



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017  
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutical Chemistry-I (Organic)  
PAPER: 1 (Old & New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q. No. 1 Describe Wittig Reaction and Wolf Rearrangement. 20
- Q. No. 2 a) Write down different methods for the resolution of racemic mixture. 10  
b) Write detail note on Geometrical Isomerism with examples. 10
- Q. No. 3 a) Discuss the mechanism of Friedel-Crafts reactions. What are its limitations? 10  
b) Write note on Baeyer Villiger Oxidation. 10
- Q. No. 4 a) Write mechanism and reaction conditions of Aldol condensation reaction. 10  
b) Write down the methods of preparation of primary, secondary and tertiary amines and discuss their Pharmaceutical applications. 10
- Q. No. 5 a) What is hyperconjugation? How does it contribute in the stability of alkenes and carbocations. 10  
b) Write down the groups which show + Mesomeric effect and – Mesomeric effect with examples. 10
- Q. No. 6 Describe methods of preparation, chemical properties and pharmaceutical applications of Pyrrole and Pyridine. 20
- Q. No. 7 How is Grignard Reagent prepared in the laboratory? Describe its applications in synthesis of organic compounds. 20



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutical Chemistry-II (Biochemistry)

Pharmaceutical Biochemistry

PAPER: 2 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

Q. No. 1: 20

Write the introduction, chemistry, physiological functions, regulations and disorders of thyroid hormone

Q. No. 2: 10+10

a) Describe the cyclic structure of hexoses and anomeric forms

b) Describe the pathway of glycolysis

Q. No. 3: 20

Write a detail note on vitamin A

Q. No. 4: 10+10

a) Define saponification number, acetyl number, iodine number, Reichert-Meissl number and Polenske number

b) Describe the beta oxidation of even number carbon fatty acids

Q. No. 5: 20

Write the introduction, chemistry, functions, regulations and disorders of insulin

Q. No. 6: 10+10

a) What is nucleic acid? Describe the major differences between DNA and RNA

b) Write the process of recombinant DNA technology

Q. No. 7: 20

Describe the Michaelis Menten equation. What are the basic assumptions of Michaelis Menten kinetics?



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-I (Physical Pharmacy)  
PAPER: 3 (Old & New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q 1 a) Define Pharmaceutics, Describe various Era in the history and development of Pharmacy. 10 Marks  
b) Write a note on the role of Pharmacist in Community Pharmacy. 10 marks
- Q 2 a) Define disperse system; How you will classify colloids? 10 Marks  
b) Define emulsions; Give classification of emulsions, How you will determine the emulsion type? 10 Marks
- Q 3 a) Define solution; discuss its various types in the light of Roul't's law. 10 marks  
b) What are solubility curves? Describe various factors affecting the solubility of a compound. 10 Marks
- Q 4 a) Differentiate between precipitation and crystallization. Explain in detail process of crystallization. 10 Marks  
b) What are the crystal systems? Describe crystals on the basis of crystal habits. 10 Marks
- Q 5 a) Define micromeritics; discuss its importance in Pharmacy. 10 Marks  
b) Why extraction of vegetable drugs is important? Discuss the principal of percolation process. 10 Marks
- Q 6 Write a note on following terms 5 Marks each  
a. Trituration and Levigation  
b. Solubilization and micelle formation  
c. Types of distillation  
d. Drying and desiccation
- Q 7 a) Define the term Thixotropy; explain the Newton's law of flow with help of diagram and equation. 10 marks  
b) Define the Expiry date; Discuss various types of chemical degradation along with its preventive measures. 10 Marks



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Physiology & Histology / Physiology**  
**PAPER: 4 (Old & New Course)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 100**

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

Q.No.		Marks
1	What is immunity? Explain its various types and discuss in detail the immune response against an antigen.	20
2	A) Discuss different types and functions of plasma proteins.	10
	B) Describe cardiac cycle in detail.	10
3	A) Describe different pairs of spinal nerves.	10
	B) What is a reflex action? Classify reflexes and describe reflex arc.	10
4	A) Discuss in detail transport of oxygen between the lungs and the tissues?	10
	B) What is hypoxia? Explain different types of hypoxia?	10
5	A) Discuss the composition and functions of pancreatic juice and regulation of pancreatic secretions.	12
	B) Discuss the composition and functions of bile?	08
6	A) Enumerate the functions of kidney and draw a labeled diagram of nephron.	10
	B) Discuss the formation of dilute and concentrated urine?	10
7	A) Describe different parts of neuron? Classify on basis of structure and functions?	10
	B) Discuss the functions of cerebrum?	10



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017  
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Anatomy/ Anatomy & Histology  
PAPER: 5(Old & New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 50

*NOTE: Attempt any FIVE questions. All questions carry equal marks.*

- |                                                                                  |    |
|----------------------------------------------------------------------------------|----|
| Q.1 (a) Draw a diagram of coronary blood supply of heart                         | 05 |
| (b) Enumerate the branches of Arch of Aorta                                      | 05 |
| Q.2 Define the following terms                                                   | 10 |
| Coronal Plane, Sagittal Plane, Medial, Posterior                                 |    |
| Q.3 Draw and label a diagram of cell showing all organelles                      | 10 |
| Q.4 Enumerate differences between Skeletal, Cardiac, Smooth Muscles with diagram | 10 |
| Q.5(a) Draw and label Circle Of Willis                                           | 05 |
| (b) Write a note on general and topographical anatomy of adrenal gland           | 05 |
| Q.6 Write a note on structure of human eye                                       | 10 |
| Q.7 Write a detail note on anatomy of renal system                               | 10 |



# UNIVERSITY OF THE PUNJAB

First Prof: 2<sup>nd</sup> Annual - 2017  
Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: English Compulsory  
PAPER: 6 (New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt all the given questions.**

**Q.1 Read the following passage and answers the questions. (15)**

All spiders spin webs. That's because webs help spiders. Webs help spiders do three things. Webs help spiders hold eggs. Webs help spiders hide. And webs help spiders catch food. Webs help spiders hold eggs. Many spiders like to lay their eggs in their webs. The webs help keep the eggs together. Webs help spiders keep their eggs safe. Webs help spiders hide. Most spiders are dark. They are brown, grey, or black. But spider webs are light. They are white and cloudy. When spiders hide in their webs, they are harder to see. Webs help spiders catch food. Spider webs are sticky. When a bug flies into the web, it gets stuck. It moves around. It tries to get out. But it can't. It is trapped! Spiders can tell that the bug is trapped. That's because spiders feel the web move. And the spider is hungry. The spider goes to get the bug. As you can see, webs help spiders hold eggs. Webs help spiders hide. And webs help spiders catch food. Without webs, spiders would not be able to live like they do. Spiders need their webs to survive!

**1) This passage is mostly about**

- A. spider colors
- B. spider webs
- C. spider eggs

**2) Spider webs help spiders**

- I. hold eggs
- II. catch food
- III. find water

A. I only

B. I and II only

C. I, II, and III

**3) As used in paragraph 4, the word trapped most nearly means**

A. stuck

B. hidden

C. eaten

**4) How can spiders tell when something is trapped in their web?**

A. They hear it.

B. They smell it.

C. They feel it.

**5) As used in the last sentence of the passage, the word survive means to stay**

A. alive

B. hidden

C. caught

PTO

Q2. Write an essay on the following topic. (15)

A) Our education system B) Social work for students

Q3. Write a paragraph on the given topic. (10)

Building of moral character

Q4. Write a letter on the given topic. (10)

Write a letter to your father telling him the cause of your failure..

