Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES
End Semester Examination, December 2023

Course: Medicinal Chemistry II Theory **Semester : V**
Program: B.Pharm **Duration : 03 Hours**
Course Code: BP501T **Max. Marks: 75**

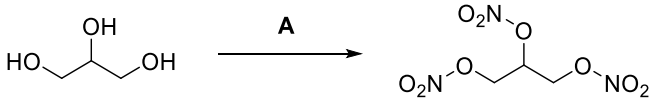
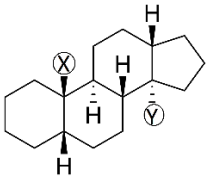
Instructions: Read each question carefully. Attempt all questions under Section A (20 x 1 marks). Attempt any two questions out of three under Section B (2 x 10 marks). Attempt any seven questions out of nine under Section C (7 x 5 marks).

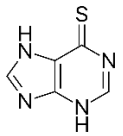
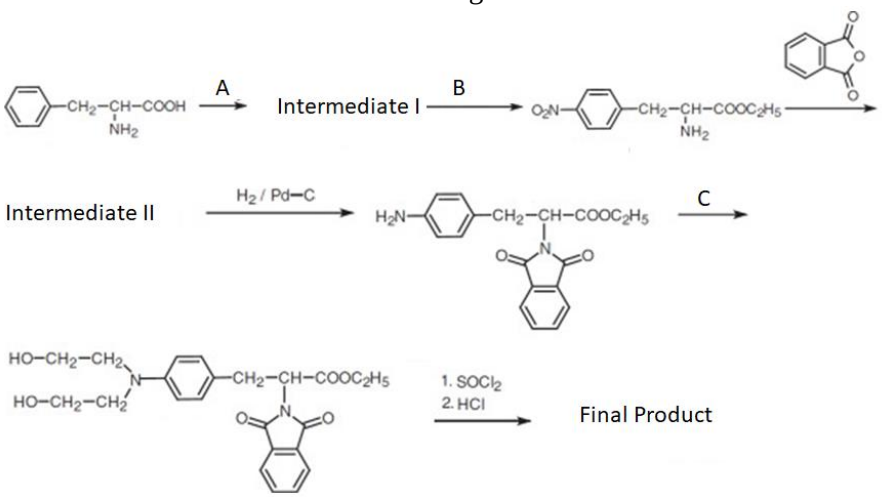
SECTION A

Multiple choice questions

(20Qx1M=20 Marks)

S. No.		Marks	COs
Q1	Which of the following diuretics is classified as a thiazide diuretic and is often used to manage hypertension and edema? A) Spironolactone B) Mannitol C) Hydrochlorothiazide D) Furosemide	**1**	**CO1**
Q2	Which of the following drug contains phenothiazine ring in its chemical structure? A) Meclizine B) Promethazine C) Azatadine D) Pyrilamine	**1**	**CO1**
Q3	Identify the correct option matching the following: (1) H1 receptor (a) Neurotransmission (2) H2 receptor (b) Gastric acid secretion (3) H3 receptor (c) Immunomodulation (4) H4 receptor (d) Allergic inflammation A) (1)-(a), (2)-(b), (3)-(c), (4)-(d) B) (1)-(a), (2)-(b), (3)-(d), (4)-(c) C) (1)-(d), (2)-(b), (3)-(a), (4)-(c) D) (1)-(d), (2)-(c), (3)-(b), (4)-(a)	**1**	**CO1**
Q4	Which of the following is an example of a first-generation H1 antihistamine? A) Loratadine B) Cetirizine C) Diphenhydramine D) Fexofenadine	**1**	**CO1**
Q5	The dihydropyridine calcium channel blockers, such as amlodipine, primarily target: A) L-type calcium channels in the heart B) T-type calcium channels in the heart C) L-type calcium channels in vascular smooth muscle D) P-type calcium channels in the central nervous system	**1**	**CO1**
Q6	Which of the following drug contains imidazolidine-2,4-dione? A) Phenytoin B) Methotrexate C) Amiodarone D) Heparin	**1**	**CO1**

