Code : 091106

B.Pharm 1st Semester Exam., 2022

REMEDIAL MATHEMATICS

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* questions : 2×7=14

(a) Let

$$B = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 3 & 4 \\ 5 & 8 & 9 \end{bmatrix}$$

Find Adj(B).

(b) Solve the following simultaneous equations by matrices :

$$2x + 4y = 2$$

$$-3x + y = 11$$

(c) Find the inverse of a scalar matrix with diagonal elements are 3.

(d) Find the value of sin 18°.

(e) Determine the perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0).

(f) Find the focus and directrix of the parabola $y^2 = 10x$.

(g) Find the eccentricity of a parabola.

(h) Find the derivative of power function with exponent n.

(i) Find the value of $\sin x$ and $\tan x$ if $\cos x = -\frac{1}{2}$, where x lies in the third quadrant.

(j) Integrate the function $f(x) = \sin^2 x$.

2. Solve the following system of equations using Cramer's rule : 14

$$7x + 2y + 3z = 6$$
$$3x + 7y + 2z = 8$$
$$x + 3y + z = 3$$

3. *(a)* If $A + B = 45°$, then evaluate

$$(1 + \tan A)(1 + \tan B) \qquad 7$$

(b) Find the value of $\tan 1° \tan 2° \cdots \tan 89°$. 7

4. *(a)* Prove that

$$\cos 20° \cos 40° \cos 60° \cos 80° = \frac{1}{16} \qquad 7$$

(b) If mean of a data is 24, median is 21, then find the mode of the data. 7

(Continued)

5. *(a)* Evaluate

$$\lim_{x \to 0} \frac{e^{1/x} - 1}{e^{1/x} + 1}$$ 7

(b) Why are mean, median and mode called measures of central tendency? Give situations where each of them is inappropriate to use. 7

6. Prove the following : 7+7=14

(a) $\sin^2 x + \cos^2 x = 1$

(b) $\tan x = \frac{\sin x}{\cos x}$

7. If $y = a\cos(\log x) + b\sin(\log x)$, then show that

$$x^2 y_2 + x y_1 = -y$$ 14

8. Discuss the kind of discontinuity, if any, of the function

$$f(x) = \begin{cases} \frac{x - |x|}{x} & , \quad x \neq 0 \\ 2 & , \quad x = 0 \end{cases}$$ 14

9. Prove that the area of a triangle formed by three collinear points is zero. 14

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Code : 091104

B.Pharm 1st Semester Exam., 2022

PHARMACOGNOSY—I

Time : 3 hours | *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are ***EIGHT*** *questions in this paper.*

(iii) Attempt ***FIVE*** *questions in all.*

(iv) Question No. ***1*** *is compulsory.*

1. Answer/Write on/Choose the correct option of the following (any *seven*) : 2×7=14

(a) Aril is present in

(i) nutmeg

(ii) castor

(iii) cardamom

(iv) coriander

(b) Father of medicine is

(i) Galán

(ii) Sushruta

(iii) Hippocrates

(iv) Aristotle

(c) Anomocytic type of stomata is present in

(i) Atropa

(ii) *Urginea maritima*

(iii) foxglove

(iv) *Cassia acutifolia*

(d) Which of the following is used as a herbicide?

(i) Zeatin

(ii) ABA

(iii) 2,4-D

(iv) IAA

(e) Seed gum is

(i) agar

(ii) carrageenan

(iii) isabgol

(iv) pectin

(f) Write the biological source and uses of hydnocarpus oil.

(g) Define stomatal index.

(h) Define inflorescence.

(i) Chemical test of carbohydrates

(j) Write the floral formula of family Solanaceae and Leguminosae.

2. Write a detailed note on plant tissue culture as source of crude drugs. What are the plant hormones used in PTC? 14

3. Define lipid. Discuss in detail about castor oil and beeswax. 14

4. Write the biological sources, chemical constituents and uses of any *two* of the following : 14

(a) Agar

(b) Tragacanth

(c) Guar gum

5. Write a detailed note on starch. 14

Code : 091101

B.Pharm 1st Semester Exam., 2022

PHARMACEUTICS—I

(Physical Pharmacy)

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 questions (any *seven*) : 2×7=14

(a) Define vapour pressure.

