

BOARD OF DIPLOMA IN PHARMACY EXAMINATIONS

D.Pharm — FIRST YEAR | ER-2020 Regulation

MODEL QUESTION PAPER — SET 1

PHARMACEUTICAL CHEMISTRY (ER20-12T)

Time: 3 Hours
Reg. No. : _____
Max. Marks: 80

***General Instructions:** All sections are compulsory. Figures to the right indicate full marks. Draw neat, labelled diagrams / flowcharts wherever necessary. Answers to Section A (Q. 1–20) must be written together as a single unit.*

SECTION – A | Multiple Choice Questions

20 × 1 = 20 Marks

*Answer **ALL** questions. Each question carries 1 mark.*

Q1. Volumetric analysis is also known as

- | | |
|-----------------|--------------------|
| (a) Gravimetry | (b) Titrimetry |
| (c) Colorimetry | (d) Chromatography |

Q2. The limit test for chlorides is based on the reaction with

- | | |
|----------------------|------------------------|
| (a) Silver nitrate | (b) Barium chloride |
| (c) Potassium iodide | (d) Ammonium molybdate |

Q3. The limit test for sulphates uses

- | | |
|----------------------|---------------------|
| (a) Barium chloride | (b) Silver nitrate |
| (c) Sodium hydroxide | (d) Copper sulphate |

Q4. Which is used as an indicator in acid–base titration?

- | | |
|------------|---------------------|
| (a) Starch | (b) Phenolphthalein |
| (c) EBT | (d) Fluorescein |

Q5. Ferrous sulphate is used as a/an

- | | |
|----------------|-----------------|
| (a) Antacid | (b) Haematinic |
| (c) Astringent | (d) Expectorant |

Q6. Which is a commonly used antacid?

- | | |
|-----------------------------|--------------------|
| (a) Aluminium hydroxide gel | (b) Silver nitrate |
| (c) Ferrous fumarate | (d) Boric acid |

Q7. Potassium permanganate acts as a/an

- | | |
|--------------------|------------------------------------|
| (a) Reducing agent | (b) Oxidising and antiseptic agent |
| (c) Antacid | (d) Haematinic |

Q8. Nitrous oxide is used as a/an

- | | |
|----------------|---------------------|
| (a) Antiseptic | (b) Anaesthetic gas |
| (c) Antacid | (d) Expectorant |

Q9. EDTA is the titrant used in

- | | |
|-------------------------|------------------------------|
| (a) Acid–base titration | (b) Complexometric titration |
| (c) Redox titration | (d) Precipitation titration |

Q10. Boric acid is used mainly as a/an

- | | |
|----------------|---------------------|
| (a) Haematinic | (b) Mild antiseptic |
| (c) Antacid | (d) Cathartic |

Q11. Which describes closeness of a measurement to the true value?

- | | |
|---------------|---------------|
| (a) Precision | (b) Accuracy |
| (c) Error | (d) Deviation |

Q12. The limit test for iron is based on formation of colour with

- | | |
|------------------------|-----------------------|
| (a) Thioglycollic acid | (b) Silver nitrate |
| (c) Barium chloride | (d) Nessler's reagent |

- Q13.** Magnesium hydroxide is used as an antacid and
 (a) Antiseptic (b) Laxative
 (c) Haematinic (d) Anaesthetic
- Q14.** Sodium bicarbonate acts as a/an
 (a) Systemic antacid (b) Astringent
 (c) Reducing agent (d) Antidote for cyanide
- Q15.** Which is a medicinal gas used in respiratory support?
 (a) Nitrogen (b) Oxygen
 (c) Argon (d) Helium only
- Q16.** Heavy metals limit test is usually carried out using
 (a) Hydrogen sulphide (b) Silver nitrate
 (c) Barium chloride (d) Iodine
- Q17.** Which is an example of a haematinic?
 (a) Ferrous ascorbate (b) Magaldrate
 (c) Silver nitrate (d) Boric acid
- Q18.** A primary standard substance should be
 (a) Hygroscopic (b) Highly pure and stable
 (c) Volatile (d) Unstable
- Q19.** Silver nitrate is used as a topical
 (a) Antacid (b) Caustic/antiseptic
 (c) Haematinic (d) Expectorant
- Q20.** Carbon dioxide as a medicinal gas is used as a
 (a) Respiratory stimulant (b) Antacid
 (c) Anaesthetic (d) Antiseptic

SECTION – B | Long Answer / Essay Questions

3 × 10 = 30 Marks

Answer any **THREE** of the following. Each question carries 10 marks.

