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MODEL PAPER-28

DIGITAL EXPLANATION

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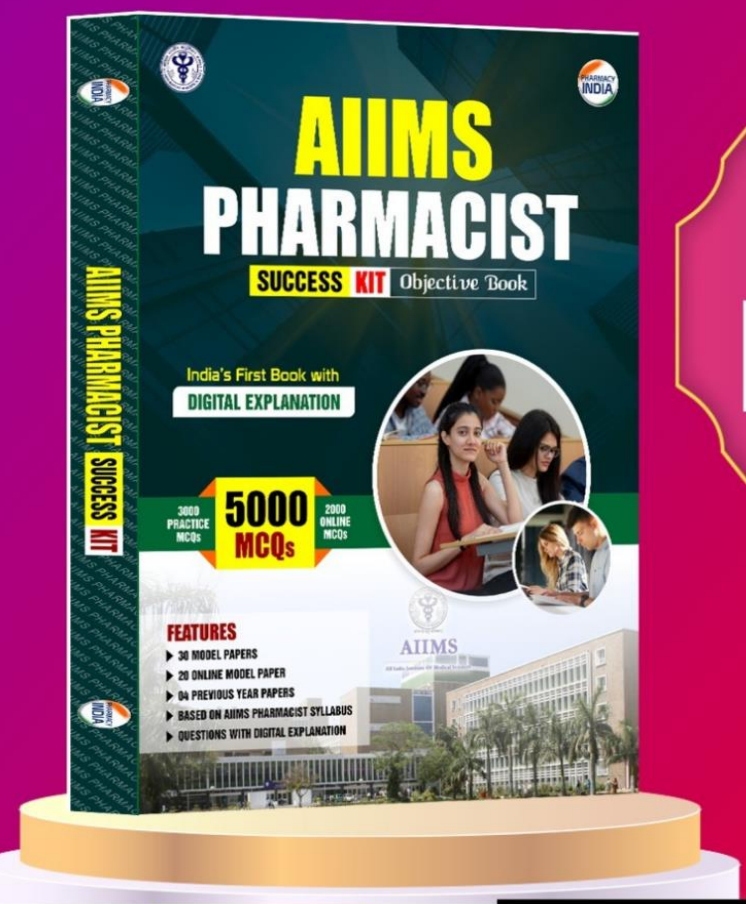

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- QUESTIONS WITH DIGITAL EXPLANATION

Model Paper – 28 | Detailed Solutions

1. The _____are:

- **Answer:** (b) Constitutive Properties
- **Explanation:** Constitutive properties depend on the arrangement of atoms or groups in a molecule, influencing characteristics like refractive index and optical rotation. These properties are distinct from physical or chemical properties.
- **Reference:** "Physical Chemistry" by Peter Atkins and Julio de Paula, 11th Edition, page 321.

2. Conductivity _____determine:

- **Answer:** (d) Both (a) & (b)
- **Explanation:**

  1. Check water pollution in rivers and lakes
  2. Alkalinity of fresh water
  3. Salinity of sea water (oceanography)
  4. Deuterium ion concentration in water - deuterium mixture
  5. Food microbiology - for tracing microorganisms
  6. Tracing antibiotics
  7. Estimate ash content in sugar juices
  8. Purity of distilled and de-ionized water can be determined
  9. Solubility of sparingly soluble salts like AgCl, $BaSO_4$ can be detected
  10. Determination of atmospheric SO_2, estimation of vanillin in vanilla flavor

- **Reference:** "Quantitative Chemical Analysis" by Daniel C. Harris, 8th Edition, page 351.

3. Which _____body?

- **Answer:** (d) All of these
- **Explanation:** Chloride (Cl), sodium (Na), and iron (Fe) are essential ions for the human body. They are involved in maintaining osmotic balance, nerve conduction, and oxygen transport, respectively.
- **Reference:** "Essentials of Medical Physiology" by K. Sembulingam and Prema Sembulingam, 8th Edition, page 46.

4. Sigma _____for:

- **Answer:** (b) Transcription
- **Explanation:** Sigma factors assist RNA polymerase in recognizing the promoter region to initiate transcription, while Rho factors are involved in terminating transcription by detaching the RNA transcript.

- **Reference:** "Molecular Biology of the Gene" by James D. Watson, 7th Edition, page 331.

5. Which _____Titration?

- **Answer:** (c) Both (a) and (b)
- **Explanation:** Potentiometric titration involves a reference electrode (e.g., calomel electrode) to maintain a constant potential and an indicator electrode (e.g., glass electrode) to measure changes in potential during the titration.
- **Reference:** "Analytical Chemistry" by Gary D. Christian, 7th Edition, page 190.