Q5. Being a good reader one should have command on speed reading, why? (10)

Q6. Write a note on CV writing? (10)

Q. 7 Apply scanning on the given text and extract the required information. (10)

Call for HELP	
<b>EMERGENCIES</b>	
Edhi Control	-----115
Police Help	-----15
Governor house	-----9200081
Fire Brigade	-----16
Bomb Disposal	-----9211022-29
MCL Complaint	-----9211022-29
<b>HOSPITALS</b>	
Services	-----9203402-11
Mayo	-----9211100-9
General	-----5810892-8
Sheikh Zayed	-----5865731
<b>AMBULANCE</b>	
Rescue	-----1122
Edhi	-----115
<b>BLOOD BANK</b>	
Edhi	-----5417440
Fatimid	-----5863950
Islamic Illiance	-----7588649
<b>RAILWAY/PIA</b>	
City Station	-----117
Reservation	-----9201772
Railway Police	-----1333
Punjab University	-----9231257

1. Find out telephone number of Rescue?

2. Whose number is 5417440?

3. What is the number of Punjab University?

4. Make a list of numbers beginning with digit 9?

5. Whose telephone number is 1333?

Q8. What is inference according to you? (10)

Q9. Write a dialogue on the given situation. (10)

- A) Dialogue between two friends on fate  
B) Dialogue between two friends on health



# UNIVERSITY OF THE PUNJAB

Second Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-II (Pharmaceutical Preparations)  
Pharmaceutics-II (Dosage Forms Science)  
PAPER: 1 (Old & New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

Q.1 (a) what are aerosols discuss its principle , container and valve assembly (12)

(b) Write a note on Liniments? (08)

Q.2 (a) Define and classify official syrups. Discuss invert syrup and different methods of preparation of simple syrup. (10)

(b) Define the Displacement value. Calculate the quantities required to make ten cocoa butter (2 mould) suppositories. Each containing 400 mg of zinc oxide ( D.V of ZnO= 4.7)(10)

Q. 3. Write notes on the followings: (05 each)

(a) Powders types and methods of preparation.

(b) Lotions

(c) Pyrogens and their prevention

(d) Poultices

Q.4 ( a) Define and discuss in detail oleaginous suppositories bases alongwith their different crystalline forms & preventive measures. (15)

(b) How the suppositories are classified according to their route of administration (05)

Q.5 (a) Discuss different methods for preparation of suspensions in detail? (10)

(b) In how many ways tablets can be prepared. Explain wet granulation method in detail. (10)

Q.6 (a) Define water for injection USP. Classify & discuss different kinds of water for injection USP.(14)

(b) Define the suppositories. Discuss different method of their preparation. (06)

Q.7 ( a) Define Transdermal drug delivery Systems. What are their advantages and disadvantages?(10)

(b) Discuss briefly enemas (10)





# UNIVERSITY OF THE PUNJAB

Second Prof: 2<sup>nd</sup> Annual - 2017

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Pharmacology & Therapeutics-I**  
**PAPER: 2 (Old & New Course)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 100**

*NOTE: Attempt any FIVE questions. All questions carry equal marks.*

- Q. 1 Discuss G-Protein coupled receptors in details. 20
- Q. 2 What is drug absorption? Discuss different ways by which drug can be transported across the membranes. 20
- Q. 3 Classify antimuscarinic drugs. Give mechanism of action, therapeutic uses and toxicity of Atropine. 20
- Q. 4 Classify sympatholytic drugs. Discuss Propranolol in detail. 20
- Q. 5 (a) Discuss H<sub>2</sub> receptor antagonists. 10  
(b) Give the pharmacology of anti-diarrheal drugs. 10
- Q. 6 What is congestive heart failure. Give the pharmacology of Digoxin. 20
- Q. 7 Write note on the following:
- (a) Potassium sparing diuretics 10
- (b) Salbutamol 10

# UNIVERSITY OF THE PUNJAB



Second Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Pharmaceutical Microbiology**  
**Pharmaceutics-III (Pharmaceutical Microbiology & Immunology)**  
**PAPER: 4 (Old & New Course)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 100**

***Instructions: Attempt any FIVE questions. Question No.1 is COMPULSORY.***  
***Illustrate your answer with Diagrams and Examples where necessary.***  
***All questions carry equal marks.***

- Q. No. 1 Define the following terms: 05
- (A) 1. Fermentation  
2. Autoclaving  
3. D-Value  
4. Z-Value  
5. Absolute Sterilization
- (B) Multiple Choice Questions (MCQs) 08
- Type IV hypersensitivity is often referred as
    - Immediate
    - Delayed
    - Anaphylactic
  - The inability to distinguish between self-cells and non-self cells may lead to
    - Hypersensitivity
    - Immunodeficiency
    - Auto-immune disease
  - Majority of the auto-immune diseases are
    - Cell mediated
    - Antibody mediated
    - Mast cell mediated
  - Which of the following immunoglobulin is involved in mediating allergic reactions
    - Ig E
    - Ig G
    - Ig A
  - The major chemical messenger involved in hypersensitivity is
    - Histamines
    - Lymphokines
    - Inter-leukines
  - Bacteria normally contain their genome in
    - Plasmid
    - Nucleoid region
    - Pilus
  - Small chemical groups on the antigen molecule that can react with antibody is
    - Epitope
    - Paratope
    - Allotope

**P.T.O.**

- 8 All of the following diseases are caused by bacteria except  
 a) Yellow fever  
 b) Typhoid  
 c) Cholera

07

(C) Fill in the following statements

- 1 Type II hypersensitivity is triggered by \_\_\_\_\_.
- 2 Allergies to sea food, eggs etc is an example of \_\_\_\_\_ hypersensitivity.
- 3 Fab stands for \_\_\_\_\_.
- 4 The ability of antigen to stimulate antibody production is called \_\_\_\_\_.
- 5 Any substance or molecule that interact with antibodies are called \_\_\_\_\_.
- 6 A molecule that reacts with specific antibody but is not immunogenic by itself is called \_\_\_\_\_.
- 7 The process of weakening a pathogen is called \_\_\_\_\_.

20

Question No. 2 What are antibodies? Discuss its types, structures and importance.

20

Question No. 3 Write note on  
 a) Hospital Hygiene  
 b) Difference between Gram -ve and Gram +ve bacteria

Question No. 4 a) What is heat sterilization? Describe in detail various methods of heat sterilization.  
 b) Write a note on Bird Flu.

10

10

20

Question No.5 Discuss immune disorders reactions in detail.

Question No. 6 a) What is Fermentation? Explain in detail process of fermentation with some examples in pharmacy.  
 b) Define Resistance and discuss non-specific Resistance in detail.

10

10

20

Question No. 7 a) Write a comprehensive note on Cell-mediated Immunity.



# UNIVERSITY OF THE PUNJAB

Second Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pakistan Studies and Islamiyat / Ethics (Comp.)  
PAPER: 5 (Old & New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

## USE SEPARATE ANSWER BOOK FOR EACH PART

### Part I – Pakistan Studies

For this portion time Allowed is 1 hr. and Max. Marks 40.

Note: The candidate who attempt their question keeping in view Allama Iqbal's Poetry will be given special weightage . Attempt any TWO question . All question carry equal mark.

Q.1 Highlight the socio-religious services of Hazrat Mujaddid Alf-e-Sani (R.A)

سوال نمبر ۱ حضرت مجدد الف ثانی کی دینی و سماجی خدمات پر روشنی ڈالیں۔

Q.2 Narrate the aims and objectives of the establishment of Pakistan.

سوال نمبر ۲ قیام پاکستان کے اغراض و مقاصد تحریر کریں۔

Q.3 Give an appraisal of the 3rd June, 1947 plan.

سوال نمبر ۳ 3 جون 1947ء کے منصوبے کا جائزہ لیں۔

Q.4 What steps have been taken for Islamisation in our country?

