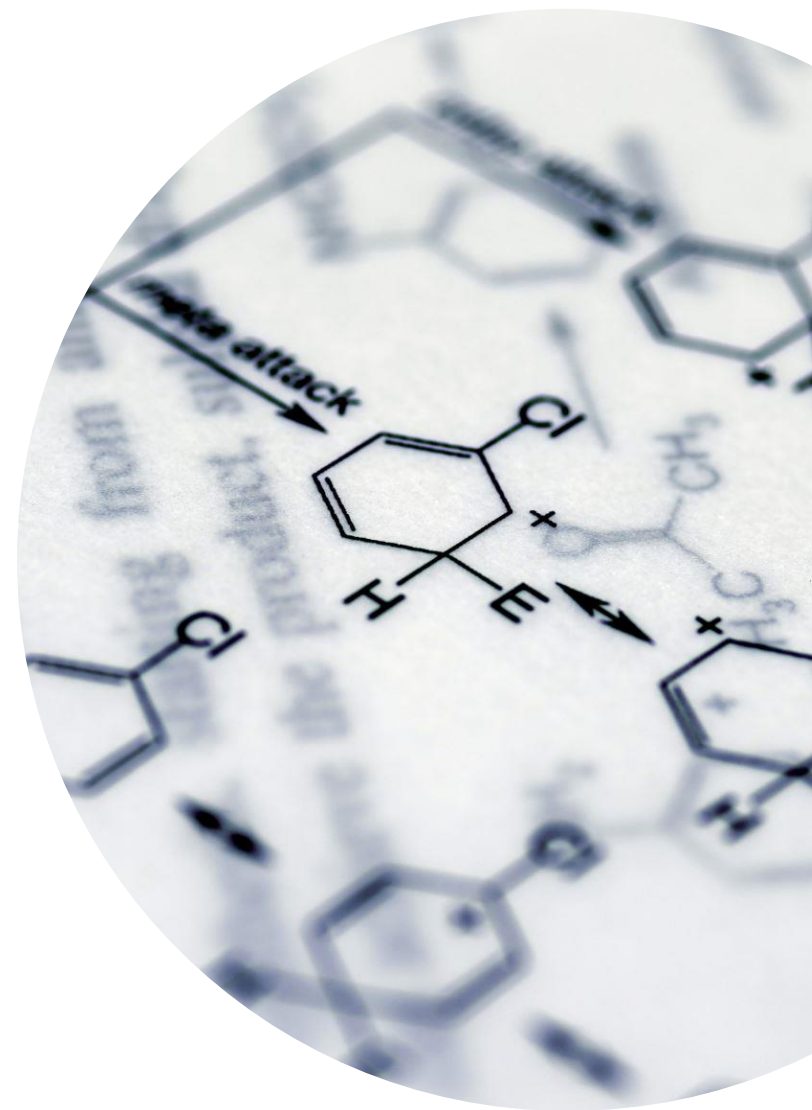


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# Answer

The carbonyl stretch of  $\alpha$ ,  $\beta$ -unsaturated esters results in an IR band in the region of:

- (a)  $730\text{ cm}^{-1}$
- (b)  $1730\text{ cm}^{-1}$**
- (c)  $2530\text{ cm}^{-1}$
- (d)  $3530\text{ cm}^{-1}$



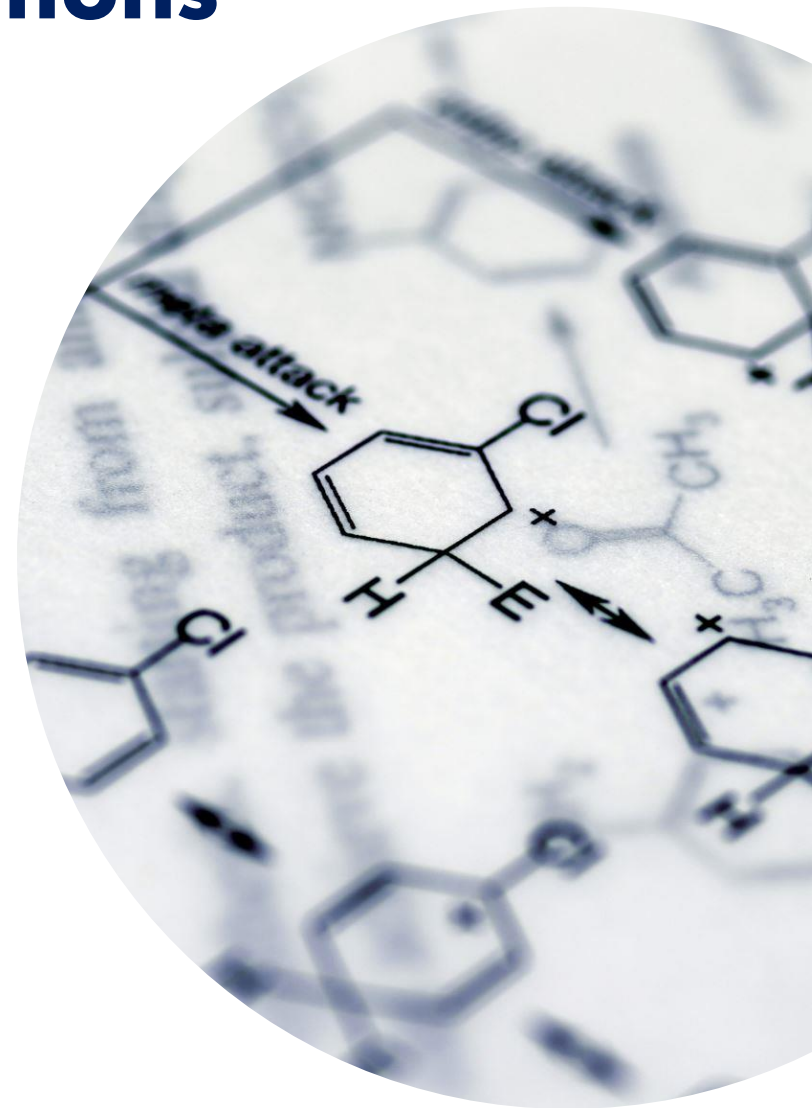
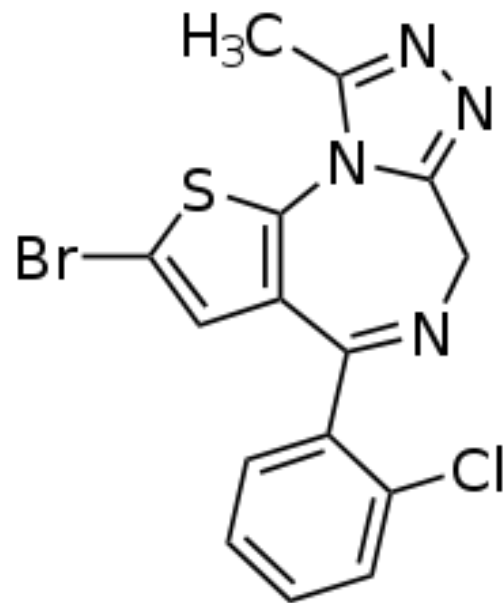


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# Pharmaceutical Chemistry Questions

What is the pharmacological classification of the attached structure?

- (a) Antimicrobial agent
- (b) Oncological agent
- (c) Cardiovascular agent
- (d) Anxiolytic agent