6. The _____dates?

- **Answer:** (b) December 31
- **Explanation:**
  - Any application for import license in Form 8 or 8-A, shall be accompanied by a copy of Registration Certificate issued in Form 41; in the case of emergencies, the issue of Import License by the central government in Form 10 or 10-A without issuance of Registration Certificate under Rule 27-A, for reasons to be recorded in writing.
  - The License remains valid up to 31st Dec of the year following the year in which it is granted unless cancelled or suspended earlier.
  - The importer should have proper storage facilities for preserving imported drugs and properties.
  - A fee of ₹250 shall be paid for a duplicate copy of license, if the original is defaced, damaged or lost.
- **Reference:** "The Drugs and Cosmetics Act, 1940," Section 10.

7. Troger _____ base is:

- **Answer:** (a) Chiral
- **Explanation:** Troger's base is a chiral compound despite lacking a stereogenic center. Its chirality arises from the restricted rotation around the nitrogen bridge due to steric hindrance, resulting in enantiomers.
- **Reference:** "Advanced Organic Chemistry" by Jerry March, 4th Edition, page 523.

8. Food _____by:

- **Answer:** (c) Clostridium botulinum
- **Explanation:** Clostridium botulinum produces a potent neurotoxin that causes foodborne botulism, leading to paralysis. It commonly occurs in improperly canned or preserved foods.
- **Reference:** "Medical Microbiology" by Patrick R. Murray, 9th Edition, page 317.

9. Number _____by:

- **Answer:** (a) Maxwell-Boltzmann equation
- **Explanation:** The Maxwell-Boltzmann equation describes the distribution of particles among various energy states at a given temperature. It is fundamental in understanding populations in ground and excited states.
- **Reference:** "Physical Chemistry" by Peter Atkins and Julio de Paula, 11th Edition, page 392.

10. Isoelectric _____a:

- **Answer:** (b) pH
- **Explanation:** The isoelectric point (pI) of an amino acid is the pH at which the amino acid has no net electric charge. It is significant for protein purification and solubility studies.
- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 108.

11. Starch _____to:

- **Answer:** (a) Amylose
- **Explanation:** The blue color arises from the formation of a polyiodide complex with amylose, a component of starch. Amylopectin, another component, does not produce the same intense color due to its highly branched structure.
- **Reference:** "Biochemistry" by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer, 7th Edition, page 328.

12. Photostability _____ of ICH:

- **Answer:** (b) Q1B
- **Explanation:** ICH Q1B guidelines specifically address photostability testing to determine the light sensitivity of drug substances and products and establish proper storage conditions.
- **Reference:** "ICH Quality Guidelines," International Council for Harmonisation, Q1B guideline.

13. Which _____ antagonist?

- **Answer:** (a) Yohimbine
- **Explanation:** Yohimbine is an alpha2-selective antagonist that blocks alpha2-adrenergic receptors, leading to increased release of norepinephrine and enhanced sympathetic activity.

- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 322.

14. Approval _____for:

- **Answer:** (d) All of these
- **Explanation:** USFDA approval is necessary for any significant changes to a drug product, including labeling revision, new drugs, or formulation revision, ensuring compliance with safety and efficacy standards.
- **Reference:** "FDA Regulatory Affairs" by Douglas J. Pisano and David Mantus, 3rd Edition, page 45.

15. Oral _____is:

- **Answer:** (b) Live attenuated polio virus
- **Explanation:** The oral polio vaccine (OPV) contains live attenuated strains of the poliovirus. It stimulates an immune response without causing disease, providing effective protection against poliovirus infections.
- **Reference:** "Medical Microbiology" by Patrick R. Murray, 9th Edition, page 509.

16. Rauwolfia _____as:

- **Answer:** (d) Antihypertensive
- **Explanation:** Rauwolfia serpentina contains alkaloids like reserpine, which are used to treat hypertension by reducing sympathetic nervous system activity.
- **Reference:** "Pharmacognosy" by G.E. Trease and W.C. Evans, 16th Edition, page 220.

17. Nucleotides _____bond:

- **Answer:** (c) Phosphodiester
- **Explanation:** Nucleotides in a DNA or RNA strand are linked by phosphodiester bonds between the 3'-hydroxyl group of one nucleotide and the 5'-phosphate group of the next, forming the sugar-phosphate backbone.
- **Reference:** "Molecular Biology of the Gene" by James D. Watson, 7th Edition, page 56.

18. Amount _____called:

- **Answer:** (a) Cardiac Output
- **Explanation:** Cardiac output is the volume of blood the heart pumps per minute. It is calculated as Cardiac Output=Stroke Volume Heart Rate\text {Cardiac Output} = \text {Stroke Volume} \times \text{Heart Rate} Cardiac Output=Stroke Volume Heart Rate.
- **Reference:** "Guyton and Hall Textbook of Medical Physiology" by John E. Hall, 13th Edition, page 224.

