Total No. of Printed Pages : 26

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

PH.D.-EE-October, 2026 (Pharmaceutical Sciences)

A

100037

Sr. No. .....

Time : 1¼ Hours **Max. Marks : 100** **Total Questions : 100**

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate) (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question bcoklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Scanned with CamScanner

1. Which of the following best defines research ?

(1) A random search for facts

(2) An intuitive guess

(3) Copying existing data

(4) A systematic effort to gain new knowledge

2. The goal of 'Basic Research' is primarily :

(1) Immediate application

(2) Expanding theoretical knowledge

(3) Solving a business crisis

(4) Political gain

3. Self-plagiarism is :

(1) Reusing one's own published work without credit

(2) Failing to cite a co-author on a manuscript

(3) Submitting an article to a journal that rejects it

(4) None of the above

Scanned with CamScanner

4. Analysis of Variance (ANOVA) is used to compare the means of :

(1) Exactly two groups

(2) Three or more groups

(3) One group against a constant

(4) None of the above

5. The 'Goodness of Fit' test is a type of :

(1) *t*-test (2) ANOVA

(3) Chi-square test (4) Z-test

6. A Z-test is typically used instead of a t-test when :

(1) The population variance is known, and the sample size is large

(2) The sample size is less than 30

(3) The data is ordinal

(4) The population variance is unknown

7. In a normal distribution, approximately what percentage of data falls within one standard deviation of the mean ?

(1) 50% (2) 68%

(3) 95% (4) 99%

Scanned with CamScanner

8. Which measure of central tendency is most affected by extreme values (outliers) ?

(1) Median
(2) Range
(3) Mode
(4) Mean

9. Which distribution is used to model the number of successes in a fixed number of independent trials with two possible outcomes ?

(1) Normal
(2) Poisson
(3) Binomials
(4) Exponential

10. 'Inferential Statistics' are used to :

(1) Make predictions about the population
(2) Collect data
(3) Draw graphs
(4) Describe sample

11. 'Mean, Median, Mode' are measures of :

(1) Dispersion
(2) Central Tendency
(3) Probability
(4) Sampling

Scanned with CamScanner

12. In research involving human subjects incapable of giving informed consent, it must be obtained from :

(1) The principal investigator

(2) A legally authorised representative

(3) The ethics committee head alone

(4) No consent is needed

13. According to the Declaration of Helsinki, unproven interventions in clinical practice may be used only when :

(1) Approved by marketing managers

(2) Proven interventions do not exist or have been ineffective and informed consent is obtained

(3) The patient cannot give consent

(4) Recommended by animal experiment results alone

14. The Declaration of Helsinki was developed and promulgated by which global organisation ?

(1) World Health Organisation (WHO)

(2) World Medical Association (WMA)

(3) United Nations Educational, Scientific and Cultural Organisation (UNESCO)

(4) Food and Drug Administration (FDA)

Scanned with CamScanner

15. Scatter Plot shows the :

(1) Various errors

(2) Mean

(3) Correlation between two variables

(4) None of the above

16. Modern Language Association (MLA) is a citation style often used in the field of :

(1) Medicines

(2) Mathematics

(3) Science

(4) Literatures\Humanities

17. 'Ibid.' is used in footnotes to mean :

(1) For example

(2) Incorrect sentence

(3) In the same place

(4) Not here

18. APA citation style stands for :

(1) American Paper Association

(2) American Psychological Association

(3) All Paper Art

(4) Annual Paper Audit

Scanned with CamScanner

19. A 'Null Hypothesis' states :

(1) There is a difference

(2) The theory is false

(3) There is no significant difference

(4) The theory is true

20. Snowball sampling, a non-probability sampling technique in research, is used for :

(1) Hard-to-reach populations

(2) Large populations

(3) Census

(4) Random groups

21. Ethical considerations mean avoiding :

(1) Hard work

(2) Using a computer and Machine learning

(3) Library visits

(4) Harm to participants

Scanned with CamScanner

22. Which of the following is an acceptable way to build upon your own previously published methodology in a new paper ?

(1) Copy and paste the entire method section word-for-word without mentioning the source

(2) Paraphrase the description and explicitly cite your previous publication where the method was first detailed