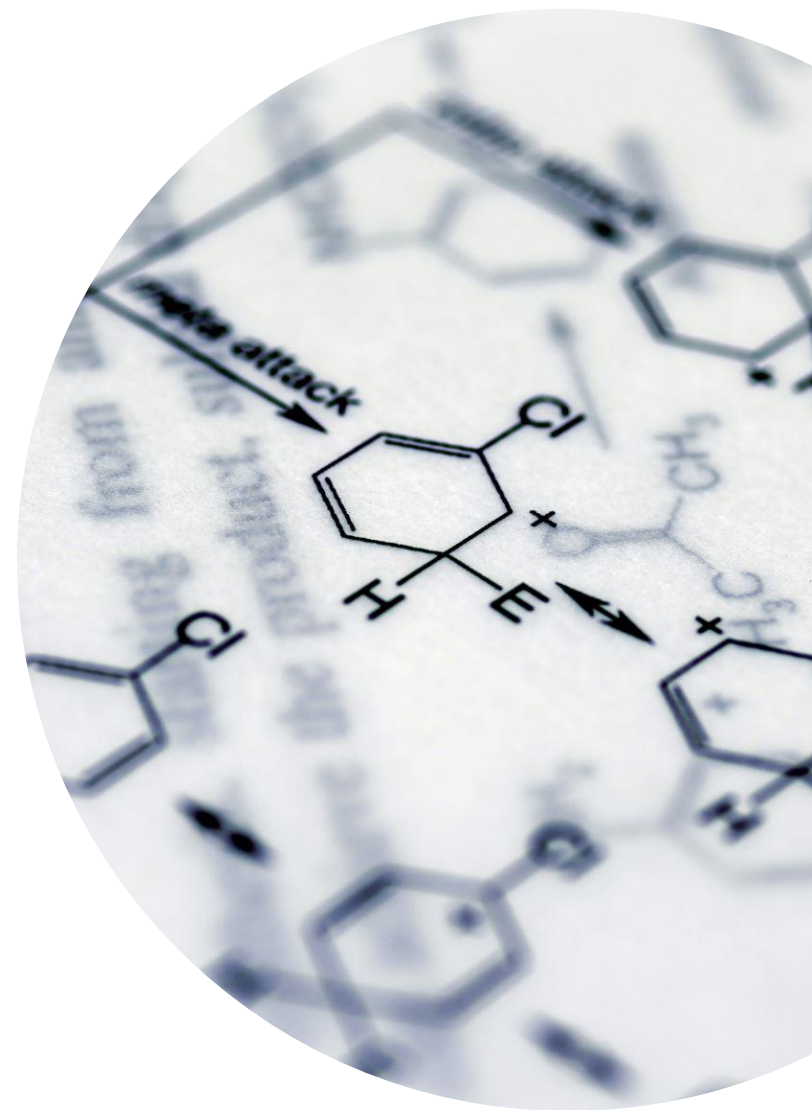
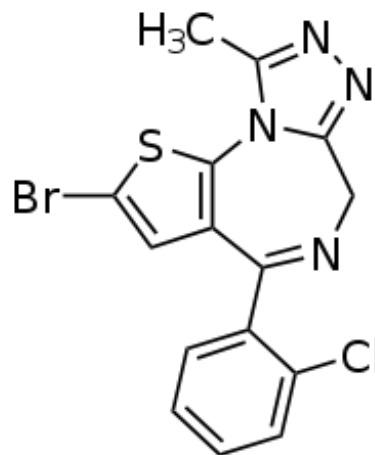
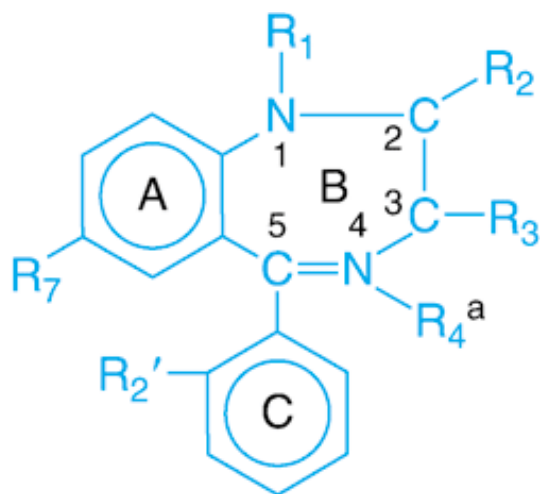




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# Problem Solving

- Structure is a benzodiazepine
- The term *benzodiazepine* refers to the portion of the structure composed of a benzene ring (A) fused to a seven-membered diazepine ring (B).
- This specific benzodiazepine is *brotizolam*



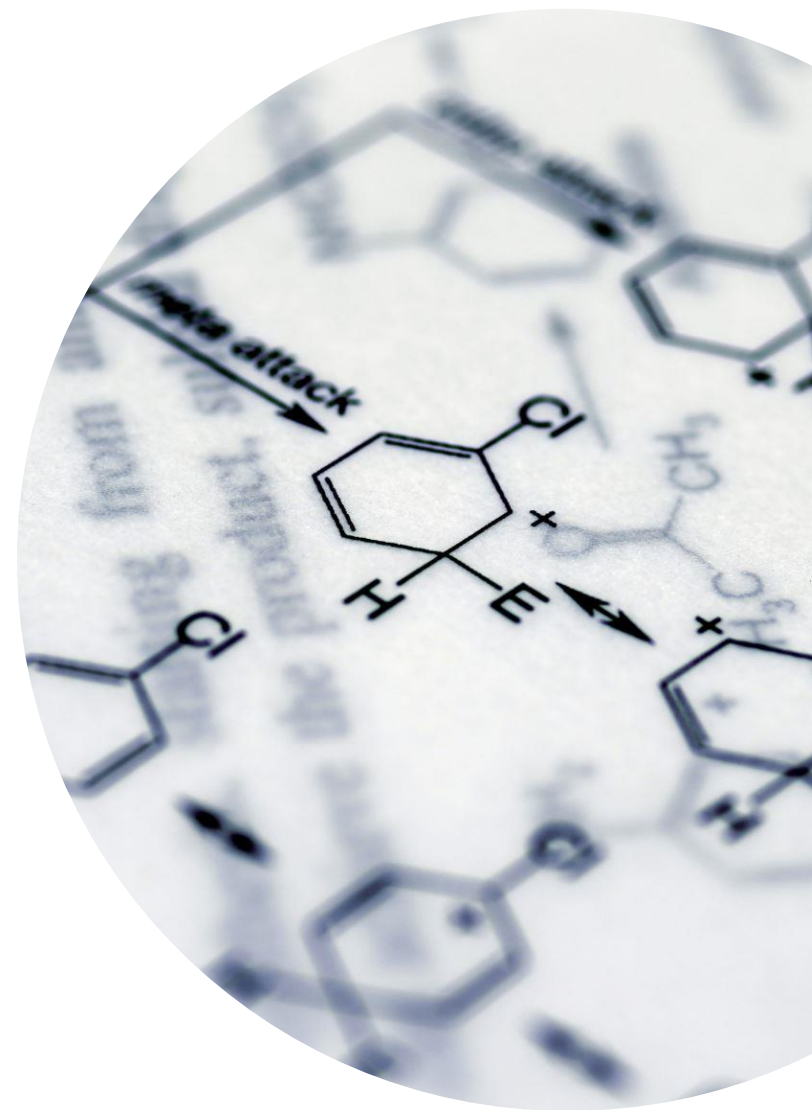
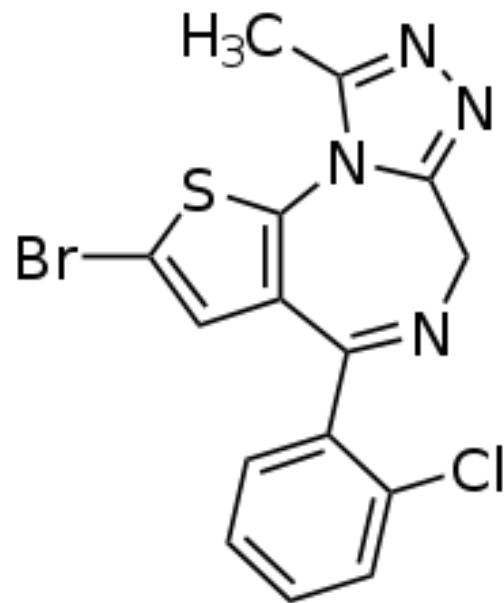


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# Answer

What is the pharmacological classification of the attached structure?

- (a) Antimicrobial agent
- (b) Oncological agent
- (c) Cardiovascular agent
- (d) Anxiolytic agent**