سوال نمبر ۴ وطن عزیز میں نفاذ اسلام کے لئے کیا اقدامات کیے گئے ہیں؟

### Part II – Islamiyat

For this portion Time Allowed is 2 hrs. and Max. Marks 60.  
Attempt the following questions. Q. No.5 is compulsory.

Q. No.1 Translate and explain Two of the following Quranic Verses:-

(20)

درج ذیل میں سے دو آیات کا ترجمہ و تشریح لکھیے۔

الف۔ اِنَّ اَكْرَمَكُمْ عِنْدَ اللّٰهِ اَتْقٰىكُمْ  
ب۔ قَالِىْزَيْنُ لَا كِشْفَ لَكَ مِنَ النَّارِ وَاِذْ اٰمَرُوْا بِالْعِفْرِ اَنْتُمْ وَاٰمَرُوْا بِالْاِحْسَانِ  
ج۔ اِنَّ اللّٰهَ عَلِيْمٌ خَبِيْرٌ  
د۔ لَقَدْ كَانَ لَكُمْ فِيْ رَسُوْلِنَا اٰسْوَةٌ حَسَنَةٌ

Q. No.2 Translate and explain any one of the following Ahadith:-

(10)

مندرجہ ذیل میں سے کسی ایک حدیث کا ترجمہ و تشریح لکھیے۔

الف۔ عَمِيْرٌ اَمِيْرِيْ قُرْبِيْ عَمُّ - اَلَّذِيْنَ يَلْقَى عَمُّهُ ثُمَّ اَلَّذِيْنَ يَلُوْا عَمُّهُ  
ب۔ التَّاجِرُ الصَّدُوْقُ وَالْاَمِيْنُ مَعَ النَّبِيِّ وَالصَّادِقِيْنَ

P.T.O.

Q. No.3 Evaluate the significance of the last Sermon of the Holy Prophet on the roof farewell pilgrimage. (10)

خطبہ حجۃ الوداع کی اہمیت و فضیلت بیان کیجیے۔

OR

Highlight the blessings and advantages of Muslim Frocternity at Madina.

مواخاۃ مدنیہ کے ثمرات پر روشنی ڈالیے۔

Q. No.4 Point out the negative aspects of Western Civilization. (10)

مغربی تہذیب کے منفی پہلو کی نشاہدی کیجیے

OR

Elucidate the cardinal features of Islamic Civilization

اسلامی تہذیب کی نمایاں خصوصیات واضح کیجیے۔

Q. No.5 Write short answers of the following:- (10)

- Which is the most widely rad book in the world?
- Who was called Ameen-ul-Millat?
- Mention old name of Madina?
- Why was Hazrat Umar Bin Abdul Aziz called 5<sup>th</sup> Pious Caliph?
- Who is called Imam-ul-Ambia?

مندرجہ ذیل پر مختصر جوابات لکھیے

سوال نمبر ۵

الف: دنیا میں سب سے زیادہ پڑھی جانے والی کتاب کونسی ہے؟

ب: امین املت کس شخصیت کو کہا جاتا ہے؟

ج: مدنیہ منورہ کا پرانا نام کیا تھا؟

د: حضرت عمر بن عبدالعزیز کو پانچواں خلیفہ راشد کیوں کہا جاتا ہے۔

ر: امام الانبیاء کس ہستی کو کہا جاتا ہے۔

### Ethics (For Non-muslim Candidates)

**Note: Attempt any THREE questions. All questions carry equal marks.**

- Q. No.1 Highlight the impoprtnance and utility of Ethics as moral philosophy.
- Q. No.2 What are the characteristics of good civilization?
- Q. No.3 Narrate the ethical teachings of Christianity.
- Q. No.4 Islam protests the religious rights and interests of miniorities. Comment.
- Q. No.5 What steps are essential for promoting high morality in the society?
- Q. No.6 Do you agree with the view that simplicity carries great value in human life?

# UNIVERSITY OF THE PUNJAB



Second Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmacy Practice-I (Pharmaceutical Mathematics and Biostatistics)  
PAPER: 6 (New Course)

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE:** Attempt FIVE questions in all, selecting THREE questions from Section I and TWO from Section II. Use of Scientific Calculators and Statistical Tables are allowed. Graph paper may be supplied on demand.

## SECTION - I

- Q.1 a) Differentiate the following in the example. (12, 8)
- Quantitative and Qualitative variables
  - Continuous and Discrete Variables
  - Independent and dependent variables

- b) The data regarding surgery in a large hospital is as:

	No. of Patients
No Surgery	120
Surgery as Part of Trial	89
Surgery within one year	72
Surgery within 1 - 5 year	29
Surgery > 5 year	17

Make bar chart of above data.

- Q.2 a) State the properties of variance. (05, 15)
- b) Given  $\bar{x} = 40$   $\bar{y} = 36$   
 $S_x = 6$   $S_y = 8$  and  $r = 0.8$   
Find the two regression lines. Predict y when x = 30 and predict x when y = 40

- Q.3 a) Describe the properties of Binomial distribution. (5, 15)
- b) Suppose that weights of 2000 male students are normally distributed with mean 150 pounds and standard deviation 20 pounds. Find the number of students with weights (i) less than or equal to 110 pounds (ii) between 125 and 135 pounds, (iii) greater than 145 pounds.

- Q.4 a) State the addition rule for not mutually exclusive events and multiplication rule for independent events. (8, 12)
- b) Out of group of 340 people exposed to infection, 265 had not been immunized, and of these 100 contracted the disease. Of those who had been immunized, 20 were infected. Does it seem that treatment gave any protection against infection? What is the difference in the significance of the result of the  $\chi^2$  test?

- Q.5 a) Differentiate between Type-I and Type-II errors in testing of hypotheses. (10, 10)
- b) The hemoglobin level of three groups of children fed three diets are given. Test whether the means of these three groups differ significantly?

Group I	11.6	10.3	10.0	11.5	11.8	10.9
Group II	11.2	8.9	9.2	8.8	8.4	9.3
Group III	9.8	9.7	11.5	11.6	10.8	11.2

- Q.6. A sample of 12 jars of peanut butter was taken from a lot whose standard deviation is 1.2 ounce and each jar being labeled "8 ounces net weight". The individual weights in ounces are: 8.3, 8.1, 7.7, 7.6, 7.8, 7.6, 7.8, 7.6, 7.4, 7.5, 7.9, 8.1, 7.5, 7.6
- a) Test whether these weights are consistent with a population mean weight of 8 ounces. Assume that the weights are normally distributed. (8, 12)
- b) Again test the hypothesis as in part (a) when standard deviation of 1.2 ounces is unknown.

P.T.O.

## SECTION-II

Q.7. a) Solve the equation

$$\frac{1}{x+1} + \frac{2}{x+2} = \frac{7}{x+5} ; x \neq -1, -2, -5.$$

(6)

b) Find three G.M<sup>s</sup>. between 2 and 32.

(7)

c) Find the number of diagonals of a 6-sided figure.

(7)

Q.8. a) What is the length of the arc intercepted on a circle of radius 14cm by the arms of a central angle of  $45^\circ$ ?

(7)

b) Find an equation of the line passing through the point (11, -5) and parallel to a line with slope -24.

(7)

c) The yield in bushels from a grove of orange trees is given by  $y = x(800 - x)$ , where  $x$  is the number of orange trees per acre. How many trees will maximize the yield. Find the maximum yield.