(3) Claim that the method was invented entirely by another researcher

(4) Omit the methodology section completely

23. The recommended light-dark cycle for standard laboratory animal housing rooms is generally :

(1) 8 hours light and 16 hours dark

(2) Continuous 24-hour light

(3) 18 hours light and 6 hours dark

(4) 12 hours light and 12 hours dark

24. Which committee in an institution must approve all proposals involving experimental animals before studies begin ?

(1) Institutional Ethics Committee (IEC)

(2) Institutional Animal Ethics Committee (IAEC)

(3) Biosafety Committee

(4) CPCSEA Quality Control Cell

Scanned with CamScanner

25. The "3Rs" principle in animal studies represents :

(1) Replacement, Reduction, Refinement

(2) Research, Review, Repeat

(3) Randomisation, Reiteration, Removal

(4) Restraint, Recovery, Rehabilitation

26. The 'Survey Method' is most commonly associated with :

(1) Experimental research (2) Case study

(3) Descriptive research (4) Historical research

27. In medical ethics, providing full, truthful information regarding diagnosis and prognosis to a patient is termed as :

(1) Truth-telling (Veracity)

(2) Referral

(3) Fatality management

(4) Autonomy

28. Which design helps to minimise subject-related variability by making each subject act as their own control ?

(1) Parallel design (2) Crossover design

(3) Cohort design (4) Factorial design

Scanned with CamScanner

29. Which characteristic ensures research can be repeated by others ?

(1) Replicability

(2) Subjectivity

(3) Complexity

(4) Ambiguity

30. Validity in research refers to :

(1) Consistency

(2) Maximum speed

(3) Accuracy/Measuring what is intended

(4) None of the above

31. Observational research is best for :

(1) Testing chemicals

(2) Analysing census data

(3) Studying behaviour in real-time

(4) Studying past events

32. Longitudinal research involves :

(1) Study at one point in time

(2) Repeated study over time

(3) Study of logs

(4) Study of distance

Scanned with CamScanner

33. The term 'degrees of freedom' in a *t*-test is generally related to :

(1) The p-value

(2) The standard deviation

(3) The mean

(4) The sample size

34. Which test would you use to see if the mean height of men is significantly different from the mean height of women ?

(1) Paired *t*-test

(2) Pearson correlation

(3) Independent samples t-test

(4) Chi-square

35. The non-parametric equivalent of the independent t-test is the :

(1) Wilcoxon Signed-Rank Test

(2) Kruskal-Wallis Test

(3) Mann-Whitney U Test

(4) Friedman Test

36. Which of the following is the non-parametric version of Pearson's correlation ?

(1) Multiple Regression

(2) Spearman's Rank Correlation

(3) Partial Correlation

(4) Linear Correlation

Scanned with CamScanner

37. A Type I error occurs when :

(1) We accept a false null hypothesis

(2) We reject a true null hypothesis

(3) The p-value is greater than 0.05

(4) The sample size is too large

38. A correlation coefficient of –0.95 indicates a :

(1) Strong negative relationship

(2) Weak positive relationship

(3) No relationship

(4) Strong positive relationship

39. Research contributes to the 'Body of Knowledge' by :

(1) Deleting old facts

(2) Validating or refuting theories

(3) Promoting the researcher

(4) None of the above

Scanned with CamScanner

40. Standard statistical power $(1 - \beta)$ in clinical study design is generally targeted at :

(1) 10% to 20%
(2) 50%
(3) 80% to 90%
(4) 100%

41. Active termination of a patient's life by a physician to end severe suffering, performed at the patient's explicit request, is called :

(1) Passive euthanasia
(2) Voluntary active euthanasia
(3) Non-voluntary euthanasia
(4) Palliative sedation

42. Which factor relates to the 'Cost' of research ?

(1) Interest
(2) Novelty
(3) Financial Resources
(4) Relevance

43. A small group meeting for intensive discussion is a :

(1) Seminar
(2) Conference
(3) Both (1) and (2)
(4) None of these

Scanned with CamScanner

44. What is the primary distinguishing feature of a cohort study ?

(1) It compares individuals with a disease to those without the disease to look back at past exposures.

(2) It groups participants based on their exposure status and follows them forward over time to observe the development of an outcome.

(3) It randomly assigns participants to experimental and control groups.

(4) It measures exposure and outcome at a single, exact point in time.

