Q.P. Code: 36885

Time: 3 hours **Marks: 70**

Please check whether you have got the right question paper.

N.B: (1) All questions are **compulsory**.
(2) Figures to the right indicate **full marks**.
(3) **Use of scientific calculator is permitted.**

Q.1		Answer the following:	
	a.	Define Bioavailability and Bioequivalence.	**2**
	b.	Drug absorption from the nasal mucosa is as rapid as observed after parenteral administration. Explain.	**2**
	c.	Chloroquine has a Volume of distribution of approximately 15000 litres. Give reasons.	**1**
	d.	What is auto-induction?	**2**
	e.	What is the cause for a bitter after-taste in the mouth after certain medications?	**2**
	f.	Formulation of which BCS class drug is the most challenging?	**2**
	g.	What do you understand by compartment modelling?	**2**
	h.	Give the difference between absolute and relative bioavailability	**2**
Q.2	a.	Discuss passive diffusion of drug absorption.	**4**
	b.	How do polymorphism and amorphism properties affect the solubility and dissolution rate of drugs?	**4**
	c.	Explain how gastrointestinal pH affects drug absorption.	**3**
Q.3	a.	How do surfactants affect drug absorption?	**3**
	b.	Enlist the physiological barriers to the distribution of drugs. Discuss any one.	**4**
	c.	What are the causes of non-linearity in drug metabolism and excretion?	**4**
		OR	
		Discuss rate of excretion method for determining K_E.	**4**
Q.4	a.	Describe the biotransformation of drugs by oxidative reactions.	**4**
	b.	Discuss hepatic blood-flow rate limited clearance.	**3**
	c.	How do the physicochemical properties of drugs affect renal excretion?	**4**
Q.5	a.	What is modified Noyes Whitney equation? Explain how the various parameters affect the dissolution of drugs.	**4**
	b.	Explain the Dissolution Apparatus I as per I.P.	**3**
	c.	Discuss any one type of bioequivalence experimental study design.	**4**
		OR	
		Discuss any four methods for enhancement of drug solubility and dissolution rate.	**4**

Q.6 a. How will you determine absorption rate constant by method of residuals? **4**

OR

Explain the pharmacokinetic parameters following IV bolus administration. **4**

b. An intravenous bolus dose of 50 mg of a drug following one compartment kinetics has a half-life of 8 hours and volume of distribution of 44 litres. Calculate :

i.) Concentration at zero hours, elimination rate constant **01**

ii.) Clearance, AUC (zero to infinity) **01**

iii.) The plasma drug concentration after 14 hours of drug administration **01**

iv.) The percent dose remaining in the body after 20 hours **02**

v.) Time required to eliminate 55% of the dose **02**

Q.P. Code :34668

[Time: Two Hours] **[Marks: 35]**

Please check whether you have got the right question paper.

N.B: 1. All questions are compulsory.
2. Figures to right indicate full marks.

Q1 Answer the following 07

i) Enlist various counselling aids used by pharmacist during patient counselling.

ii) Write any two improvements in dispensing practices to be made by pharmacist for effective patient compliance.

iii) Explain type B adverse drug reaction with any one suitable example.

iv) Justify why prolonged administration of cholestyramine reduces absorption of vitamin k leading to increased bleeding tendencies in some patients.

v) Postural hypotension is often aggravated by alpha blockers in geriatric patients.

vi) Why therapeutic drug monitoring is required for digoxin.

vii) Define term contract research organization.

Q2 a) Answer **any one** of the following 04

i) Discuss various steps involved in patient counselling.

ii) Define the term clinical pharmacy. write functions of clinical pharmacist in hospital.

Q2 b) Answer the following 03

i) Explain various reasons for patient non-compliance.

Q3 a) Answer **any one** of the following. 04

i) Discuss various factors predisposing adverse drug reactions with examples.

ii) Explain mechanisms of type A adverse drug reaction.

03 b) Answer the following 03

i) Discuss various conditions during which therapeutic drug monitoring becomes must.