(6)

Q.9. a) Evaluate

(6)

$$\lim_{x \rightarrow 0} \left( \frac{\sin ax}{\sin bx} \right)$$

b) Find  $f(x)$  when  $f(x) = \frac{2}{x^{3/2}} + \sin^3(3x^2 - 4)$

(7)

c) Find  $\int \frac{x^2 + 2x + 2}{x + 2} dx$

(7)



# UNIVERSITY OF THE PUNJAB

Third Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pathology (Old & New Course)  
PAPER: 1

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 50

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

**Question no 1:**

- a) Define pathological calcification. What are its types. Briefly describe its types with examples (6)
- b) What is apoptosis? Describe the mechanism of apoptosis (4)

**Question no 2:**

- a.) Write down the differences between transudate and exudate (5)
- b.) Name different chemical mediators of inflammation with their functions? (5)

**Question no 3:**

- a) What are the differences between primary and secondary wound healing? (5)
- b) Describe cells on the basis of division capacity. Draw cell cycle (5)

**Question no 4:**

- A) What is thrombosis? What is the fate of thrombus? (5)
- B) Define edema. What are the different causes of edema (5)

**Question no 5**

- a) Describe antigen- antibody mediated hypersensitivity reaction ( Type III) . (5)
- b) What are different types of antibodies? Write down their important features (5)

**Question no 6**

- a. Define malignant tumor?What are its features (6)
- b. Nomenclature of benign tumor with examples? (4)

**Question no 7**

Write short notes on

- a) Metastasis (4)
- b) Granuloama (3)
- c) Reversible cell injury (3)





# UNIVERSITY OF THE PUNJAB

Third Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmacology & Therapeutics-II (Old & New Course) TIME ALLOWED: 3 hrs.  
PAPER: 2 MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q1. Classify antimetabolite agents. Discuss the mechanism of action, therapeutic uses and adverse effects of methotrexate. (20)
- Q2. Classify antidepressant drugs. Discuss the pharmacological actions, and adverse effects of tricyclic antidepressants. (20)
- Q3. Classify general anesthetics? Explain in detail the Pharmacokinetics and pharmacodynamics of thiopental (20)
- Q4. Classify  $\beta$ -lactam antibiotics. Discuss the mechanism of action, clinical uses and adverse effects of cephalosporins. (20)
- Q5. Classify antifungal drugs. Discuss the mechanism of action, clinical uses and adverse effects of amphotericin B. (20)
- Q6. Classify antiretroviral drugs. Discuss the mechanism(s) of action and resistance of Zidovudine (20)
- Q7. Classify NSAIDs. Describe mechanism of action, pharmacokinetics and unwanted effect of Aspirin. (20)



# UNIVERSITY OF THE PUNJAB

Third Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmacognosy-II (Old Course)

Pharmacognosy-II (Advance) (New Course)

Common

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

PAPER: 3

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q-No.1. Differentiate between volatile oils and fixed oils. Discuss the crude drugs containing phenolic volatile oils. 20
- Q-No.2. (A) What are alkaloids. Discuss the extraction method of alkaloids.  
(B) Write a note on Ergot. 12+08
- Q-No.3. (A) Differentiate between tannins and pseudo tannins. Discuss the chemical and biological properties of tannins  
(B) Describe Lanoline. 14+06
- Q-No.4. (A) Discuss the chemistry, pharmacological actions and uses of digitalis.  
(B) Write Pharmacognostic note on cannabis. 14+06
- Q-No.5. Define adsorption Chromatography, Explain thin layer chromatography. 20
- Q-No.6. Give the botanical origin, family, constituents and uses of following 20
- |                 |                |
|-----------------|----------------|
| i. Nux-vomica   | iii. Cochineal |
| ii. Ipecacuanha | iv. Podophylum |
- Q-No.7. Give the structural formulae of the followings. 20
- |              |               |
|--------------|---------------|
| i. Isoprene  | iii. Vanillin |
| ii. Nicotine | iv. Ephadrine |

# UNIVERSITY OF THE PUNJAB



Third Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

Subject: **Pharmaceutics-III (Disp. & Comm., Pharmacy) (Old Course)**  
**Pharmacy Practice-II (Disp. Comm., School Admn Pharmacy) (New Course)**

**PAPER: 4**

**NOTE: Attempt FIVE questions. Select Two from first part and Three from second part. All questions carry equal marks.**

## PART-I (Dispensing)

- Q.1 (a) Elaborate parts of a prescription? (08)  
(b) Discuss labelling of Topical dispensed medications? (12)
- Q. 2. (a) What are Basic operations used in Compounding? (10)  
(b) Discuss Physical incompatibilities in detail? (10)
- Q.3. (a) Define and classify powders. Discuss various techniques of preparing extemporaneous powders. (12)  
(b) How you will dispense Eutectic mixtures and deliquescent powders? (08)

## PART-II (Community, Social & Administrative Pharmacy)

- Q.4. a) Write a note the steps involved in patients Education with particular emphasis on Assessment and Documentation. (12)  
b) What are different perspectives and costs involved in pharmaco-economic studies. (8)
- Q.5. a) Describe patient's counseling content and process items and how minimize barriers of counseling. (12)  
b) Briefly describe cost of illness and cost consequences analysis. (8)
- Q.6. a) Should Disprin be dispensed without supervision of community pharmacist? If not than what are complications associated with Disprin? (10)  
b) Briefly discuss the epidemiology under the umbrella of MDGs & SDGs. (10)
- Q.7. a) How can pharmacist play his/her role in prevention of non-communicable diseases? Discuss with examples of any two non-communicable diseases. (10)  
b) What are the social complications of illicit drug taking? (10)



# UNIVERSITY OF THE PUNJAB

Roll No. ....

Third Prof: 2<sup>nd</sup> Annual - 2017Examination: Doctor of Pharmacy (Pharm.D.)

Subject: Pharmaceutical Chemistry-II (Instrumentation) (Old Course) TIME ALLOWED: 20 min.  
Pharmaceutical Chemistry-III (Pharmaceutical Analysis) (New Course) MAX. MARKS: 20

PAPER: 5

Attempt this Paper on this Question Sheet only.

**Note:** This paper comprises of TWO Parts, Part – I (MCQs) and Part – II (descriptive). Part – I is compulsory, whereas attempt any FOUR questions from Part – II. Each question carries equal marks.

Part – I Multiple Choice Questions (MCQs). Please encircle the correct statement.  
Each MCQ carries 2 marks, total Marks. 20.

No. of question	Question	Marks
Q.1	<p>1- In an electrolytic cell, which of the following is the half-cell where reduction takes place?</p> <ol style="list-style-type: none"><li>Anode</li><li>Cathode</li><li>Combination electrode</li><li>Electrode response</li></ol> <p>2-Mercury covered by a layer of mercurous chloride in contact with saturated potassium chloride solution is a description of which of the following types of electrodes?</p> <ol style="list-style-type: none"><li>Sodium</li><li>Calcium</li><li>Silver/silver chloride</li><li>Calomel</li></ol> <p>3- The <sup>13</sup>C NMR spectrum of a compound A contains two signals and in the <sup>1</sup>H NMR spectrum there is a singlet. Which compound is consistent with these data?</p> <ol style="list-style-type: none"><li>Acetone</li><li>Dichloromethane</li><li>Ethanol</li><li>Bromoethane</li></ol> <p>4- Vicinal coupling is:</p> <ol style="list-style-type: none"><li>coupling between <sup>1</sup>H nuclei in an alkane</li><li>coupling between <sup>1</sup>H nuclei attached to the same C atom</li><li>coupling between <sup>1</sup>H nuclei in an alkene</li><li>coupling between <sup>1</sup>H nuclei attached to adjacent C atoms</li></ol> <p>5- Which of the following techniques would be most useful to identify and quantify the presence of a known impurity in a drug substance?</p> <ol style="list-style-type: none"><li>NMR</li><li>MS</li><li>IR</li><li>HPLC</li></ol>	20

PTO

6- Which of the following assays could not be performed by gas chromatography?