19. Which _____effect?

- **Answer:** (c) Penicillin
- **Explanation:** Penicillins are bactericidal antibiotics that inhibit bacterial cell wall synthesis, leading to cell lysis. Tetracyclines and macrolides are bacteriostatic, inhibiting bacterial growth but not killing the bacteria directly.
- **Reference:** "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, 12th Edition, page 1461.

20. 8th _____year:

- **Answer:** (d) 2018
- **Explanation:**

Edition	Year	Addendum	Chairmanship	Volume
1st	1955	1960	Dr. B. N. Ghose	1
2nd	1966	1975	Dr. B. Mukherjee	1
3rd	1985	1989/ 1991	Dr. Nityanand	2
4th	1996	2000/ 2002/ 2005	Dr. Nityanand	2
5th	2007	2008	Dr. Nityanand	3
6th	2010	2012	Shri K Chandramouli	3
7th	2014	2015/ 2016	Nabi Azad	4
8th	2018	2019/ 2021	Dr. C.K. Mishra	4
9th	2022	-	Dr Mansukh Mandaviya	4

- **Reference:** "Indian Pharmacopoeia 2014," Indian Pharmacopoeia Commission, Preface section.

21. Rabies _____by:

- **Answer:** (c) L. Pasteur and Emile Roux
- **Explanation:** Louis Pasteur and Emile Roux developed the first rabies vaccine in 1885. They used a weakened form of the rabies virus to immunize individuals successfully.
- **Reference:** "Microbiology: An Introduction" by Gerard J. Tortora et al., 12th Edition, page 729.

22. Okazaki _____of:

- **Answer:** (c) RNA and DNA
- **Explanation:** Okazaki fragments are short sequences of nucleotides formed on the lagging strand during DNA replication. They consist of an RNA primer and a DNA segment, synthesized discontinuously.

- **Reference:** "Molecular Biology of the Gene" by James D. Watson, 7th Edition, page 314.

23. Which _____sense?

- **Answer:** (a) Water
- **Explanation:** Water is the most polar solvent among the options listed, as it has a high dielectric constant and can form hydrogen bonds extensively, making it highly polar in chromatography.
- **Reference:** "Principles of Instrumental Analysis" by Douglas A. Skoog et al., 7th Edition, page 723.

24. 2-propanol _____ isomerism?

- **Answer:** (d) Position isomerism
- **Explanation:** 2-propanol and 1-propanol are position isomers because they differ in the position of the hydroxyl (-OH) group on the carbon chain.
- **Reference:** "Organic Chemistry" by Paula Yurkanis Bruice, 8th Edition, page 51.

25. Skin _____pigment?

- **Answer:** (d) All of these
- **Explanation:** Skin color is determined by:
  - **Melanin**: Provides brown or black pigmentation and protection against UV radiation.
  - **Carotene**: Contributes to yellow-orange hues.
  - **Hemoglobin**: Adds a reddish tint based on blood oxygen levels.
- **Reference:** "Human Anatomy & Physiology" by Elaine N. Marieb and Katja Hoehn, 11th Edition, page 157.

26. Which _____substituted?

- **Answer:** (b) Inductive effect
- **Explanation:** In meta-substituted compounds, the resonance effect is minimal or absent as it does not influence the meta position significantly. The inductive effect, which involves electron withdrawal or donation through sigma bonds, is the primary factor at play.
- **Reference:** "Organic Chemistry" by Paula Yurkanis Bruice, 8th Edition, page 303.

27. The _____range is:

- **Answer:** (a) Phosphoric acid buffer

- **Explanation:** Phosphoric acid buffer is effective across a wide pH range because of its multiple dissociation constants (pKa values), allowing buffering action in acidic, neutral, and basic conditions.
- **Reference:** "Remington: The Science and Practice of Pharmacy," 22nd Edition, page 417.

28. Mental _____of:

- **Answer:** (c) Vitamin B6
- **Explanation:** Vitamin B6 (pyridoxine) deficiency can lead to neurological symptoms such as mental confusion and skin conditions like seborrheic dermatitis, due to its role in amino acid metabolism and neurotransmitter synthesis.
- **Reference:** "Modern Nutrition in Health and Disease" by Maurice E. Shils et al., 11th Edition, page 472.

29. Carboxylic _____of:

- **Answer:** (a) LiAlH4
- **Explanation:** Lithium aluminum hydride (LiAlH4) is a strong reducing agent capable of reducing carboxylic acids and esters to their respective alcohols. Sodium borohydride (NaBH4) is not strong enough for this reaction.
- **Reference:** "Advanced Organic Chemistry" by Francis A. Carey and Richard J. Sundberg, 5th Edition, page 725.

