

OJEE LE Pharm Sample Paper 01

A) Mode and Time: The exam is a Computer Based Test (CBT) lasting 60 minutes.

B) Total Questions: The exam contains 60 questions.

C) Marking Scheme & Rules:

- +4 marks for each correct answer; -1 mark for each incorrect answer.

Q1. According to the Indian Pharmacopoeia (IP), what is the precise concentration of sucrose in Simple Syrup?

- A. 85% w/v
- B. 66.7% w/w
- C. 66.7% w/v
- D. 85% w/w

Q2. Which of the following polymers is most widely used in the pharmaceutical industry for the enteric coating of tablets?

- A. Hydroxypropyl methylcellulose (HPMC)
- B. Polyethylene glycol (PEG)
- C. Cellulose acetate phthalate (CAP)
- D. Polyvinyl alcohol (PVA)

Q3. In the numerical sizing system for hard gelatin capsules, which size represents the largest capsule capacity?

- A. Size 0
- B. Size 5
- C. Size 000
- D. Size 00

Q4. According to the general notices of the Indian Pharmacopoeia, "Cold Storage" specifically indicates a temperature range of:

- A. -20°C to 0°C
- B. 2°C to 8°C
- C. 8°C to 15°C

D. 15°C to 25°C

Q5. Theobroma oil, widely utilized as an ideal suppository base, is naturally extracted from the roasted seeds of:

A. *Arachis hypogaea*

B. *Theobroma cacao*

C. *Ricinus communis*

D. *Cocos nucifera*

Q6. Which pharmaceutical mill operates on the combined principles of both impact and attrition to achieve size reduction?

A. Hammer mill

B. Roller mill

C. Ball mill

D. Cutter mill

Q7. In the traditional prescription format, the symbol "Rx" (Superscription) originates from Latin and means:

A. Mix these

B. Take thou (Recipe)

C. Write on label

D. Let it be given

Q8. Which sterilization technique is strictly required for thermolabile biological preparations such as vaccines and blood products?

A. Dry heat sterilization at 160°C

B. Autoclaving at 121°C

C. Membrane filtration ($0.22\mu\text{m}$)

D. Moist heat sterilization

Q9. A "Liniment" is a liquid or semi-liquid pharmaceutical preparation intended for external application to the unbroken skin, typically applied:

A. With friction and rubbing

B. Without friction using a soft brush

- C. As an aerosol spray
- D. As a wet compress

Q10. Which of the following chemical compounds is the primary active ingredient in standard Calamine lotion, giving it its characteristic pink color?

- A. Zinc oxide with trace Ferric oxide
- B. Aluminum hydroxide
- C. Magnesium silicate
- D. Calcium carbonate

Q11. In the standard Indian Pharmacopoeia limit test for Iron, the color produced by the complex of iron with thioglycolic acid is:

- A. Deep blue
- B. Pale yellow
- C. Pink to deep purple
- D. Opaque white

Q12. Which widely used antacid compound is known to commonly cause constipation as an adverse effect?

- A. Magnesium hydroxide
- B. Aluminum hydroxide
- C. Sodium bicarbonate
- D. Calcium carbonate

Q13. The chemical compound Nitrous oxide (N_2O), used as a mild general anesthetic and analgesic, is commonly known as:

- A. Tear gas
- B. Laughing gas
- C. Marsh gas
- D. Water gas

Q14. Lugol's solution, traditionally used as an antiseptic and in the management of thyrotoxicosis, is chemically an aqueous solution of:

- A. Hydrogen peroxide

- B. Potassium permanganate
- C. Iodine and Potassium iodide
- D. Silver nitrate

Q15. Which of the following is the major intracellular cation responsible for maintaining cellular resting membrane potential?

- A. Sodium (Na^+)
- B. Calcium (Ca^{2+})
- C. Potassium (K^+)
- D. Chloride (Cl^-)

Q16. According to standard medical practice, Normal Saline (NS) solution contains what percentage of Sodium Chloride ($NaCl$)?