- a. Characterisation of volatile oils
- b. Measurement of drugs and metabolites in biological fluids
- c. Analysis of intravenous sodium chloride infusion
- d. Characterisation of raw materials for drug synthesis

7- Which of the following compounds does not absorb light in the UV/visible spectrum?

- a. Chloral hydrate
- b. Aspirin
- c. Paracetamol
- d. Phenobarbitone

8- In infrared spectroscopy which frequency range is known as the fingerprint region?

- a.  $400 - 1400\text{cm}^{-1}$
- b.  $1400 - 900\text{cm}^{-1}$
- c.  $900 - 600\text{cm}^{-1}$
- d.  $600 - 250\text{cm}^{-1}$

9- The compound eluted last and retained more in Normal and Reversed phase are

- a. Polar and Non-polar
- b. Non-polar and Polar
- c. Both are in Polar
- d. Both are in Non-polar

10- Which of the following is true for a DSC calibrant?

- a- high purity
- b- accurately known enthalpies
- c- thermally stable
- d- a,b,c



# UNIVERSITY OF THE PUNJAB

Third Prof: 2<sup>nd</sup> Annual - 2017

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Pharmacy Practice-III (Computer & its Application in Pharmacy)**  
**PAPER: 6 (New Course)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 50**

**Instructions:**

- Solve entire paper (both Objective and Subjective Parts) on Answer Book.
- In case of MCQs, write the Correct Option only, cutting / overwriting is not allowed.
- There is no choice among questions, you have to attempt all questions.
- Read the Questions carefully before attempting.
- No lead pencils, only BLUE or BLACK ink is allowed to solve the paper.

**"BEST OF LUCK"**

Determine the correct option for each of the following questions. Write the Question Number and your selected option like (A, B, C or D) in CAPITAL letters on the Answer Book only in a clear manner. You do not need to write the question statement on the Answer Book.

**Q.1.** Hardware refers to

- A. Collection of Programs
- B. Electronic and Electromagnetic Devices
- C. Data of Information
- D. Any Collection of Data

**Q.2.** Software is the \_\_\_\_\_ part that tells the computer how to do its job.

- A. Tangible
- B. Non-Tangible
- C. Invisible
- D. None of Above

**Q.3.** A CPU contains

- A. a card reader and a printing device
- B. an analytical engine and a control unit
- C. a control unit and an arithmetic logic unit
- D. an arithmetic logic unit and a card reader

**Q.4.** A byte can store

- A. Alphabet
- B. Special Character
- C. Space
- D. All of Above

**Q.5.** Which of the followings is a Primary Storage Device?

- E. Hard Disk
- F. RAM
- G. Flash USB Drive
- H. CPU

- Q.6. \_\_\_\_\_ is the processed and organized data presented in a meaning form.
- A. Data
  - B. Information
  - C. Byte
  - D. None of Above
- Q.7. If we increase the size of RAM, then system will reduce the usage of \_\_\_\_\_.
- A. ROM
  - B. Virtual Memory
  - C. Cache Memory
  - D. Registers
- Q.8. Which of the following is an example of input device.
- A. Audio Speakers
  - B. Touch Screen LED Monitor
  - C. Printer
  - D. None of Above
- Q.9. Cache Memory exist in
- A. ROM
  - B. Hard Disk
  - C. Central Processing Unit
  - D. Registers
- Q.10. Which of the following is generally called "The brain of the Computer".
- A. Memory
  - B. Central Processing Unit
  - C. Hard Disk
  - D. Registers
- Q.11. CD-ROM stands for
- A. Compactable Read Only Memory
  - B. Compact Data Read Only Memory
  - C. Compact Disk Read Only Memory
  - D. Compactable Disk Read Only Memory
- Q.12. \_\_\_\_\_ contains the pre-programmed computer instructions such as the Basic Input Output System (BIOS).
- A. RAM
  - B. ROM
  - C. CPU
  - D. Registers
- Q.13. A normal CD- ROM usually can store up to \_\_\_\_\_ data?
- A. 680 KB
  - B. 680 Bytes
  - C. 680 MB
  - D. 680 GB

- Q.14.** The main role of data de-fragmentation is to
- A. Secure your data from viruses
  - B. Stop unauthorized use of data
  - C. Increase the data access speed
  - D. None of the Above
- Q.15.** \_\_\_\_\_ perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers.
- A. Application Software
  - B. Messaging Software
  - C. Operating System
  - D. Management Information System
- Q.16.** What is LINUX?
- A. Malware
  - B. Operating System
  - C. Application Program
  - D. Firmware
- Q.17.** Which Printer is an expensive one and better than other printers in performance?
- A. Dot-Matrix Printer
  - B. Laser Printer
  - C. Ink-Jet Printer
  - D. Thermal Printer
- Q.18.** The physical arrangement in a computer that contains the computer's basic circuitry and components is called.
- A. Processor
  - B. Hard Disk
  - C. Motherboard
  - D. RAM
- Q.19.** Operating System is an example of \_\_\_\_\_.
- A. Application Software
  - B. Banking System
  - C. System Software
  - D. Management Information System
- Q.20.** Pictures/Images may have the following file extensions.
- A. exe, doc, pdf
  - B. dll, lib, ppt
  - C. bmp, gif, jpg
  - D. txt, zip



[REDACTED]

[REDACTED]

How does the computer technology be used to enhance the performance of a pharmaceutical professional?

[REDACTED]

What is the difference between systems analysis and systems design?

[REDACTED]

Write the role of computers in the identification of drug-related problems.

[REDACTED]

What are the likely benefits of using computer at community pharmacy? Briefly discuss

[REDACTED]

You have established an office of graphic designing and you have to purchase a computer for this office. Please list down the specifications of the following devices that will fulfill your needs as a graphic designer.

- a. Processor
- b. Memory
- c. Input Devices
- d. Storage Devices
- e. Communication Devices



# UNIVERSITY OF THE PUNJAB

Fourth Prof: 2<sup>nd</sup> Annual - 2017

Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-IV (Hospital Pharmacy)

PAPER: 1

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

*Note: Attempt any FIVE questions. All questions carry equal marks.*

- Q1 Write down the Generic name, company name, Dosage form, Strengths, indications, contra indication and Drug-Drug interactions of the following drugs: (20)
- |                 |                   |                |
|-----------------|-------------------|----------------|
| I. Keflex       | V. Valium         | IX. Glucophage |
| II. Synflex     | VI. Mixtard-30 HM | X. Arinac      |
| III. Entamizole | VII. EyeMox       |                |
| IV. Angised     | VIII. Dermovate   |                |
- Q2 a) Define the hospital pharmacy. What are the minimum standards for pharmacy department in a hospital? (10)
- b) Define TPN, What are precautions to be taken in the preparation of TPN (10)
- Q3 a) Name the types of purchasing; describe the procedure of bulk purchase by making a flow chart. (10)
- b) Describe stock/storage control tools particularly expiry calendar, also give various options for stocking the medicine like FIFO, FEFO, LIFO etc. (10)
- Q4 a) Define & discuss the purposes of CSSR. In how many ways CSSR is managed. (10)
- b) Briefly discuss P& TC. Highlight its role with reference to hospital. (10)
- Q.5 a) What is the organizational pattern of pharmacy department in a hospital? Explain with charts (10)
- b) Write a detail note on In-patients dispensing. (10)
- Q.6 a) Define medication errors, propose some strategies to prevent medication errors in a hospital. (15)
- b) What are Hazards associated with the handling of cytotoxic drugs. How you will dispense them? (05)
- Q.7 a) Define the hospital. What types of supportive services are provided in a hospital? (15)
- b) What are High Alert Medications (05)



# UNIVERSITY OF THE PUNJAB

Fourth Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-V (Clinical Pharmacy-I)  
PAPER: 2

