Code No: 248AA

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, September - 2025
BIOSTATISTICS AND RESEARCH METHODOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a) Define Frequency distribution. [2]
b) Define Dispersion, Range and Standard deviation with simple examples. [3]
c) What is called Alternate hypothesis? [2]
d) Discuss about Standard Error of Mean. [3]
e) Define Graphs. List out them. [2]
f) Give any three importance reasons of need for research. [3]
g) What is called MINITAB®? Explain. [2]
h) Enlist statistical software used in Clinical trials. [3]
i) Define 2^3 factorial design with examples. [2]
j) Write any three differences between 2^2 and 2^3 designs. [3]

PART - B

(50 Marks)

2. Briefly discuss about measures of dispersion giving pharmaceutical examples. [10]

OR

3. Define Correlation and correlation co-efficient. With suitable examples explain about multiple correlation. [10]

4.a) Define Sampling and its types with suitable example.
b) Write Error I type and Error II Type. [5+5]

OR

5. Discuss the role of ANOVA (One way) in analyzing data to find out the level of significance with suitable example. [10]

6. Write short notes on the following:
a) Report writing and presentation of data
b) Cohort studies. [5+5]

OR

7. Brief about Mann- Whitney's U test and Friedman's test with suitable example. [10]

8. Write a detailed note on application of SPPS statistical software in clinical trials problems. [10]

OR

9. Explain in detail about statistical analysis using R-Online software programs. [10]

10. Give an elaborate note factorial design. Add a note on advantages of factorial design. [10]

OR

11. Give a detail note on optimization techniques by response surface methodology. [10]

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Code No: 248AA

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, July/August - 2025
BIOSTATISTICS AND RESEARCH METHODOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A (25 Marks)

1.a) What is correlation? [2]
b) Define mean, median and mode. [3]
c) What is curve fitting? [2]
d) Brief on types of sampling errors. [3]
e) Define sample size. [2]
f) Describe the counter plot graph. [3]
g) Illustrate the uses of clinical trials. [2]
h) Describe the statistical software's for industry. [3]
i) What is historical design? [2]
j) Write applications of factorial design. [3]

PART-B (50 Marks)

2. Discuss in detail about the scope and applications of biostatistics in pharmacy. [10]

OR

3. Calculate the range and standard deviation for following data: [10]

Students	A	B	C	D	E	F	J	H	I
Marks	48	54	61	97	85	73	55	49	79

4. Describe about the types of ANOVA and its applications with suitable industry examples. [10]

OR

5. Write about the multiple regression and standard error of regression in detail. [10]

6. Discuss in detail about the Wilcoxon Rank Sum Test, Mann-Whitney U test. [10]

OR

7. Explain in detail about the report writing and presentation of data with suitable illustration. [10]

8. Discuss about the various online statistical software's used in clinical trial. [10]

OR

9. Elaborate the statistical analysis using various tools and their applications. [10]

10. Write about the types and advantage of factorial design. [10]

OR

11. Describe about the Response Surface methodology methods. [10]

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Code No: 248AA

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, August - 2024
BIOSTATISTICS AND RESEARCH METHODOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A (25 Marks)

1.a) Define the term Frequency Distribution. [2]
b) Give the importance of measures of dispersion in solving pharmaceutical problems. [3]
c) Enumerate the important parametric tests. [2]
d) What do you mean by regression? Give its importance. [3]
e) What is Kruskal wallis test? [2]
f) Write a note on the need for research. [3]
g) Write a note on the importance of online statistical software's. [2]
h) List out the important application of Excel. [3]
i) What is Response surface methodology? [2]
j) What are the applications of factorial design? [3]

PART-B (50 Marks)

2. Find the standard deviation of the following data [10]

Size of item	10	11	12	13	14	15	16
Frequency	2	7	11	15	10	4	1

OR

3. Compute the median and mode of the following distribution of tracheal ventilation scores (ml per minute) of a sample of beetle. [10]

Class interval	61-65	66-70	71-75	76-80	81-85
Frequencies	12	25	45	30	8

4.a) Write Error I type and Error II Type.
b) Describe the types of sampling used in biostatistics. [5+5]

OR

5.a) Write the steps involved in the computation of Paired and unpaired t-test with an example.
b) Examine the importance of null hypothesis in research. [5+5]

6.a) Discuss in detail the construction and labeling of different types of graphs.
b) Describe the experiential design techniques used in pharma research. [5+5]

OR

7. Explain in detail about report writing and presentation of data in report writing with a real – world example. [10]

8.a) Examine the role of "R"- online statistical software in clinical trials.
b) Explain the basic tools in SPSS software and SAS. [5+5]

OR

9. Explain the basic tools, importance and applications of Design of Experiments tool.[10]

10. Write a note on the following:
a) 2^2 and 2^3 designs in factorial design.
b) Advantages and disadvantages of factorial design. [6+4]

OR

11. Summarize and write a detailed note on the optimization techniques employing response surface methodology. [10]

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Code No: 248AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, September - 2025
SOCIAL AND PREVENTIVE PHARMACY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A **(25 Marks)**

1.a) Define public health and explain its key concepts. [2]
b) Explain the concept of disease control and the methods used to achieve it. [3]
c) Mention the causative organisms for cholera and malarial disease. [2]
d) Briefly discuss the prevention and control measures for SARS. [3]
e) What is Universal Immunization Programme (UIP)? [2]
f) Explain how National Programme for Control of Blindness helps to reduce the prevalence of blindness. [3]
g) Write a note on National Family Welfare Programme. [2]
h) Discuss the objectives of the National Health Intervention Programme for Mother and Child. [3]
i) What is the importance of health education? [2]
j) Write a note on National Urban Health Mission (NUHM). [3]

PART - B **(50 Marks)**

2. Describe the components of a balanced diet and their significance. Discuss the causes and prevention of vitamin deficiencies. [10]

OR

3. Discuss the socio-cultural factors that influence health and disease. Analyze the impact of urbanization on health and disease. [10]

4. Explain the strategies for preventing and controlling malaria. Describe the preventive measures and public health strategies for combating drug addiction and substance abuse. [10]

OR

5. Evaluate the preventive and control measures for dengue fever. Identify the preventive measures for hypertension and explain their importance. [10]

6. Describe the objectives, functioning, and outcomes of the HIV and AIDS Control Programme in India. Write a note on National Tuberculosis (TB) Control Programme. [10]