Q4 a) Answer **any one** of the following 04

i) Write notes on drug food interaction and drug alcohol interaction.

ii) Explain mechanisms of following drug interactions

a) MAO inhibitors & SSRI

b) Rifampicin and oral contraceptives

Q.P. Code :34668

Q4 b) Answer the following 03

i) Discuss factors altering absorption of drug administered by various routes in pediatric patients.

Q5 a) Answer **any one** of the following 04

i) State types of clinical trials &write a note on double blind trials.

ii) Discuss role of preclinical studies in drug development.

b) Answer the following 03

i) Define : a) Institutional Review Board

b) Protocol

c)Randomization

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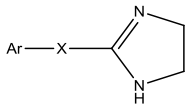
Time: 3 hrs **Marks: 70**

N. B. All questions are compulsory.

Q.1. Answer the following questions-

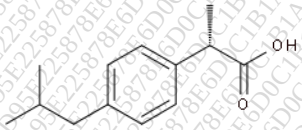
(i) Imidazolines of the type drawn below are known to act at the α-adrenergic receptor. How does the substituent X control α_1 vs α_2 selectivity?



(1)

(ii) Rivastigmine is a reversible inhibitor of acetylcholinesterase. What is it used for? **(1)**

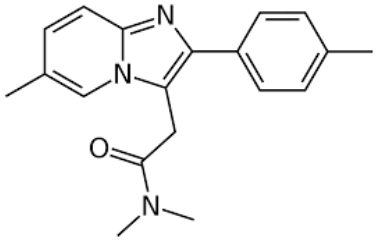
(iii) Give the chemical name of the following anti-inflammatory agent **(1)**



iv) Draw the structure of any succinimide used as an anticonvulsant. Which type of seizure is it used for? It's action is due to blockade of which channel? **(2)**

(v) Name any two opioids that are used as anti-diarrhoeal agents. (Structures not needed) **(1)**

(vi) The compound shown below is a sedative-hypnotic acting on the benzodiazepine receptor. State whether True/False **(1)**



(vii)Give the name and structure of the prodrug of the antithyroid drug methimazole **(1)**

(viii) Give example of an anabolic steroid. **(1)**

(ix) What is the effect of introduction of 9α-F group in corticosteroids? **(1)**

(x) Draw the structure of tranylcypromine. Mention any pertinent stereochemical feature of this molecule. **(1)**

(xi) Give the name and structure of any anxiolytic drug. **(1)**

(xii) To alleviate the positive symptoms associated with schizophrenia, drugs should interact at which receptor? (mention also the subtypes) **(1)**

(xiii) Give the MOA of Selegiline in the treatment of Parkinsonism. **(1)**

(xiv) Give the chemical class and use of Alendronate.. **(1)**

Q.2

(i) (a) The following statements relate to the SAR of barbiturates. State whether they are true or false giving a reasonable explanation. **(3)**

(1) At C5 at least one of the hydrogens should be left unsubstituted.

(2) N-methylation increases the duration of action.

(b) Give the structure of a BZD with an N-oxide functionality. **(1)**

(ii) (a) Match the following drugs with their respective profiles-

Drugs: i) Dicylomine ii) Bethanechol iii) Sarin iv) Ecothiophate

Description: i) Organophosphate used in glaucoma ii) Antidote for organophosphate poisoning iii) ganglionic blocker iv) Muscarinic antagonist v) Muscarinic agonist vi) Chemical warfare agent vii) Insecticide **(2)**

(b) Explain why succinyl choline chloride has a shorter duration of action. Draw structure. **(1)**

(c) Escitalopram is a selective norepinephrine reuptake inhibitor. True or false? **(1)**

(iii) Give structures of Propranolol and Sotalol. Designate their chiral carbons as R or S. Give metabolism of Propranolol. **(3)**

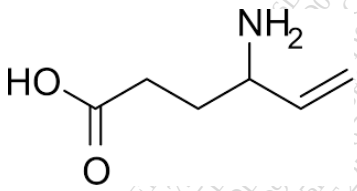
OR

(b) Compare the direct acting and indirect acting sympathomimetics with respect to their MOA and structural features. Explain giving examples. **(3)**