45. Quota sampling technique is a type of :

(1) Scientific method

(2) Probability method

(3) Non-probability method

(4) Random method

46. Any variable other than the independent variable that can influence the dependent variable and potentially confound the results of a study is known as :

(1) Extraneous variables

(2) Dependent variable

(3) Confounding variable

(4) Independent variable

Scanned with CamScanner

47. Focused Group Discussion (FGD) is :

(1) Random

(2) Statistical

(3) Quantitative

(4) Qualitative

48. Which of the following is the square root of the variance ?

(1) Range

(2) Standard deviation

(3) Quartile deviation

(4) Mean deviation

49. If two events are mutually exclusive, the probability of both occurring simultaneously is :

(1) 0

(2) 1

(3) 0.5

(4) None of these

50. An Ogive is a :

(1) Bar chart

(2) Cumulative frequency graph

(3) Pie chart

(4) None of the above

Scanned with CamScanner

51. Which of the following nuclei has a spin property and is NMR active ?

(1) $^{12}C_6$

(2) $^{16}O_8$

(3) $^{14}N_7$

(4) $^{40}Ca_{20}$

52. Intermolecular hydrogen bonding in alcohols causes which type of O-H stretching band in an IR spectrum ?

(1) Broader and lower-frequency stretching

(2) Sharper and higher-frequency stretching

(3) No change in stretching

(4) None of the above

53. According to Woodward-Fieser rules, what is the base value for a homoannular conjugated diene system ?

(1) 215 nm

(2) 253 nm

(3) 245 nm

(4) 275 nm

54. What effect does changing from a non-polar solvent to a polar solvent typically have on the $\pi \rightarrow \pi^*$ transition band in UV-Visible spectroscopy ?

(1) Hyperchromic shift

(2) Bathochromic shift (red shift)

(3) Hypsochromic shift (blue shift)

(4) Hypochromic shift

Scanned with CamScanner

55. In which spectroscopy technique is tetramethylsilane (TMS) used as the primary reference substance ?

(1) Nuclear Magnetic Resonance (NMR) Spectroscopy

(2) Infrared (IR) Spectroscopy

(3) Ultraviolet-Visible (UV-Vis) Spectroscopy

(4) Mass Spectrometry (MS)

56. What does the base peak represent in a mass spectrum of any sample ?

(1) The peak with the lowest mass-to-charge ratio

(2) Ion with the greatest relative abundance

(3) Both (1) and (2)

(4) None of the above

57. Which parameter quantifies the efficiency of a chromatographic column based on plate height ?

(1) Separation factor (α)

(2) Retention factor (κ')

(3) Resolution (R_s)

(4) Height equivalent to a theoretical plate (HETP)

Scanned with CamScanner

58. In ion-exchange chromatography, which type of stationary phase is used to separate cations ?

(1) Unmodified silica gel

(2) Cross-linked dextran gel

(3) Acidic cation exchange

(4) Basic anion exchange

59. What is the primary underlying principle of paper chromatography ?

(1) Adsorption chromatography

(2) Ion exchange chromatography

(3) Partition chromatography

(4) Size exclusion chromatography

60. In Infrared (IR) Spectroscopy, the range of the carbonyl group shows the stretching frequency is :

(1) 1650-1800 cm^{-1}

(2) 1100-2100 cm^{-1}

(3) 3000-3500 cm^{-1}

(4) 2200-3900 cm^{-1}

Scanned with CamScanner

61. The physical defect of a tablet which is characterised as unequal distribution of colour on the surface of a tablet is known as :

(1) Picking
(2) Capping
(3) Lamination
(4) Mottling

62. The Limulus Amebocyte Lysate (LAL) test is used for parenteral quality control to detect which of the following contamination ?

(1) Particulate matter
(2) Isotonicity level
(3) Pyrogen
(4) Virus

63. According to the Biopharmaceutical Classification System (BCS), high-solubility and low-permeability drugs are classified into which type of class ?

(1) Class 1
(2) Class 4
(3) Class 2
(4) Class 3

64. Which component of a Transdermal Drug Delivery System (TDDS) controls the rate of release of the drug into the systemic circulation in rate-controlling membrane systems ?

