Duration:3Hrs.   **Marks:75**

Q. 1 Attempt all multiple-choice questions (MCQ)   **20M**

Sr No	Questions		Options
1	_____ joint allows the rotatory movement of one bone on the other which remains fixed.	a	Saddle
		b	Pivot
		c	Gliding
		d	Angular
2	Phagocytosis is _____type of cell transport	a	Diffusion
		b	Osmosis
		c	Exocytosis
		d	Endocytosis
3	Transmembrane glycoproteins present in Adherence junctions is_____	a	Integrins
		b	Cadherins
		c	Laminin
		d	Actin
4	_____ are unique to cardiac muscle fibers	a	Epimysium
		b	Endomysium
		c	Intercalated discs
		d	Perimysium
5	_____is a regulatory protein that blocks the myosin-binding sites.	a	Titin
		b	Troponin
		c	Nebulin
		d	Epimysium
6	_____ is an example of liquid connective tissue	a	Adipose tissue;
		b	Elastic connective tissue
		c	Bone
		d	Blood
7	The percentage of total blood volume occupied by RBCs is called the	a	Haemoglobin
		b	Density of RBC
		c	Hematocrit
		d	Cellular contain
8	The vertebral column in the adult typically contains _____ vertebrae	a	26
		b	22
		c	36
		d	14
9	_____ pairs of spinal nerves are present in nervous system	a	12
		b	31
		c	30
		d	10

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10	The fluid that passes through the lymphatic vessels_____.	a	Moves in a single direction toward the heart
		b	Passes from the lymphatic vessels into the arteries
		c	Enters the left ventricle of the heart through the right thoracic duct
		d	Flows toward the lungs
11	Phagocytic cells are involved in _____	a	Haemolysis
		b	Formation of haemoglobin
		c	Formation of WBC
		d	Formation of RBC
12	The tricuspid valve is present between_____	a	Ventricle and pulmonary artery
		b	Ventricle and aorta
		c	Left auricle and left ventricle
		d	Right auricle and right ventricle
13	The artery that carries deoxygenated blood is_____	a	Renal artery
		b	Hepatic artery
		c	Pulmonary artery
		d	Mesenteric artery
14	_____part of eye ball is also known as blind spot.	a	Fovea
		b	Optic disc
		c	Iris
		d	Ciliary body
15	Person with Blood group _____have Red blood cells that do not contain either A or B antigens on their surface	a	O
		b	AB
		c	B
		d	A
16	The heart is specifically located in _____	a	Thoracic cavity
		b	Mediastinum
		c	Pleural cavity
		d	Ventral cavity
17	The QRS complex in the ECG marks the onset of_____.	a	Ventricular depolarization
		b	Ventricular repolarization
		c	Atrial systole
		d	Atrial depolarization
18	_____cells in blood do not have a nucleus.	a	Lymphocyte
		b	Erythrocyte
		c	Monocyte
		d	Basophil

19	The only movable bone of the skull is_____	a	Maxilla
		b	Mandible
		c	Temporal bone
		d	Frontal bone
20	In peripheral nervous system the nerves that arise from brain are called as _____	a	Spinal nerves
		b	Temporal nerves
		c	Cranial nerves
		d	Frontal nerves

Q 2. A. Attempt ANY TWO questions of the followings   10×2= 20M

a. i. Explain principle of diffusion & factors affecting rate of diffusion.

 ii. Explain the structure of plasma membrane.

b. i. Write a note on ECG.

 ii. Explain the conduction system of the heart.

c. i. Compare and contrast sympathetic and parasympathetic nervous system.

 ii.. Write the functions of lymph node and describe formation and circulation of lymph.

Q 2.B. Attempt ANY SEVEN questions of the followings   5×7=   35M

  a. Define Homeostasis. Explain positive and negative feedback mechanisms.

  b. Give the composition and functions of Blood.

  c. Give the structural and functional classification of joints with examples.

  d. Draw a neat labelled diagram of the sarcomere and enlist various types of proteins
     present in the skeletal muscle.

  e. Write a detailed note on blood groups.

  f. Draw a well-labelled diagram of the eye showing internal parts.

  g. Describe the physiology of vision.

  h. Differentiate between artery and vein.

  i. Explain the sequence of events in cardiac cycle.