30. The _____reaction?

- **Answer:** (c) 2
- **Explanation:** The unit of the rate constant for a second-order reaction is $L.mol^{-1}.s^{-1}$. For a reaction of order n, the unit of k is $mol^{1-n}L^{n-1}s^{-1}$
- **Reference:** "Physical Chemistry" by Peter Atkins and Julio de Paula, 11th Edition, page 572.

31. Puff-_____by:

- **Answer:** (b) Lactose
- **Explanation:**

TYPES OF OSAZONES

1. Glucose, fructose, mannose — Needle shaped osazones.
2. Maltose — Sunflower shaped osazones.
3. Lactose — Powder puff shaped osazones.
4. Galactose — Rhombic like osazones.

- **Reference:** "Textbook of Biochemistry" by Thomas M. Devlin, 7th Edition, page 211.

32. IPC was _____year:

- **Answer:** (a) 1965
- **Explanation:** The Indian Pharmacopoeia Commission (IPC) was established in 1965 to set standards for drugs in India and ensure the quality and safety of medicines.
- **Reference:** "Indian Pharmacopoeia 1966," Preface section.

33. Mitochondria _____in:

- **Answer:** (c) Electron transport
- **Explanation:** Mitochondria play a key role in the electron transport chain (ETC) during cellular respiration, producing ATP. While it is indirectly related to fat and glucose metabolism, the primary role is energy production.
- **Reference:** "Molecular Biology of the Cell" by Alberts et al., 6th Edition, page 642.

34. The _____imaginary:

- **Answer:** (a) Boundary
- **Explanation:** A system is separated from its surroundings by a boundary, which can be real (e.g., a container) or imaginary (e.g., in thermodynamics). This concept is fundamental in analyzing energy and matter exchanges.
- **Reference:** "Thermodynamics: An Engineering Approach" by Yunus A. Çengel and Michael A. Boles, 8th Edition, page 11.

35. Spin-spin _____between:

- **Answer:** (a) Different protons
- **Explanation:** Spin-spin coupling in NMR spectroscopy occurs between nonequivalent (chemically or magnetically different) protons. This results in signal splitting patterns that provide structural information.
- **Reference:** "Organic Spectroscopy" by William Kemp, 3rd Edition, page 108.

36. A _____is:

- **Answer:** (c) Maltose
- **Explanation:** Maltose is a disaccharide composed of two glucose units linked by an α-1,4 glycosidic bond. Lactose has a β-1,4 linkage, sucrose has an α-1,β-2 linkage, and cellulose is a polysaccharide with β-1,4 linkages.
- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 292.

37. Glycolysis _____in:

- **Answer:** (b) Cytosol
- **Explanation:** Glycolysis, the breakdown of glucose into pyruvate, occurs in the cytosol of cells. It is the first step in cellular respiration and produces ATP and NADH.
- **Reference:** "Molecular Biology of the Cell" by Alberts et al., 6th Edition, page 630.

38. Which _____ hepatotoxicity?

- **Answer:** (d) Streptomycin
- **Explanation:** Streptomycin is an aminoglycoside antibiotic that is not associated with hepatotoxicity but may cause ototoxicity and nephrotoxicity. Rifampicin, pyrazinamide, and tetracycline are known to cause liver damage.
- **Reference:** "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, 12th Edition, page 1116.

39. The _____is:

- **Answer:** (b) 3400
- **Explanation:** The N-H bond typically exhibits a stretching vibration in the IR spectrum between 3300 and 3500 cm^{-1}. This range is characteristic of amines and amides.
- **Reference:** "Spectrometric Identification of Organic Compounds" by Robert M. Silverstein et al., 8th Edition, page 92.

40. The _____by:

- **Answer:** (b) Seydler
- **Explanation:** The term "Pharmacognosy" was first coined by Johann Adam Schmidt and later elaborated in the book "Analecta Pharmacognostica" by Seydler in 1815. It refers to the study of medicinal drugs derived from natural sources.
- **Reference:** "Pharmacognosy" by G.E. Trease and W.C. Evans, 16th Edition, page 1.

41. Fertilization _____ the:

- **Answer:** (a) Oviduct
- **Explanation:** Fertilization typically occurs in the ampulla of the oviduct (fallopian tube), where the ovum meets the sperm after ovulation.
- **Reference:** "Human Anatomy & Physiology" by Elaine N. Marieb and Katja Hoehn, 11th Edition, page 1037.

42. Humulin _____ is:

- **Answer:** (b) Protein

- **Explanation:** Humulin is recombinant human insulin, a protein used to manage diabetes by regulating blood glucose levels.
- **Reference:** "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, 12th Edition, page 1355.

43. Cobalt_____is:

- **Answer:** (b) Vitamin B12
- **Explanation:** Vitamin B12 (cobalamin) contains cobalt in its structure. It is essential for DNA synthesis and red blood cell production.
- **Reference:** "Modern Nutrition in Health and Disease" by Maurice E. Shils et al., 11th Edition, page 442.

