

**MANIPAL UNIVERSITY****FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2015**

**SUBJECT: ADVANCES IN MOLECULAR PHARMACOLOGY & CHEMOTHERAPY (PHA 601T)**  
**(SPECIALIZATION: PHARMACOLOGY)**  
**(2014 REGULATION)**

Monday, May 18, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

✍ **Draw neat, labeled diagrams wherever necessary.**

1. Discuss the molecular mechanisms of induction of drug metabolism. Explain with examples the implications of enzyme induction in drug action.
2. Describe the structure of the tyrosine kinase-linked receptors and the mechanism of activation.
3. Explain the series of events taking place in replication of DNA.
4. Discuss the event of mitochondrial apoptosis.
5. Describe the molecular and cellular mechanisms involved in the down regulation of the beta-receptor density and explain its implication in heart failure.
6. Write briefly on peptides as drug molecules.
7. Explaining the structure of the fungal cell membrane, discuss the mechanisms of action of antifungal drugs.
8. With various examples, discuss the molecular mechanisms involved in the resistance development to anticancer drugs. How is the resistance tackled in cancer chemotherapy?
9. **Write short notes on:**
  - 9A. Mechanism of action and resistance development to co-trimoxazole
  - 9B. Cosmid vectors
10. **Write short notes on:**
  - 10A. Replication of influenza virus and drugs affecting it
  - 10B. Targeting immunodeficiency disorders for gene-therapy

(10 marks × 10 = 100 marks)



# MANIPAL UNIVERSITY

## FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2015

SUBJECT: DYNAMICS OF DRUGS AFFECTING MAJOR ORGAN SYSTEMS (PHA 602T)  
(SPECIALIZATION: PHARMACOLOGY)

(2014 REGULATION)

Wednesday, May 20, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ Answer ALL the questions.

✍ Draw neat, labeled diagrams wherever necessary.

1. Explain the lipoprotein metabolism in plasma. Discuss the mechanisms of statins as lipid lowering agents.
2. Discuss the physiology of urine formation. Explain the mechanisms of action of diuretics
3. Discuss the genesis of epilepsies. Explain the major mechanisms of action of antiepileptic drugs.
4. Describe the molecular basis of pain. Discuss the mechanisms of action of analgesics
5. Discuss the mechanism of anti-inflammatory and analgesic action of NSAIDs. Discuss the advantages of COX<sub>2</sub> selective drugs.
6. Discuss the principles of immunosuppression.
7. With a brief description of thyroid function, explain the mechanisms of action of antithyroid drugs
8. Discuss the mechanisms of action of oral antidiabetic drugs
9. Write briefly on:
  - 9A. Molecular mechanism of action of digoxin
  - 9B. Drugs for Alzheimer disease
10. Write briefly on:
  - 10A. Beta blockers as anti-arrhythmic drugs.
  - 10B. Basis of preanaesthetic medications

(10 marks × 10 = 100 marks)



**MANIPAL UNIVERSITY**  
**FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2015**  
**SUBJECT: APPLIED AND CLINICAL PHARMACOLOGY (PHA 603T)**  
**(SPECIALIZATION: PHARMACOLOGY)**

(2014 REGULATION)

Friday, May 22, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

✍ **Draw the neat, labeled diagram wherever necessary.**

1. Explain the clinical pharmacokinetic parameters and their applications in therapeutics.
2. Discuss the significance of liver and kidney function tests.
3. What is Parkinsonism? Discuss the management of Parkinson's disease.
4. Discuss the etio-pathogenesis and management of iron deficiency and megaloblastic anemia.
5. Explain the role of diuretics in the management of hypertension with special emphasis on choice of diuretics, mechanism, adverse effects and dose.
6. Discuss the treatment modality in acute myeloblastic and lymphoblastic leukemia.
7. Discuss the pathophysiology of Type I, II and Gestational diabetes. Explain the relevant drug therapy.
8. Explain the pathogenesis and treatment of NSAIDs-induced gastric ulcers.
9. **Write short notes on:**
  - 9A. Essential medicine concept
  - 9B. Management of thyrotoxicosis
10. **Write briefly on the following:**
  - 10A. Role of ORS in management of diarrhea
  - 10B. Role of pharmacogenetics in therapeutic outcome

(10 marks × 10 = 100 marks)





## MANIPAL UNIVERSITY

### FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2015

**SUBJECT: PRECLINICAL DRUG DISCOVERY AND ANALYTICAL TECHNIQUES (PHA 604T)**  
**(SPECIALIZATION: PHARMACOLOGY)**  
**(2014 REGULATION)**

Monday, May 25, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL questions.**

1. Discuss the modern approaches and methods of drug discovery and drug development. (10 marks)
2. Write the principle, instrumentation and application of gel electrophoresis. (10 marks)
3. Following are the data for liver glycogen content (mg/dl) of three groups of animals who received vehicle, standard (5 mg/kg) and test drug (15 mg/kg), respectively in the following order.