- Q21.** Define limit test. Explain the principle and procedure of the limit tests for chlorides and sulphates with the role of each reagent. [10]
- Q22.** Classify inorganic pharmaceuticals. Explain haematinics with the preparation, properties, assay and uses of ferrous sulphate. [10]
- Q23.** Define antacids. Classify them and describe the properties and uses of aluminium hydroxide gel, magnesium hydroxide and sodium bicarbonate. [10]
- Q24.** What are medicinal gases? Describe the preparation, storage and uses of oxygen and nitrous oxide. [10]
- Q25.** Explain volumetric analysis. Describe acid–base, precipitation and complexometric titrations with suitable examples and indicators. [10]

SECTION – C | Short Notes

5 × 6 = 30 Marks

Answer any **FIVE** of the following. Each question carries 6 marks.

- Q26.** Sources and effects of impurities in pharmaceutical substances [6]
- Q27.** Accuracy, precision and errors in analysis [6]
- Q28.** Limit test for iron [6]
- Q29.** Topical agents (silver nitrate and potassium permanganate) [6]
- Q30.** Dental products (calcium carbonate and sodium fluoride) [6]
- Q31.** Primary and secondary standards [6]
- Q32.** Expectorants and emetics (with examples) [6]

— END OF QUESTION PAPER —

BOARD OF DIPLOMA IN PHARMACY EXAMINATIONS

D.Pharm — FIRST YEAR | ER-2020 Regulation

MODEL QUESTION PAPER — SET 2

PHARMACEUTICAL CHEMISTRY (ER20-12T)

Time: 3 Hours
Reg. No. : _____
Max. Marks: 80

General Instructions: All sections are compulsory. Figures to the right indicate full marks. Draw neat, labelled diagrams / flowcharts wherever necessary. Answers to Section A (Q. 1–20) must be written together as a single unit.

SECTION – A | Multiple Choice Questions

20 × 1 = 20 Marks

Answer **ALL** questions. Each question carries 1 mark.

Q1. The limit test for arsenic is performed by the

- | | |
|------------------|------------------|
| (a) Gutzeit test | (b) Nessler test |
| (c) Fehling test | (d) Molisch test |

Q2. Which reagent is used in the limit test for heavy metals?

- | | |
|---------------------------------------|--------------------|
| (a) Hydrogen sulphide / thioacetamide | (b) Silver nitrate |
| (c) Barium chloride | (d) EDTA |

Q3. Complexometric titration commonly uses the indicator

- | | |
|---------------------|------------------------|
| (a) Phenolphthalein | (b) Eriochrome Black-T |
| (c) Methyl orange | (d) Starch |

Q4. Ferrous fumarate is used to treat

- | | |
|------------------|-----------------------------|
| (a) Peptic ulcer | (b) Iron-deficiency anaemia |
| (c) Constipation | (d) Fever |

Q5. Magaldrate is chemically a combination of aluminium and

- | | |
|-------------|---------------|
| (a) Iron | (b) Magnesium |
| (c) Calcium | (d) Sodium |

Q6. Bleaching powder liberates which active agent?

- | | |
|--------------|--------------|
| (a) Chlorine | (b) Iodine |
| (c) Oxygen | (d) Fluorine |

Q7. Which acidifying agent is used in the stomach for achlorhydria?

- | | |
|------------------------------|------------------------|
| (a) Dilute hydrochloric acid | (b) Sodium bicarbonate |
| (c) Magnesium hydroxide | (d) Boric acid |

Q8. Sodium fluoride is used mainly for

- | | |
|-------------|------------------------------|
| (a) Anaemia | (b) Dental caries prevention |
| (c) Acidity | (d) Cough |

Q9. The titrant in a redox titration involving permanganate is

- | | |
|---------------------|---------------------|
| (a) KMnO_4 | (b) AgNO_3 |
| (c) EDTA | (d) NaOH |

Q10. Chlorhexidine gluconate is used as a/an

- | | |
|-----------------------------|---------------|
| (a) Antiseptic/disinfectant | (b) Antacid |
| (c) Haematinic | (d) Cathartic |

Q11. Hydrogen peroxide acts as a topical

- | | |
|--------------------|--------------------------|
| (a) Antacid | (b) Oxidising antiseptic |
| (c) Reducing agent | (d) Haematinic |

Q12. Which is a systemic antacid causing alkalosis in overdose?