OR

7. Analyze the objectives and effectiveness of the National Leprosy Eradication Programme (NLEP). Write a note on National Mental Health Programme (NMHP). [10]

8. Analyze the objectives and implementation strategies of the National Tobacco Control Programme. Write a note on National Malaria Prevention Programme. [10]

OR

9. Explain the purpose and activities of social health programmes in India. Explain the role of World Health Organization (WHO) in supporting Indian national health programs. [10]

10. Describe the functions of a Primary Health Centre (PHC) in rural health services. Write a note on Community services in rural areas. [10]

OR

11. Discuss the strategies and outcomes of improving rural sanitation in India. Write a note on community health services in urban areas. [10]

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R17

Code No: 248AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, July/August - 2025
SOCIAL AND PREVENTIVE PHARMACY

Time: 3hours **Max.Marks:75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A **(25 Marks)**

1.a) Discuss the concept of public health. [2]
b) Describe various nutritional deficiencies. [3]
c) Write prevention and control of Influenza. [2]
d) Discuss methods of prevention of dengue. [3]
e) Describe pulse polio program. [2]
f) Elaborate on national program on deafness. [3]
g) Write role of WHO in Indian national health program. [2]
h) Discuss national malaria prevention program. [3]
i) Elaborate on the importance of rural sanitation. [2]
j) How national urban health mission impacted India? [3]

PART- B **(50 Marks)**

2. Discuss the concept of balanced diet with suitable examples. [10]

OR

3. Describe the following
a) Vitamin deficiencies
b) Poverty and health. [6+4]

4. Discuss the general principles of prevention and control of hypertension. [10]

OR

5. Describe the principles of prevention and control of cancer. [10]

6. Elaborate on the execution and outcomes of tuberculosis control programme. [10]

OR

7. Describe the national programme for prevention and control of mental illness in India. [10]

8. Give a detail account on national health intervention programme for elderly population in India. [10]

OR

9. Discuss the importance and significance of national family welfare programme. [10]

10. Discuss the long term outcomes of health promotion and health education in school in India. [10]

OR

11. Describe the impact of community engagement in health and wellbeing of Indian population in rural as well as urban areas. [10]

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Code No: 248AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, August - 2024
SOCIAL AND PREVENTIVE PHARMACY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A

(25 Marks)

1.a) Define balanced diet and its significance. [2]
b) Discuss the different levels of disease prevention with suitable examples. [3]
c) Mention the causative organisms for flu and pneumonia disease. [2]
d) Briefly discuss the prevention and control measures for filariasis. [3]
e) Write a note on National Programme for Prevention and Control of Deafness. [2]
f) Write a note on Pulse Poljo Programme. [3]
g) What is National malaria prevention program? [2]
h) Write a note on National Programme for Health Care of the Elderly? [3]
i) Define health education. [2]
j) Write a note on Primary Health Centre (PHC). [3]

PART-B

(50 Marks)

2. Define malnutrition, differentiate between undernutrition and overnutrition, and propose public health measures to prevent malnutrition. [10]

OR

3. Define personal hygiene and its importance in maintaining health. Examine the relationship between poverty and health. [10]

4. Evaluate the preventive and control measures for dengue fever and acute respiratory infections. [10]

OR

5. Explain the strategies for preventing and controlling cholera. Discuss the public health approaches to preventing diabetes mellitus. [10]

6. Explain the objectives and key strategies of the National Tuberculosis (TB) Control Programme. What are the aims and components of the Integrated Disease Surveillance Program (IDSP)? [10]

OR

7. Write a note on National Leprosy Eradication Programme (NLEP) and HIV and AIDS Control Programme in India. [10]

8. Describe the National Tobacco Control Programme and National Family Welfare Programme in India. [10]

OR

9. Discuss the objectives, key strategies, and outcomes of the National Health Intervention Programme for Mother and Child. [10]

10. What are the objectives and key components of the National Urban Health Mission (NUHM)? Discuss the strategies for improving rural sanitation in India. [10]

OR

11. Discuss the importance of health promotion and education in schools. Discuss the importance community health services in urban areas. [10]

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Code No: 248AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, June - 2024
SOCIAL AND PREVENTIVE PHARMACY

Time: 3hours **Max.Marks:75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A (25 Marks)

1.a)	Write about evaluation of public Health.	[2]
b)	Why Personal hygiene is important?	[3]
c)	What are community engagements?	[2]
d)	Write problem associated with Pneumonia.	[3]
e)	What is Pulse Polio Program?	[2]
f)	Write about AIDS control programmes.	[3]
g)	Write role of WHO in Indian national program.	[2]
h)	Write about national tobacco control programme.	[3]
i)	Write functions of PHC.	[2]
j)	What are health promotion programme?	[3]

PART- B (50 Marks)

2. Discuss various components of social and health education with suitable examples. [10]

OR

3. Describe the drug therapy for
a) Avoidable habits
b) Impact of urbanization on health and disease. [5+5]

4. Discuss the general principles of prevention and control of hypertension and malaria. [10]

OR

5. Give your views on prevention and control of SARS and drug addiction-drug substance abuse. [10]

6. Elaborate on Integrated Disease Surveillance Program (IDSP) program and National programme for control of blindness. [10]

OR

7. Describe national mental health program and universal immunization programme. [10]

8. Give a detailed account on national family welfare programme and social health programme. [10]

OR

9. Discuss national malaria control programme and national programme for the health care for the elderly. [10]

10. Discuss improvement in rural sanitation and national urban health mission. [10]

OR

11. Describe community services in rural, urban and school health? [10]

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Code No: 228AA

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, September - 2025
NOVEL DRUG DELIVERY SYSTEMS AND REGULATORY AFFAIRS

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a) Define controlled release systems. Give their advantages. [2]
b) Explain the principle in ion exchange resin system for controlled release dosage forms. [3]
c) Give the ideal physicochemical properties of drug suitable for transdermal drug delivery systems. [2]
d) What are permeation enhancers? Give their role in TDDS. [3]
e) Give the advantage of buccal drug delivery systems? [2]
f) Write the applications of nanoparticles. [3]
g) Write about product filing. [2]
h) Write the major differences between NDA and ANDA. [3]
i) Write the importance of analytical method validation. [2]
j) Explain about robustness importance in analytical method validation. [3]

PART - B

(50 Marks)

2. Explain the mathematical approaches for differentiating zero and first order release kinetics for controlled drug delivery systems. [10]