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Duration: 3 hours   **Total marks: 75**

N.B. : 1. All questions are compulsory
   2. Figures to right indicate full marks

Q. 1   **Choose the appropriate option for following multiple choice based**   **20**
             questions.

1   _____is known as the father of pharmacy education in India.
           a. Prof. Mahadeva Lal Schroff
           b. P.C.Ray
           c. Col. R.N.Chopra
           d. Dr. B.N. Ghosh

2   When two or more drugs are used in combination, their action increases.
           This phenomenon is known as
           a. Additive effect
           b. Antagonism
           c. Synergism
           d. Accumulation

3   The sequence of faster absorption from different routes of administration
           is _____
           a. Parenteral>topical>oral
           b. Topical>oral>parenteral
           c. Parenteral>oral>topical
           d. Oral>topical>parenteral

4   The information of dosage form and number of doses is contained
           in_____
           a. Description
           b. Inscription
           c. Prescription
           d. Subscription

5   _____explains the movement and fate of drugs, and factors
           affecting the absorption, distribution, metabolism, and excretion of drugs.
           a. Pharmacokinetics
           b. Pharmacodynamic
           c. Pharmacotherapeutics
           d. Pharmacognosy

6   Meaning of Rx is _____
           a. You take
           b. Do not take
           c. To be given
           d. Never take

7   1 Gallon = ___fluid ounce
           a.   160
           b.   260
           c.   360
           d.   460

8   _____means the amount in weight of API or excipient in 100 g of
           formulation
           a.   %w/w
           b.   % w/v
           c.   %v/v
           d.   ppm

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9 One of the approaches used to enhance the solubility of a drug are
   a.   Addition of flavor
   b.   Addition of preservatives
   c.   Addition of pH modifiers
   d.   Fermentation

10 The direction "Shake well before use" is given for ……..
   a. Powder
   b. Suspension
   c. Syrup
   d. Elixir

11 Which of the following is not used as a solvent in the oral formulation of liquid?
   a. Ethanol
   b. Ethylene glycol
   c. Propylene glycol
   d. Glycerin

12 Role of emulsifying agent is
   a. Reduce the interfacial tension between immiscible phases
   b. Decrease surface area in emulsion
   c. Improves medication taste
   d. Increase the size of globules

13 Polymorphism is one of the serious disadvantage of following suppository base
   a. Glycero gelatin
   b. Cocoa butter
   c. Macrogol
   d. Synthetic fat

14 The number of parts by weight of medicament that displaces one part by weight of base is
   a. Displacement value
   b. Acid value
   c. Peroxide value
   d. Saponification value

15 Incompatibilities encountered in eutectic mixture is
   a. precipitation
   b. Complexation
   c. Immiscibility
   d. Liquefaction

16 Double decomposition is an example of ____ incompatibility
   a. Chemical
   b. Physical
   c. Biological
   d. Therapeutic

17 Following types of ointment bases are easily removed from hairs
   a. Hydrocarbon
   b. Absorption
   c. Water miscible
   d. Water soluble

18 Iodine ointments are prepared by
   a. Chemical reaction
   b. Trituration
   c. Fusion
   d. Levigation

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19 Carbomer is an example of
   a. Sweetener
   b. Colourant
   c. Preservative
   d. Gelling agent

20 Paste differ from ointment in containing large amount of
   a. Diluents
   b. Sweeteners
   c. Finely powdered solids
   d. Preservatives

Q. 2   **Answer any two out of three questions.**   **20**
   a Define powders and discuss in detail powders for internal use.
   b Define and classify Emulsion. Give identification tests for the determination of types of Emulsion.
   c Classify with example and explain different types of ointment bases