- A. 0.45% w/v
- B. 0.9% w/v
- C. 3.0% w/v
- D. 5.0% w/v

Q17. In dental preparations, compounds like stannous fluoride or sodium fluoride are specifically added for their role as:

- A. Abrasives
- B. Desensitizing agents
- C. Anti-caries agents
- D. Bleaching agents

Q18. The chemical compound "Epsom salt," used as a saline laxative and in soaking baths, is chemically known as:

- A. Magnesium sulfate heptahydrate
- B. Sodium sulfate decahydrate
- C. Copper sulfate pentahydrate
- D. Calcium sulfate dihydrate

Q19. Who is historically recognized worldwide as the "Father of Medicine"?

- A. Charaka

- B. Hippocrates
- C. Galen
- D. Dioscorides

Q20. Pharmacognostically, the potent laxative drug Senna is obtained from the dried leaflets of plants belonging to which botanical family?

- A. Rubiaceae
- B. Apocynaceae
- C. Leguminosae
- D. Solanaceae

Q21. Mayer's reagent, a standard chemical test used to indicate the presence of alkaloids, typically produces what color precipitate?

- A. Reddish-brown
- B. Cream or pale yellow
- C. Deep blue
- D. Black

Q22. The essential oil extracted from Clove buds (*Syzygium aromaticum*) owes its strong dental analgesic properties to the active constituent:

- A. Menthol
- B. Eugenol
- C. Cineole
- D. Camphor

Q23. The term "Adulteration" in pharmacognosy specifically refers to:

- A. Purification of a crude drug
- B. Proper storage of a crude drug
- C. The intentional or accidental substitution of an original drug with inferior substances
- D. The extraction of active constituents

Q24. The traditional Indian medicinal plant *Rauwolfia serpentina* is primarily utilized in modern medicine for the treatment of:

- A. Diabetes
- B. Hypertension
- C. Malaria
- D. Tuberculosis

Q25. Which specific part of the Aloe vera plant is utilized to extract the medicinal gel and the bitter yellow exudate (aloin)?

- A. Roots
- B. Stem
- C. Leaves
- D. Seeds

Q26. Ergot, a rich source of alkaloids used to treat migraines, is biologically classified as a:

- A. Dried latex
- B. Parasitic fungus
- C. Dried rhizome
- D. Seed extract

Q27. In human cellular biology, which organelle is universally referred to as the "powerhouse of the cell" due to ATP generation?

- A. Nucleus
- B. Golgi apparatus
- C. Mitochondrion
- D. Ribosome

Q28. In the ABO blood group system, individuals with which blood type are considered "Universal Donors"?

- A. Type A, Rh-positive
- B. Type AB, Rh-positive
- C. Type O, Rh-negative
- D. Type B, Rh-negative

Q29. What is the name of the longest, heaviest, and strongest bone in the human body?

- A. Tibia
- B. Femur
- C. Humerus
- D. Fibula

Q30. The human peripheral nervous system structurally contains how many pairs of cranial nerves?

- A. 10 pairs
- B. 12 pairs
- C. 31 pairs
- D. 43 pairs

Q31. Which specific anatomical structure is referred to as the natural "pacemaker" of the human heart?

- A. Atrioventricular (AV) node
- B. Bundle of His
- C. Purkinje fibers
- D. Sinoatrial (SA) node

Q32. The pituitary gland, often called the "master gland" of the endocrine system, is anatomically situated in the:

- A. Neck region
- B. Abdominal cavity
- C. Base of the brain (Sella turcica)
- D. Upper chest

Q33. In a healthy resting adult, the standard normal blood pressure is clinically defined as:

- A. 120/80 mmHg
- B. 140/90 mmHg
- C. 100/60 mmHg
- D. 160/100 mmHg

Q34. Bile, an essential digestive fluid required for the emulsification of dietary fats, is continuously synthesized by the:

- A. Gallbladder
- B. Pancreas
- C. Liver
- D. Small intestine

Q35. In pharmacology, "Pharmacokinetics" is best defined as the study of:

- A. The mechanism of action of drugs
- B. What the drug does to the body
- C. The absorption, distribution, metabolism, and excretion of drugs
- D. The adverse effects of drugs

Q36. The sublingual route of drug administration provides rapid onset of action and highly bypasses which major physiological barrier?

- A. The blood-brain barrier
- B. Hepatic first-pass metabolism
- C. The placental barrier
- D. Renal excretion

Q37. Which of the following drugs acts as a highly selective agonist at the Beta-2 (β_2) adrenergic receptors, causing bronchodilation in asthma?