OR

3. Explain the principle of osmotic drug delivery systems. How the osmotic pressure is created in these systems for drug release and write about formulation ingredients used in these systems. [10]

4.a) Give the salient features of good manufacturing practices for personnel and equipment as per Schedule M.
b) Discuss the scenario of pharmaceutical industry before and after implementation of Schedule M. [5+5]

OR

5. What are the specific advantages of nanoparticles over other nano systems? Explain the preparation methods for nanoparticles. [10]

6. Mention the problems associated in the design of mucoadhesive systems. Discuss the theories of mucoadhesion. [10]

OR

7. Explain the formulation and evaluation of liposomes. [10]

8. Explain the functions of CDSCO and add a note on its role in fighting the Covid 19 pandemic. [10]

OR

9. Explain the applications and approval process for ANDA. [10]

10. Discuss the validation parameters used in analytical method validation with their relevance. [10]

OR

11. Explain the significance and procedure for concurrent validation. [10]

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Code No: 248AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy IV Year II Semester Examinations, June - 2024

NANO TECHNOLOGY

R17

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A

(25 Marks)

1.a) Name some properties that make nano materials unique. [2]
b) Name the different types of nanoparticles with example. [3]
c) Name some polymers used for preparation of polymeric nanoparticles. [2]
d) What are Niosomes? Give examples. [3]
e) Define Nano-thernostics. [2]
f) Difference between active and passive targeting using nanoparticles. [3]
g) What are the nanomaterials used in pulmonary drug delivery system? [2]
h) Mention three main advantages of nanoparticles in cardiovascular drug delivery? [3]
i) What is the formula for calculating drug entrapment and drug loading for nanoparticles? [2]
j) What is zeta potential? Explain the importance of it. [3]

PART - B

(50 Marks)

2. Discuss the history of introduction of nanoparticles as a drug delivery vector in drug delivery technology. [10]

OR

3.a) What are the most important properties of nanoparticles?
b) Explain the effect of change of particle size in mechanical and optical properties of nanoparticles. [5+5]

4.a) Briefly explain about super para-magnetism in nanoparticles.
b) Write briefly on magnetic features of Nanoparticles. [3+7]

OR

5.a) Discuss in detail about the characterization of polymeric nanoparticles.
b) Discuss the major drawbacks of polymeric nanoparticles in drug delivery and targeting? [5+5]

6. How has nanotechnology helped to improve medical treatment and diagnosis? Explain in details. [10]

OR

7.a) How are nanoparticles used for drug targeting?
b) Explain how nanoparticles target cells. [5+5]

8.a) What are the major factors and barriers in intranasl drug delivery?
b) Discuss the role of nanoparticles in intra-nansal drug delivery? [5+5]

OR

9.a) Critically analyze the major factors that should be considered before desi... nanoparticles for drug delivery.

b) How will you design a transdermal patch for a localized drug delivery? [5+...

10.a) How to check the stability of nanoparticles?

b) What are the factors that add to the instability of nanoparticles? Elaborate. [5+5]

OR

11.a) What is the mechanism of drug release from nanoparticles?

b) How do you measure drug release from nanoparticles? [5+5]

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Code No: 248AF

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, September - 2025
EXPERIMENTAL PHARMACOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a) Name the different routes of drug administration to animals. [2]
b) Name the techniques for the collection of blood from the animals. [3]
c) Write the name different methods for grouping of animals. [2]
d) Write about parameters for the selection of preclinical screening models. [3]
e) Name two sympathomimetics and sympatholytics. [2]
f) Write the principle and uses of photoactometer. [3]
g) Write the steps involved in coagulation cascade. [2]
h) Write the principle and uses of carbonic anhydrase inhibition test. [3]
i) Write the names of databases available for review of literature. [2]
j) Write various types of study designs. [3]

PART - B

(50 Marks)

2. Write in detail:
a) Transgenic and mutant animals along with their advantages and limitations.
b) Normal life span, average feed and water intake, average weight of commonly used laboratory animals. Differentiate between Wistar rats and SD rats. [5+5]

OR

3. Describe various species and strains of laboratory animals along with their use in particular research. [10]

4. What is sham negative and positive control groups? Write their importance in preclinical screening models. [10]

OR

5. Write the current challenges and limitations of animal models along with suitable examples. [10]

6. Write a short note on the following:
a) Screening of hyoscine as anti-motion sickness drug.
b) Screening of atenolol as anti-hypertensive drug. [5+5]

OR

7. Write in detail about Preclinical screening models or ANS activity along with their advantages and limitations. [10]

8. Describe in detail about various animal models for cancer along with their advantages and limitations. [10]

OR

9. Explain about *In-vitro* and *In-vivo* models for hepatic cancer along with their limitations and advantages. [10]

10. Differentiate between paired 't' test and unpaired 't' test with suitable examples. [10]

OR

11. Write different types of hypotheses with suitable examples. Write briefly about selection of research topic. [10]

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Code No: 248AF

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, July/August - 2025
EXPERIMENTAL PHARMACOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A **(25 Marks)**

1.a) What is OECD? Name the breeding Techniques? [2]
b) Enlist the Various techniques for blood collection. [3]
c) Explain the preparation of Drug solution in regard with various solvents used. [2]
d) What are the rationales for the selection of Animal species? [3]
e) Enumerate the different screening methods for Parasympatholytics. [2]
f) Explain the invitro screening method for drugs acting on Eye. [3]
g) List out the preclinical screening methods for Diuretic activity. [2]
h) What is the significance of preclinical screening? [3]
i) Explain the possible ways of Graphical representation of data. [2]
j) Write a short note on Review of Literature. [3]

PART-B **(50 Marks)**

2. Write in detail about common routes of drug administration in laboratory animals along with their advantages and limitations. [10]

OR

3. Mention the Objectives of CPCSEA. Write the composition and responsibilities of IAEC. [10]

4. Write in detail about the basics of preclinical screening models along with their advantages and limitations. [10]

OR

5. Explain the process of dose selection for preclinical studies and explain the steps involved in preparing drug solutions/suspensions for administration to animals in preclinical studies. [10]

6. Write in detail about animal models used for screening of sympathomimetics. [10]

OR

7. Write in detail about animal models used for screening of parasympathomimetics. [10]

8. Explain any three pre clinical screening methods for Anti-cancer drugs. [10]

OR

9. Discuss the Animal models and End points measured in pre-clinical screening models for Anticoagulants. [10]

10. Describe the process of conducting a literature review in Biomedical research. Write objectives and how does it contribute to the development of Research hypothesis and study design. [10]