- | | |
|-------------------------|---------------------------|
| (a) Aluminium hydroxide | (b) Magnesium trisilicate |
| (c) Sodium bicarbonate | (d) Calcium carbonate |

Q13. Carbonyl iron is used as a source of

- | | |
|---------------|--------------|
| (a) Calcium | (b) Iron |
| (c) Magnesium | (d) Fluoride |

Q14. Which is used as an adsorbent and protective in GI disorders?

- | | |
|----------------|--------------------|
| (a) Kaolin | (b) Silver nitrate |
| (c) Boric acid | (d) Oxygen |

Q15. The colour produced in the limit test for iron is

- | | |
|-----------|-------------------------|
| (a) Blue | (b) Pale pink to purple |
| (c) Green | (d) Yellow-brown |

Q16. An indicator used in precipitation titration (Mohr's method) is

- | | |
|------------------------|---------------------|
| (a) Potassium chromate | (b) Phenolphthalein |
| (c) EBT | (d) Starch |

Q17. Which gas is stored in black cylinders with white shoulders (India)?

- | | |
|--------------------|-------------------|
| (a) Oxygen | (b) Nitrous oxide |
| (c) Carbon dioxide | (d) Nitrogen |

Q18. Nitrous oxide is popularly known as

- | | |
|------------------|------------------|
| (a) Laughing gas | (b) Marsh gas |
| (c) Water gas | (d) Producer gas |

Q19. Denture cleansers commonly contain

- | | |
|--------------------------------|----------------------|
| (a) Sodium perborate/oxidisers | (b) Ferrous sulphate |
| (c) Silver nitrate | (d) Boric acid only |

Q20. Which is an antidote for cyanide poisoning?

- | | |
|--|----------------|
| (a) Sodium thiosulphate / sodium nitrite | (b) Boric acid |
| (c) Kaolin | (d) Oxygen |

SECTION – B | Long Answer / Essay Questions

3 × 10 = 30 Marks

Answer any **THREE** of the following. Each question carries 10 marks.

Q21. Explain the limit tests for iron, heavy metals and arsenic in detail with principles, reagents and the apparatus used. [10]

Q22. Define gastrointestinal agents. Classify them and describe antacids, acidifiers, adsorbents, protectives and cathartics with examples. [10]

Q23. Write about topical pharmaceutical agents — silver nitrate, hydrogen peroxide, boric acid, potassium permanganate and bleaching powder — with their uses. [10]

Q24. Explain the theory and types of titrations (neutralisation, precipitation, complexometric and redox) with the choice of indicators and end-point detection. [10]

Q25. Describe dental products and medicinal gases used in pharmacy, giving the composition, uses and precautions for each. [10]

SECTION – C | Short Notes

5 × 6 = 30 Marks

Answer any **FIVE** of the following. Each question carries 6 marks.

Q26. Gutzeit apparatus and arsenic limit test [6]

Q27. Astringents (with examples) [6]

Q28. Complexometric titration and its indicators [6]

Q29. Antidotes and their uses [6]

Q30. Haematinics — types and examples [6]

Q31. Buffers and buffer capacity [6]

Q32. Storage and handling of medicinal gases [6]

— END OF QUESTION PAPER —

BOARD OF DIPLOMA IN PHARMACY EXAMINATIONS

D.Pharm — FIRST YEAR | ER-2020 Regulation

MODEL QUESTION PAPER — SET 3

PHARMACEUTICAL CHEMISTRY (ER20-12T)

Time: 3 Hours
Reg. No. : _____
Max. Marks: 80

General Instructions: All sections are compulsory. Figures to the right indicate full marks. Draw neat, labelled diagrams / flowcharts wherever necessary. Answers to Section A (Q. 1–20) must be written together as a single unit.

SECTION – A | Multiple Choice Questions

20 × 1 = 20 Marks

Answer **ALL** questions. Each question carries 1 mark.

Q1. The suffix used for heterocyclic five-membered rings with one nitrogen is

- | | |
|--------------------|----------|
| (a) -ole (pyrrole) | (b) -ine |
| (c) -ane | (d) -ol |

Q2. Pyridine is a heterocyclic compound containing

- | | |
|-----------------|-------------------|
| (a) One oxygen | (b) One nitrogen |
| (c) One sulphur | (d) Two nitrogens |

Q3. Which is a bicyclic heterocyclic nucleus?