Q. 3   **Answer any seven out of nine questions**   **35**
   a Define dosage forms and classify the various dosage forms with examples.
   b Enlist factors affecting Posology.
      25mg of a drug can be given to an adult. What will be the dose of the drug for a girl of 16 years?
   c Define monophasic liquids. What are the advantages, and disadvantages of liquid dosage forms?
   d Calculate the volume of 95 percent alcohol required to prepare 600 ml of 70 percent alcohol.
   e Define Elixir, Liniments, Lotions, Throat paints, and Gargles with examples.
   f Explain in detail the formulation components of Suspensions.
   g Write a note on evaluation of suppositories.
   h Enlist different types of incompatibilities and explain insolubility in detail with suitable examples
   i Differentiate between ointments-paste and creams-gels

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Duration: 3 Hrs   **Total marks: 75**

N.B.: 1. All questions are compulsory
     2. Figures to right indicate full marks

Q. I Choose appropriate option for the following multiple choice-based questions.   20

1   What is the concentration of solution containing 2g of NaOH in 200 ml of solution?
       a. 0.10 M
       b. 0.25 M
       c. 0.50 M
       d. 1.00 M

2   Precision of an analytical method is measured in terms of _____.
       a. Standard deviation
       b. Mean
       c. Median
       d. Absolute error

3   In a limit test for impurities in a pharmaceutical substance, limit concentration for each impurity indicates _____.
       a. Therapeutic value of impurity
       b. Molecular weight of impurity
       c. Acceptable value of impurity
       d. Chemical formula of impurity

4   _____ is an example of indicator used in bromatometry
       a. Mordant black
       b. Starch
       c. Phenolphthalein
       d. Potassium thiocyanate

5   The pH at the equivalence point of a titration of weak base with strong acid is usually _____.
       a. 5.5
       b. 7.0
       c. 8.5
       d. 11.5

6   Which of the following is a specific conductivity reagent?
       a. Potassium chloride
       b. Sodium chloride
       c. Magnesium chloride
       d. Hydrogen chloride

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7 Traces of water from perchloric acid and acetic acid are removed by addition of
   _____.
   - a. Acetone
   - b. Acetonitrile
   - c. Acetic anhydride
   - d. Acetanilide

8 Cerric ammonium sulphate acts as _____ in acidic medium.
   - a. Strong oxidizing agent
   - b. Strong reducing agent
   - c. Complexometric agent
   - d. Precipitating agent

9 The following substances are primary standard EXCEPT _____.
   - a. Arsenic trioxide
   - b. Anhydrous sodium carbonate
   - c. Sodium hydroxide
   - d. Potassium hydrogen pthalate

10 According to Ostwald theory of indicators, phenolphthalein in acidic medium is
   _____ and appears _____.
   - a. Ionized, pink
   - b. Unionized, pink
   - c. Ionized, colorless
   - d. Unionized, colorless

11 Sodium chloride I.P. is assayed by _____ method
   - a. Mohr's method
   - b. Volhard's method
   - c. Modified Volhard's method
   - d. Fajan's method

12 Complexing agent that will form complex more strongly with the metal than the
   titrant under the condition of titration is known as ____.
   - a. Precipitating agent
   - b. Masking agent
   - c. Demasking agent
   - d. Redox agent

13 Quantitative analysis of polarograph is based on _____.
   - a. Half wave potential
   - b. Migration current
   - c. Limiting current
   - d. Electrode potential

14 How many lone pair of electrons are there in EDTA?
- a. Two
- b. Four
- c. Six
- d. Eight

15 Protogenic solvents are _____ in nature
- a. Acidic
- b. Basic
- c. Neutral
- d. Amphoteric

16 During gravimetric analysis, when two or more ions are precipitated simultaneously in the sample solution, the condition is referred to as _____.
- a. Ostwalds's ripening
- b. Post precipitation
- c. Co-precipitation
- d. Digestion

17 Compounds that can be assayed by diazotization titrations include _____.
- a. Metals
- b. Amines
- c. Acids
- d. Alkali