44. NSAID _____is:

- **Answer:** (d) Paracetamol
- **Explanation:** Paracetamol (acetaminophen) is an analgesic and antipyretic drug without significant anti-inflammatory activity.
- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 308.

45. Opposite _____is:

- **Answer:** (a) U
- **Explanation:** The alphabet has 26 letters. The opposite of a letter is calculated by subtracting its position from 27. 'B' is the 2nd letter, so the opposite is the 25th letter, which is 'U'.
- **Reference:** General logical and alphabetical rules.

46. Solid _____of:

- **Answer:** (d) Molecular Crystal
- **Explanation:** Solid iodine is a molecular crystal in which iodine molecules (I2I_2I2) are held together by weak van der Waals forces. It lacks the strong bonding found in covalent, ionic, or metallic crystals.
- **Reference:** "Solid State Chemistry" by Lesley Smart and Elaine Moore, 4th Edition, page 83.

47. The _____is:

- **Answer:** (a) Glycine
- **Explanation:** Glycine is the only optically inactive amino acid because it lacks a chiral center, as its side chain is a single hydrogen atom.

- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 112.

48. The _____by:

- **Answer:** (b) 44 kJ/mol
- **Explanation:** The boat form of cyclohexane is less stable than the chair form due to steric strain and eclipsing interactions, making its energy approximately 44 kJ/mol higher.
- **Reference:** "Organic Chemistry" by Paula Yurkanis Bruice, 8th Edition, page 119.

49. Itai_____by:

- **Answer:** (a) Cadmium
- **Explanation:** Itai-itai disease is a painful condition caused by cadmium poisoning, typically from contaminated water or food. It leads to brittle bones and kidney damage.
- **Reference:** "Environmental Chemistry" by Stanley E. Manahan, 10th Edition, page 233.

50. The _____describe:

- **Answer:** (d) Dissolution rate
- **Explanation:** The Noyes-Whitney equation describes the dissolution rate of a solid in a solvent, influenced by surface area, diffusion layer thickness, and solubility.
- **Reference:** "Pharmaceutics: The Science of Dosage Form Design" by Aulton and Taylor, 2nd Edition, page 231.

51. Drug _____is:

- **Answer:** (b) Vesamicol
- **Explanation:** Vesamicol inhibits the vesicular acetylcholine transporter (VAChT), preventing acetylcholine from entering synaptic vesicles. This leads to an increased acetylcholine concentration in the cytoplasm but reduced cholinergic transmission.
- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 420.

52. Which _____nucleotides?

- **Answer:** (a) DNA polymerase
- **Explanation:** DNA polymerase is responsible for synthesizing DNA by attaching nucleotides to the growing DNA strand during replication. It catalyzes the formation of phosphodiester bonds between nucleotides.
- **Reference:** "Molecular Biology of the Gene" by James D. Watson, 7th Edition, page 212.

53. Penicillin _____6-APA in:

- **Answer:** (a) Alkaline conditions
- **Explanation:** Penicillin amylase (or penicillin acylase) hydrolyzes penicillin under alkaline conditions to produce 6-aminopenicillanic acid (6-APA), a key intermediate for synthesizing semisynthetic penicillins.
- **Reference:** "Biotechnology: Principles and Applications" by Satyanarayana U., 2nd Edition, page 158.

54. Modified _____ starch is:

- **Answer:** (a) Starch 1500
- **Explanation:** Starch 1500 is a modified starch used in the pharmaceutical industry as a binder, disintegrant, and filler in tablet formulations. It is pregelatinized to enhance its functionality.
- **Reference:** "Handbook of Pharmaceutical Excipients" by Raymond C. Rowe et al., 6th Edition, page 715.

55. Catalytic _____by:

- **Answer:** (d) All of these
- **Explanation:** Enzymes lose their catalytic activity when exposed to extreme pH, high or low temperatures, or denaturing agents, as these conditions disrupt the enzyme's structure and active site.
- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 158.

56. Chromosomes _____in:

- **Answer:** (d) Anaphase
- **Explanation:** During anaphase of mitosis, sister chromatids are separated and pulled to opposite poles of the cell by spindle fibers, ensuring equal distribution of genetic material.
- **Reference:** "Molecular Biology of the Cell" by Alberts et al., 6th Edition, page 1083.

57. Ethacrynic _____of:

- **Answer:** (a) Loop diuretic
- **Explanation:** Ethacrynic acid is a loop diuretic that inhibits the $Na^+/K^+/2Cl^-$ symporter in the thick ascending limb of the loop of Henle, promoting the excretion of sodium, chloride, and water.
- **Reference:** "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, 12th Edition, page 670.