(1) Backing layer
(2) Polymer matrix or rate-controlling membrane
(3) Release liner
(4) Pressure-sensitive adhesive

Scanned with CamScanner

65. In preformulation studies, a powder with an Angle of Repose between 45°–50° exhibits which type of flow ?

(1) Excellent
(2) Very Poor
(3) Very Good
(4) Passable

66. According to the Indian Pharmacopoeia (IP), Simple Syrup contains _____ sucrose dissolved in purified water.

(1) 66.7% w/w
(2) 66.7% w/v
(3) 85% w/w
(4) 85% w/v

67. In soft gelatin capsule shell manufacturing, glycerol is added as a plasticiser to enhance which capsule feature ?

(1) Preventing microbial growth
(2) Solubility in gastric fluid
(3) Flexibility and elasticity
(4) Opacity against UV light

68. In the evaluation of suspensions, what value of sedimentation volume (F) is typical for a stable flocculated suspension where the volume of sediment equals the original total volume ?

(1) $F < 0$
(2) $F > 10$
(3) $F = 1.0$
(4) $F = 0.001$

Scanned with CamScanner

69. Which suppository base exhibits a sharp melting point at 37°C temperature and requires temperature control during preparation to prevent transformation into unstable polymorphic forms ?

(1) Cocoa butter

(2) Polyethene glycol (PEG)

(3) Glycerinated gelatin

(4) None of the above

70. What type of degradation reaction in drug stability testing involves the cleavage of chemical bonds by reaction with water molecules, generally seen in esters and amides ?

(1) Racemisation

(2) Oxidation

(3) Hydrolysis

(4) Reduction

71. Which type of drug-receptor interaction is considered the strongest under physiological conditions ?

(1) Covalent interactions

(2) Ionic interactions

(3) Van der Waals interactions

(4) Hydrogen interactions

Scanned with CamScanner

72. Methyl derivative of morphine opioids is known as :

(1) Heroin
(2) Thebaine
(3) Naloxone
(4) Codeine

73. Which compound is used in benzodiazepine poisoning as first aid ?

(1) Barbiturates
(2) Flumazenil
(3) Carbamazepine
(4) Valproic acid

74. Which core nucleus is essential for the pharmacological activity of cephalosporins ?

(1) Thiazolidine ring
(2) Thiazine ring
(3) β-lactam ring
(4) Lactone ring

75. Which of the following anti-tubercular drugs contain a pyridine ring nucleus as core ?

(1) Isoniazid
(2) Ethambutol
(3) Both (1) and (2)
(4) None of these

76. The specific antidote and reversal agent in the acute overdose or poisoning of opioids is known as :

(1) Naloxone
(2) Norepinephrine
(3) Acetylcholine
(4) Phenytoin

Scanned with CamScanner

77. An equimolar mixture of two optical enantiomers that exhibits an optical rotation of zero is known as :

(1) Mesocompound
(2) Racemic Mixture
(3) Enantiomer
(4) Diastereomer

78. What is the main purpose of converting a polar drug into a lipophilic prodrug such as an ester derivative ?

(1) To decrease its oral bioavailability
(2) To enhance permeability across biological membranes
(3) To increase its binding towards blood albumin protein
(4) None of the above

79. Insulin is a classic example of which type of receptor ?

(1) G-protein coupled receptor GPCR
(2) Ligand-gated ion channels
(3) Tyrosine kinase-linked receptor
(4) Nuclear receptor

80. Two pairs of enantiomers are separated by which physical properties ?

(1) Melting and Boiling point
(2) Solubility in a solvent
(3) Ability to rotate the plane of polarised light in opposite directions
(4) Molecular weight

Scanned with CamScanner

81. Which of the following is *not* an example of CYP3A4 Inducers ?

(1) Rifampicin
(2) Carbamazepine
(3) Phenytoin
(4) Paracetamol

82. Which of the following agents act as choline reuptake inhibitors ?

(1) Glutamate
(2) Hemicholinium
(3) Acetylcholine
(4) Catechols

83. Which of the following administration route/dosage forms has 100% bioavailability ?

(1) Oral Route
(2) Intravenous (IV)
(3) Intramuscular
(4) Transdermal Patch

84. Unusual, Unexpected and abnormal drug response that is different from its known pharmacological effect and occurs in a small, genetically susceptible population known as :