18 Indirect titration of iodine is also referred as _____.
- a. Iodimetry
- b. Iodometry
- c. Cerrimetry
- d. Dichrometry

19 The curve obtained by plotting pH as ordinate against volume of titrant as abscissa is known as _____.
- a. Calibration Curve
- b. Polarograph
- c. Neutralization curve
- d. Standard Curve

20 The number of moles of solute dissolved per 1000 g (1kg) of solvent is known as _____.
- a. Molarity
- b. Formality
- c. Molality
- d. Normality

Q. II Answer any two questions. (Any 2)   **20**

1   Define Acidimetry. Explain the resonance theory of indicators with suitable   **10**
example. Write a brief note on solvents used in non-aqueous titrations.

2   Explain the following terms: (i) Primary Standard (ii) Normality   **10**
(iii) Precision (iv) Pharmacopoeia (v) Significant figures.

3   Enlist types of redox titrations. Explain the principle and reaction involved in   **10**
Cerrimetry and potassium iodate titrations.

Q. III Answer any seven questions (Any Seven)   **35**

1   Explain the determination of halogens by Mohr's method.   **5**

2   Define Chelating agents. Discuss the principle involved in the assay of Calcium   **5**
gluconate.

3   What is Gravimetric analysis? Explain masking and demasking agents used in   **5**
complexometric titrations.

4   Write a note on factors affecting precipitations titrations? State the indicator and   **5**
applications of diazotization titration.

5   Enlist the types of conductometric titration and explain the principle of   **5**
conductometry. State any two applications.

6   What are potentiometric titrations and their applications? Explain the construction   **5**
and working of standard Calomel electrode.

7   Explain the terms half wave potential, diffusion current, limiting current with the   **5**
help of Polarographic C-V curve. Give the applications of polarography.

8   Enlist the different techniques of analysis. Classify errors with suitable example.   **5**

9   What volume of 0.1M HCl solution would be required to neutralize 50 ml of   **5**
0.1M NaOH? Calculate pH at the start of titration and after adding 10 ml, 25 ml,
and 60 ml of titrant.

_____

Duration: 3 Hours   **Total Marks: 75**

N.B.: 1. All questions are compulsory.
       2. Figures to right indicate full marks.

**Q.1   Choose the appropriate option for following multiple choice based   20
          questions.**

1   Type of Titration involved in the assay of Chlorinated lime is
      _____
      a   Redox Titration
      b   Acid Base Titration
      c   Formal Titration
      d   complexometric titration

2   Rad is —----------
      a   Unit of radioactivity
      b   Unit of half life
      c   X ray contrast media
      d   Radiation

3   Achlorhydria is ---------------- in gastric secretion
      a   Increase quantity of HCl
      b   Insufficient quantity of HCl
      c   Increase quantity of NaOH
      d   Decrease quantity of NaOH

4   Identify the incorrect pair
      a   Expectorant : Potassium Iodide
      b   Emetic : ferrous gluconate
      c   Antacid: Magnesium Hydroxide
      d   Haematinic: Ferrous Sulphate

5   Which of the following is used as a contrast medium for X-ray examination
      of the alimentary tract.
      a   Barium Sulphate
      b   Phosphate
      c   Iodine solution
      d   Yttrium solution

6   In Limit test of Arsenic, reduction of Arsenious acid results into _____
      a   Arsenic acid
      b   Arsine Gas
      c   Arsenic mercury chloride complex
      d   Hydrochloric acid

7   Buffers are the solution prepared by mixing
      a   a strong base and salt with strong acid
      b   a weak base and salt with an weak acid
      c   a strong acid and its salt with strong base
      d   a weak acid and its salt with a strong base

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8   The example of intracellular ion is
  a   Sodium
  b   Potassium
  c   Calcium
  d   Chloride

9   Latest edition of IP i.e. 9th Edition is published in the year_____.
  a   2023
  b   2022
  c   2020
  d   2018

10   Neutralising capacity of an antacid is expressed in
  a   mEq of NaOH
  b   mEq of HCl
  c   mEq of $NaHCO_3$
  d   mEq H2SO4