58. Pharmexcil _____ works for:

- **Answer:** (c) Betterment of Indian retail pharma exports
- **Explanation:** The Pharmaceuticals Export Promotion Council of India (Pharmexcil) focuses on promoting and improving the export of pharmaceutical products from India to global markets.
- **Reference:** Pharmexcil official website (pharmexcil.com).

59. The _____is:

- **Answer:** (c) 55.5
- **Explanation:** The molarity of pure water is calculated as:

  $$\text{Molarity} = \frac{\text{Density (1 g/ } cm^3\text{)}}{\text{Molar mass (18 g/mol)}} \times 1000 = 55.5 \text{ mol/L}.$$

- **Reference:** "Physical Chemistry" by Peter Atkins and Julio de Paula, 11th Edition, page 245.

60. Which _____opener?

- **Answer:** (a) Nicorandil
- **Explanation:** Nicorandil is a potassium channel opener that causes vasodilation by activating ATP-sensitive potassium channels in vascular smooth muscle. It is used to treat angina pectoris.
- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 419.

61. Cardiac _____are:

- **Answer:** (d) All of these
- **Explanation:** Adrenaline, isoprenaline, and dobutamine are all cardiac stimulants. They act by increasing heart rate and contractility:
  - **Adrenaline**: Acts on α and β-adrenergic receptors.
  - **Isoprenaline**: A non-selective β-adrenergic agonist.
  - **Dobutamine**: A selective β1-adrenergic agonist.
- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 312.

62. Erythropoietin _____by:

- **Answer:** (b) Kidney
- **Explanation:** Erythropoietin (EPO) is a hormone primarily produced by the kidneys in response to hypoxia. It stimulates red blood cell production in the bone marrow.

- **Reference:** "Guyton and Hall Textbook of Medical Physiology" by John E. Hall, 13th Edition, page 435.

63. The _____is:

- **Answer:** (b) 3
- **Explanation:** Collagen consists of three polypeptide chains (α-chains) arranged in a triple helix. This unique structure provides tensile strength to connective tissues.
- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 331.

64. Osteomalacia _____of:

- **Answer:** (c) Adults due to Vitamin D deficiency
- **Explanation:** Osteomalacia occurs in adults due to Vitamin D deficiency, leading to impaired calcium absorption and softening of bones. In children, the analogous condition is rickets.
- **Reference:** "Modern Nutrition in Health and Disease" by Maurice E. Shils et al., 11th Edition, page 845.

65. Detection _____is:

- **Answer:** (c) Murexide Test
- **Explanation:** The Murexide test is used to detect caffeine and other purines. It involves reacting the sample with oxidizing agents to form a purple-colored complex.
- **Reference:** "Practical Pharmacognosy" by C.K. Kokate, 4th Edition, page 157.

66. Erythrose _____are:

- **Answer:** (a) Diastereomers
- **Explanation:** Erythrose and threose are diastereomers because they differ in the spatial arrangement of atoms around one or more chiral centers but are not mirror images of each other.
- **Reference:** "Organic Chemistry" by Paula Yurkanis Bruice, 8th Edition, page 223.

67. Milk _____as:

- **Answer:** (c) Lactose
- **Explanation:** Lactose is a disaccharide found in milk, composed of glucose and galactose linked by a β-1,4 glycosidic bond.
- **Reference:** "Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox, 7th Edition, page 292.

68. Swine _____is:

- **Answer:** (a) H1N1
- **Explanation:** The H1N1 influenza virus is commonly known as the swine flu virus. It caused a global pandemic in 2009 and is a subtype of the Influenza A virus.
- **Reference:** "Medical Microbiology" by Patrick R. Murray, 9th Edition, page 653.

69. Biuret _____for:

- **Answer:** (a) -CONH- linkages
- **Explanation:** The Biuret test detects proteins by identifying peptide bonds (-CONH-). When treated with copper sulfate in an alkaline solution, proteins produce a violet color.
- **Reference:** "Biochemistry" by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer, 7th Edition, page 118.

70. Pasteur _____ effect is:

- **Answer:** (d) All of the above
- **Explanation:** The Pasteur effect refers to the inhibition of glycolysis in the presence of oxygen, as oxidative phosphorylation becomes the primary ATP source. This effect involves the inhibition of phosphofructokinase.
- **Reference:** "Molecular Biology of the Cell" by Alberts et al., 6th Edition, page 630.

71. Which _____aminoglycosides?

- **Answer:** (c) Renal clearance via glomerular filtration
- **Explanation:** Aminoglycosides are primarily eliminated by renal clearance through glomerular filtration. They exhibit low protein binding, are not metabolized in the liver, and do not undergo significant enterohepatic circulation.
- **Reference:** "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, 12th Edition, page 1531.