- A. Propranolol
- B. Atropine
- C. Salbutamol (Albuterol)
- D. Adrenaline

Q38. The highly specific and life-saving antidote for Acetaminophen (Paracetamol) poisoning is:

- A. Flumazenil
- B. Naloxone
- C. Atropine
- D. N-acetylcysteine

Q39. Isoniazid (INH), Rifampin, Pyrazinamide, and Ethambutol are collectively recognized as the primary first-line therapy for treating:

- A. Leprosy
- B. Malaria
- C. Tuberculosis
- D. HIV/AIDS

Q40. Which of the following is a classic example of a "Proton Pump Inhibitor" (PPI) used in the treatment of peptic ulcers?

- A. Ranitidine
- B. Omeprazole
- C. Famotidine
- D. Sucralfate

Q41. Penicillin antibiotics exert their rapid bactericidal effect by binding to penicillin-binding proteins and specifically inhibiting:

- A. Bacterial protein synthesis
- B. Bacterial DNA replication
- C. Bacterial cell wall synthesis
- D. Bacterial RNA transcription

Q42. Which antimalarial drug, originally derived from the Cinchona tree, is the historic standard treatment for malaria?

- A. Artemisinin
- B. Chloroquine
- C. Quinine
- D. Primaquine

Q43. The anticoagulant drug Warfarin functions by antagonizing the action of which essential vitamin required for clotting factor synthesis?

- A. Vitamin A
- B. Vitamin C
- C. Vitamin K
- D. Vitamin E

Q44. To avoid enzymatic destruction in the gastrointestinal tract, standard Insulin preparations must be administered via which route?

- A. Subcutaneous injection
- B. Oral tablets
- C. Topical patch
- D. Sublingual spray

Q45. In clinical pathology, what is the generally accepted normal range for fasting blood glucose levels in a healthy adult?

- A. 70 – 100 mg/dL
- B. 120 – 150 mg/dL
- C. 150 – 200 mg/dL
- D. 40 – 60 mg/dL

Q46. The severe deficiency of Vitamin A (Retinol) in the human diet primarily manifests as:

- A. Scurvy
- B. Night blindness (Nyctalopia)
- C. Rickets
- D. Pellagra

Q47. In cellular biochemistry, the process of Glycolysis breaks down one molecule of glucose into two molecules of:

- A. Lactic acid
- B. Acetyl-CoA
- C. Pyruvate
- D. Citric acid

Q48. Proteins are highly complex organic macromolecules fundamentally constructed from long chains of:

- A. Fatty acids
- B. Monosaccharides
- C. Nucleotides
- D. Amino acids

Q49. In a hospital setting, the primary function of the Pharmacy and Therapeutics Committee (PTC) is to:

- A. Hire nursing staff
- B. Maintain hospital hygiene
- C. Develop and update the hospital formulary
- D. Manage patient billing

Q50. In inventory control management, the "Lead Time" is specifically defined as the:

- A. Time taken to manufacture a drug
- B. Time required to consume a batch of drugs
- C. Time interval between placing an order and receiving the goods
- D. Time taken to distribute drugs to patients

Q51. The widely used "ABC Analysis" in pharmacy inventory management categorizes drug items strictly based on their:

- A. Pharmacological action
- B. Annual consumption value (Usage value)
- C. Alphabetical names
- D. Expiration dates

Q52. In a standard prescription, the portion that contains the actual names and quantities of the prescribed ingredients or drugs is called the:

- A. Superscription
- B. Inscription
- C. Subscription
- D. Signatura

Q53. The primary objective of conducting Patient Counseling in a community pharmacy is to:

- A. Promote the sale of cosmetics
- B. Reduce the price of medications
- C. Improve patient compliance and therapeutic outcomes
- D. Diagnose complex medical conditions

Q54. Drugs that are considered safe enough to be sold directly to the consumer without a prescription from a healthcare professional are termed:

- A. Schedule X drugs
- B. Orphan drugs
- C. Over-The-Counter (OTC) drugs
- D. Essential drugs

Q55. The Pharmacy Act, which formally constituted the Pharmacy Council of India and standardized pharmacy education, was enacted in the year:

- A. 1940
- B. 1948
- C. 1954
- D. 1970

Q56. Under the Drugs and Cosmetics Rules 1945, which specific schedule contains a strict list of prescription-only drugs?