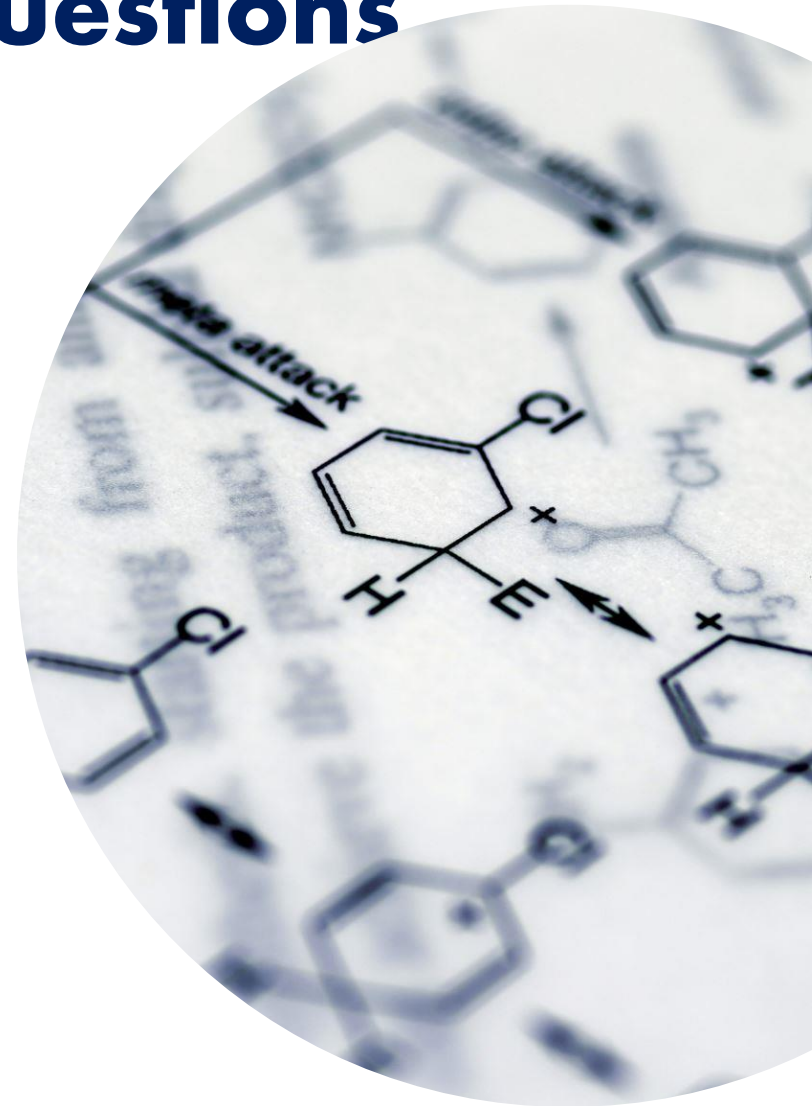


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# Pharmaceutical Chemistry Questions

Which macrolide lacks the C6 hydroxyl group and therefore does not undergo internal ketal formation associated with gastrointestinal cramping?

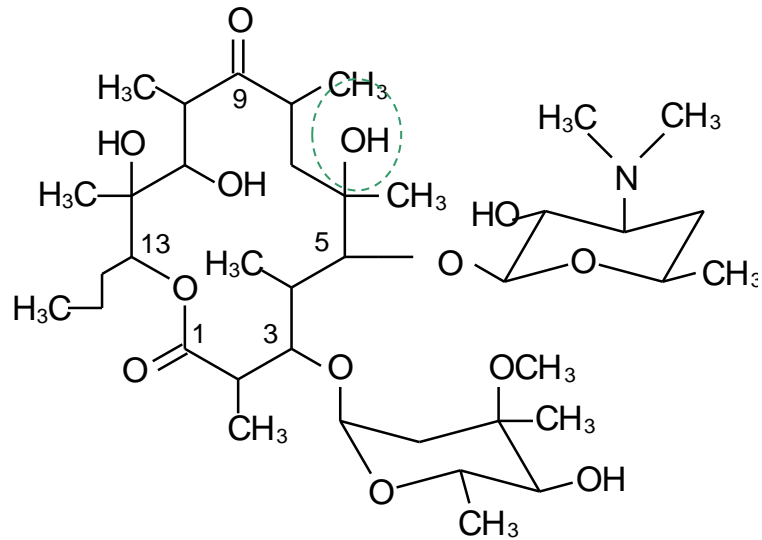
- (a) Erythromycin
- (b) Lincomycin
- (c) Clarithromycin
- (d) Clindamycin



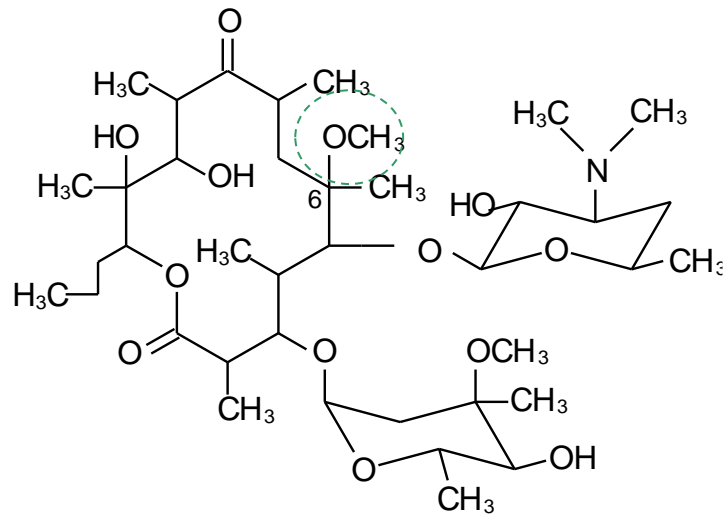


# Problem Solving

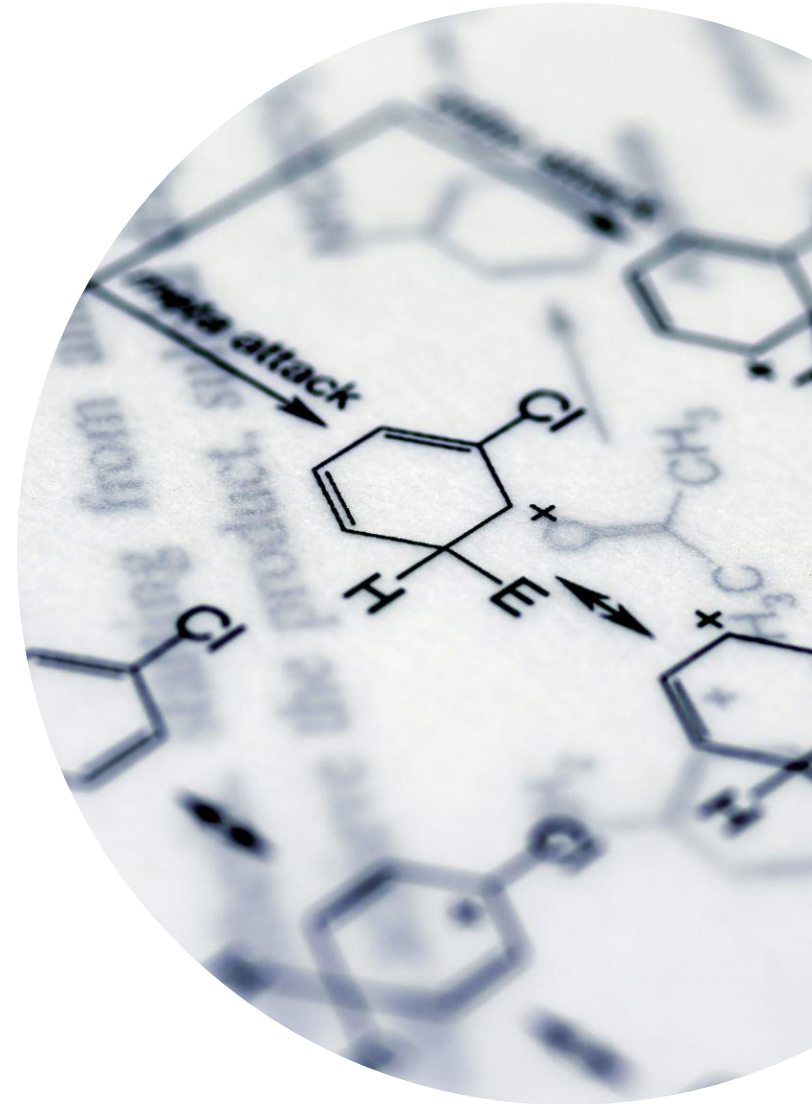
- The macrolides listed are erythromycin and clarithromycin.
- Clarithromycin → the C6 hydroxyl group is converted to a methyl ether → C6 hydroxyl group is essential for inactive ketal formation.