OR

11. What is one way ANOVA? Write its uses along with its advantages and limitations. [10]

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Code No: 248AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy IV Year II Semester Examinations, August -2024

R17

Time: 3 Hours **EXPERIMENTAL PHARMACOLOGY**

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A

(25 Marks)

1.a) Write a note on Grouping of laboratory animals. [2]
b) Write a note on Euthanasia. [3]
c) Write the importance of sham negative and positive control groups in experimental animal studies. [2]
d) Write about selection of doses for preclinical screening models along with suitable examples. [3]
e) Name four skeletal muscle relaxant. [2]
f) Write any screening model for sympathomimetic. [3]
g) Write the steps involved in coagulation cascade. [2]
h) Write the principle and uses of carbonic anhydrase inhibition test. [3]
i) Define nonparametric tests. [2]
j) Write various types of study designs. [3]

PART- B

(50 Marks)

2. Explain the techniques of blood collection and euthanasia. [10]

OR

3. Write about common routes of administration in laboratory animals in detail and its merits and demerits. [10]

4. Write about dose selection, calculation and conversions. [10]

OR

5. Write a note on:
a) Preparation of drug solution.
b) Grouping of animals. [5+5]

6. Write in detail about animal models used for screening of parasympathomimetics. [10]

OR

7. Write in detail about clinical models used for skeletal muscle relaxants. [10]

8. Write a note on screening methods any two for
   a) Anticoagulants
   b) Anticancer activities. [5+5]

OR

9. Classify animal models for screening diuretic activity and describe any two models in detail. [10]

10. Describe the role of Biostatistics in clinical trial. Discuss phase zero (Micro dosing) and role of Placebo in clinical trial. [10]

OR

11. What is one way ANOVA? Write its uses along with its advantages and limitations. [10]

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Code No: 248AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

R17

B. Pharmacy IV Year II Semester Examinations, June - 2024

EXPERIMENTAL PHARMACOLOGY

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A **(25 Marks)**

1.a)	Name the Techniques for Euthanasia.	[2]
b)	Write a short note on Routes of drug Administration.	[3]
c)	Explain the preparation of drug solution in regard with various solvents used.	[2]
d)	Define Blinding and Randomisation.	[3]
e)	Write any screening model for Sympathomimetics.	[2]
f)	Define Skeletal muscle relaxants and write any one screening model.	[3]
g)	Write the mechanisms of action of anticoagulants.	[2]
h)	Write any Preclinical screening model for Anticancer activities.	[3]
i)	Define Parametric and Nonparametric tests.	[2]
j)	Define Research and name the types of Research.	[3]

PART-B **(50 Marks)**

2. Write a brief note on Maintenance of Laboratory Animals and use of Transgenic animals in Preclinical Screening methods. [10]

OR

3. Write a brief note on Mutant Animals and Techniques for collection of blood. [10]

4. Discuss the importance of Sham negative and positive control groups in preclinical studies and role of these control groups in assessing experimental outcomes. [10]

OR

5. Explain in detail about Calculation and Conversions in Dose selection. [10]

6. Describe Various Screening models for Sympatholytic drugs and Explain any one model in detail. [10]

OR

7. Describe two Screening methods for Skeletal muscle relaxant drugs. [10]

8. Explain any three pre clinical screening methods for Anti cancer drugs. [10]

OR

9. Explain any two pre clinical screening methods for Diuretics. [10]

10. Compare the different types of study designs like Observational studies, Experimental studies, Clinical trails and write the strengths and limitations of each type of study design. [10]

OR

11. The three samples below have been obtained from normal populations with equal variances. Test the hypothesis that the sample means are equal. [10]

Data –A	**8**	**10**	**7**	**14**	**11**	**16**
Data -B	**8**	**6**	**1**	**8**	**8**	**13**
Data - C	**17**	**10**	**12**	**12**	**15**	**12**

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Code No: 248AG

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year II Semester Examinations, July/August - 2025
ADVANCED INSTRUMENTATION TECHNIQUES

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A **(25 Marks)**

1.a) Define chemical shift with basic formula. [2]
b) Mention the applications of mass spectrometry. [3]
c) Define X-ray crystallography. [2]
d) Write the principle involved in DSC. [3]
e) Define Calibration as per ICH and US FDA. [2]
f) Describe about standards involved during calibration of HPLC. [3]
g) Define radio immunoassay. [2]
h) Write the principle involved in solid phase extraction. [3]
i) Define LC-MS/MS. [2]
j) Write the applications of GC-MS/MS. [3]

PART-B **(50 Marks)**

2.a) Write the factors affecting chemical shift.
b) Write the principle of mass spectrometry. [5+5]

OR

3.a) Describe about spin-spin coupling.
b) Explain briefly about the mass spectrometry instrumentation with block diagram. [5+5]

4.a) Describe in detail about origin of X-rays.
b) Explain in detail on the instrumentation of TGA. [5+5]

OR

5.a) Write the principle involved in X-ray diffraction technique.
b) Describe on the instrumentation of DTA. [5+5]

6.a) Describe in detail on calibration of GC.
b) Write about the calibration of wavelength and detector for UV-Visible spectrophotometer. [5+5]

OR

7.a) Write about calibration of flame photometer.
b) Write about the calibration of Fluorimeter. [5+5]

8.a) Write in detail the working of radio immunoassay.

b) Describe in brief on applications and general procedure of liquid- liquid extraction. [5+5]

OR

9.a) Explain in detail on any one method involved in radio immunoassay.

b) Write in detail on various types of stationary phases involved in solid phase extraction. [5+5]

10. Mention the applications and basic instrumentation involved in HPTLC-MS. [10]

OR

11. Describe in detail the working procedure of GC-MS/MS. [10]

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Code No: 247AA

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharm IV Year I Semester Examinations, July/August - 2025
INSTRUMENTAL METHODS OF ANALYSIS

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A (25 Marks)

1.a) What are Chromophores? [2]
b) Derive Beer and Lambert's law. [3]
c) Explain the factors affecting vibrations in IR Spectroscopy. [2]
d) Write the principle involved in Flame Photometry? [3]
e) Define and classify Chromatography. [2]
f) Describe the applications of Electrophoresis. [3]
g) What are the advantages and disadvantages of Gas Chromatography? [2]
h) Give a note on theory of HPLC. [3]
i) Define and classify Ion exchange chromatography. [2]
j) Write the theory of Gel Chromatography. [3]