- A. Schedule C
- B. Schedule G
- C. Schedule H
- D. Schedule X

Q57. The landmark Indian Drugs and Cosmetics Act, which regulates the import, manufacture, distribution, and sale of drugs, was passed in:

- A. 1940
- B. 1945
- C. 1948
- D. 1955

Q58. Schedule M of the Drugs and Cosmetics Act explicitly lays out the mandatory requirements regarding:

- A. Life periods of drugs
- B. Good Manufacturing Practices (GMP)
- C. Standards for cosmetics
- D. Poisons and hazardous chemicals

Q59. Which of the following legally defines an "Orphan Drug"?

- A. A drug with no known side effects
- B. A drug used to treat rare diseases or conditions
- C. A drug that has been banned from the market
- D. A drug available without a prescription

Q60. The strict Narcotic Drugs and Psychotropic Substances (NDPS) Act, aimed at controlling drug abuse and trafficking in India, was passed in:

- A. 1940
- B. 1970
- C. 1985
- D. 2000

Solutions

1. B

Explanation: According to the Indian Pharmacopoeia, Simple Syrup is prepared by dissolving 66.7 grams of sucrose in water to produce 100 grams of syrup, resulting in a concentration of 66.7% w/w.

2. C

Explanation: Cellulose acetate phthalate (CAP) is an acid-insoluble polymer. It protects the tablet core from stomach acid but dissolves readily in the alkaline environment of the intestines.

3. C

Explanation: In the hard gelatin capsule sizing scale used for human consumption, '000' is the largest size (holding approx 1.37 ml), and '5' is the smallest size.

4. B

Explanation: The Indian Pharmacopoeia clearly defines "Cold Storage" as any temperature between 2°C and 8°C , typically achieved in a standard pharmaceutical refrigerator.

5. B

Explanation: Theobroma oil, also known as cocoa butter, is derived from the seeds of *Theobroma cacao*. Its ability to melt smoothly at body temperature ($34 - 35^{\circ}\text{C}$) makes it an ideal traditional suppository base.

6. C

Explanation: A ball mill consists of a rotating hollow cylinder filled with heavy balls. Size reduction occurs via impact (balls dropping on the material) and attrition (balls grinding the material against each other).

7. B

Explanation: The symbol "Rx" stands for the Latin word *Recipe*, which translates to "take thou" or "you take," historically serving as a directive to the pharmacist to prepare the medication.

8. C

Explanation: Vaccines and blood products are degraded by heat (thermolabile). They must be sterilized non-thermally by membrane filtration, passing the liquid through a $0.22\mu\text{m}$ filter to physically remove bacteria.

9. A

Explanation: Liniments are liquid or semi-liquid rubefacient preparations applied to unbroken skin with friction and rubbing to relieve pain or stiffness, unlike lotions which are applied without friction.

10. A

Explanation: Calamine is primarily composed of Zinc oxide (ZnO) mixed with a small proportion (about 0.5%) of Ferric oxide (Fe_2O_3), which gives the powder and the lotion its characteristic pink color.

11. C

Explanation: In the IP limit test for iron, thioglycolic acid reduces Fe(III) to Fe(II), which then reacts in an ammoniacal alkaline medium to form a ferrous thio-

glycolate complex, producing a pink to deep purple color.

12. B

Explanation: Aluminum hydroxide is a common antacid that frequently causes constipation. It is often combined with Magnesium hydroxide (which causes diarrhea) to balance out gastrointestinal side effects.

13. B

Explanation: Nitrous oxide (N_2O) is universally known as "laughing gas" due to the euphoric effects it can produce when inhaled. It is commonly used in dentistry and surgery.

14. C

Explanation: Lugol's solution (Strong Iodine Solution) is composed of 5% w/v Iodine (I_2) and 10% w/v Potassium iodide (KI) dissolved in distilled water.

15. C

Explanation: Potassium (K^+) is the primary intracellular cation, while Sodium (Na^+) is the primary extracellular cation. Their gradient is vital for cellular resting membrane potentials.

16. B

Explanation: Normal Saline (NS) is an isotonic crystalloid solution containing 0.9% w/v of Sodium Chloride ($NaCl$) dissolved in sterile water for injection.