Q. 3

(i) (a) Outline the synthesis of Carbamazepine. **(2)**

(b) Identify the anticonvulsant drug given below and give it's mechanism of action. **(2)**



(ii) Draw the structure of testosterone and give it's chemical name. What is the importance of the following changes in structure? **(3)**

Esterification of 17β – OH group

#C-17α-methylation

(iii) (a)What are progestins? Explain in brief including their uses , giving suitable examples. **(2)**

(b) Elaborate the therapeutic role of bisphosphonates in osteoporosis. **(2)**

Q. 4

(i) (a) Outline the synthesis of Haloperidol. **(3)**

OR

(i) (a) The following statements relate to the SAR of Phenothiazines. State whether they are true or false. Correct those which are false (any three) ;-

Substitution at positions 1 and 2 on the phenothiazine ring improve activity

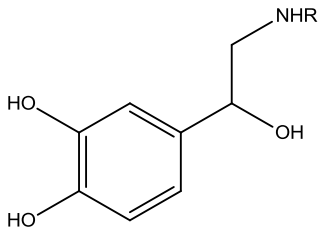
A 4-atom chain connecting N^{10} to the side chain amino group is best for activity

Branching of side chain with large groups (ex phenyl) decreases activity.

A methyl at the β-position in the side chain creates a chiral centre and both stereoisomers are equally active.

Of the amino groups in the side chain the dimethylamino and the diethylamino are equally active.

(ii) (a) Draw structure of the modified catechol nucleus (with numbering) for each of the following drugs. The general structure is given below- **(2)**



(1) Terbutaline
(2) Ritodrine
(3) Phenylephrine &
(4) Salbutamol.

b) Draw the structure of Nimesulide and give reason why the sulfonamide group is important for it's activity. **(2)**

(iii) (a). Explain with an example the structural features required for mu receptor antagonistic activity**.(2)**

(b)Give the schematic metabolism of methadone and label the metabolites as active and inactive. **(2)**

Q.5

(i) Answer the following questions- **(4)**

(a) Using Newman projection formula, draw the conformer of Acetylcholine that binds to the muscarinic receptor.

(b) Why is Pralidoxime ineffective if administered 36 hrs after exposure to insecticide?

(c) Name a muscarinic antagonist belonging to the class of aminoamides and give its therapeutic use.

(d) What is the effect of change of acetyl group to carbamoyl group in acetylcholine?

(ii)(a) Outline the synthesis of Doxepine. **(3)**

OR

(a) Classify antidepressants based on their mechanism of action giving one example of each class. (structures not needed) **(3)**

(iii)(a)What are non-steroidal estrogens? Explain giving examples. **(2)**

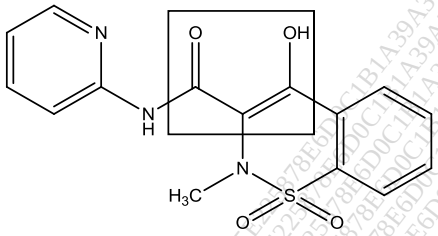
(b) Discuss the peripheral modifications of morphine with respect to SAR. **(2)**

Q. 6.

(i) Outline the synthesis of Labetalol **(3)**

(ii) (a) Draw the structure of Diclofenac. Which chemical class does it belong to? **(2)**

(b) Following is the structure of Piroxicam. Why is the marked portion so important for cyclooxygenase inhibitory activity? Is there any relationship between activity and the 2-pyridyl substituent? **(2)**



(iii) (a) Name two drugs acting as antiparkinsons agents by different mechanisms. Indicate their mechanism of action. **(2)**

(b) How are the atypical antipsychotics different from the typical antipsychotics? **(1)**