- | | |
|-------------|---------------|
| (a) Furan | (b) Indole |
| (c) Pyrrole | (d) Thiophene |

Q4. The number of nitrogen atoms in a pyrimidine ring is

- | | |
|-----------|----------|
| (a) One | (b) Two |
| (c) Three | (d) Four |

Q5. Furan contains which heteroatom?

- | | |
|--------------|----------------|
| (a) Nitrogen | (b) Oxygen |
| (c) Sulphur | (d) Phosphorus |

Q6. Thiophene is a five-membered ring containing

- | | |
|--------------|----------------|
| (a) Oxygen | (b) Sulphur |
| (c) Nitrogen | (d) Phosphorus |

Q7. Which ring system is present in caffeine?

- | | |
|---------------|--------------|
| (a) Purine | (b) Indole |
| (c) Quinoline | (d) Pyridine |

Q8. Quinoline is formed by fusion of benzene with

- | | |
|-------------|---------------|
| (a) Furan | (b) Pyridine |
| (c) Pyrrole | (d) Thiophene |

Q9. Antioxidants are added to formulations to prevent

- | | |
|----------------------|------------------------|
| (a) Hydrolysis | (b) Oxidation |
| (c) Microbial growth | (d) Colour change only |

Q10. Which is a chelating agent used to treat metal poisoning?

- | | |
|----------------------|----------------|
| (a) EDTA/dimercaprol | (b) Boric acid |
| (c) Kaolin | (d) Oxygen |

Q11. An emetic is a drug used to

- | | |
|--------------------|---------------------|
| (a) Stop vomiting | (b) Induce vomiting |
| (c) Reduce acidity | (d) Relieve cough |

Q12. Which is an expectorant?

- | | |
|-----------------------|--------------------|
| (a) Ammonium chloride | (b) Silver nitrate |
| (c) EDTA | (d) Boric acid |

- Q13.** Isotonic sodium chloride solution has a concentration of
 (a) 0.9% w/v (b) 5% w/v
 (c) 10% w/v (d) 0.09% w/v
- Q14.** ORS (oral rehydration salt) is used to correct
 (a) Anaemia (b) Fluid and electrolyte loss
 (c) Acidity (d) Fever
- Q15.** Which cation is the major intracellular electrolyte?
 (a) Sodium (b) Potassium
 (c) Calcium (d) Chloride
- Q16.** Indole nucleus is present in the neurotransmitter
 (a) Dopamine (b) Serotonin
 (c) Histamine (d) Acetylcholine
- Q17.** A saturated calomel electrode is used as a
 (a) Indicator electrode (b) Reference electrode
 (c) Glass electrode (d) Dropping electrode
- Q18.** The pH of blood is maintained near
 (a) 4.0 (b) 7.4
 (c) 2.0 (d) 9.5
- Q19.** Which technique separates ions based on migration in an electric field?
 (a) Chromatography (b) Electrophoresis
 (c) Distillation (d) Filtration
- Q20.** Sodium chloride injection is chiefly used as a/an
 (a) Nutrient (b) Electrolyte replenisher
 (c) Antacid (d) Antiseptic

SECTION – B | Long Answer / Essay Questions

3 × 10 = 30 Marks

Answer any **THREE** of the following. Each question carries 10 marks.

- Q21.** Introduce the nomenclature of organic chemical systems. Explain the nomenclature of common heterocyclic compounds containing up to three rings with examples. [10]
- Q22.** Explain the concept of electrolytes used in therapy. Describe sources, uses and preparations of sodium chloride, potassium chloride and oral rehydration salts. [10]
- Q23.** Define impurities. Discuss the sources and effects of impurities in pharmaceutical substances and the importance of limit tests in quality control. [10]
- Q24.** Explain acid–base titrations in detail including theory, standard solutions, indicators and applications, with a worked assay example. [10]
- Q25.** Describe the pharmaceutical importance of buffers. Explain buffer equation, buffer capacity and the buffers used in ophthalmic and injectable products. [10]

SECTION – C | Short Notes

5 × 6 = 30 Marks

Answer any **FIVE** of the following. Each question carries 6 marks.