72. Which _____codon?

- **Answer:** (d) AUG
- **Explanation:** AUG is the initiation codon in mRNA that codes for methionine in eukaryotes and formylmethionine (fMet) in prokaryotes, marking the start of protein synthesis.
- **Reference:** "Molecular Biology of the Gene" by James D. Watson, 7th Edition, page 411.

73. Vinegar _____of:

- **Answer:** (d) Both (b) and (c)
- **Explanation:**
    - Vinegar is produced through a two-step fermentation process:

      1. Yeast converts sugar to alcohol - Yeast produces enzymes that convert sugar into alcohol. This is the first step of the fermentation process.

      2. Acetobacter converts alcohol to acetic acid – Acetobacter bacteria convert ethanol into acetic acid in the presence of oxygen. This is the second step of the fermentation process.

- **Reference:** "Industrial Microbiology" by Prescott and Dunn, 4th Edition, page 331.

74. The _____regarding

- **Answer:** (a) Charge
- **Explanation:** Zeta potential measures the surface charge of particles in a suspension. It is used to determine the stability of colloidal systems, as high zeta potential prevents particle aggregation.
- **Reference:** "Colloid and Interface Chemistry for Water Quality Control" by Qing Chang, 1st Edition, page 127.

75. Main _____is:

- **Answer:** (b) Noradrenaline
- **Explanation:** Noradrenaline (norepinephrine) is the primary neurotransmitter of the sympathetic nervous system, involved in the fight-or-flight response. Adrenaline acts as a hormone, not a primary neurotransmitter.
- **Reference:** "Rang & Dale's Pharmacology" by Humphrey P. Rang et al., 9th Edition, page 304.

76. Which _____internet?

- **Answer:** (a) FTP
- **Explanation:** The File Transfer Protocol (FTP) is a standard network protocol used to transfer files between a client and a server over the internet.
- **Reference:** "Computer Networking: A Top-Down Approach" by Kurose and Ross, 7th Edition, page 55.

77. Which _____many?

- **Answer:** (c) CD-R

- **Explanation:** A CD-R (Compact Disc-Recordable) allows data to be written only once. Once written, the data cannot be erased or overwritten, making it read-only for subsequent uses.
- **Reference:** "Computer Organization and Design" by David A. Patterson and John L. Hennessy, 5th Edition, page 327.

78. In _____center?

- **Answer:** (a) Ctrl + E
- **Explanation:** The keyboard shortcut `Ctrl + E` aligns the selected text or paragraph to the center in Microsoft Word.
- **Reference:** Microsoft Word Documentation (support.microsoft.com).

79. Which _____ networks?

- **Answer:** (d) Access Point
- **Explanation:** A wireless access point (WAP) is a networking device that allows wireless devices to connect to a wired network. It is used to manage and extend wireless network coverage.
- **Reference:** "Data Communications and Networking" by Behrouz A. Forouzan, 5th Edition, page 412.

80. Which _____Word?

- **Answer:** (a) Ctrl + W
- **Explanation:** The `Ctrl + W` shortcut closes the current document in MS Word without exiting the application.
- **Reference:** Microsoft Word Documentation (support.microsoft.com).

81. Pointing _____Ramesh?

- **Answer:** (b) Mother
- **Explanation:** "My father's only son" refers to Ramesh himself. Therefore, "She is the mother of my father's only son" means the woman is Ramesh's mother.

82. Find _____Chair.

- **Answer:** (d) Chair
- **Explanation:** Pen, pencil, eraser, and paper are all stationary items, whereas a chair is furniture and unrelated to stationery.

83. If "_____coded?

- **Answer:** (a) CSBUF
- **Explanation:** Each letter in the word is shifted one position forward in the alphabet:
  - B→C, R→S, A→B, U→V,E→F (+1, +1, +1, -1, +1)
  - Therefore, "BRAVE" becomes "CSBUF."

84. What _____, 37, ?

- **Answer:** (a) 49
- **Explanation:** The differences between consecutive terms are:
  17−10=7, 26−17=9, 37−26=11
  The next difference is 11+2=13;
  37+13=49

85. What _____F, J, O, ?

- **Answer:** (c) U
- **Explanation:** The differences between the positions of consecutive letters are increasing:
  A→C(2),C→F(3),F→J(4),J→O(5)
  The next difference is 5+1=6

86. If _____number?

- **Answer:** (b) 450
- **Explanation:**
  Let the number be x.
  20% of x = 120
  0.2x = 120
  x = 120 ÷ 0.2 = 600
  75% of x = 0.75 × 600 = 450

87. A _____together?

- **Answer:** (a) 7.2 days
- **Explanation:**
  Work rate of the first man = $\frac{1}{12}$
  Work rate of the second man = $\frac{1}{18}$
  Combined rate = $\frac{1}{12}+\frac{1}{18}=\frac{3}{36}+\frac{2}{36}=\frac{5}{36}$
  Time to complete the work together = $\frac{1}{\frac{5}{36}}=\frac{36}{5}$ = 7.2 days