11   Calculate the number of mEq of NaCl in one liter of a 0.9% w/v solution of 0.9% NaCl
  a   153.8 mEq NaCl/l
  b   58.5 mEq NaCl/l
  c   585.3 mEq NaCl/l
  d   15.38 mEq NaCl/l

12   Which agent prevents tooth decay?
  a   Cleaning agent
  b   Polishing agent
  c   Anticaries agent
  d   Dentifrices

13   Isotopes emitting _____particles will decay to the element having a mass number of Four less and an atomic number of two less than the original isotope.
  a   alpha
  b   beta
  c   gamma
  d   k-capture

14   One of the advantage of Povidine-Iodine is
  a   easy to apply
  b   minimizes toxicity
  c   greater antimicrobial effect than iodine
  d   pleasant odour

15   which of the following is the purification method used for purification of Ammonium chloride
  a   Sublimation
  b   extraction
  c   dissolution
  d   filtration

16 Which of the following titrant is used in the assay of Hydrogen Peroxide
   a Silver Nitrate
   b Sodium Thiosulphate
   c Potassium permanganate
   d Ceric ammonium sulphate

17 The antacids should have buffer in the pH range
   a 0 to 3
   b 7 to 8
   c 4 to 6
   d 10 to 12

18 Copper sulphate is also called as
   a Green vitriol
   b Pink Vitriol
   c White vitriol
   d Blue vitriol

19 Which of the following rays can penetrate through thick metal blocks
   a alpha ray
   b beta rays
   c gamma rays
   d both alpha and beta rays

20 Epsom salt is ___.
   a Potassium Iodide
   b Magnesium sulphate
   c Ammonium chloride
   d Copper sulphate

Q.2   **Long Answers (Answer any 2 out of 3)**   **20**

[A] Write a note on the scintillation counter OR Geiger Muller counter for the measurement of radioactivity.[4M] Enlist various Units of Radioactivity.[2M] Give comparison of alpha, beta and gamma radiations [at least 4 points] [4M]   **10**

[B] [i] What are cathartics? Classify cathartics based on mechanism and give its significance.   **04**

    [ii] Write the category, mechanism of action and uses of Magnesium hydroxide and Bentonite.   **03**

    [iii] Classify and explain inorganic antimicrobial agents on the basis of the exact mechanism of action. Give one example of each category.   **03**

[C] [i] Define and classify expectorants with examples. Give a method of preparation and purification of Ammonium chloride. Discuss principle behind assay of Ammonium chloride.   **07**

    [ii] Write a note on the Limit test of Iron.   **03**

Q.3 **Short Answers (Answer 7 out of 9)** **35**

[A] Write a note on Emetics. [3M] Discuss the principle involved in the assay of **05**
Copper Sulphate. [2M]

[B] What are the ideal properties of antacids? Explain the combination of antacids **05**
with suitable examples.

[C] Discuss in detail Modified limit test for Sulphate. **05**

[D] Explain types and sources of Impurities in Pharmaceutical substances. **05**

[E] Match the following: **05**

	COLUMN A		COLUMN B
a	Chlorinated lime	**i**	Hypophosphatemia
b	Sodium orthophosphate	**ii**	Disinfectant & Germicide
c	Ammonium chloride	**iii**	Saline cathartic
d	Aluminum hydroxide	**iv**	Antimicrobial & Antifungal
e	Potassium permanganate	**v**	Gastric acidifier & Expectorant

[F] Discuss Pharmaceutical applications of Radioactive substances **05**

[G] [i] Discuss electrolyte replacement therapy with reference to its **03**
significance and electrolytes used.

[ii] Explain the physiological role of Calcium. **02**

[H] Which are the antidotes used for cyanide poisoning and explain their **05**
action in detail.

[I] [i] Explain buffer action with suitable examples. Give Buffer Equation. **03**
Explain terms involved in it.

[ii] Define Dentifrices. Give the role of Fluoride in dental products. **02**