- Q26.** Heterocyclic compounds — furan, pyrrole, thiophene [6]
- Q27.** Purine and pyrimidine ring systems [6]
- Q28.** Antioxidants used in pharmaceuticals [6]
- Q29.** Physiological electrolytes and their functions [6]
- Q30.** Isotonic solutions and tonicity adjustment [6]
- Q31.** Emetics and expectorants [6]
- Q32.** Reference electrodes [6]

— END OF QUESTION PAPER —

BOARD OF DIPLOMA IN PHARMACY EXAMINATIONS

D.Pharm — FIRST YEAR | ER-2020 Regulation

MODEL QUESTION PAPER — SET 4

PHARMACEUTICAL CHEMISTRY (ER20-12T)

Time: 3 Hours
Reg. No. : _____
Max. Marks: 80

General Instructions: All sections are compulsory. Figures to the right indicate full marks. Draw neat, labelled diagrams / flowcharts wherever necessary. Answers to Section A (Q. 1–20) must be written together as a single unit.

SECTION – A | Multiple Choice Questions

20 × 1 = 20 Marks

Answer **ALL** questions. Each question carries 1 mark.

Q1. Which is used to standardise a solution of NaOH?

- | | |
|--|------------|
| (a) Oxalic acid / potassium hydrogen phthalate | (b) NaCl |
| (c) Glucose | (d) Starch |

Q2. The end point in Mohr's method is indicated by a

- | | |
|-------------------------|-------------------------------|
| (a) Blue colour | (b) Reddish-brown precipitate |
| (c) Colourless solution | (d) Green colour |

Q3. Milk of magnesia chemically is

- | | |
|-------------------------|------------------------------------|
| (a) Aluminium hydroxide | (b) Magnesium hydroxide suspension |
| (c) Calcium carbonate | (d) Sodium bicarbonate |

Q4. Which impurity gives a positive test with Nessler's reagent?

- | | |
|--------------|--------------|
| (a) Chloride | (b) Ammonium |
| (c) Sulphate | (d) Iron |

Q5. Calcium gluconate is used to treat

- | | |
|-------------|-------------------|
| (a) Anaemia | (b) Hypocalcaemia |
| (c) Acidity | (d) Fever |

Q6. Which is a saline cathartic?

- | | |
|------------------------|----------------------|
| (a) Magnesium sulphate | (b) Ferrous sulphate |
| (c) Boric acid | (d) Silver nitrate |

Q7. The valency of iron in ferrous salts is

- | | |
|--------|--------|
| (a) +1 | (b) +2 |
| (c) +3 | (d) +4 |

Q8. Which reagent detects sulphate in the limit test by turbidity?

- | | |
|----------------------|--------------------|
| (a) Barium chloride | (b) Silver nitrate |
| (c) Sodium hydroxide | (d) Iodine |

Q9. Aluminium hydroxide gel is preferred as an antacid because it is

- | | |
|----------------|-------------------------------------|
| (a) Systemic | (b) Non-systemic and non-absorbable |
| (c) A laxative | (d) An oxidiser |

Q10. The oxidation state of manganese in KMnO_4 is

- | | |
|--------|--------|
| (a) +2 | (b) +4 |
| (c) +6 | (d) +7 |

Q11. Which is an inhalation anaesthetic gas?

- | | |
|--------------------|-------------------|
| (a) Oxygen | (b) Nitrous oxide |
| (c) Carbon dioxide | (d) Nitrogen |

Q12. Which is used as a protective and adsorbent in diarrhoea?

- | | |
|-----------------------|--------------------|
| (a) Kaolin and pectin | (b) Silver nitrate |
| (c) Boric acid | (d) EDTA |

Q13. Fehling's solution is used to detect

- | | |
|---------------|---------------------|
| (a) Chlorides | (b) Reducing sugars |
| (c) Sulphates | (d) Heavy metals |

Q14. Which test detects arsenic as arsine gas?

- | | |
|------------------------|--------------------|
| (a) Marsh/Gutzeit test | (b) Nessler test |
| (c) Mohr method | (d) Volhard method |

Q15. Sodium thiosulphate is used as an antidote for

- | | |
|--------------------|-----------------------|
| (a) Iron poisoning | (b) Cyanide poisoning |
| (c) Lead poisoning | (d) Acid poisoning |

Q16. Which is a haematinic given by injection?