PART-B (50 Marks)

2.a) Discuss a note on detectors used in UV Visible Spectroscophy.
b) Differentiate between Chromophores and Auxochromes. [5+5]

OR

3.a) Write the instrumentation and applications of Fluorimetry.
b) Explain the factors affecting Fluorimetry. [5+5]

4. Give a note on sample handling techniques in IR Spectroscopy. [10]

OR

5.a) Describe the detectors used in IR Spectroscopy.
b) Outline the principle and applications of Nepheloturbidometry. [5+5]

6.a) Describe the techniques of Paper Electrophoresis.
b) What are the advantages and disadvantages of Adsorption Chromatography? [5+5]

OR

7.a) Write a note on methodology of TLC.
b) Write the principle and applications of TLC. [5+5]

8.a) Explain the instrumentation of HPLC.
b) Write the advantages and applications of HPLC. [5+5]

OR

9.a) Give a note on components used in Gas Chromatography.
b) Write the applications of Gas Chromatography. [5+5]

10.a) Explain the factors affecting Ion exchange Chromatography.

b) Discuss the mechanism and properties of Ion exchange process. [5+5]

OR

11.a) Describe the theory involved in the Gel Chromatography.

b) What are the applications of Affinity Chromatography? [5+5]

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Code No: 247AA

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, February - 2025
INSTRUMENTAL METHODS OF ANALYSIS

Time: 3 Hours **Max. Marks: 75**

Note: i) The question paper consists of Part *A* and Part *B*.
ii) Part *A* is compulsory, which carries 25 marks. In Part *A*, answer all questions.
iii) In Part *B*, answer any one question from each unit. Each question carries 10 marks and has a, and b as sub-questions.

PART- A (25 Marks)

1.a) Justify the fact that the UV-Visible Spectroscopy is a technique of molecular spectroscopy. [2]
b) Give examples in support of the fact that simple heterocycles do not exhibit molecular fluorescence while fused-ring structures containing these rings fluoresce. [3]
c) Define and give an example of Fermi Resonance. [2]
d) What are factors associated with the increase of the ratio of number of atoms in the excited state to the number of ground state atoms in Flame Photometry? [3]
e) How the Normal Phase Chromatography technique is different from that of Reverse Phase Chromatography technique? [2]
f) Enumerate the advantages of Thin Layer Chromatography technique. [3]
g) What are the properties of the liquid used as the stationary phase in the Gas-Liquid Chromatography technique? [2]
h) How the bulk property detectors are different from the solute property detectors that are used in HPLC technique? [3]
i) What is the working principle of Gel Chromatography technique? [2]
j) Explain the theoretical basis of the Affinity Chromatography technique giving an example of its application. [3]

PART-B (50 Marks)

2.a) Explain the Beer-Lambert's equation and discuss its applications citing examples from the current edition of the Indian Pharmacipoeia.
b) Define the terms "Singlet excited state" and "Triplet excited state" giving schematic diagram. Explain the electronic transition of organic molecules associated with the emission of fluorescence. [5+5]

OR

3.a) Define the term "UV cut off" of a solvent giving example. What are the desirable properties of a solvent used for the study of a compound by UV-Vis spectroscopy?
b) What is the difference between a "Filter fluorimeter" and a "Spectrofluorimeter"? Describe the advantages of Fluoremetry with respect to the sensitivity and selectivity for quantitative analysis. [5+5]

4.a) Explain the working principle of FTIR spectrometer describing its instrumentation. Indicate the utility of IR spectroscopy in pharmacopoeial monographs.
b) Describe the special characteristics of the Atomic Absorption Spectroscopy technique. Discuss the utlity of this technique in the analysis of metals and metalloids. [5+5]

OR

5.a) Describe the instrumentation of Flame Photometry technique and mention the analytical applications of this technique.

b) Explain the principle of working and applications of the Nephelometry technique citing examples. [5+5]

6.a) Classify the various chromatographic techniques mentioning the salient features of each type giving example.

b) Explain the working principle, describe the instrumentation, and applications of Gel Electrophoresis technique giving example. [5+5]

OR

7.a) Describe the general methodology adopted, and discuss the applications of Adsorption Column Chromatography technique giving example.

b) Discuss the general working procedure, and analytical applications of Thin Layer Chromatography technique. [5+5]

8.a) Name and explain the working principle at least two types of detectors used in Gas Chromatography mentioning the specific advantages associated with each type.

b) Discuss the applications of HPLC technique in the Pharmacopoeial Monographs for qualitative and quantitative analysis citing examples from the current edition of the Indian Pharmacopoeia. [5+5]

OR

9.a) Explain the salient features of a Gas Chromatogram giving a schematic diagram and describe how the chromatogram is useful in the identification of compounds.

b) Name the methods and describe the procedure for the determination of the quantity of a compound in a sample by HPLC technique. [5+5]

10.a) Describe an ion exchange resin used in Ion-exchange Chromatography and explain the mechanism of the cation-exchange process in this technique.

b) Describe the properties of a gel material used in the Gel Chromatography technique and discuss the pharmaceutical applications of this technique. [5+5]

OR

11.a) Describe the important components of Affinity Chromatography technique, and discuss the advantages with this technique.

b) Enumerate the advantages of conductivity method for the analysis of eluate in the Ion Exchange Chromatography. Explain the necessity and working principle of suppressor based column in this detection technique. [5+5]

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Code No: 247AA

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, June/July - 2024
INSTRUMENTAL METHODS OF ANALYSIS

Time: 3 Hours **Max. Marks: 75**

Note: i) The question paper consists of Part A and Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, answer any one question from each unit. Each question carries 10 marks and has a, and b as sub-questions.