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

Q.NO.1: (a) Write a detailed note on the merits and demerits of the research study question, and how to turn a research question into a proposal taking into account the bias, confounding, ethics, planning and selection of variables. (15 marks)

(b) Briefly, describe how pharmacist can manage drug-drug interaction in clinical settings. (5marks)

Q.#NO.2: (a) Discuss second Generation Cephalosporins. (5 marks)

(b) Discuss warnings and precautions of Adrenaline use. (7 marks)

(c) What is CORE and PRIME? (8 marks)

Q.#NO.3: (a) Write about the utilization of computer in hospital and clinical pharmacy.(10 mark)

(b) Describe three clinical differences among different types of corticosteroids. (6 marks)

(c) How can vasodilator drugs induce cardiovascular diseases? Give examples of two drugs (4marks)

Q.#NO.4: (a) Classify ADRs in older adults according to Bear's criteria. Give one example under each. (8 marks)

(b) Classify the drugs according to the severity of ADRs in pregnancy and give few examples (6marks)

(c) What are the predisposing factors of torsades *de pointes* arrhythmia. (6marks)

Q.#NO.5: (a) What are major difference between induction and inhibition due to drug-drug interaction at metabolism level, and describe in detail enzyme induction process with at least three examples. (10 marks)

(b) Explain with examples the difference between synergism, potentiation and additive effects due to drug-drug interactions. (7 marks)

(C) Name three inhibitors of CYP-enzymes (3 marks)

Q.#NO.6 (a) A patient is presented in ED with left side paralysis, cognitive deficit, headache,

B.P 165/95 and alter level of consciousness. CT scan shows hypo intense dark area. Write down diagnose and treatment protocol for this patient. (12 marks)

(b) Write down different ADRs in pediatrics due to altered metabolism. (8 marks)

Q.#NO.7 (a) Write a note on the predicators of drug induced hepatitis. (10 marks)

(b) Write a note on phenytoin induced hepatotoxicity. (10 marks)



# UNIVERSITY OF THE PUNJAB

Fourth Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Pharmaceutics-VI (Industrial Pharmacy)**  
**PAPER: 3**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 100**

**NOTE: Attempt any FIVE questions. All Questions carry equal marks.**

**Question 1:**

(a) - Define Hazard, Give the different classes of hazards and discuss in detail the different aspects of fire hazards? (10)

(b)- Write a detailed note on the chemicals as an industrial hazard and explain the prevention of chemical hazards in industry. (10)

**Question 2:**

Define Good Manufacturing Practices (GMP) and Current Good Manufacturing Practices (cGMP) and discuss the significance and different aspects of GMP for Finished pharmaceutical products (FPP). (20)

**Question.3:**

(a)- Discuss in detail the types of heat transfer mechanism and its applications (10)

(b)- Briefly discuss the principles and mechanism of mass transfer and its applications in pharmaceutical industrial? (10)

**Question.4:**

(a) - Describe the ideal characteristics of sterile products and explain the requirements for the preparation of parenteral preparations in pharmaceutical industry (12)

(b) - Describe the method of production for sterilized products in pharmaceutical industry (8)

**Q.5 (a)** What is comminution ? Discuss the advantages, disadvantages and the factors affecting the particle size reduction (10)

(b) Define filtration, clarification, sedimentation and decantation and also discuss the mechanism of filtration with reference to Darcy's Law. (10)

**Q.6 a)** Define & discuss the properties of an ideal filter media and also discuss the different factors affecting the selection of filter media. (06)

b) Write a detail note on the different types of filter media used in an industry. (14)

**Q.7. Write note on four of the following (5 marks each)**

a) - Compression and Compaction

b) - Angle of Repose

c) - Ball mill

d) - Hussner's ratios

e) - Problems of tablets manufacturing



# UNIVERSITY OF THE PUNJAB

Fourth Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-VII (Biopharmaceutics)  
PAPER: 4

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All Questions carry equal marks.**

- Q1 a) Define the following: 5 Marks  
i) Therapeutic equivalents ii) Closed compartment  
iii) Pharmaceutical alternatives iv) Catenary model  
v) Pharmacokinetics
- b) Describe how does biopharmaceutics effect design of dosage forms 15 Marks
- Q2 a) Discuss how do dissolution requirements meet with USP specifications? 8 Marks  
b) Discuss design and evaluation of bioequivalence studies. 12 Marks
- Q3 a) Describe the process of therapeutic drug monitoring. 8 Marks  
b) How is the distribution rate constant determined in two compartment open model after oral administration? Demonstrate with illustration. 12 Marks
- Q4 a) What is the significance of I/V infusion? How are steady state concentration (C<sub>ss</sub>), Pre-C<sub>ss</sub>, Post-C<sub>ss</sub>, Elimination rate and Half life are computed for I/V infusion? 3+12 Marks  
b) Briefly describe protein binding. What is the significance of protein binding 3+2 Marks
- Q5 a) Explain the difference between drug clearance and drug excretion. 8 Marks  
b) What is non-linear pharmacokinetics? How does it differ from other kinetic orders? What is its impact on Pharmacokinetics. 4+4+4 Marks
- Q6 a) What are the roles of biotransformation? What are the changes brought about in drug molecules during Phase I and II reactions? 3+3 Marks  
b) What is the extraction ratio? What is its importance? Describe the factors affecting biotransformation. 3+3+8 Marks
- Q7 Write short notes on the following: 5+10+5 Marks  
i) Dose consideration in hepatic diseases ii) IVIVC  
iii) Flip-flop model



# UNIVERSITY OF THE PUNJAB

Fourth Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-VIII (Pharmaceutical Quality Control)  
PAPER: 5

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All Questions carry equal marks.**

**Question 1.**

- A. Differentiate with example between official and non official quality control tests for tablets and capsules. Describe in detail method and apparatus for dissolution test of compressed tablets. (12)
- B. What is Assay? Name different techniques for the assay of pharmaceutical materials. Differentiate between percentage purity and content uniformity test. (8)

**Question 2.**

- A. Name different quality control tests performed for suppositories. Describe in detail disintegration test of suppositories. (10)
- B. What is IPQC stands for give its importance in the quality control of tablets? Describe principle, apparatus and procedure and for the disintegration test of uncoated tablets. (10)

**Question 3.**

- A. Write a note on breaking and liquefaction test of suppositories (12)
- B. Differentiate between cGMP, quality control and quality assurance. (8)

**Question 4.**

- A. How you will perform sterility test on semi-solid dosage form, also describe the interpretation of results of sterility testing. (10)
- B. What are pyrogens? Why their testing is important in pharmaceuticals? Describe in-vitro testing of pyrogens. (10)

**Question 5.**

- A. Write a note on any two of the followings (5 each)
  - I. Toxicity testing
  - II. Particle size determination in ointments
  - III. Microbiological assay with example
  - IV. Assay of insulin
- B. Why quality testing of glass is important in pharmaceuticals? How it is tested for Type I glass. (10)

**Question 6**

- A. Define Statistical Process Quality Control (SPQC) Charts. What are different types of Quality Control Charts? (10)
- B. Describe applications of Shewarts charts. (10)

**Question 7**

- A. Write a note on Alkaloidal drug assay. (10)
- B. Name different test performed for liquid dosage form. Describe in detail density determination of syrup and elixirs. (10)



# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutical Chemistry-III (Medicinal Chemistry)  
PAPER: 1

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions, Each question carries equal marks.**

Q.1: Discuss the chemistry, mechanism of action, synthesis, SAR of the followings (10+10)  
(i) Acetazolamide. (ii) Ribavirin