- | | |
|------------------|----------------|
| (a) Iron dextran | (b) Boric acid |
| (c) Kaolin | (d) Oxygen |

Q17. A standard solution of exactly known concentration is called a

- | | |
|-------------------|-------------------------------|
| (a) Test solution | (b) Standard/titrant solution |
| (c) Blank | (d) Buffer |

Q18. Boric acid solution is used as an

- | | |
|-------------------------|-----------------|
| (a) Eye wash antiseptic | (b) Antacid |
| (c) Haematinic | (d) Expectorant |

Q19. Which electrolyte solution is used in severe dehydration IV therapy?

- | | |
|------------------------------|------------------|
| (a) Ringer's / normal saline | (b) Boric acid |
| (c) Kaolin suspension | (d) Simple syrup |

Q20. Potassium permanganate solution turns colourless on reaction with a

- | | |
|---------------------|--------------------|
| (a) Oxidising agent | (b) Reducing agent |
| (c) Buffer | (d) Salt |

SECTION – B | Long Answer / Essay Questions

3 × 10 = 30 Marks

Answer any **THREE** of the following. Each question carries 10 marks.

Q21. Define titration. Explain precipitation titrations (Mohr's, Volhard's and Fajan's methods) with principles, indicators and applications. [10]

Q22. Write in detail about haematinics — oral and parenteral iron preparations — their properties, assay and therapeutic uses. [10]

Q23. Explain cathartics and gastrointestinal protectives/adsorbents with classification, mechanism and examples used in pharmacy. [10]

Q24. Describe the theory and procedure of complexometric titration using EDTA, including masking agents, indicators and pharmaceutical applications. [10]

Q25. Explain the role of major and minor electrolytes in the body and describe the pharmaceutical preparations used to correct electrolyte imbalance. [10]

SECTION – C | Short Notes

5 × 6 = 30 Marks

Answer any **FIVE** of the following. Each question carries 6 marks.

Q26. Standardisation of solutions and standard substances [6]

Q27. Acidifying agents used in therapy [6]

Q28. Assay of ferrous sulphate [6]

Q29. Antacids — ideal properties [6]

Q30. Nomenclature of heterocyclic compounds (with examples) [6]

Q31. Volhard's method [6]

Q32. Sources of impurities in raw materials [6]

— END OF QUESTION PAPER —

BOARD OF DIPLOMA IN PHARMACY EXAMINATIONS

D.Pharm — FIRST YEAR | ER-2020 Regulation

MODEL QUESTION PAPER — SET 5

PHARMACEUTICAL CHEMISTRY (ER20-12T)

Time: 3 Hours
Reg. No. : _____
Max. Marks: 80

General Instructions: All sections are compulsory. Figures to the right indicate full marks. Draw neat, labelled diagrams / flowcharts wherever necessary. Answers to Section A (Q. 1–20) must be written together as a single unit.

SECTION – A | Multiple Choice Questions

20 × 1 = 20 Marks

Answer ALL questions. Each question carries 1 mark.

Q1. Which of the following is NOT a limit test reagent for chlorides?

- | | |
|---------------------|-----------------|
| (a) Silver nitrate | (b) Nitric acid |
| (c) Barium chloride | (d) Water |

Q2. The valency change of iron from ferrous to ferric is a

- | | |
|--------------------|-------------------|
| (a) Reduction | (b) Oxidation |
| (c) Neutralisation | (d) Precipitation |

Q3. Which antacid can cause constipation?

- | | |
|-------------------------|---------------------------|
| (a) Magnesium hydroxide | (b) Aluminium hydroxide |
| (c) Sodium bicarbonate | (d) Magnesium trisilicate |

Q4. Complexometric titration measures ions such as

- | | |
|--------------------------|---|
| (a) H ⁺ only | (b) Ca ²⁺ and Mg ²⁺ |
| (c) Cl ⁻ only | (d) Na ⁺ only |

Q5. Which is used as a caustic to remove warts?

- | | |
|--------------------|----------------|
| (a) Silver nitrate | (b) Boric acid |
| (c) Kaolin | (d) Oxygen |

Q6. Nitrous oxide combined with oxygen is used for

- | | |
|-----------------|-----------------------|
| (a) Anaesthesia | (b) Antacid action |
| (c) Antisepsis | (d) Haematinic action |

Q7. An antioxidant that is water soluble is

- | | |
|---------------------------|----------------------|
| (a) Sodium metabisulphite | (b) Alpha-tocopherol |
| (c) BHA | (d) BHT |

Q8. Which is an example of a purine derivative drug?