(b) What is meant by pseudoplastic?

(c) Define spreading coefficient.

(d) What is channel-type complex? Give example.

(e) Enumerate any four viscometers.

(f) Define polymorphism with example.

(g) What are protective colloids?

(h) Define the term 'isotonicity' with an example.

(i) What do you mean by shelf life?

(j) Define relative humidity.

2. Define interfacial tension. Describe any one method in detail for determining interfacial tension. 14

3. (a) What are colloidal dispersions? Discuss electrical and kinetic properties of colloids. 7

(b) What do you understand by controlled flocculation? Differentiate between flocculated and deflocculated suspensions. 7

4. (a) Define the term 'stability' of a drug. Discuss in detail about various modes of decomposition of drug with suitable examples. 7

(b) Describe various methods for determination of order of reaction. 7

5. Differentiate between Newtonian and Non-Newtonian systems. Discuss thixotropy in formulations. 14

6. *(a)* Discuss the properties of various states of matter. How does transition take place from one state of matter to other? 7

(b) Write a short note on particle size and distribution. 7

7. *(a)* Give the classification of complexes. 7

(b) Describe the significance of complexation in pharmaceuticals. 7

8. What do you understand by buffer capacity? Explain the various methods of adjusting isotonicity. 14

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

(a) HLB classification

(b) Particle size and distribution

(c) Applications of colloids in pharmacy

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Code : 091103

B.Pharm 1st Semester Exam., 2022

PHARMACEUTICAL CHEMISTRY—I

(Inorganic Pharmaceutical 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. Attempt any *seven* of the following : 2×7=14

(a) What are respiratory stimulants? Give examples.

(b) Why is povidone-iodine superior to other iodine preparations?

(c) Write the role of thioglycollic acid in limit test of Iron.

(d) What are the expectorants? Give their examples.

(e) Write the compositions and uses of Shilajit.

(f) Write the disadvantages of systemic antacids.

(g) Give any four examples of radiopharmaceuticals.

(h) What is milk of magnesia?

(i) Write about Epsom salt.

(j) What are physiological ions?

2. What are the gastro-intestinal agents? Classify them with examples. Write about antitussive with examples. 14

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

(a) Isotonic solutions

(b) Activated charcoal

(c) Iodine preparations and their uses

4. Write a detailed account on the major intracellular and extracellular electrolytes. 14

5. Define astringents. Write the chemical formula, preparation and uses of alums. 14

6. Explain about radiopharmaceuticals with their uses and methods of measurement of radioactivity. 14

7. Explain the methods of preparation, identification tests and test of purity of bentonite and aluminium hydroxide gel. 14

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

   (a) Pharmaceutical importance of chelates

   (b) Antidotes

   (c) Laxatives

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

   (a) Pharmaceutical glasses

   (b) Dentifrices

   (c) Trace metals

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Code : 091102

B.Pharm 1st Semester Exam., 2022

PHARMACEUTICAL ANALYSIS—I

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 : 2×7=14

(a) Write the formula of EDTA.

(b) Write the principle of Mohr's method.

(c) Define the term 'oxidation number'.

(d) What is the method of preparation of 0·2 *N* NaOH solution?

(e) Define end point.

(f) Write a note on significant figure.

(g) Write about thermogravimetric curves.

(h) Write about acid-base indicator.

(i) Define accuracy and precision.

(j) Differentiate between titrant and titrand.

2. Define pharmaceutical analysis. Discuss the different techniques of analysis. 14

3. Describe the concept of oxidation and reduction in detail. 14

4. What is error? Discuss its types in detail with their uses in pharmaceutical analysis. 14

5. Write short notes on any *two* of the following : 14

(a) Volhard method

(b) Amino acid titration

(c) Titration involving ceric ammonium sulphate

6. Describe the preparation and standardization of 0·1 *N* oxalic acid solution. 14

7. What are various steps involved in gravimetric analysis and their uses? 14

8. What is argentometric titration? Differentiate between primary and secondary standards. 14

9. Write a note on neutralization curve between strong acid and strong base with complete illustration, including neutralization curve graph. 14

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