Q7	Osmotic diuretics, such as mannitol, are often used in clinical settings to reduce intracranial pressure and intraocular pressure. Which of the following best describes their mechanism of action? A) Inhibition of carbonic anhydrase B) Inhibition of the sodium-potassium pump C) Promotion of sodium and water excretion by increasing osmotic pressure in the tubules D) Blocking the effects of aldosterone on the distal convoluted tubule	**1**	**CO1**
Q8	Which of the following drug inhibits Vitamin K epoxide reductase complex 1? A) Menadione B) Warfarin C) Clofibrate D) Gemfibrozil	**1**	**CO1**
Q9	Which of the following is a thiol-containing ACE inhibitor? A) Lisinopril B) Enalpril C) Fosinopril D) Captopril	**1**	**CO1**
Q10	Identify the reagent A in the following reaction:  A) Nitric acid B) Nitric acid & Sulphuric acid C) Nitrous acid D) Nitrous acid & Sulphuric acid	**1**	**CO1**
Q11	Cyclopentanoperhydrophenanthrene ring is present in: A) Pentobarbital B) Hydrocortisone C) Tetracycline D) Diethylstilbestrol	**1**	**CO1**
Q12	What are the configurations of groups X and Y in the given structure?  A) α and α, respectively B) β and β, respectively C) β and α, respectively D) α and β, respectively	**1**	**CO1**
Q13	Statins are commonly associated with which adverse effect related to muscle tissue? A) Hepatotoxicity B) Rhabdomyolysis C) Nephrotoxicity D) Gastrointestinal bleeding	**1**	**CO1**
Q14	The conversion of proton pump inhibitors (PPIs) into their active form occurs in which physiological environment? A) Alkaline blood B) Acidic stomach C) Neutral small intestine D) Basic duodenum	**1**	**CO1**
Q15	Second-generation H1 antihistamines are characterized by: A) High affinity for H1 receptors and sedative effects B) Low selectivity for H1 receptors and anticholinergic effects C) High selectivity for H1 receptors and reduced sedative effects D) Low selectivity for H1 receptors and high risk of QT prolongation	**1**	**CO1**

Q16	Which position of guanine is alkylated by Melphalan? A) Position 1 B) Position 3 C) Position 7 D) Position 9	**1**	**CO1**
Q17	Identify the name of drug with the following chemical structure?  A) Azathioprine C) 6-Mercaptopurine B) 6-Thioguanine D) Cytarabine	**1**	**CO1**
Q18	Which of the following is a bile acid sequestrant? A) Lovastatin B) Colestipol C) Clofibrate D) Nicotinic acid	**1**	**CO1**
Q19	Which of the following drug belongs to biguanide class of antidiabetic drug? A) Nateglinide B) Rosiglitazone C) Voglibose D) Metformin	**1**	**CO1**
Q20	The molecule PABA is the precursor for the synthesis of: A) Procaine B) Lignocaine C) Bupivacaine D) Cocaine	**1**	**CO1**
	SECTION B (20 Marks) **Attempt 2 Question out of 3** **(2Qx10M=20 Marks)**		
Q1	Describe the chemical structure, mechanism of action and important uses of the following drugs: (a) Cimetidine (b) 6-Mercaptopurine (c) Fosinopril (d) Sotalol	**2.5 x 4**	**CO2**
Q2	Explain the structure-activity relationships of Calcium Channel Blockers. Describe the synthesis of any two of the following drugs: (a) Disopyramide (b) Thiotepa (c) Acetazolamide	**4 + (2 x 3)**	**CO3**
Q3	(a) Consider the reaction with the following scheme:  (i) Name the reagents A, B and C in the above reaction? **(2 marks)** (ii) Write the chemical structures of intermediates I and II. **(2 marks)** (iii) Write the chemical structure and common name of the final product. **(2 marks)** (b) Discuss on the mechanism of action and uses of **any two** of the following: (i) Sildenafil (ii) Quinidine (iii) Methimazole	**(6+4)**	**CO5**

SECTION-C (35 Marks)

Attempt 7 Question out of 9 **(7Qx5M=35 Marks)**

Q1	Define and classify the H1 antihistamine with suitable examples. Draw the chemical structure of at least one second-generation H1 antihistamine.	**3+2**	**CO2**
Q2	Write the structure, synthesis, storage and biodistribution of histamine.	**5**	**CO2**
Q3	Write the classification of anti-hyperlipidemic agents, giving one example of drug for each class. Write the structure of any one anti-hyperlipidemic drug	**3+2**	**CO2**
Q4	Describe the sites of actions of diuretics. Write the chemical structure and MOA of Hydrochlorothiazide.	**2+3**	**CO4**
Q5	Discuss the chemical structure, structure activity relationship and metabolism of Testosterone.	**5**	**CO4**
Q6	Write the chemical structures and mechanism of actions of Isosorbide dinitrate and Tolbutamide.	**2x2.5**	**CO3**
Q7	Describe the MOA of ACE inhibitors. Write the chemical structures of any one of these drugs: (i) Pioglitazone (ii) Heparin.	**2.5+2.5**	**CO3**
Q8	Write the chemical structures of thyroid hormones T3 and T4. Illustrate the mechanism of action of L-thyronine.	**3+2**	**CO2**
Q9	Illustrate the nomenclature of steroids. Write the chemical structure and uses of Betamethasone.	**2+3**	**CO3**