- | | |
|-----------------|----------------|
| (a) Caffeine | (b) Aspirin |
| (c) Paracetamol | (d) Boric acid |

Q9. The pharmacopoeial assay of many acids/bases uses

- | | |
|--------------------|------------------------------|
| (a) Gravimetry | (b) Neutralisation titration |
| (c) Chromatography | (d) Electrophoresis |

Q10. Which is used in the treatment of hyperacidity and as a source of calcium?

- | | |
|-----------------------|--------------------|
| (a) Calcium carbonate | (b) Silver nitrate |
| (c) Ferrous sulphate | (d) Boric acid |

Q11. Which impurity limit test uses stannous chloride and potassium iodide?

- | | |
|--------------|--------------|
| (a) Iron | (b) Arsenic |
| (c) Chloride | (d) Sulphate |

Q12. A glass electrode is used to measure

- | | |
|------------------|------------|
| (a) Conductivity | (b) pH |
| (c) Turbidity | (d) Colour |

Q13. Which is the reference standard for acidimetry?

- | | |
|----------------------|---------------------|
| (a) Sodium carbonate | (b) Sodium chloride |
| (c) Glucose | (d) Starch |

Q14. Bleaching powder is chemically

- | | |
|-------------------------|------------------------|
| (a) Calcium oxychloride | (b) Sodium bicarbonate |
| (c) Ferrous sulphate | (d) Boric acid |

Q15. Which is a locally acting oxidising antiseptic that releases oxygen?

- | | |
|-----------------------|---------------------|
| (a) Hydrogen peroxide | (b) Kaolin |
| (c) EDTA | (d) Sodium chloride |

Q16. The theory behind acid–base titration end point is

- | | |
|-----------------------|----------------------------------|
| (a) Redox change | (b) Neutralisation and pH change |
| (c) Complex formation | (d) Adsorption |

Q17. Which electrolyte is essential for nerve and muscle function and is mainly extracellular?

- | | |
|---------------|--------------|
| (a) Potassium | (b) Sodium |
| (c) Iron | (d) Fluoride |

Q18. Which is a source of oxygen for medical use industrially?

- | | |
|---|--------------------------|
| (a) Fractional distillation of liquid air | (b) Electrolysis of NaCl |
| (c) Heating limestone | (d) Roasting sulphur |

Q19. Ferrous ascorbate combines iron with

- | | |
|----------------|---------------|
| (a) Vitamin C | (b) Vitamin D |
| (c) Folic acid | (d) Calcium |

Q20. The normal saline used as a vehicle for injections contains NaCl at

- | | |
|-----------|----------|
| (a) 0.45% | (b) 0.9% |
| (c) 1.8% | (d) 5% |

SECTION – B | Long Answer / Essay Questions

3 × 10 = 30 Marks

Answer any **THREE** of the following. Each question carries 10 marks.

Q21. Explain in detail the principle, apparatus, procedure and interpretation of the limit tests for arsenic and heavy metals. [10]

Q22. Classify inorganic pharmaceuticals used in the gastrointestinal tract and describe antacids, protectives, adsorbents, cathartics and acidifiers with examples. [10]

Q23. Define and classify titrimetric methods of analysis. Explain redox titration with potassium permanganate, giving theory, indicator and an assay example. [10]

Q24. Discuss the pharmaceutical importance of antioxidants and buffers, with classification, mechanism of action and examples used in formulations. [10]

Q25. Describe the topical inorganic agents used in pharmacy (silver salts, boric acid, hydrogen peroxide, potassium permanganate, bleaching powder) with uses and precautions. [10]

SECTION – C | Short Notes

5 × 6 = 30 Marks

Answer any **FIVE** of the following. Each question carries 6 marks.

Q26. Importance of limit tests in pharmacy [6]

Q27. Ferrous fumarate and ferrous ascorbate [6]

Q28. Redox titration (permanganometry) [6]

Q29. Medicinal gases — oxygen and carbon dioxide [6]

Q30. Adsorbents and protectives in GI disorders [6]

Q31. pH and its measurement [6]

Q32. Heterocyclic nuclei of pharmaceutical importance [6]

— END OF QUESTION PAPER —