88. A _____pole?

- **Answer:** (b) 10 seconds
- **Explanation:**
  Speed of the train = 54 km/h = $54 \times \frac{1000}{3600}$ = 15 m/s
  Time = $\frac{\text{Length of train}}{\text{Speed}} = \frac{150}{15}$ = 10 seconds

89. If _____income?

- **Answer:** (d) ₹40,000
- **Explanation:**
  Let the income be x.
  Rent = 0.4x, Food = 0.3x, Savings = ₹12,000.
  0.4x + 0.3x + 12,000 = x
  0.7x + 12,000 = x
  x − 0.7x = 12,000
  0.3x = 12,000
  x = 12,000 ÷ 0.3 = 40,000

90. The _____principal?

- **Answer:** (b) ₹12,000
- **Explanation:**
  Simple Interest (SI) = $\frac{P \times R \times T}{100}$
  2,160 = $\frac{P \times 6 \times 3}{100}$
  2,160 = $\frac{18P}{100}$ 18P
  P = $\frac{2160 \times 100 \times 3}{18}$ = 12,000.

91. The _____to:

- **Answer:** (a) The Indigo farmers
- **Explanation:** The Champaran Satyagraha was Mahatma Gandhi's first significant satyagraha in India. It aimed to address the grievances of indigo farmers in Bihar, who were forced to grow indigo under oppressive conditions by British planters.
- **Reference:** "India's Struggle for Independence" by Bipan Chandra, page 161.

92. Which _____Gandhi'?

- **Answer:** (a) Khan Abdul Ghaffar Khan

- **Explanation:** Khan Abdul Ghaffar Khan, also called the 'Frontier Gandhi,' was a Pashtun leader and close associate of Mahatma Gandhi. He promoted non-violence and led the Khudai Khidmatgar (Servants of God) movement in the North-West Frontier Province.
- **Reference:** "Modern Indian History" by Sumit Sarkar, page 204.

93. Which _____basis?

- **Answer:** (c) Andhra Pradesh
- **Explanation:** Andhra Pradesh was formed in 1953 based on the demand for a separate state for Telugu-speaking people, following the death of Potti Sriramulu after a hunger strike.
- **Reference:** "Indian Polity" by M. Laxmikanth, 6th Edition, page 379.

94. The _____country?

- **Answer:** (a) Germany
- **Explanation:** The Treaty of Versailles, signed in 1919, imposed heavy reparations and territorial losses on Germany and held it responsible for World War I, significantly weakening the nation politically and economically.
- **Reference:** "The First World War: A Complete History" by Martin Gilbert, page 415.

95. Which _____Lakes'?

- **Answer:** (a) Udaipur
- **Explanation:** Udaipur, located in Rajasthan, is famously called the 'City of Lakes' due to its numerous artificial and natural lakes, including Lake Pichola, Fateh Sagar Lake, and Udai Sagar Lake.
- **Reference:** "Rajasthan: A Land of Kings" by Dharmendra Kanwar, page 105.

96. The _____of:

- **Answer:** (c) The Salt Tax
- **Explanation:** The Dandi March (Salt March) was organized by Mahatma Gandhi in 1930 to protest against the British-imposed salt tax. It marked the beginning of the Civil Disobedience Movement.
- **Reference:** "India's Struggle for Independence" by Bipan Chandra, page 265.

97. Who _____1929?

- **Answer:** (c) Jawaharlal Nehru
- **Explanation:** The Lahore Session of 1929, presided over by Jawaharlal Nehru, declared complete independence (Purna Swaraj) as the goal of the Indian National Congress and decided to celebrate January 26, 1930, as Independence Day.

- **Reference:** "Modern Indian History" by Sumit Sarkar, page 278.

98. Which _____ South'?

- **Answer:** (d) Kaveri
- **Explanation:** The Kaveri River is often called the 'Ganga of the South' because of its cultural and religious significance in southern India, akin to the Ganga in northern India.
- **Reference:** "Geography of India" by Majid Husain, 8th Edition, page 212.

99. The _____year?

- **Answer:** (c) 1951
- **Explanation:** The first census of independent India was conducted in 1951, marking the start of systematic population data collection post-independence.
- **Reference:** "Indian Polity" by M. Laxmikanth, 6th Edition, page 856.

100. The _____collection?

- **Answer:** (b) Sutta Pitaka
- **Explanation:** The Digha Nikaya, a collection of long discourses of the Buddha, is part of the Sutta Pitaka, one of the three baskets (Tipitaka) of Theravada Buddhist scriptures.
- **Reference:** "The Buddha and His Dhamma" by B.R. Ambedkar, page 201.