Erythromycin



Clarithromycin



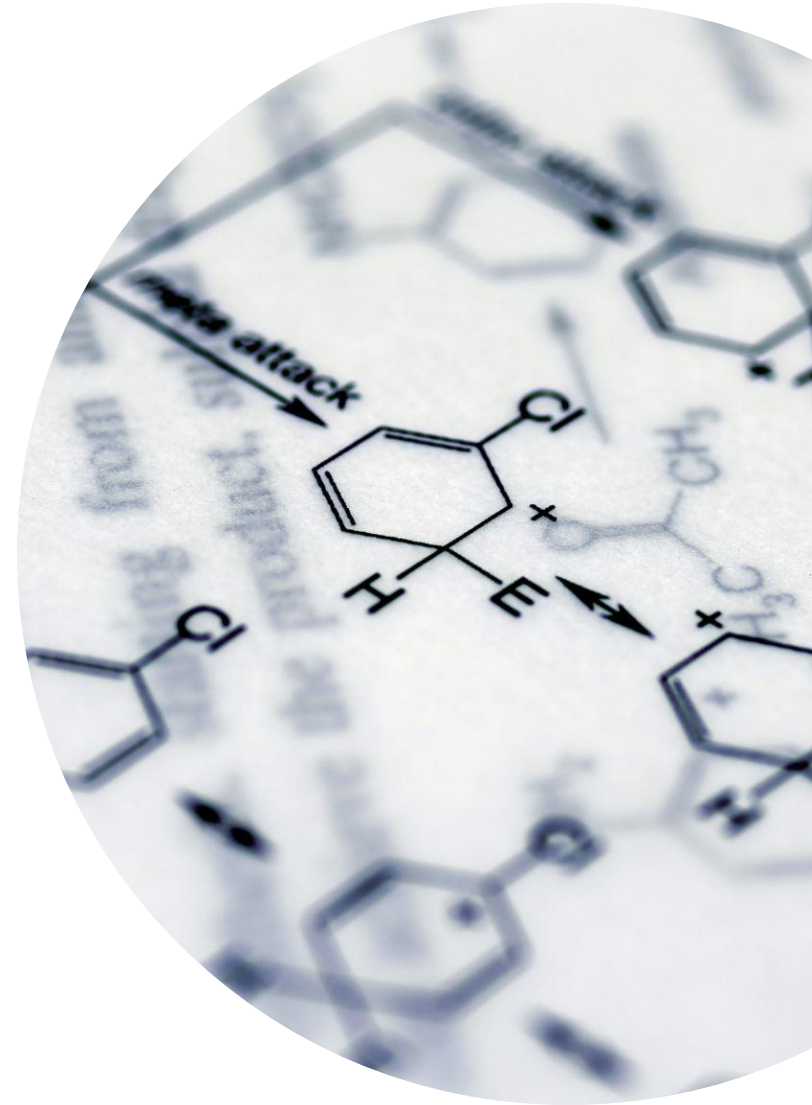


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# Answer

Which macrolide lacks the C6 hydroxyl group and therefore does not undergo internal ketal formation associated with gastrointestinal cramping?

- (a) Erythromycin
- (b) Lincomycin
- (c) **Clarithromycin**
- (d) Clindamycin





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# REFERENCE MATERIAL: PHARMACEUTICAL CHEMISTRY

- Drug design and metabolism:
  - **Drug-like Properties: Concepts, Structure Design and Methods**, Elsevier (Academic Press). Authors: Edward H. Kerns and Li Di.
  - **The Organic Chemistry of Drug Design and Drug Action**, latest edition, Elsevier (Academic Press). Author: Richard B. Silverman.
- Pharmaceutical analysis:
  - **Fundamentals of Analytical Chemistry**, Latest edition, Brooks/Cole. Authors: Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch. (Or similar analytical chemistry text).
- **Pharmaceutical analysis. A textbook for pharmacy students and pharmaceutical chemists.** Elsevier, Churchill Livingstone. Author: David G Watson. (Or similar analytical chemistry text)
- **Pharmaceutical Calculations.** Lippincott, Williams & Wilkins. Authors: Howard C. Ansel, Mitchell J. Stoklosa
- **Introduction to Pharmaceutical Chemical Analysis**, John Wiley & Sons, Ltd; 2011, Authors: S. Hansen, S. Pedersen-Bjergaard, K. Rasmussen K
- **Organic Chemistry**, Latest edition, Brooks/Cole. Author: John E. McMurry. (Or similar organic chemistry text) (Organic chemistry)
- **Foye's principles of Medicinal Chemistry**, Latest edition. Authors: Thomas L. Lemke, David A. Williams, Victoria F. Roche, S. William Zito. (Or similar medicinal chemistry text)
- **An introduction to Medicinal Chemistry**, Latest edition, Oxford. Author: Graham L. Patrick. (Or similar medicinal chemistry text)
- **Spectrometric Identification of Organic Compounds**, Latest edition, Wiley. Authors: Robert M. Silverstein, Francis X. Webster, David Kiemle (Spectroscopy)



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# Helpful tips

## Exam technique

- Select the correct formula.
- Transcribing – Double-check against the question that you have used the correct figures in your formula.
- If possible, estimate a range for your answer.
- Always double-check your calculation.





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# Managing time



Maximising your time - 180 minutes

90 MCQs

Approximately 2 minutes per question

No negative marking.  
Do not leave anything blank.





# WEIGHT PER EXIT LEVEL OUTCOME (ELO) PER SUBJECT

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ELOs	Weight (%)					
	Total	PHARMACOLOGY	APPLIED PHARMACY PRACTICE IN A LEGAL FRAMEWORK		APPLIED PHARMACEUTICS AND PHARMACEUTICAL CHEMISTRY	
			PHARMACY PRACTICE	LAW AND ETHICS	PHARMACEUTICS	PHARMACEUTICAL CHEMISTRY
1	12.33%	1.50%	1%	0.33%	2.50%	7%
2	9%	0	0	0	5%	4%
3	5.50%	0	0	2%	3.50%	0
4	9%	0	0	1%	6%	2%
5	4%	0	3%	1%	0	0
6	17%	9%	4%	4%	0	0
7	16.17%	9.50%	6.67%	0	0	0
8	13%	6%	5%	2%	0	0
9	9%	4%	4%	1%	0	0
10	5%	0	3%	2%	0	0
11	0	0	0	0	0	0
TOTAL	100%	30%	26.67%	13.33%	17.00%	13%
	100%	30%	40%		30%	
Number of questions	300	90	120		90	

# Types of questions: Pharmacology

- 90 questions in total:
- level of cognition
  - Knowledge  $\leq$  10%;
  - Application  $\geq$  40% (case study based and scenarios);
  - Problem Solving  $\leq$  50%
- 3 hours





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# REFERENCE MATERIAL: APPLIED PHARMACOLOGY & TOXICOLOGY

- **Basic and Clinical Pharmacology.** Latest Edition. Katzung, Masters and Trevor
- **Pharmacology.** Latest Edition. Rang, H.P., Dale, M.M. & Ritter, J.M., Churchill Livingstone, Edinburgh.
- **Pharmacology.** Latest Edition. Mycek, M.J., Harvey, R.A., & Champe, P.C., (Part of Lippincott's Illustrated Review Series), Lippincott-Raven, Philadelphia. (ISBN 0- 397-51567-79)
- **Goodman and Gilman's:** The Pharmacological Basis of Therapeutics; Latest Edition. Brunton, Lazo and Parker
- **Pharmacotherapy: A Pathophysiologic Approach.** Latest Edition. DiPro, R.L., Talbert, P.E., Yee, G.C., Matzke, G.R., Posey, L.M., Appelton & Lange, Norwalk, Connecticut, (ISBN 0-8385-7976-0)
- **South African Medicines Formulary (SAMF).** Latest edition
- **South African Clinical Guidelines for various conditions e.g.** South African Hypertension Practice Guideline
- South African Essential Medicines Lists and Standard Treatment Guidelines:
  - Paediatric Hospital Level STGS and EML\_4th Ed 2017 – final. Available at:  
<http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicineslist>
  - Hospital level (Adult) 2015\_v5.0. Available at:  
<http://www.health.gov.za/index.php/standardtreatment-guidelines-and-essential-medicines-list/category/286-hospital-level-adults>
  - Primary Healthcare level 2014. Available at:  
<http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/285-phc#>



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# Helpful tips

- **READ** the question carefully.
- **IDENTIFY** the statements of which you are sure.
- **CONFIRM** (using references) the statements you are unsure of.
- **CARRY ON** if you can't complete the question, and when you have time towards the end of the exam come back to it.

## NB!

“TRUE”, “IS” and “CORRECT”

“EXCEPT”, “FALSE”, “NOT”  
and “INCORRECT”

“MOST APPROPRIATE”  
implies that more than one  
answer is possible, thus  
select the most inclusive  
answer



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# Managing time



Maximising your time - 180 minutes

90 MCQs

Approximately 2 minutes per question

No negative marking.  
Do not leave anything blank.



# Examination examples

<https://sapc.za.org/fqpexam>



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To assist in your preparations for the professional examination, the SAPC makes the following practice papers available (click on title to download):

- [1. Applied Pharmacology and Toxicology](#)
- [2. Applied Pharmacy Practice in a Legal Framework](#)
- [3. Applied Pharmaceutics and Pharmaceutical Chemistry Section A \(Pharmaceutical Chemistry\)](#)
- [4. Applied Pharmaceutics and Pharmaceutical Chemistry Section B \(Pharmaceutics\)](#)

Further information on the Professional Examination for Foreign-qualified Persons is available in the [2024 Brochure Foreign Graduate Registration Guidelines](#).

## Foreign-qualified Persons Professional Examination Study Guide

The SAPC produces the [Guidelines to the South African Professional Examination for pharmacists with foreign qualifications](#) annually. This is a guide containing detailed information on the professional examination for foreign-qualified persons as well as competencies and exit level outcomes. To download the [2024 Professional Examination Study Guide](#) [click here](#).

