

B.Pharm 2nd Semester Exam., 2019

PHARMACEUTICAL CHEMISTRY—III
(Organic Chemistry)

(Old Course)

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. **1** is compulsory.

1. Answer the following as directed (any seven) :

2×7=14

- (a) Write at least any two differences between meso-compounds and racemic modifications.
- (b) Define intramolecular forces with examples.
- (c) Molecules that are superimposable on their mirror images are not chiral comp.
(Fill in the blank)

(2)

- (d) A carbon atom to which four different groups are attached is known as chiral centre.

(Write True or False)

- (e) Define the following terms with examples :

Nitrene and Nitrenium ions

- (f) Draw the structures of vinylbenzene and *p*-xylene.

- (g) The acidic reagents are seeking a pair of electrons are called ____ (nucleophilic reagents/electrophilic reagents).

(Choose the correct option)

- (h) Stereoisomers that are not mirror images of each other are called ____ (enantiomers/diastereomers).

(Choose the correct option)

- (i) Arrange the following compounds of each set in order of reactivity towards S_N2 displacement :

(i) 1-Bromo-3-methylbutane (✓)

(ii) 2-Bromo-2-methylbutane (✓)

(iii) 3-Bromo-2-methylbutane (✓)

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(Continued)

(3)

- (j) Write the chemical structural formulae for :

(i) *n*-Butyl methyl ether

(ii) *n*-Octyl alcohol

(iii) 2-Methoxypentane

(iv) 1-Methoxy-2-propanol

2. Write short notes on any two of the following : 7×2=14

(a) Molecular orbital theory

(b) Bond dissociation energy

(c) Acids and bases

3. (a) Discuss in detail about the enantiomers with examples.

(b) Write about the methods for the preparation of racemic modification.

4. (a) Define carbanions. Explain structure, relative stabilities and stabilization of carbanions.

(b) Discuss aromaticity of benzene in detail.

5. (a) What is S_N1 reaction? Explain its mechanism with suitable examples.

(b) Explain nucleophilic aliphatic substitution reaction and its mechanism with examples.

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(Turn Over)

6. (a) Write any five chemical properties of alkyne. 7

(b) Give physical and chemical properties of aliphatic aldehydes. 7

7. Write short notes on any *two* of the following : $7 \times 2 = 14$

(a) Carboxylic acids

(b) Cycloalkanes

(c) Epoxides

8. Write the preparation methods of (any *two*) : $7 \times 2 = 14$

(a) Dienes

(b) Ethers

(c) Ketones

9. Write the chemical properties of any *two* of the following : $7 \times 2 = 14$

(a) Phenol

(b) Acetyl chloride

(c) Diethyl ether

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B.Pharm 2nd Semester Exam., 2019**ANATOMY, PHYSIOLOGY AND
HEALTH EDUCATION—I****(Old Course)**

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No 1 is compulsory.

1. Answer the following as directed (any seven) : 2×7=14

- (a) Define anatomy.
- (b) Enlist the functions of lymph node.
- (c) Define neuron.
- (d) Describe erythrocytes.
- (e) The inner membrane of a mitochondrion invaginates to form _____.
(Fill in the blank)
- (f) What is AV node?

(2)

(g) What do you mean by the term 'systole'?

(h) In gout, _____ crystals accumulate in joints.

(Fill in the blank)

(i) What is the key role of Golgi complex?

(j) Describe diffusion.

2. Draw a neat diagram of human cell. Discuss in detail about active transport. 14

3. Classify various tissues of body. Explain the structure and functions of nervous tissue. 14

4. Answer the following questions : 7+7=14

(a) Describe the events of skeletal muscle contraction.

(b) Explain the process of blood coagulation.

5. Answer the following questions :

10+4=14

(a) Discuss the disorders of lymphatic system.

(b) Describe the structure and functions of a lymph node.

(3)

6. Answer the following questions : 10+4=14

(a) Explain various events of a cardiac cycle.

(b) What is the electrocardiogram?

7. Answer the following questions : 6+6+2=14

(a) Discuss various blood groups and their significance.

(b) Explain the structure and functions of spleen.

(c) What are the types of cartilage?

8. Describe the following in brief : 5+4+5=14

(a) Angina

(b) Gout

(c) Rheumatoid arthritis

9. Describe the following in brief : 5+4+5=14

(a) Arteriosclerosis

(b) Various joint movements

(c) Endoplasmic reticulum

B.Pharm 2nd Semester Exam., 2019

(Old Course)

PHARMACEUTICS—II

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. **1** is compulsory.

1. Answer/Write on/Fill in the blank of any seven of the following :

 $2 \times 7 = 14$

- (a) ✓ Define valves.
- (b) ✓ Define viscosity.
- (c) ✓ Laminar flow
- (d) Define crystal habit.
- (e) ✓ Define dehumidification.
- (f) ✓ Define supersaturation.
- (g) ✓ Define filtration.
- (h) Use of flowmeters
- (i) What is the use of bins?
- (j) ✓ Stainless steel is _____ resistant.

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(Turn Over)

(2)

2. Explain construction, working and application of the following : $7 \times 2 = 14$

- (a) Krystal crystallizer
- (b) Industrial filter

3. Answer the following questions : $7 \times 2 = 14$

- (a) Describe the various types of valve in detail.
- (b) Describe the refrigeration cycle.

4. What are the various types of pumps? With the help of neat diagram, describe the working of piston pump. 14

5. Answer the following questions : $8 + 6 = 14$

- (a) What are unit operations? Describe the law of conservation of matter and the law of conservation of energy.
- (b) Define the following terms :
 - (i) Caking
 - (ii) Tonne of refrigeration
 - (iii) Adiabatic saturation temperature

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(3)

6. Write notes on the following : $5 + 5 + 4 = 14$

- (a) Industrial dermatitis
- (b) Corrosion
- (c) Stainless steel as plant construction material

7. Answer the following questions : $7 \times 2 = 14$

- (a) Describe the theory of filtration and the factors influencing filtration.
- (b) Describe the important features of humidity charts.