PART- A

(25 Marks)

1.a) Define "Chromophores" and "Auxochromes" giving examples. [2]
b) Explain the difference between singlet and triplet excited states of electrons, and indicate which is associated with the emission of fluorescent radiation. [3]
c) What are the advantages of FTIR equipment over that of dispersive type? [2]
d) Describe the special feature associated with the radiation source used in an Atomic Absorption Spectroscopy technique. [3]
e) Define and indicate the significance of R_f values. [2]
f) Describe the methodology and applications of the TLC technique. [3]
g) Describe the properties of the stationary phase used in a GLC technique. [2]
h) Name and explain the working principle of any one type of in-line detector used in HPLC equipment. [3]
i) What is the basic principle involved in the separation of a compound from the sample by the Gel Chromatography technique? [2]
j) What is the purpose of using a suppressor column in the analysis of eluate in the Ion-exchange chromatography technique and how do they act? [3]

PART-B

(50 Marks)

2.a) Describe the instrumental components of a UV-visible spectrophotometer and explain the working principle of the equipment.
b) Define "Quencing" giving examples and explain how this phenomenon is useful in the quantitative analysis of some substances by the Fluorimetery technique. [5+5]

OR

3.a) Describe the utility of Beer-Lambert's equation in the quantitative analysis of medicinal compounds citing examples from the Indian Pharmacopoeia.
b) Explain the working principle of a Filter Fluorimeter giving a schematic diagram of the instrumentation. [5+5]

4.a) Explain the working principle ATR-IR technique and indicate the advantages of this technique over the conventional method of sample handling.
b) Describe the interferences associated with the analysis of samples by Flame Photometry and mention the necessary measures to overcome such interferences. [5+5]

OR

5.a) Name two detectors used in IR Spectrometers and explain their working principle giving necessary schematic diagrams.
b) Explain the principle of Nephelometry and Turbidometry giving schematic diagrams, and describe their applications citing examples. [5+5]

6.a) Classify the various techniques of chromatography based on different considerations giving an example of each type.

b) Explain the working principle and describe the applications of the Gel Electrophoresis technique giving examples. [5+5]

OR

7.a) Explain the distinctive features between "Adsorption Column Chromatography" and "Partition Column Chromatography" and describe their applications.

b) Describe the similarities and differences between "Paper Chromatography" and "Paper Electrophoresis" in the working principle and their applications. [5+5]

8.a) Describe the major changes made in the conventional liquid chromatography to increase the performance of the technique resulting the High-Performance Liquid Chromatography (HPLC) technique.

b) Explain the working principle of a Gas Chromatograph giving a schematic diagram of instrumentation. [5+5]

OR

9.a) Describe the instrumentation of a High-Performance Liquid Chromatography equipment giving a block diagram.

b) Why and how derivatization of certain samples are done for their analyses by Gas Chromatography? [5+5]

10.a) What are ion-exchange resins and how they are modified for ion-exchange processes in the Ion-exchange Chromatography?

b) Explain the working principle and methodology adopted in a Gel Chromatography technique giving an example. [5+5]

OR

11.a) Explain the basic principle involved, and describe the advantages and limitations of the Affinity Chromatography technique.

b) Name the various methods available for the detection of analyte in the Ion-exchange Chromatography and explain the working principle of any one method. [5+5]

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Code No: 247AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, July/August - 2025
INDUSTRIAL PHARMACY - II

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Highlight the significance of personnels requirement for pilot plant scale-up techniques. [2]
b) Why we do need to develop a platform technology? [3]
c) What do you understand by granularity of technology transfer process? [2]
d) What is the role of TIFAC and NRDC in technology transfer? [3]
e) Enlist the responsibilities of regulation affairs professionals. [2]
f) Enlist the steps for an NDA application? [3]
g) What is the main responsibility of quality control team? [2]
h) Define QbD. Discuss its significance. [3]
i) Enlist the highlight of Module 5 of CTD. [2]
j) Write briefly about COPP. [3]

PART – B

(50 Marks)

2.a) Discuss the various challenges of a pilot plant scale-up process.
b) Elaborate in detail the SUPAC guidelines. [5+5]

OR

3.a) What are the steps involved in setting a pilot plant for semi- solids?
b) How can one assess the space requirements for scale-up techniques? [5+5]

4.a) What are the various documents required for technology transfer process?
b) Enlist any four TOT agencies and discuss any one in detail. [5+5]

OR

5.a) What are the various problems associated with commercialization of a technology?
b) Write a note on QRM. [6+4]

6.a) Elaborate the role of drug development teams during a regulatory approval process.
b) Write a note on clinical research. [5+5]

OR

7.a) Write a detailed note on Investigator's Brochure (IB).
b) Discuss the historical overview of regulatory affairs. [5+5]

8.a) Write a note on QMS.

b) Discuss the process involved in NABL accreditation. What is the difference between certification and accreditation. [3+7]

OR

9.a) Discuss the specification under ISO 9000 series.

b) Write a note of OOS. [5+5]

10.a) Elaborate the role and functions of CDSCO.

b) Illustrate the stepwise procedure for IND application. [5+5]

OR

11.a) Discuss the responsibilities of state licensing authority of India.

b) Draw the CTD triangle and explain various modules. [5+5]

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Code No: 247AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, February - 2025
INDUSTRIAL PHARMACY - II

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) What is SUPAC and explain SUPAC level - I changes. [2]
b) Write about personnel requirements during lab scale to large scale production. [3]
c) Write the legal issues observed in technology of transfer process. [2]
d) Explain the role of TBSE during technology of transfer. [3]
e) What are the Phase – I clinical trials objectives. [2]
f) Write the Investigator's Brochure used in the clinical trials. [3]
g) Write about Out Of Specification (OOS). [2]
h) Write a short note on NABL. [3]
i) Write about grant of permission to import new drugs to India. [2]
j) Write about objective of certification of Pharmaceutical product and which type of drugs COPP is issued. [3]

PART – B

(50 Marks)

2. Write about space requirements, raw materials and equipment during scale up of tablets from lab-scale to large scale production. [10]

OR

3. Explain SUPAC guidelines for manufacturing changes in a pharma industry. [10]

4. Write about licensing and MOUs during technology transfer process. [10]

OR

5. Explain the role of SIDBI and TIFAC during technology transfer process. [10]

6. Write about the information given in New Drug Application submitted to the FDA. [10]

OR

7. Write in detail about different study designs used in Bioequivalence study. [10]

8.a) Explain about concept of quality by design. [5+5]
b) Write about ISO 9000 series.

OR

9. Write in detail about Good Laboratory Practice. [10]

10. Write about Regulatory requirements and approval procedures for new drugs in India. [10]

OR

11. Explain the Central Drug Standard control organization and its functions. [10]

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Code No: 247AB

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, June/July - 2024
INDUSTRIAL PHARMACY - II

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Write a short note about personnel requirement in pilot studies in pharmaceutical research. [2]
b) Define SUPAC and elaborate the guidelines for SUPAC. [3]
c) Write a note on technology transfer protocol. [2]
d) Give an account of analytical method transfer. [3]
e) Write a role of regulatory affairs. [2]
f) Write a short note about clinical research protocol. [3]
g) Write about OOS. [2]
h) Define Quality by Design (QbD). [3]
i) Explain a short note on CTD and ECTD. [2]
j) Define about Certificate of Pharmaceutical Product (COPP). [3]

PART – B

(50 Marks)

2.a) Discuss the importance of considering raw materials in pilot plant scale-up processes. [5+5]
b) Write a short note on Platform Technology.