(c) Oxazepam is used as an antanxiety agent. True/false. Justify. **(1)**

Time: 3 Hours **Marks: 70**

N. B.: (1) **All** questions are **compulsory**.

(2) **Figures** to the **right** indicate full **marks.**

(3) **Draw** neat labeled **diagram** wherever **necessary.**

1	(a)	Elaborate on the validation of mixing process with a suitable example.	**4**
	(b)	Classify types of inventories and explain ABC Concept of inventory management.	**4**
		OR	
		Explain EOQ in materials management.	
	(c)	Which are the methods used in evaluating mucoadhesive drug delivery systems?	**3**
	(d)	State the principle of osmotic drug delivery.	**2**
	(e)	What is meant by standards of purity?	**2**
2	(a)	Discuss the multiorifice centrifugal process of microencapsulation.	**4**
		OR	
		Explain coacervation phase separation as a method for manufacture of microcapsules?	
	(b)	Illustrate layout for manufacture of film coated tablets.	**4**
	(c)	Give the salient features of Schedule M of Drugs and Cosmetics Act.	**3**
3	(a)	Briefly explain the advantages, applications and formulation of Microemulsions.	**4**
	(b)	How is the validation of steam sterilization conducted?	**4**
	(c)	Justify the need for documentation and state why it is significant.	**3**
4	(a)	What are the considerations in designing a pharmaceutical manufacturing facility	**4**
	(b)	What techniques are used in statistical quality control? Explain any one.	**3**
	(c)	Give four examples of targeted drug delivery systems.	**2**
	(d)	What is the role of bioadhesive polymers in formulations for colonic use?	**2**

OR

Justify use of NDDS in colon targeting of drugs .

5 (a) Write a note on the need for raw material control in Quality Assurance. **4**

(b) Discuss any two theories of mucoadhesion . **3**

(c) Explain advantages and applications of microencapsulation with suitable examples. **2**

(d) What are the eligibility criteria for personnel working in Pharmaceutical industry? **2**

6 (a) With the help of a neat diagram, explain the working of an elementary osmotic pump. **4**

(b) Give the flowchart to explain steps involved in scale up of a tablet prepared by Dry granulation. **4**

OR

Prepare a BMR for manufacture of a semi solid formulation.

(c) State approaches used for drug targeting to colon and elaborate on any one. **3**

Time: 3 Hrs **Marks: 70**

NB
1. **All questions are compulsory.**
2. **Write all sub questions together**
3. **Draw structure and diagrams where ever necessary**

Q.1	Answer the following	**15**
a.	Write name and structure of any one monocyclic monoterpenoid volatile oil constituent.	
b.	Write name of preferred method of extraction of lemon grass volatile oil.	
c.	Give advantages of terpeneless volatile oil.	
d.	Mention two species of Brahmi.	
e.	Write chemical test for saponin glycosides.	
f.	Give name and structure of any one steroidal saponin constituent.	
g.	Write name and source of any one oleo resin containing drug.	
h.	Write the name of pungent and coloring principle of Capsicum.	
i.	Write biological source of any one herbal photosensitizer drug.	
j.	Mention biopotential of Rutin.	
k.	Write any one biological source of Lycopene.	
l.	Give traditional uses of Ashoka.	
m.	Mention source of any one herbal binding agent.	
n.	Write names of any two Ayurvedic Arista Preparation.	
o.	Write name and structure of any one flavonoid marker.	
Q.2		
a.	Give a complete pharmacognostic account of Fennel **OR** Dill.	**4**
b.	Write source, constituents and uses of Kalmegh and Quassia.	**4**
c.	Write a note on any one skin care drug of herbal origin.	**3**
Q.3		
a.	Discuss in detail about Dioscorea.	**4**
b.	Write source, constituents and traditional uses of Tulsi and Lehsun.	**4**
c.	Write a note on any one Herbal hair colorant.	**3**
Q.4		
a.	Write pharmacognostic account of Clove	**4**
b.	Explain detoxification process for ayurvedic formulations with any two examples.	**4**
c.	Explain herb drug interaction with two examples.	**3**
Q.5		
a.	Differentiate between cardenolide and bufadienolide. Write source, constituents and uses of squill.	**4**
b.	Write biological source, chemical constituents and uses of orange peel and soyabean.	**4**
c.	Write a note on Schedule T for ASU drugs.	**3**
Q.6		
a.	Give biological source, constituents, chemical test and uses of Colophony **OR** Guggul.	**4**
b.	Write a note on Asafoetida.	**4**
c.	Write biosynthetic pathway of any one monoterpenoid.	**3**

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