### Professional Exam Dates for 2024:

<b>Applied Pharmacy Practice in a Legal Framework</b>	27 May 2024	7 October 2024
<b>Applied Pharmaceutics and Pharmaceutical Chemistry</b>	30 May 2024	9 October 2024
<b>Applied Pharmacology and Toxicology</b>	03 June 2024	11 October 2024



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# TIPS FOR PREPARATIONS

Use the latest reference material.

Check the current events (pandemics/epidemics) locally / globally.

Keep abreast with the latest developments/information.

Familiarise yourself with each reference material (index/topic).

Use reference material that you have used before.

Understand the SA work environment (SOPs).





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# Preparing for the examination

**Update your details on  
your SAPC profile.**

Cell phone number

Email address

Profile picture

You are notified via email  
and SMS when bookings  
are open.

## IMPORTANT DATES

Applied Pharmacy Practice in a Legal Framework	27 May 2024
Applied Pharmaceutics and Pharmaceutical Chemistry	30 May 2024
Applied Pharmacology and Toxicology	3 June 2024



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# Remote online examination





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# Examination booking



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Check List

Dashboard

Log Out

## Check List

/ Dashboard

Record of practical training as a pharmacist and required documentation



Record of practical training as a pharmacist



Required documentation



Submit foreign qualification application to the  
SAPC





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# Examination booking (cont.)



Check List

Dashboard

Log Out

Dashboard

/ Dashboard



Finance  
Balance : R



Applications



Letters and certificates



Professional examinations



Contact



Telecommunication



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# Examination booking (cont.)



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Check List

Dashboard

Log Out

## Professional Examinations

/ Dashboard



Professional Examination Bookings



Professional Examination Results



Practise Professional Examinations



Professional Examination



# Examination booking (cont.)

- Check List
- Dashboard
- Log Out

## Professional Examination Booking

[/ Dashboard](#)

- Document check list - Candidate must have complied with all the requirements as per checklist on Foreign Qualification application.

Professional Examination Papers	Date	Cost	Venue
<input type="checkbox"/> Applied Pharmaceutics and Pharmaceutical Chemistry	30/05/2024	4391.00	-Select- ▼
<input type="checkbox"/> Applied Pharmacology and Toxicology	31/05/2024	4391.00	-Select- ▼
<b>[Successful] : Applied Pharmacy Practice in a Legal Framework</b>	N/A	N/A	N/A

Note A

Professional examinations for 2024 are scheduled as follows:

<b>*THESE DATES ARE SUBJECT TO CHANGE*</b>		
Applied Pharmacy Practice in a Legal Framework	27 May 2024	07 Oct 2024
Applied Pharmaceutics and Pharmaceutical Chemistry	29 May 2024	09 Oct 2024
Applied Pharmacology and Toxicology	31 May 2024	11 Oct 2024

**Council reserves the right to cancel/postpone any exam sitting should there be a low number of candidates for any scheduled exam.**

For candidates who wish to sit for any of the examination paper (s) at a particular date, bookings must be made four weeks before the examination date or as communicated by Council. A fee of **R 4391.00 (VAT incl.) per examination paper** is payable upon booking for the examination (s).

Note B

**Candidates will only be allowed to sit for the professional examination after-**

- Their credentials have been evaluated and approved by the South African Pharmacy Council (SAPC)
- They have been issued with the SAPC decision letter

**The following supporting documents must be submitted when booking for the examination-**

# Remote online examination





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# Remote online examination



Find a quiet suitable workplace with enough space for devices and references.



Keep calm.  
Communicate with your remote invigilator if you are experiencing any difficulty.



Download electronic references before the examination date.



Ensure you have the equipment you will need i.e. calculator, paper for working out calculations.



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# Device and connectivity for candidates

**SUGGESTED  
DEVICES:**



**OR**



**AND**



**DEVICE MUST HAVE A CAMERA OR A  
LINKED CAMERA WITH VIDEO  
CAPABILITIES**



**CONNECTIVITY (MINIMUM 3G)**



**BROWSERS**

  
Google Chrome

 Firefox

  
Microsoft Edge



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# Profile picture

Image uploaded on SAPC needs to be:

- a colour image,
- taken in last 6 months,
- of your head and shoulders



**PLEASE NOTE:**  
Profile picture is used by the invigilator  
to verify the identity of the candidate  
writing the exam.





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# Day of the examination

**08h00**

**Login to the SAPC website & enter a one-time pin (cell phone) to enter the examination**

Complete the declaration

Read the examination rules



**09h00**

**Examination commences (remote invigilator)**

Live invigilation through video streaming. Images taken to verify learner (periodically images will be taken throughout the exam)



**13h00**

**Examination ends**





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# STEPS TO LOGIN AND ACCESS THE EXAMINATION PLATFORM ON THE SAPC WEBSITE





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# ACCESSING THE EXAMINATION PLATFORM

- The examination can be accessed on the SAPC website under **Quick Links** → **Foreign-qualified Persons** → **Professional Examination** → **Click on the link “Click here” to access the Professional Examination.** Alternatively use the below URL to connect:

<https://sapc.za.org/fqpexam>

South African Pharmacy Council

About SAPC Registered Persons Registered Organisations Members of the Public COVID-19 Login

## Foreign-qualified Persons

Overview Application Process Forms Application Form **Professional Exam**

Only foreign-qualified persons whose [application for recognition/registration](#) as pharmacists has been approved by the South African Pharmacy Council (SAPC) may sit for the professional examination for foreign-qualified persons. The professional exams take place in May and October of each year and are written at venues determined by the SAPC. Duly completed [application forms](#) and **applicable fees** must be sent to the SAPC **at least one month before the date of the professional examination.**

**PROFESSIONAL EXAMINATION**

Please [click here](#) to access the professional examination.

Only candidates booked for the professional examination will be able to access the examination.

The professional exams are open-book examinations. Applicants are required to achieve a minimum of 50% in each paper written in order to pass and be registered.

Candidates are allowed a maximum of four (4) attempts at the exam in a period of four (4) years, after which they will no longer be considered for registration as a Pharmacist in South Africa.



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# Step 2: Insert your login credentials



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P Number

National ID/Passport

Password

Enter



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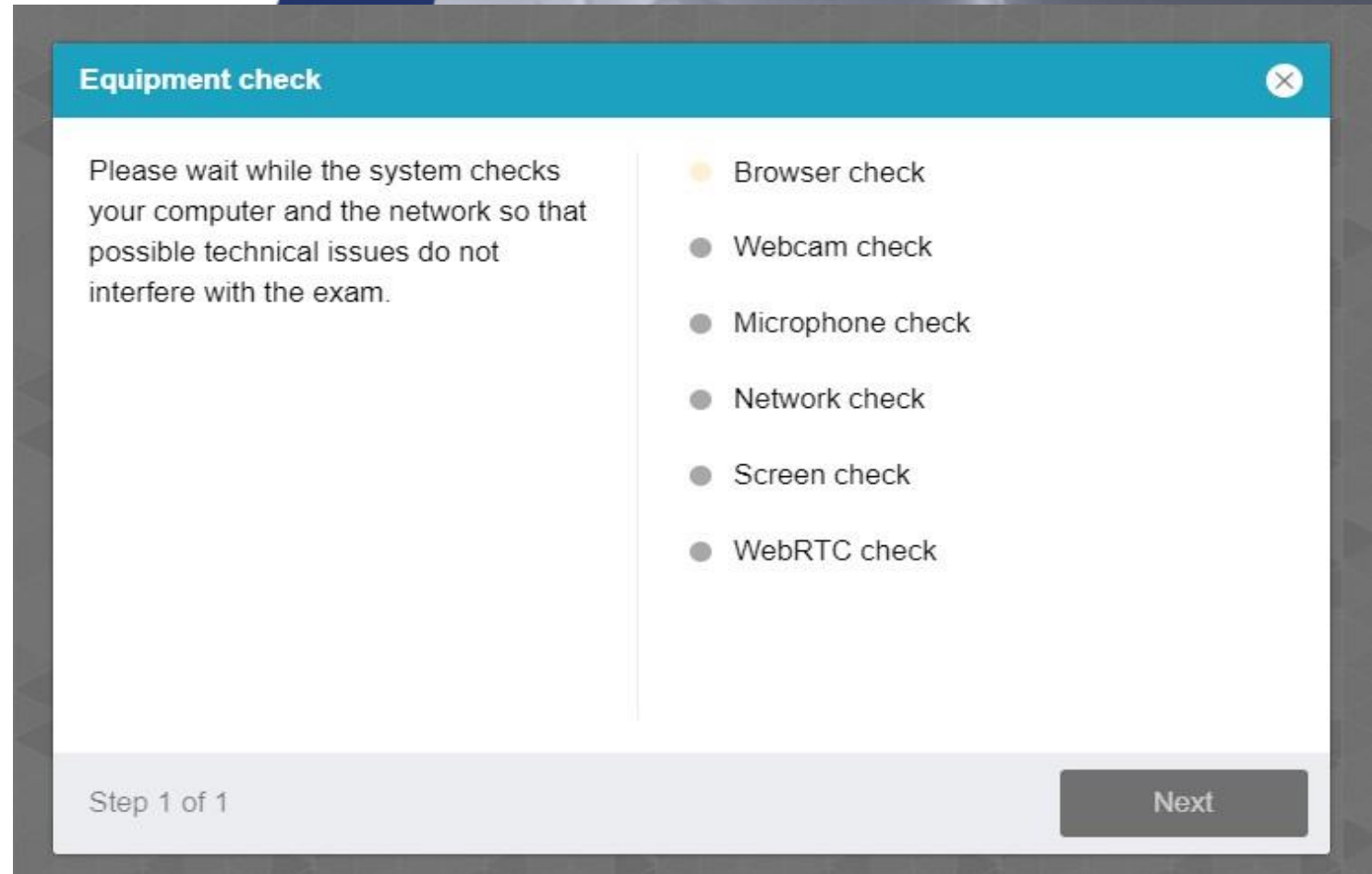
# Step 3: Insert your OTP