OR

3. Explain in detail the techniques employed in pilot plant scale-up for solid dosage forms. [10]

4. Explain briefly about the transfer from R & D to production. [10]

OR

5. Explain briefly about TOT agencies in India - APCTD, NRDC, TIFAC, BCIL, TBSE / SIDBI. [10]

6.a) Discuss the historical overview of Regulatory Affairs. [5+5]
b) Discuss briefly about Non-Clinical Drug Development.

OR

7.a) Provide an overview of general considerations of NDA (New Drug Application). [5+5]
b) Describe biostatics in Pharmaceutical Product development.

8. Explain in detail the concept about TQM. [10]

OR

9. Write a brief explanation ISO 9000 and ISO 14000 series of quality systems standards. [10]

10. Explain the organization and responsibilities of the State Licensing Authority. [10]

OR

11.a) Write a brief explanation of the Common Technical Document (CTD).

b) Explain briefly about Regulatory requirements and approval procedures for New Drugs. [5+5]

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Code No: 247AC

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy IV Year I Semester Examinations, July/August - 2025

PHARMACY PRACTICE

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define Hospital Pharmacy.	[2]
b)	Classify non clinical basis of Hospital.	[3]
c)	List the types of Drug distribution system.	[2]
d)	What is the factors to be considered during the TDM?	[3]
e)	Name the steps involved in patient counselling.	[2]
f)	List the sources of Drug information.	[3]
g)	Define Clinical pharmacy.	[2]
h)	Define Pharmaceutical care.	[3]
i)	What is Recorder quantity level?	[2]
j)	Define Inventory control.	[3]

PART – B

(50 Marks)

2.	Discuss in detail about functions of hospital pharmacy.	[10]
	OR	
3.a)	Evaluate dispensing of proprietary products.	
b)	Explain maintenance of records of retail and wholesale drug store.	[5+5]
4.a)	Discuss dispensing of drugs to inpatients.	
b)	Analyze the advantages and disadvantages of Unit dose drug distribution system.	[5+5]
	OR	
5.a)	Explain in detail about infrastructure requirements in community pharmacy.	
b)	Discuss in detail about Indian scenario for TDM.	[5+5]
6.	Analyze the pharmacist involved in patient counselling.	[10]
	OR	
7.a)	Explain in detail about computerized services and storage of drug information.	
b)	Analyze role of pharmacist in the education and training program.	[5+5]

8.a) Explain in detail about functions and responsibilities of clinical pharmacist.
b) Analyze clinical review and pharmacist intervention as clinical pharmacist. [5+5]

OR

9.a) Explain in detail about rational use of common over the counter medications.
b) Explain ward round participation. [5+5]

10.a) Analyze organization of drug store.
b) Explain in detail about types of materials stocked and storage conditions. [5+5]

OR

11.a) Analyze economic order quantity.
b) Discuss principles of purchase. [5+5]

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Code No: 247AC

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, February - 2025
PHARMACY PRACTICE

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A **(25 Marks)**

1.a)	Give the differences between primary and secondary hospitals.	[2]
b)	Write about functions of hospital pharmacists.	[3]
c)	What are precautions for dispensing controlled substances?	[2]
d)	Comment on the present scenario of therapeutic drug monitoring in India.	[3]
e)	What is patient counselling?	[2]
f)	What are sources of drug information?	[3]
g)	What are OTC drugs and give two examples?	[2]
h)	Briefly write about the significance of patient medication history.	[3]
i)	What is purchase order and mention its significance.	[2]
j)	What are the advantages of reorder quality level?	[3]

PART – B **(50 Marks)**

2. Explain the structure and working of a tertiary care hospital. [10]

OR

3. What are the legal requirements for establishment of drug store and explain its functioning. [10]

4. Explain the drug distribution systems in hospital. Give the differences in drug distribution to in patients and ambulatory patients. [10]

OR

5. Describe the community pharmacy management. [10]

6. Write short notes on the following:
a) Role of pharmacist in health education.
b) External training programmes. [5+5]

OR

7. Explain the working of Drug and Poison Information Centre. [10]

8. What is clinical pharmacy and explain the functions and responsibilities of clinical pharmacist. [10]

OR

9. Write about the following:
a) Drug therapy monitoring
b) Ward round participation. [5+5]

10. Write about the purchase and inventory control methods in drug store management. [10]

OR

11. Enumerate the methods used for analysis of drug expenditure. [10]

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Code No: 247AC **R17**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, June/July - 2024
PHARMACY PRACTICE

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define and write the functions of hospital.	[2]
b)	Write a note on types of records required in a community pharmacy.	[3]
c)	Enlist the types of free floor stock system.	[2]
d)	Write the legal requirements in pricing bulk drugs and drug formulation.	[3]
e)	Define Patient Counseling and Mention the steps involved in it.	[2]
f)	Write a note on sources of drug information.	[3]
g)	What is the Thalidomide Tragedy in clinical pharmacy?	[2]
h)	Discuss about the scope of clinical pharmacy.	[3]
i)	Define lead time and re-order level.	[2]
j)	Write about the different types of inventory costs.	[3]

PART – B

(50 Marks)

2.a) Define Hospital pharmacy. Write the requirements and abilities required for hospital pharmacist.
b) Define and Write the scope of Community pharmacy in India. [7+3]

OR

3.a) Give an objective of layout design and plan of an ideal retail and whole sale drug store.
b) Describe about various departments and services provided by hospital. [6+4]

4.a) Explain drug distribution system in hospital to out-Patient.
b) Discuss about the TDM process. [5+5]

OR

5. Discuss about the Staff and material management in community pharmacy management. [10]

6.a) Explain history, need and objectives of drug information Services.
b) Discuss about the techniques and barriers of Patient Counseling. [5+5]

OR

7.a) Write a note on Poison information services.
b) Discuss about the internal and external teaching programs in hospital. [5+5]

8.a) Describe the history and status of clinical pharmacy in India.
b) Write a short note of OTC drugs. [5+5]

OR

9.a) Explain medication chart review in clinical pharmacy.
b) Describe Ward round participation in clinical pharmacy. [5+5]