17. C

Explanation: Fluoride compounds (like stannous fluoride or sodium fluoride) are included in toothpastes and dental products as anti-carries agents because they convert tooth hydroxyapatite into harder, decay-resistant fluoroapatite.

18. A

Explanation: Epsom salt is the common chemical name for Magnesium sulfate heptahydrate ($MgSO_4 \cdot 7H_2O$).

19. B

Explanation: Hippocrates, an ancient Greek physician, is universally regarded as the "Father of Medicine" for his enduring contributions to medical ethics (the Hippocratic Oath) and clinical observation.

20. C

Explanation: Senna is obtained from the dried leaflets of *Cassia acutifolia* or *Cassia angustifolia*, which are shrubs belonging to the Leguminosae (pea/bean) family.

21. B

Explanation: Mayer's reagent (Potassium mercuric iodide solution) is a standard identification test for alkaloids. When added to an acidic alkaloidal solution, it produces a characteristic cream or pale yellow precipitate.

22. B

Explanation: Eugenol is the major active constituent (up to 90%) of clove oil. It is widely used in dental practice as a topical local anesthetic and antiseptic for toothaches.

23. C

Explanation: Adulteration involves the debasement of an article. In pharmacog-

nosy, it means substituting an original crude drug partially or fully with inferior, cheaper, or inactive substances.

24. B

Explanation: *Rauwolfia serpentina* (Indian Snakeroot) roots contain the alkaloid reserpine. It depletes catecholamines, producing a profound antihypertensive and tranquilizing effect.

25. C

Explanation: The fleshy, succulent leaves of the Aloe vera plant are harvested to extract two products: the clear mucilaginous inner parenchyma gel (for burns) and the bitter yellow latex/exudate containing aloin (a laxative).

26. B

Explanation: Ergot is the dried sclerotium of the parasitic fungus *Claviceps purpurea*, which infects the ovaries of rye plants. It is rich in highly vasoactive indole alkaloids.

27. C

Explanation: The mitochondrion is deemed the "powerhouse of the cell" because it is the primary site of cellular respiration, generating the vast majority of the cell's supply of adenosine triphosphate (ATP).

28. C

Explanation: Type O, Rh-negative blood lacks A, B, and Rh antigens on its red blood cells, meaning it will not trigger an immune reaction when transfused into a patient of any other blood type.

29. B

Explanation: The femur (thigh bone) is the longest, heaviest, and strongest bone in the human body, extending from the pelvis to the knee.

30. B

Explanation: The human nervous system comprises exactly 12 pairs of cranial nerves that emerge directly from the brain and brainstem, and 31 pairs of spinal nerves.

31. D

Explanation: The Sinoatrial (SA) node, located in the right atrium, generates the initial electrical impulse that triggers each heartbeat, acting as the heart's natural pacemaker.

32. C

Explanation: The pituitary gland is a pea-sized endocrine gland situated at the base of the brain in a bony hollow called the sella turcica. It controls the function of most other endocrine glands.

33. A

Explanation: A normal, healthy blood pressure reading in a resting adult is defined as a systolic pressure of less than 120 mmHg and a diastolic pressure of less than 80 mmHg (120/80).

34. C

Explanation: Bile is a digestive fluid continuously produced and secreted by the liver. It is then transported to the gallbladder, where it is stored and concentrated

before being released into the small intestine.

35. C

Explanation: Pharmacokinetics (PK) is the quantitative study of drug movement through the body, summarized by the acronym ADME (Absorption, Distribution, Metabolism, and Excretion).

36. B

Explanation: Sublingual administration (under the tongue) allows the drug to be absorbed directly into the systemic venous circulation via the oral mucosa, completely bypassing the destructive hepatic first-pass metabolism.

37. C

Explanation: Salbutamol (Albuterol) is a short-acting β_2 -adrenergic agonist. It selectively binds to receptors in the lungs, relaxing bronchial smooth muscle to relieve asthma attacks.

38. D

Explanation: N-acetylcysteine (NAC) is the antidote for paracetamol toxicity. It replenishes depleted hepatic glutathione stores, neutralizing the toxic metabolite NAPQI and preventing fatal liver necrosis.

39. C

Explanation: This specific combination of four bactericidal and bacteriostatic drugs (HRZE) forms the rigorous first-line standard treatment regimen required to eradicate *Mycobacterium tuberculosis*.