Vehicle treated (G1)	5.6	5.7	6.4	6.0	5.9	6.0	5.6	5.7	6.4	---
Standard drug (G2)	2.5	2.7	3.4	3.0	2.0	2.1	1.9	2.5	2.7	3.4
Test drug (G3)	3.6	3.8	3.0	3.2	2.9	3.6	3.1	3.6	3.8	3.0

With the help of suitable statistical test, answer the following questions:

- a) Do the standard and test drugs have any influence on liver glycogen?
- b) Which of the two treatments is more efficacious in its action? (10 marks)
4. With the help of a flow chart, discuss the animal house design and facilities. (10 marks)
5. Describe any four methods for screening of anti-epileptic drugs. (10 marks)
6. Discuss different animal models for analgesics screening. (10 marks)
7. Discuss the general toxicity testing of an NCE. (10 marks)
8. Explain the various pre-clinical tests to assess the mutagenic potential of a NCE. (10 marks)
9. **Write short notes on:**
  - 9A. HFD-induced metabolic disorder in rodents
  - 9B. Immunofluorescence (5 marks × 2 = 10 marks)
10. **Write briefly on the following:**
  - 10A. *In vitro* cytotoxicity assay
  - 10B. ELISA (5 marks × 2 = 10 marks)



**MANIPAL UNIVERSITY**  
**FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2015**  
**SUBJECT: CLINICAL DRUG DEVELOPMENT (PHA 605T)**  
**(SPECIALIZATION: PHARMACOLOGY)**  
**(2014 REGULATION)**

Wednesday, May 27, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Draw neat, labeled diagrams wherever necessary.**

1. Explain the roles and responsibilities of sponsor and CRA.
2. Write a note on the clinical trial protocol review procedures by ethics committee.
3. Write a note on missing data and its management.
4. Explain the SOPs for the use of computers [21 CFR part 11] in clinical trials.
5. Describe the ICH guideline for the clinical investigation in a pediatric population.
6. Explain the roles and responsibilities of a clinical research organization.
7. Describe 'assessment of relative and absolute bioavailability of drugs in man'.
8. Discuss the CONSORT (Consolidated Standards of Reporting Trials) statement.
- 9A. Explain the components of an informed consent.
- 9B. Explain Orphan drug development and the regulatory challenges involved it.
- 10A. What are the prospectus of CRO in India?
- 10B. Write a short note on the importance of Literature review in clinical research.  
(10 marks × 10 = 100 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M. PHARM. DEGREE EXAMINATION – JULY 2015**

**SUBJECT: ADVANCES IN MOLECULAR PHARMACOLOGY & CHEMOTHERAPY (PHA 601T)**  
**(SPECIALIZATION: PHARMACOLOGY)**  
**(2014 REGULATION)**

Monday, July 20, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

**✍ Answer ALL questions.**

**✍ Draw neat, labeled diagrams wherever necessary.**

1. Describe various hepatic models of ABC and SLC transporters contributing to biotransformation of drug.
2. Discuss the intracellular signal transduction through the PI-3-kinase/Akt/and mTOR pathways.
3. Describe the DNA replication process in leading and lagging strand.
4. With a neat sketch, discuss the mechanisms that control the smooth muscle contraction and relaxation. Show how drugs affect these mechanisms.
5. Discuss the cholinergic transmission and drugs affecting it.
6. Explain the cannabinoid signaling and its pathophysiological implications. Discuss the potential clinical uses of cannabinoid agonist and antagonist.
7. Discuss the mechanism of action of various antifungal drugs used clinically.
8. Write briefly on the genesis of cancer and clonal selection of cancer.
9. **Write short note on:**
  - 9A. Salient features of newer macrolides and their mechanisms of action
  - 9B. Intricacies of the preparation of plasmid DNA
10. **Write short note on:**
  - 10A. Replication of HIV and drugs affecting it
  - 10B. Non-viral DNA-delivery strategies employed in human gene-therapy

(10 marks × 10 = 100 marks)





**MANIPAL UNIVERSITY****FIRST YEAR M. PHARM. DEGREE EXAMINATION – JULY 2015**

**SUBJECT: DYNAMICS OF DRUGS AFFECTING MAJOR ORGAN SYSTEMS (PHA 602T)**  
**(SPECIALIZATION: PHARMACOLOGY)**  
**(2014 REGULATION)**

Wednesday, July 22, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

- ✍ **Answer ALL the questions.**  
✍ **Draw neat, labeled diagrams wherever necessary.**