Q. 2: Describe in detail the medicinal chemistry of the Inhalation Anaesthetics. (20)

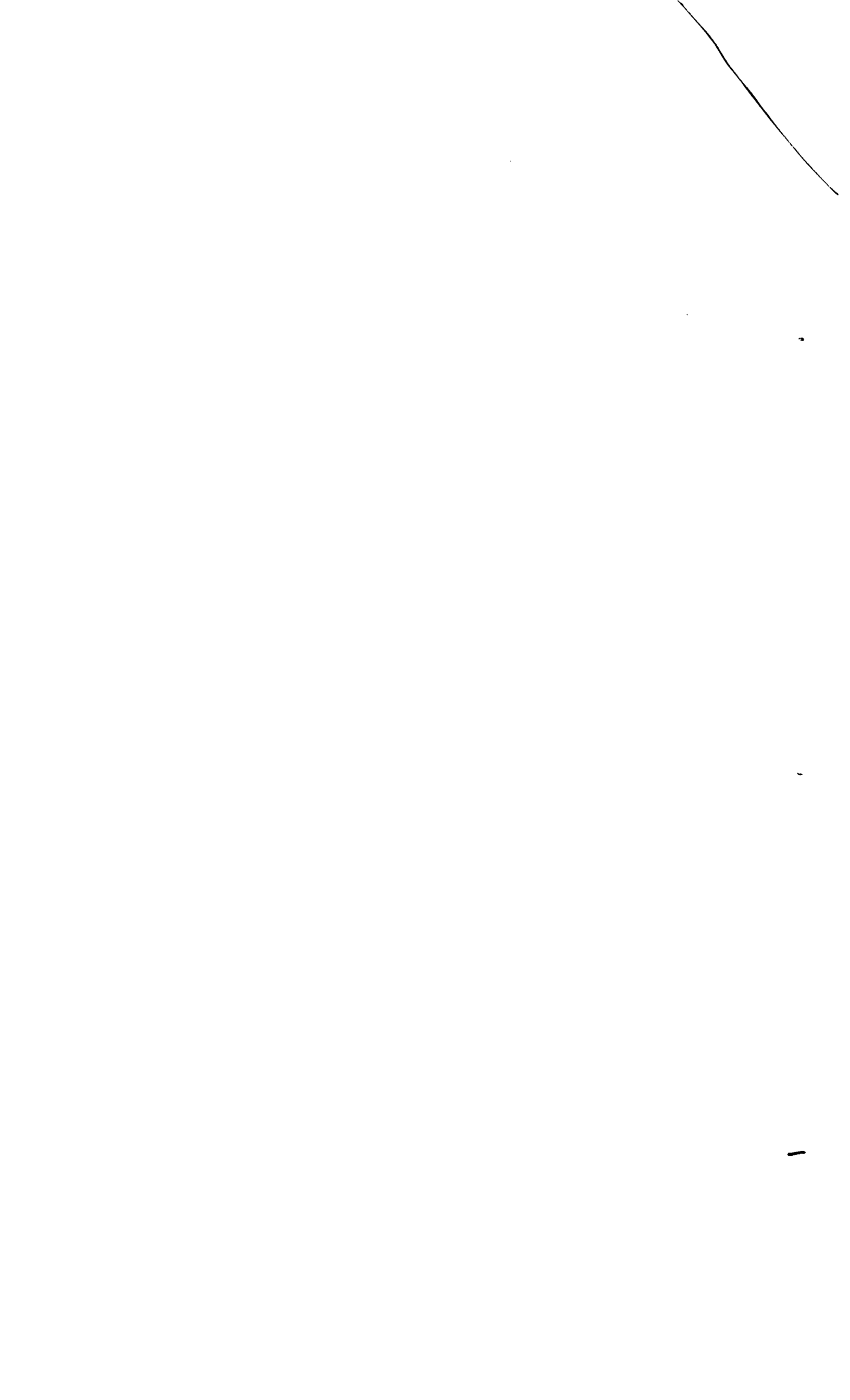
Q. 3: Discuss the medicinal chemistry of the followings Anti-cancer drugs. (10+10)  
(i) 5-Fluorouracil (ii) 5-Mercaptopurine

Q. 4: Discuss chemistry, SAR and mechanism of action of aminoglycosides antibiotics. (20)

Q. 5: Discuss the synthesis, mechanism of action and SAR of the followings. (10+10)  
(i) Ethambutol  
(ii) Pyrazinamide

Q. 6: Discuss the mechanism of action, synthesis, SAR of 8-Aminoquinolines. (20)

Q. 7: Write note on the followings. (10+10)  
(i) Vitamin-K (ii) Vitamin-C







# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutics-IX (Clinical Pharmacy-II)  
PAPER: 2

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q. # 1: (a) Briefly explain the followings (10)**  
(i) Negative Chronotropic (ii) Quality Adjusted Life Years (iii) Sero-conversion  
(iv) Sampling Frame (v) Trough Levels  
**(b) Describe Therapeutic Monitoring of Single dose and once daily Gentamicin regimen with and without Renal Impairment (7 marks)**  
**(c) Write a brief note on Stratified Sampling method (3 marks)**
- Q. # 2. (a) What are potential complications of Hepatitis B Viral Infection and pertinent treatment options (8 marks).**  
**(b) What are WHO core drug use indicators, and describe Patient related indicators in detail (7 marks)**  
**(c) What are the factors that affect Therapeutic Drug Monitoring (5 marks)**
- Q. # 3. a) What are clinical characteristics, symptoms and complications of URTIs ? (10)**  
**(b) Define Drug Utilization Review (DUR) and various categories of DUR in detail (7 marks)**  
**(c) What are the pre-requisites of TDM (3 marks)**
- Q. # 4. (a) Discuss the Pharmaco-therapeutic options for HTN in geriatrics (10)**  
**(b) Write a detailed note on therapeutic drug monitoring of Lithium (10)**
- Q. # 5. (a) Write in detail the antimicrobial treatment options for CAP in different clinical scenarios (15)**  
**(b) Write the prevention and treatment of Tetanus. (5 marks)**
- Q. # 6. (a) Write a brief note on the treatment and prevention of scabies. (10 marks)**  
**(b) What are response-optimized treatment options in chronic HCV patients and how to monitor treatment response (10 marks).**
- Q. # 7. (a) Write a note on the diabetes management algorithm for type II diabetes with more emphasis on the role of various Insulin regimens in the management of type-II diabetes (10 marks)**  
**(b) Write a note on the predictors, sign and symptoms, and treatment of candida infection (10 marks)**

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# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutical Technology  
PAPER: 3

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q. 1. (a) Discuss new current technologies in Oral drug delivery system? (10)  
(b) Describe Liposomes and their applications? (10)
- Q. 2. (a) Describe Passive and Active Targetting? (08)  
(b) Write a note on Lactide/Glycolide polymers used for development of controlled drug delivery? (08)  
(c) One factor at a time (OFAT) approach fails to achieve optimum product? Comment. (04)
- Q. 3. (a) Describe different methods for sterilization of pharmaceutical preparations? (10)  
(b) Define isotonicity. Describe methods for making isotonic solution? (10)
- Q. 4. (a) Define pre-formulation studies; describe strategies for the formulation of a newly discovered compound which has poor solubility but high permeability. (10)  
(b) Define microencapsulation and describe various polymer classes used in this process. (10)
- Q. 5. (a) What are the factors effecting the final stages of a product? (10)  
(b) Write notes on the following;  
I. Quality by Design (QBD)  
II. Process Analytical Technique (PAT) approaches (5+5)
- Q. 6. (a) Define Modified release drug delivery system. Briefly describe the design parameters for Zero order released modified delivery system? (2+8)  
(b) Which are the physicochemical and pharmacodynamics features that make a drug as appropriate candidate for modified release delivery system? (10)
- Q.7. (a) Discuss Particulate carriers used for Drug Targeting delivery system? (10)  
b) How the following parameters are important at the stage of product development. (5+5)  
i) Excipient compatibility  
ii) Stability of compound



# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Forensic Pharmacy  
PAPER: 4

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q 1 Give brief answers of following terms 4 Marks each
- Adulterated drug
  - Health and OTC products
  - Opium under Narcotic Act
  - Formula of price fixation for local drugs
  - Quality audit
- Q 2 a) Describe the requirements of Premises as given in Schedule B under Drugs Act 1976. 10 Marks
- b) Name the types of drugs/remedies that cannot be advertised under Drugs Act 1976. Describe the conditions to be fulfilled for advertisement of drugs. 10 Marks
- Q 3 Describe the followings under Drugs Act 1976. 10 marks each
- Offences and penalties
  - Drug courts
- Q 4 a) Give composition of Central Licensing Board (CLB). 10 Marks
- b) Enlist various types of application of registration of drugs. How renewal of registration can be obtained for biological drugs. 10 Marks
- Q 5 a) Describe the procedure of PQCB in a case of expired drugs referred by provincial inspector of drugs. 10 Marks
- b) Describe Prohibitions and Penalties under Control of Narcotic Substances Act 1997. 10 Marks
- Q 6 a) Describe the following under Factory Act 1934 5 Marks each
- Precautionary measures taken in case of fire
  - Facilities provided to workers
- b) Describe the following under Pharmacy Act 1967. 5 Marks each
- Election of Vice-President under Section 11
  - Furnishing of information under Section 20
- Q 7 a) Write a list of instructions for a Pharmacist working in Pharmacy with reference to controlled drugs. 10 marks
- b) What is the composition of Drug Regularity Authority of Pakistan (DRAP)? 10 Marks



# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

Subject: Pharmaceutical Management & Marketing  
PAPER: 5

TIME ALLOWED: 3 hrs.  
MAX. MARKS: 100

**NOTE: Attempt any FIVE questions. All questions carry equal marks.**

- Q.1. Define marketing and explain marketing system. Discuss 4Ps and 4Cs concepts in marketing. (20)
- Q.2. Enlist elements of Production management and discuss operational management in detail. (20)
- Q.3. a). Define creativity and innovation. Discuss the personality traits and characteristics of creative people (10).  
b). Discuss the organizational design of creativity and write the elements to foster the creativity skills of their employees. (10)
- Q.4. What is sales management. What activities are involved in managing a sales force. (20)
- Q.5. Discuss strategic importance of pharmacy lay out design. Explain different layout considerations. (20)
- Q.6. a). Define motivation. Discuss why people are comparatively lazy in public organizations and which elements contribute towards motivation. (10)  
b). List the all theories of motivation and discuss only the motivation theory of Maslow's Hierarchy of Needs. (10).
- Q.7. Define Pharmaceutical ethics. Discuss ethical relationship between pharmacist - doctor and pharmacist – patient. (20)



# UNIVERSITY OF THE PUNJAB

Final Prof: 2<sup>nd</sup> Annual - 2017  
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No. ....

**Subject: Computer and its Applications in Pharmacy**  
**PAPER: 6**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 50**

**Instructions:**

- Solve entire paper (both Objective and Subjective Parts) on Answer Book.
- In case of MCQs, write the Correct Option only, cutting / overwriting is not allowed.
- There is no choice among questions, you have to attempt all questions.
- Read the Questions carefully before attempting.
- No lead pencils, only BLUE or BLACK ink is allowed to solve the paper.

**"BEST OF LUCK"**

Determine the correct option for each of the following questions. Write the Question Number and your selected option like (A, B, C or D) in CAPITAL letters on the Answer Book only in a clear manner. You do not need to write the question statement on the Answer Book.

Q.1. \_\_\_\_\_ is the processed and organized data presented in a meaning form.

- A. Data
- B. Information
- C. Byte
- D. None of Above

Q.2. A byte consists of

- A. 4 bits
- B. 8 bits
- C. 12 bits
- D. 16 bits

Q.3. A byte can store

- A. Alphabet
- B. Special Character
- C. Space
- D. All of Above

Q.4. Hardware refers to

- A. Collection of Programs
- B. Electronic and Electromagnetic Devices
- C. Data of Information
- D. Any Collection of Data

Q.5. Software is the \_\_\_\_\_ part that tells the computer how to do its job.

- A. Tangible
- B. Non-Tangible
- C. Invisible
- D. None of Above

**Q.6. Which of the followings is a Primary Storage Device?**

- A. Hard Disk
- B. RAM
- C. Flash USB Drive
- D. CPU

**Q.7. Which of the following is generally called "The brain of the Computer".**

- A. Memory
- B. Central Processing Unit
- C. Hard Disk
- D. Registers

**Q.8. Cache Memory exist in**

- A. ROM
- B. Hard Disk
- C. Central Processing Unit
- D. Registers

**Q.9. If we decrease the size of RAM, then system will increase the usage of \_\_\_\_\_.**

- A. ROM
- B. Virtual Memory
- C. Cache Memory
- D. Registers

**Q.10. \_\_\_\_\_ contains the pre-programmed computer instructions such as the Basic Input Output System (BIOS).**

- A. RAM
- B. ROM
- C. CPU
- D. Registers

**Q.11. Which of the following is an example of input device.**

- A. Audio Speakers
- B. Touch Screen LED Monitor
- C. Printer
- D. None of Above

**Q.12. CD-ROM stands for**

- A. Compactable Read Only Memory
- B. Compact Data Read Only Memory
- C. Compact Disk Read Only Memory
- D. Compactable Disk Read Only Memory

**Q.13. \_\_\_\_\_ perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printers.**

- A. Application Software
- B. Messaging Software
- C. Operating System
- D. Management Information System

- Q.14.** Which Printer is an expensive one and better than from other printers in performance?
- A. Dot-Matrix Printer
  - B. Laser Printer
  - C. Ink-Jet Printer
  - D. Thermal Printer
- Q.15.** System Restore Utility can enable us to restore
- A. drives data where OS is not installed
  - B. your personal files
  - C. system state
  - D. option a & b both
- Q.16.** The main role of data de-fragmentation is to
- A. Secure your data from viruses
  - B. Stop unauthorized use of data
  - C. Increase the data access speed
  - D. None of the Above
- Q.17.** Pictures/Images may have the following file extensions.
- A. exe, doc, pdf
  - B. dll, lib, ppt
  - C. bmp, gif, jpg
  - D. txt, zip
- Q.18.** The physical arrangement in a computer that contains the computer's basic circuitry and components is called.
- A. Processor
  - B. Hard Disk
  - C. Motherboard
  - D. RAM
- Q.19.** Operating System is an example of \_\_\_\_\_.
- A. Application Software
  - B. Banking System
  - C. System Software
  - D. Management Information System
- Q.20.** What is LINUX?
- A. Malware
  - B. Operating System
  - C. Application Program
  - D. Firmware



[REDACTED]

[REDACTED]

How does the computer technology be used to enhance the performance of a pharmaceutical professional?

[REDACTED]

What is Systems Development Life Cycle (SDLC)? Briefly, explain its phases.

[REDACTED]

Define Local Area Network (LAN) & Wide Area Network (WAN), also draw sample LAN implementation.

[REDACTED]

You have established a small office and you have to purchase a computer for this office. Please list down the specifications of the following devices that will fulfill your needs as a small office user.

- a. Processor
- b. Memory
- c. Input Devices
- d. Storage Devices
- e. Communication Devices

[REDACTED]

Define the following terms briefly. Each term should be defined no more than six lines.

- a. Network Topology & Types of Topology
- b. Computer Viruses & Anti-Viruses
- c. Name any five software applications for data analysis