8. Write the theory of crystallization. Draw a neat labelled diagram of Swenson Walker crystallizer and discuss the construction, working, advantages and disadvantages. 14

9. Write notes on/Answer the following : $5 + 7 + 2 = 14$

- (a) Concept of boundary layer
- (b) What are the chemical hazards? How can they be prevented?
- (c) Dust explosion

AK9-370/704

Code : 09120

B.Pharm 2nd Semester Exam., 2019

(Old Course)

PHARMACEUTICAL CHEMISTRY—II

(Physical Chemistry)

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Answer any seven of the following questions :

2×7=14

- (a) Define Charles law.
- (b) Define surface tension. Give its one application.
- (c) What is Le Chatelier principle for chemical equilibrium?
- (d) Define conductance for a solution.

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(Turn Over)

(2)

- (c) Define heat capacity.
- (f) Define Lambert law.
- (g) What is fluorescence?
- (h) Define quantum mechanics.
- (i) Give the formula of rate constant for first-order kinetics.
- (j) What is half-life?
2. Discuss kinetic theory of gases. Explain the reason of deviation of real gases from ideal behavior. Derive van der Waals' equation for real gases. 14
3. Discuss parachor, refractive index and optical rotation. Also discuss different types of dipole interaction. 14
4. Discuss first and second laws of thermodynamics. Explain entropy and enthalpy. Illustrate Gibbs' free energy and spontaneous chemical reactions. 14
5. Differentiate between physical adsorption and chemical adsorption. Explain various factors affecting gas-solid adsorption. Discuss Langmuir theory of adsorption. 14

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(Continued)

(3)

6. What do you understand by colligative properties? Discuss any two in detail. 14
7. Discuss various theories of chemical kinetics. Write a detailed note on first-order reaction. Discuss the factors affecting second-order reactions. 14
8. Discuss various methods of quantum mechanics. Also discuss various uses and applications of quantum approach in Chemistry in pharmacy. 14
9. Write detailed notes on any two of the following : 7×2=14
- (a) Ideal and real solutions
- (b) Jablonski diagram
- (c) Biocatalysis and biocatalyst

AK9-350/705

Code : 091202

B.Pharm 2nd Semester Exam., 2019

ADVANCED MATHEMATICS

(Old Course)

Time : 3 hours

Full Marks : 70

Instructions :

- (i) All questions carry equal marks.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No 1 is compulsory.

1. Answer the following questions (any seven) :

~~(a)~~ Solve :

$$\frac{dy}{dx} + \frac{y}{x} = x^n$$

~~(b)~~ Define the equations reducible to homogeneous equations.

(c) Solve :

$$\frac{dz}{dx} + \frac{z}{x} \log z = \frac{z}{x} (\log z)^2$$

~~(d)~~ What is general solution of an ordinary differential equation?

(2)

(3)

(a) If $L\{f(t)\} = \bar{f}(s)$, then show that

$$L\{e^{at}f(t)\} = \bar{f}(s-a)$$

(f) State the second translation theorem for inverse Laplace transform.

(g) What do you understand by skewness? How does it describe a distribution?

(h) An urn contains 4 tickets numbered 1, 2, 3, 4 and another contains 6 tickets numbered 2, 4, 6, 7, 8, 9. If one of the two urns is chosen at random and a ticket is drawn at random from the chosen urn, find the probabilities that the ticket drawn bears the number

(i) 2 or 4

(ii) 1 or 9

(i) Let A , B and C denote events. If $P(A|C) \geq P(B|C)$ and $P(A|\bar{C}) \geq P(B|\bar{C})$, then show that $P(A) \geq P(B)$.

(j) Define coefficient of correlation. What is the range of correlation coefficient?

2. Solve the following simultaneous equations using L-transform :

$$\frac{dy}{dt} + 2x = \sin 2t \quad \frac{dx}{dt} - 2y = \cos 2t \quad (t > 0)$$

if at $t=0$, $x=1$ and $y=0$.

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(Continued)

3. Solve $[tD^2 + (1-2t)D - 2]y = 0$ if $y(0) = 1$, $y'(0) = 2$.

4. Solve the following :

(i) $x\sqrt{1+y^2} dx + y\sqrt{1+x^2} dy = 0$

(ii) $\frac{dy}{dx} = e^{3x-2y} + x^2e^{-2y}$

5. Solve the following :

(i) $\frac{dx}{dt} + 5x + y = e^x$

(ii) $\frac{dy}{dt} - x + 3y = e^{2t}$

6. Calculate median for the given frequency distribution :

Class interval	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	8	13	14	22	19	12	5

7. Solve the following differential equations :

(i) $x^2 + 2xy \frac{dy}{dx} - y^2 = 0$

(ii) $(3x - 7y - 3) \frac{dy}{dx} = 3y - 7x + 7$

AK9/706

(Turn Over)

8. Determine the relationship between the semi-interquartile range and standard distribution in a standard normal probability curve.
9. A pharmaceutical company wishes to launch 3 new medicines of different salt compositions and wishes to determine whether one of them is more effective than the others in curing a certain disease. Four months of usage figures are observed at random on each medicine and results are give below :

<i>Observations</i>	<i>Medicine A</i>	<i>Medicine B</i>	<i>Medicine C</i>
1	22	31	24
2	30	35	30
3	29	38	33
4	38	42	29

Determine whether the medicines differ significantly in their mean effect.

F value at 5% level of significance = 3.55.