1. Discuss the basis of cardiac dysrhythmia and the mechanisms of action of antidysrhythmic drugs.
2. Discuss the role of kidneys in volume regulation. Describe the mechanisms of diuretics.
3. Discuss the mechanisms of drugs used in the treatment of rheumatoid arthritis.
4. Discuss GABA<sub>A</sub> receptor and how drugs affect its functions.
5. Discuss the central dopaminergic pathways and the effects of drugs affecting them.
6. Discuss the mechanism of action of oral antidiabetic drugs.
7. Bone mineralization: Explain the role of parathyroid hormone and vitamin D.
8. Peptic ulcer: Discuss the mechanisms of antiulcer drugs.
9. **Write briefly on:**
  - 9A. Pre-anaesthetic medication
  - 9B. Drug dependence
10. **Write briefly on:**
  - 10A. Leukotriene antagonists in bronchial asthma
  - 10B. Cyclosporine as immunosuppressant

(10 marks × 10 = 100 marks)



**MANIPAL UNIVERSITY****FIRST YEAR M. PHARM. DEGREE EXAMINATION – JULY 2015****SUBJECT: APPLIED AND CLINICAL PHARMACOLOGY (PHA 603T)****(SPECIALIZATION: PHARMACOLOGY)****(2014 REGULATION)**

Friday, July 24, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Draw neat, labeled diagram wherever necessary.**

1. Explain how inheritance affects pharmacokinetic and pharmacodynamic drug response.
2. Define drug interaction and discuss the various mechanisms of drug interaction.
3. Explain the clinical manifestations and pharmacological management of generalized tonic-clonic seizures.
4. Discuss the management of CCF.
5. Describe the pathogenesis of cardiac arrhythmia and classify the antiarrhythmic drugs based on their clinical applications.
6. Describe the etiology and pathogenesis of UTI. Discuss the anti-infective agents used in treatment of UTI.
7. Discuss the pathophysiology and disease management algorithm for primary open-angle glaucoma.
8. What is Hodgkin's disease and non-Hodgkin's lymphoma? Give an account on treatment algorithms.
9. **Write short notes on:**
  - 9A. Importance of  $V_d$  in TDM
  - 9B. Treatment algorithm of schizophrenia
10. **Write briefly on following:**
  - 10A. Complications of estrogen and progesterone therapy
  - 10B. Management of type 2 diabetes

(10 marks × 10 = 100 marks)





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**SUBJECT: PRECLINICAL DRUG DISCOVERY AND ANALYTICAL TECHNIQUES (PHA 604T)**  
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**(2014 REGULATION)**

Monday, July 27, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

**Answer ALL the questions.**

1. Discuss the various stages of the drug development programme. (10 marks)

2. Describe the principle, instrumentation and pharmaceutical applications of UV spectroscopy. (10 marks)

3. Following are the data for plasma triglyceride (mg/dl) of three groups of animals who received vehicle, standard drug (100 mg/kg) and test compound (200 mg/kg), respectively in the following order. With the help of suitable statistical test, answer the following questions;

Vehicle treated (G1)	180	215	180	178	240	220
Standard drug (G2)	114	122	98	100	102	115
Test drug (G3)	198	130	136	140	132	122

a) Do the standard and test drugs have any influence on triglyceride content?  
 b) Which of the two treatments is more efficacious in its action? (10 marks)

4. Describe the guideline recommended for laboratory animal maintenance and use. (10 marks)

5. Discuss two methods each for chemically and electrically induced nociception in rodents. (10 marks)

6. Describe any four methods for screening antidepressant drugs. (10 marks)

7. Describe the objectives, methods and criteria of chronic toxicity studies. (10 marks)

8. Discuss the in-vivo PK studies for determining absorption characteristics of a drug in a preclinical trial. (10 marks)

9. **Write short notes on:**

- 9A. DNA ladder assay
- 9B. Cell culture principle and maintenance

(5 marks × 2 = 10 marks)

10. **Write briefly on the following:**

- 10A. Radio ligand binding assay
- 10B. RT-PCR

(5 marks × 2 = 10 marks)



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Wednesday, July 29, 2015

Time: 10:00 – 13:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Draw neat, labeled diagrams wherever necessary.**

1. What is an Institutional Review Board (IRB)? Explain the roles and responsibilities of IRB.
2. Write a note on vulnerable subjects in clinical trials. Explain the difference between adverse drug reaction and adverse effect.
3. Discuss the CONSORT (Consolidated Standards of Reporting Trials) statement.
4. Discuss the importance of Schedule Y in clinical trials.
5. Elaborate the ICH guideline for the 'Thorough QT/QTc Study' [E14].
6. What is DSUR? Give an account of its presentation.
7. Explain the importance of blinding in clinical trials.
8. Describe 'exploratory assessment of drug dose linearity' and its use for study optimization.
- 9A. Explain the process of getting Informed Consent from an illiterate subject.
- 9B. Write a short note on Orphan drugs.
- 10A. Write a short note on CROs in India.
- 10B. What is the importance of Literature review in clinical research?

(10 marks × 10 = 100 marks)