- The OTP will be sent as an SMS to your cell phone and via Email, and will be valid for 10 minutes, if unused. A new OTP will be generated for each login.

The screenshot shows a web interface for the South African Pharmacy Council. At the top left is the council's logo and name. The main heading is 'One-Time Password (OTP)'. Below this, a message states: 'Please wait 10 minutes, one-time password will be sent to your cell phone. Enter the number in the textbox below and click the [Continue] button. If you have not received a SMS, check emails or'. A 'Resend OTP in' section features a large digital timer showing '00 09 20' in three colored circles (green, cyan, and blue). Below the timer, the text 'Examination Intern Pre - Registration Examination Paper' and 'Date 19 Jul 2023' are displayed. A text input field labeled 'One-Time Password' is present, followed by a red 'Continue' button.

# Step 4: Equipment check

- The examination platform will conduct an equipment check to ensure your device is compatible with the examination platform.
- **Use the following link:**  
<https://proctored.com/check> to test the compatibility of your laptop/desktop.



**Equipment check**

Please wait while the system checks your computer and the network so that possible technical issues do not interfere with the exam.

- Browser check
- Webcam check
- Microphone check
- Network check
- Screen check
- WebRTC check

Step 1 of 1

Next



# Step 5: Equipment check successfully completed

## Equipment check

Please wait while the system checks your computer and the network so that possible technical issues do not interfere with the exam.

- Browser check
- Webcam check
- Microphone check
- Network check
- Screen check
- WebRTC check

Step 2 of 4

Next



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# Step 6: Profile check

- Click on **NEXT** when profile check is completed.

### Filling in the profile ✕

Fill in or check your last name, first name and middle name (if available).

Last name \*

First name \*

Middle name

Step 3 of 6

[Next](#)



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# Step 7: verification of the picture

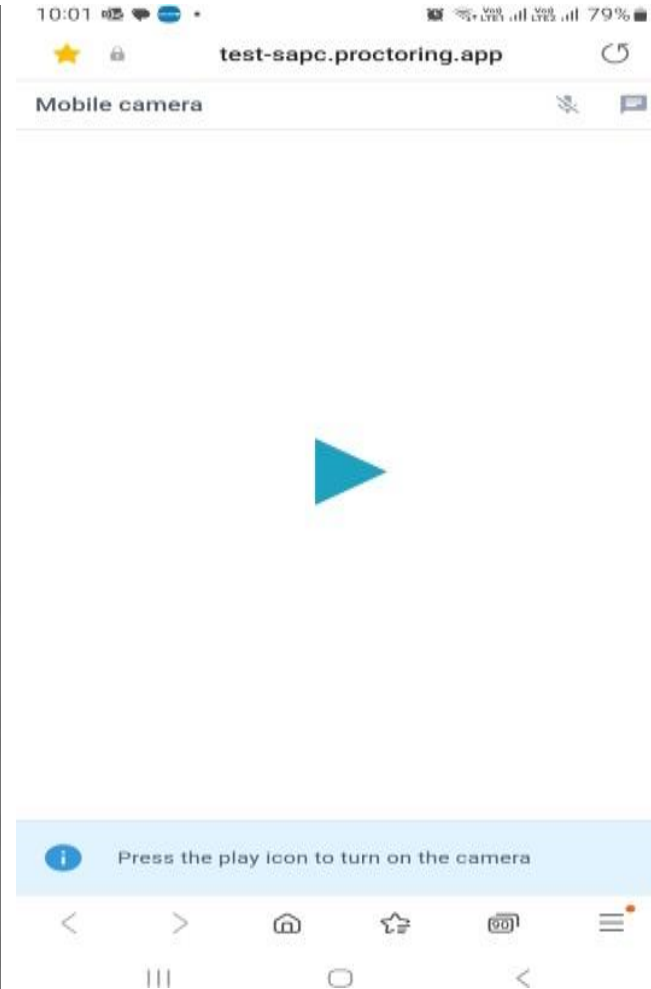
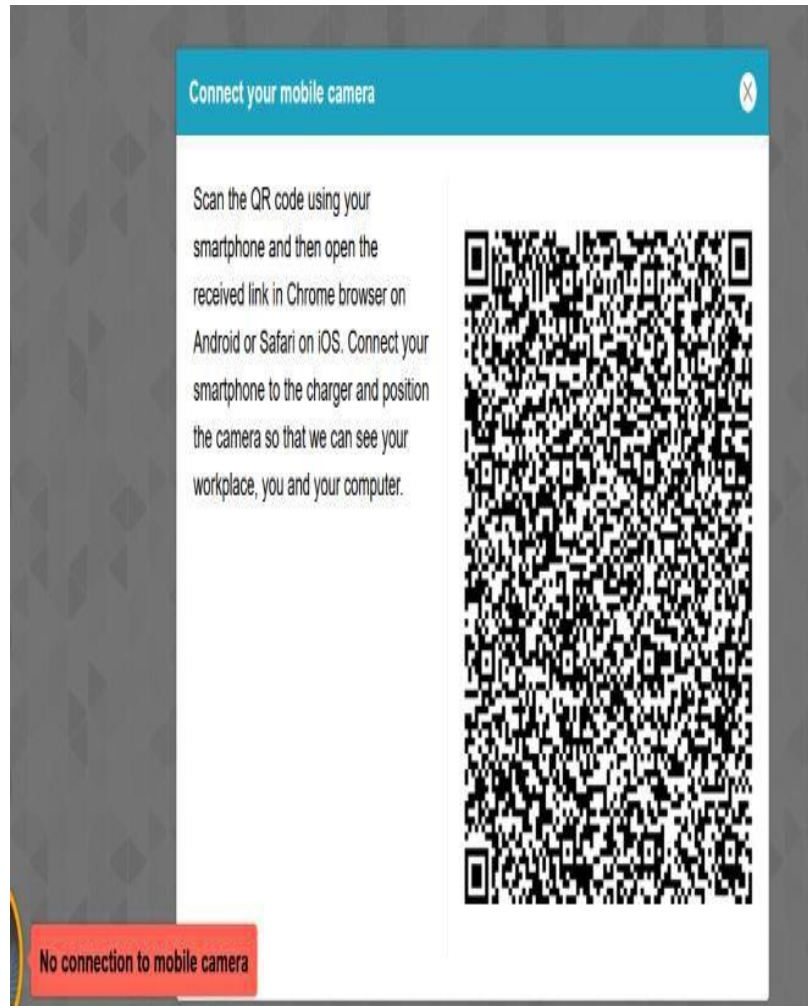
- Click on **NEXT** if satisfied with the photo

The screenshot shows a mobile application interface for taking a face photo. At the top, a teal header contains the text "Taking a face photo" and a close button (X). Below the header, on the left, is a white text box with instructions: "Take a photo with your face fitting into the oval frame on the screen. Make sure that there is enough light in the room. If the photo is not verified, please take a new photo." On the right is a video preview window showing a man in a white lab coat. Above the video, the text reads "Snapshot saved. You can retake the picture if this photo does not suit you." Below the video is a black bar with the word "RETRY" in white. At the bottom left, a grey bar shows "Step 4 of 4". At the bottom right, a green button labeled "Next" is highlighted with a yellow circle.