10. Explain about the classification of Inventory control. [10]

OR

11. Define Purchasing. Write its principles and Procedure for Purchasing of materials. [10]

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Code No: 247AE

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, July/August - 2025
PHARMACEUTICAL MARKETING

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) How to analyze industrial buying behavior? [2]
b) Enlist quantitative and qualitative aspects of market. [3]
c) What is meant by product designing and product branding? [2]
d) Write about of product life cycle. [3]
e) Write different online promotional techniques. [2]
f) Write the list of five pharmaceutical journals where promotion of marketing. [3]
g) What are the different tasks in physical distribution management? [2]
h) How to we design marketing channels? [3]
i) Write duties of DPCO and NPPA. [2]
j) Define consumerism and its importance. [3]

PART – B

(50 Marks)

2. Write about size, composition and demographic description of pharmaceutical market. [10]

OR

3. Write about motivation and prescribing habits of the physician and role of market research. [10]

4. Write the classification of product decision, product line and product decisions. [10]

OR

5. Explain packaging of product and product management in pharmaceutical industry. [10]

6. Explain determinants of promotional mix and promotional budget. [10]

OR

7. Write different types of advertising, sampling and retailing of product promotion. [10]

8. Write the purpose and duties of PSR. How selection of sales representatives are done? [10]

OR

9. Write brief note on channel members selection of appropriate channel and conflict in channels. [10]

10. Write overview of DPCO and NPPA. [10]

OR

11. What is meant of vertical and horizontal marketing? [10]

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Code No: 247AE

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy IV Year I Semester Examinations, February - 2025
PHARMACEUTICAL MARKETING

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A **(25 Marks)**

1.a) What is the need for studying the composition of the market? [2]
b) Give the differences between marketing and sales. [3]
c) Mention the significance of product branding. [2]
d) Briefly discuss the significance of product packing. [3]
e) What are the determinants of promotional mix? [2]
f) Write about role of direct mail in sales promotion. [3]
g) Name the factors influencing the selection of marketing channels. [2]
h) Give the future prospects of professional service representative. [3]
i) Mention the importance of pricing of pharmaceuticals. [2]
j) Give the differences between vertical and horizontal marketing. [3]

PART – B **(50 Marks)**

2. Explain the approaches for market research and discuss its role in marketing of drugs. [10]

OR

3. Write about the following:
a) Marketing environment
b) Industry and competitive analysis [5+5]

4. What is product life cycle and how it is fixed. Discuss methods for extending product life cycle. [10]

OR

5. Discuss the approaches for product portfolio analysis and product positioning. [10]

6. What is the need for promotional budget and how it is planned? Explain. [10]

OR

7. Write about the following:
a) Online promotional techniques for OTC products
b) Medical exhibition. [5+5]

8. Explain the methods for selection of appropriate channels and write about conflict of channels. [10]

OR

9. Write about functioning of professional service representatives. [10]

10. Write about pricing methods and strategies. [10]

OR

11. Write about the following:
a) National Pharmaceutical Pricing Authority
b) Drugs Price Control Order. [5+5]

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Code No: 247AE

R17

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy IV Year I Semester Examinations, June/July - 2024

PHARMACEUTICAL MARKETING

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Differentiate between selling and marketing. [2]
b) What is meant by competitive analysis? [3]
c) Why packaging and labeling is important in pharmaceutical industry? [2]
d) Enlist a few functions a product manager performs in a pharmaceutical company. [3]
e) Compare prescription and OTC products. [2]
f) Provide determinants of promotion mix. [3]
g) Define physical distribution management. [2]
h) List traits of a professional sales representative. Provide norms of industry for customer calls. [3]
i) Outline a few factors affecting pricing of products. [2]
j) Define objectives of Drug Price Control Order and NPPA? [3]

PART – B

(50 Marks)

2. Compare and contrast industrial and consumer buying decision process. Explain role and importance of market research with reference to primary and secondary market research. [10]

OR

3. Provide phases involved in the process of consumer buying decision making. Provide bases of segmentation in pharmaceutical industry. [10]

4. Highlight the importance of product management in a pharmaceutical industry. Examine product depth, width and breadth with relevant pharmaceutical examples? [10]

OR

5. Summarize product portfolio analysis and schematically highlight product life cycle. [10]

6. Elaborate various methods used to decide promotion budget in the pharmaceutical sector? Provide example of each method. [10]

OR

7. Discuss various methods of pharmaceutical promotion and list each methods advantage and disadvantage. [10]

8. Justify as to why detailing is important in pharmaceutical industry. Enumerate measures involved in selecting, training, motivating and evaluating a professional sales representative. [10]

OR

9. What are different levels of pharmaceutical distribution channels? Discuss functions of stockiest, Carrying and Forwarding Agents, Wholesalers and Distributors. [10]

10. Write short notes on:
a) Pricing strategies employed in the pharmaceutical sector.
b) Industrial Marketing. [5+5]

OR

11. Evaluate Global marketing, Rural Marketing, Vertical marketing and Horizontal Marketing. [10]

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Code No: 247AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

R17

B. Pharmacy IV Year I Semester Examinations, June/July - 2024

PHARMACEUTICAL REGULATORY SCIENCE

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A

(25 Marks)

1.a) Write down the difference between innovator and generics. [2]
b) Write a note on IRB. [3]
c) What are pre-clinical studies? [2]
d) What is ACTD? [3]
e) What are the advantages of ACTD? [2]
f) Write about the safety monitoring of medical products. [3]
g) What is the importance of investigator's brochure? [2]
h) Write about the approaches of 21 CFR part 11. [3]
i) What is informed consent process? [2]
j) What are clinical trials? [3]

PART- B

(50 Marks)

2. Define new drug according to FDA. Explain in detail the new drug development process with the time course for each phase. [10]

OR

3. Explain different stages of drug discovery. [10]

4. Explain the organization and functions of Australia and US drug regulatory bodies. [10]

OR

5. Explain the application and regulatory approval process for IND. [10]

6. What are open and closed part of DMF. Explain in detail on DMF system in India. [10]

OR

7. What is Common Technical Document? Describe various CTD modules. [10]

8. Discuss different stages of clinical studies. [10]

OR

9. How can be clinical trials managed and monitored. Explain the development of clinical trial protocols. [10]

10. Explain the code of federal regulation. Write a note on federal register. [10]

OR

11. Explain in detail about orange book and purple book. [10]

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