40. B

Explanation: Omeprazole belongs to the Proton Pump Inhibitor (PPI) class. It irreversibly blocks the H^+/K^+ ATPase enzyme in gastric parietal cells, powerfully suppressing stomach acid secretion.

41. C

Explanation: Penicillins (and all β -lactam antibiotics) act by covalently binding to Penicillin-Binding Proteins (transpeptidases), preventing the cross-linking of peptidoglycan polymers required for bacterial cell wall synthesis.

42. C

Explanation: Quinine is a highly bitter alkaloid extracted from Cinchona bark. Before the synthesis of modern alternatives like Chloroquine, it was the only effective treatment for malaria.

43. C

Explanation: Warfarin acts as a Vitamin K antagonist by inhibiting the enzyme Vitamin K epoxide reductase. This halts the hepatic synthesis of active clotting factors II, VII, IX, and X.

44. A

Explanation: Insulin is a delicate polypeptide hormone. If taken orally, it is rapidly destroyed by stomach acid and proteolytic digestive enzymes. It must be injected parenterally, typically via subcutaneous injection.

45. A

Explanation: In a healthy non-diabetic adult, normal fasting blood glucose (tested after 8 hours of no caloric intake) is typically between 70 and 100 mg/dL.

46. B

Explanation: Vitamin A is an essential component of rhodopsin, a light-sensitive pigment in the retina. Its deficiency leads to night blindness (nyctalopia) and, if severe, irreversible corneal damage (xerophthalmia).

47. C

Explanation: Glycolysis is a 10-step metabolic pathway that splits one 6-carbon glucose molecule into two 3-carbon Pyruvate molecules, generating a net yield of 2 ATP.

48. D

Explanation: Proteins are essential biological polymers. They are synthesized by linking together various specific amino acids through covalent peptide bonds.

49. C

Explanation: The Pharmacy and Therapeutics Committee (PTC) represents the official line of communication between the medical and pharmacy staff. Its chief duty is to develop, evaluate, and maintain the hospital formulary (the approved drug list).

50. C

Explanation: In supply chain and inventory management, Lead Time is the exact duration between the initiation of an order request and the actual physical receipt of the requested goods into inventory.

51. B

Explanation: ABC (Always Better Control) analysis classifies inventory into three groups (A, B, and C) based strictly on their annual consumption value (quantity used $\times$ unit cost), focusing strict control on the high-value 'A' items.

52. B

Explanation: The Inscription is the main body of a prescription. It clearly lists the names and exact quantities of the active ingredients and vehicles to be compounded or dispensed.

53. C

Explanation: The goal of patient counseling is to ensure the patient fully understands how, when, and why to take their medication, thereby enhancing medication compliance and optimizing therapeutic outcomes.

54. C

Explanation: Over-The-Counter (OTC) drugs are non-prescription medications. Regulatory agencies have deemed them safe and effective for use by the general public without a doctor's supervision for minor ailments.

55. B

Explanation: The Pharmacy Act of 1948 was enacted to regulate the profession of pharmacy in India. It established the Pharmacy Council of India (PCI) to maintain standardized pharmacy education across the country.

56. C

Explanation: Schedule H of the Drugs and Cosmetics Rules 1945 contains the strict list of drugs that can only be sold by a licensed pharmacist upon the presentation of a valid prescription from a Registered Medical Practitioner.

57. A

Explanation: The Drugs and Cosmetics Act was passed in 1940 (with Rules framed in 1945) to comprehensively regulate the import, manufacture, distribution, and sale of all drugs and cosmetics in India.

58. B

Explanation: Schedule M outlines the legal standards for Good Manufacturing Practices (GMP). It dictates the stringent requirements for premises, equipment, quality control, and personnel in a pharmaceutical manufacturing plant.

59. B

Explanation: An "Orphan drug" is a pharmaceutical agent specifically developed to treat, prevent, or diagnose a rare medical condition (an orphan disease). Governments often provide incentives to encourage their development.

60. C

Explanation: The Narcotic Drugs and Psychotropic Substances (NDPS) Act was passed in 1985. It provides a stringent legal framework to combat illicit drug trafficking and the abuse of narcotic and psychotropic substances in India.

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