# Step 8: Scanning of the QR code

- Use a smartphone to scan the QR code to connect the phone to the examination platform for a better view of your workspace and examination room. Click on the play button to record a short video of your room surroundings.





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# Step 9: Complete the examination declaration

## Declaration

- I am writing the examination at the place stipulated in my booking confirmation.
- I am not sitting next to or in close proximity to any other candidates writing the examination.
- I will not receive any form of assistance from any person while writing this examination.
- I will not communicate (verbal / electronic / in person) with any candidate / pharmacist / tutor / registered person during the examination.
- I will only use the reference material permitted in the examination.
- I will not give any assistance to any person writing this examination.
- I will neither share, copy nor discuss the examination with any person during or after the examination.
- I will inform the South African Pharmacy Council if I am aware of any candidates that contravene this code of conduct.

Continue



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# DECLARATION FOR THE ONLINE/REMOTE PROFESSIONAL EXAMINATIONS

## • PRIOR TO START OF EXAMINATION

I hereby declare that I am the candidate registered to write the pre-registration examination on the \_\_\_\_\_ and agree to abide by the Examination Code of Conduct:

- I am completing the examination in a suitable area with minimal anticipated distractions.
- I am completing the examination at the location/place stipulated in my booking confirmation.
- I have procured the minimum required data for the purpose of the examination, which is equivalent to 3Gb per paper.
- I am not sitting next to or in close proximity to any other candidate completing this examination.
- I will not receive any form of assistance from any person while writing this examination.
- I will not communicate (verbally/electronically / in person) with any registered person during the examination.
- I will only use the reference material permitted in the examination.
- I will not access any other reference material that has been prohibited including websites.
- I will not give any assistance to any person completing this examination.
- I will not share or retain the contents of the examination via electronic, printed, written or verbal means with any person.
- I will inform the South African Pharmacy Council if I am aware of any candidate that contravenes the Examination Code of Conduct.



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# DECLARATION FOR THE ONLINE/REMOTE PROFESSIONAL EXAMINATIONS

## • END OF EXAMINATION

- I confirm that I have completed the examination without assistance from any person and adhered to the Examination Code of Conduct. I understand that if it is found that I have contravened the Examination Code of Conduct, the SAPC will implement disciplinary action against me in terms of Chapter V of the Pharmacy Act.
- I will not/ have not shared or retained the contents of the examination via electronic, printed, written or verbal means with any person.



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# Step 10: Read the examination instructions

- Only click on “**start the examination**” at 09h00 when the examination is scheduled to start. SAPC will communicate if there are any delays in starting the examination.

Start the exam

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### Paper Details

Time Allowed	4 hrs 30 minutes
Time	08:55 to 23:00
Total	120
Overall pass %	50
Calculations	
Duration	2 hrs 0 minutes
Pass %	60
General	
Duration	2 hrs 30 minutes
Pass %	50

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<b>Examiners</b>	<b>Moderators</b>
✓ P21053 - Ms. Kamohelo Prudence Moloi	

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### Instructions

- ✓ Ensure that you are writing the correct section of the examination.
- ✓ You may start the examination at 9h00.
- ✓ Once the examination starts, a timer will be displayed on your screen.
- ✓ Time lapsed reminders will pop-up on your screen at 30-minute intervals and for the last 30 minutes, the pop-ups will appear when 15 minutes, 10 minutes and 5 minutes remain.
- ✓ The system will take pictures at random intervals, please ensure your camera is on at all times and/or correctly positioned to take a picture of you.
- ✓ All questions are worth one mark. There is no negative marking for selecting an incorrect answer.
- ✓ The questions for this examination are randomised. Therefore, the order of questions differs for each candidate writing.
- ✓ There are four (4) answer options per question. There is only ONE CORRECT answer per question.
- ✓ Use the mouse to select an answer option. The selected option is treated as your answer for the question. Your answers are auto-saved by the system.
- ✓ Once you have answered the question you cannot return to the question.
- ✓ If you do not answer a question, you may revisit the question at the end of the examination.
- ✓ Clicking the "Submit" button completes the examination and candidates cannot go back to the examination questions.
- ✓ If the allocated examination time lapses without you answering all questions, your answers will be automatically submitted even if you have not clicked the "Submit" button.

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Start the exam



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# Examination format

**ONE QUESTION PER PAGE.**

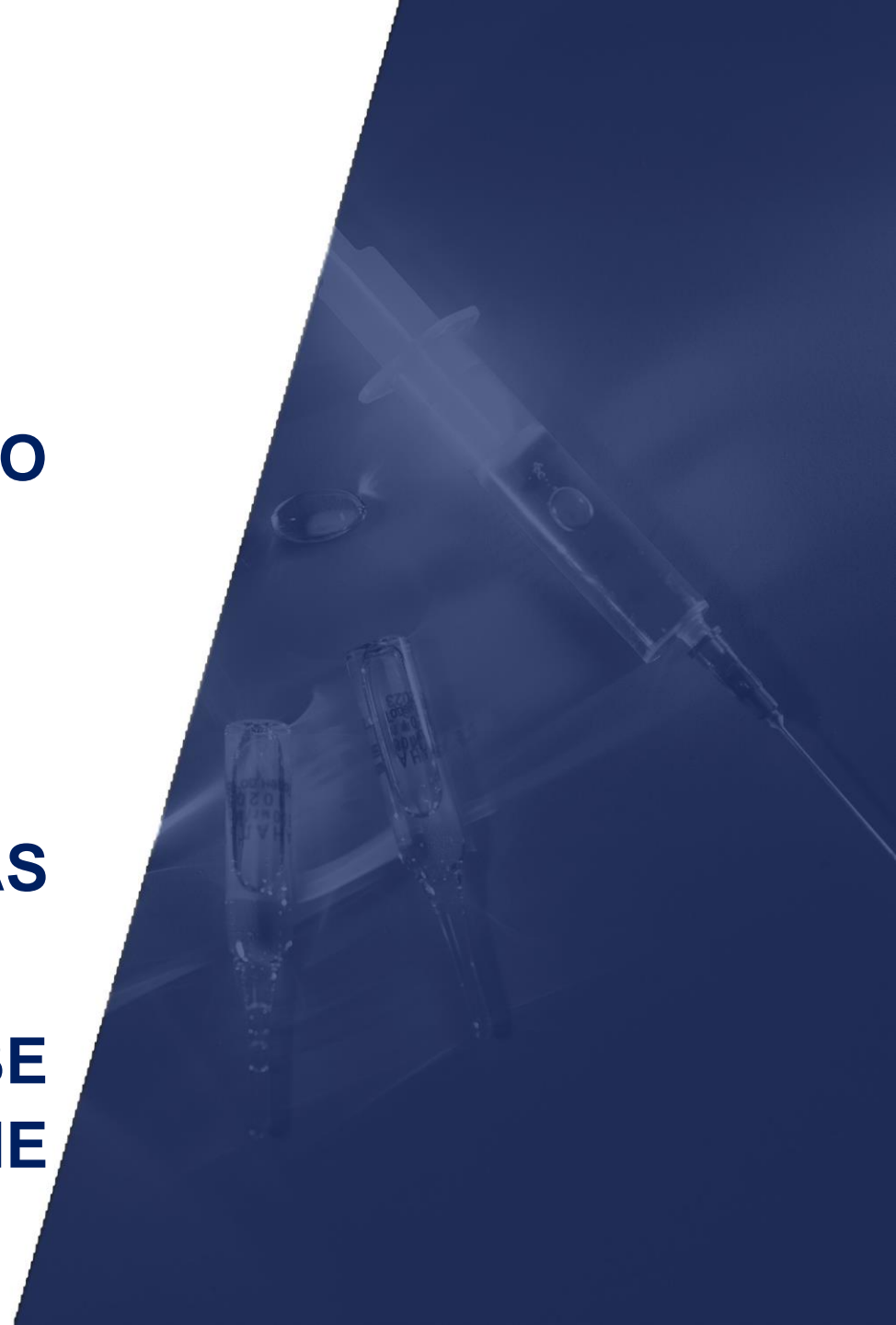
**CANNOT SELECT WHICH QUESTIONS TO ANSWER FIRST.**

**RANDOMISATION OF QUESTIONS.**

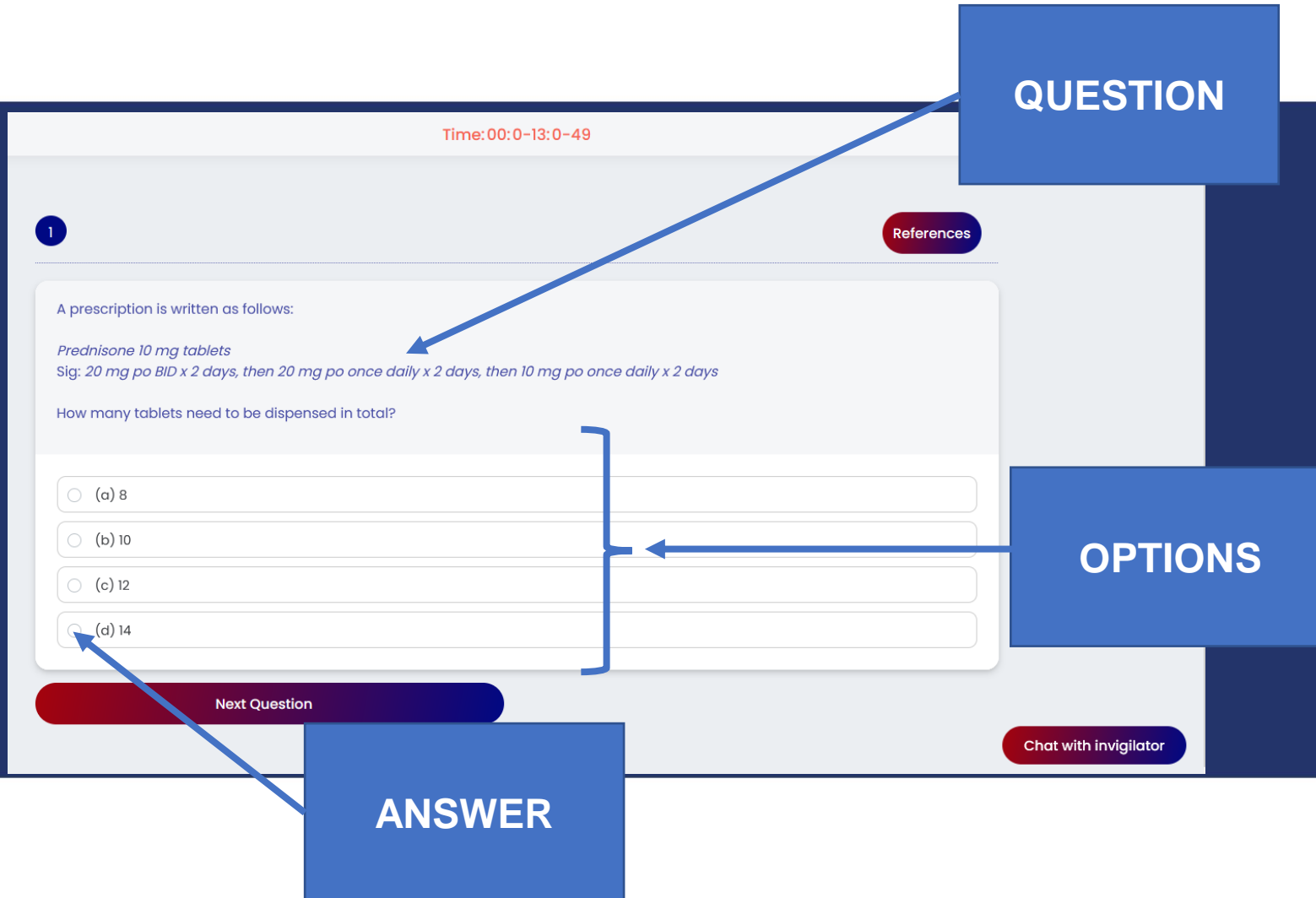
**TIMED EXAMINATION.**

**CANNOT REVISIT ANY QUESTION THAT HAS BEEN ANSWERED.**

**UNANSWERED QUESTIONS MAY BE REVISITED AT THE END OF THE EXAMINATION.**



# Single best answer Multiple choice questions



Time: 00:0-13:0-49

1

References

A prescription is written as follows:

*Prednisone 10 mg tablets*  
*Sig: 20 mg po BID x 2 days, then 20 mg po once daily x 2 days, then 10 mg po once daily x 2 days*

How many tablets need to be dispensed in total?

(a) 8

(b) 10

(c) 12

(d) 14

Next Question

Chat with invigilator

**QUESTION**

**OPTIONS**

**ANSWER**

The diagram illustrates the components of a single best answer multiple choice question. A blue box labeled 'QUESTION' points to the text of the question. A blue box labeled 'OPTIONS' points to the list of four possible answers. A blue box labeled 'ANSWER' points to the selected option (d) 14. The interface also includes a timer, a 'References' button, a 'Next Question' button, and a 'Chat with invigilator' button.



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# VIOLATION DURING EXAMINATION

Google to access  
approved online  
reference material  
only

~~Google~~

- Any action undertaken by the candidate to gain unfair academic advantage.
- This may include cheating/copying and possession of unauthorised materials.



There is conversation or background noise



Focus switched to a different window





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# FAQs

## Where can I get help?

### 1. Chat function

- Type your question in the chat function.
- Your invigilator will respond via the chat.

### 2. WhatsApp

- Send a message to the invigilator on WhatsApp.
- Keep calm, the invigilator will respond to your message (give him/her a few minutes to respond).



## FAQs

# What if the invigilator needs to contact me?

1. Keep your cell phone next to you, ensure that it is fully charged, and you have data.
2. The invigilator may call or send you a message on the cell phone number you have provided to SAPC.



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## FAQs

# What to do if you experience load shedding / loss in electricity?

1. Keep calm.
2. Check your load-shedding schedule and make an alternative plan.
3. Ensure the laptop is fully charged before the examination.
4. Ensure an alternative Wi-Fi connection is available (if you are using a fibre connection).
5. If you are unable to find an alternate WiFi connection or if you need to be connected to a power supply, please find an alternative place. NB Notify us via the WhatsApp number.
6. If load shedding happens in the middle of the exam, your work will be saved.



## FAQs

# What happens to the questions you have answered if you lose connection?

1. Keep calm.
2. All questions are saved as you answer them.
3. When you log on again you will only have access to questions you have not yet answered.
4. The questions will be randomized, and they may renumber (starting at 1). Continue to answer the questions as they appear.



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# Where you sit is **IMPORTANT!**

Images are taken of the candidate throughout the exam.

Ensure there is sufficient lighting (for example close curtains or blinds if sitting in front of a window).

Test the lighting beforehand (take a selfie of yourself).

Ensure your camera is on.

Dress appropriately – images taken form part of your permanent record.

If the invigilator cannot see the images taken, they will phone you on your cell phone.



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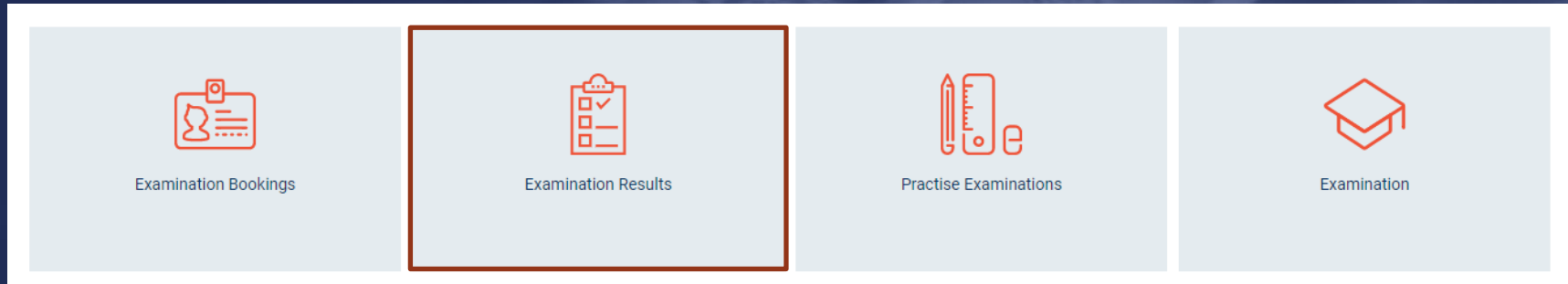
# FAQs

## When will you receive your results?

## Can you view your exam paper?

## Can my examination be remarked?

- The exam results will be released once the results have been analysed and verified. This may take some time. Council endeavours to have the results available within two (2) months of the date of the examination.



- You may apply to review your examination (complete an application form and pay the applicable fee). You will be allowed to view the exam question and the answer you provided. The correct answer will be indicated. You may ask the facilitator for the reference or the steps to the calculation. You are permitted to make notes, however you may not take a copy or photos of the examination.
- You may not apply for a remark. The results have been checked and verified before release.

# APPEAL PROCESS

Request a review of your exam paper.

- The above requests must be submitted to Council in writing.
- No later than 30 days after results are released.



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# Do you have any questions?



**[foreignqualified@sapc.za.org](mailto:foreignqualified@sapc.za.org)**





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# Thank you!