(1) Hypersensitivity
(2) Teratogenicity
(3) Idiosyncrasy
(4) Carciogenicity

85. Which of the following drugs is a classic example of zero-order elimination kinetics at therapeutic level ?

(1) Phenytoin
(2) Propranolol
(3) Omeprazole
(4) Verapamil

Scanned with CamScanner

86. Which of the following acts as a natural receptor for the glutamate neurotransmitter ?

(1) μ receptor
(2) muscarinic receptor
(3) NMDA receptor
(4) α receptor

87. Which of the following agents increase the duration of opening of the GABA channel ?

(1) Isoniazid
(2) Benzodiazepine
(3) Cimetidine
(4) Barbiturates

88. Range for acute toxicity studies in preclinical animal screening for a single administered dose is :

(1) 14 days
(2) 90 days
(3) 120 days
(4) 54 days

89. Which of the following drug has a narrower therapeutic index ?

(1) Digoxin
(2) Aspirin
(3) Cetirizine
(4) Ethambutol

90. Which of the following diseases is known for severe dopamine deficiency ?

(1) Polycystic ovarian disease (PCOS)
(2) Parkinson disease
(3) Arrhythmia
(4) Angina pectoris

Scanned with CamScanner

91. Organoleptic evaluation of natural drugs is described as :

(1) Preclinical Screening

(2) Quantitative estimation using HPLC

(3) Evaluation using sensory characteristics

(4) Microbial testing

92. In pharmacognosy and quantitative microscopy, the standard benchmark size and count for a Lycopodium is :

(1) 25 µm and 94000

(2) 30 µm and 84000

(3) 50 µm and 50000

(4) 100 µm and 10000

93. Glandular trichomes are used as a diagnostic feature present in which of the following natural compounds ?

(1) Senna leaf

(2) Nux vomica

(3) Gossypium hirsutum

(4) Mentha piperita

94. Anisocytic stomata are the characteristic feature belonging to which family of natural products ?

(1) Liliaceae

(2) Solanacea

(3) Rubiaceae

(4) None of these

95. What is the primary role of fractionation in phytochemical processing ?

(1) Measuring leaf constants and palisade ratios

(2) Counting spores under a microscope

(3) Evaluating acute animal toxicity

(4) Separating groups of phytoconstituents based on polarity

Scanned with CamScanner

96. What is a key advantage of Microwave-Assisted Extraction (MAE) in phytochemistry ?

(1) Reduced extraction time

(2) Lower solvent consumption using microwave energy

(3) Both (1) and (2)

(4) None of the above

97. What is the principal application of Flash column chromatography in phytochemical studies ?

(1) Identification of crude drug adulteration via visual inspection

(2) Purification of complex plant extracts

(3) Permanent conversion of active constituents into synthetic drugs

(4) None of the above

98. In vitro assays such as disc diffusion or broth microdilution methods in phytochemical studies are used for :

(1) Hepatic studies

(2) Antimicrobial studies

(3) Anti-epileptic studies

(4) Diuretic activity

99. Keller-Kiliani Test is used to identify which of the following natural compound ?

(1) Digitalis

(2) Dhatura

(3) Senna

(4) Rauwolfia

100. Picrorhiza kurroa is primarily used as :

(1) Analgesics

(2) Hepatoprotective

(3) Diuretic

(4) Anti-microbial

Scanned with CamScanner

Total No. of Printed Pages : 26

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

PH.D.-EE-October, 2026 (Pharmaceutical Sciences)

B

100034

Sr. No. .....

Time : 1¼ Hours | Max. Marks : 100 | Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate) (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue <u>BALL POINT PEN</u> of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Scanned with CamScanner

1. In research involving human subjects incapable of giving informed consent, it must be obtained from :

(1) The principal investigator

(2) A legally authorised representative

(3) The ethics committee head alone

(4) No consent is needed

2. According to the Declaration of Helsinki, unproven interventions in clinical practice may be used only when :

(1) Approved by marketing managers.

(2) Proven interventions do not exist or have been ineffective and informed consent is obtained

(3) The patient cannot give consent

(4) Recommended by animal experiment results alone

3. The Declaration of Helsinki was developed and promulgated by which global organisation ?

(1) World Health Organisation (WHO)

(2) World Medical Association (WMA)

(3) United Nations Educational, Scientific and Cultural Organisation (UNESCO)

(4) Food and Drug Administration (FDA)

Scanned with CamScanner

4. Scatter Plot shows the :

(1) Various errors

(2) Mean

(3) Correlation between two variables

(4) None of the above

5. Modern Language Association (MLA) is a citation style often used in the field of :

(1) Medicines

(2) Mathematics

(3) Science

(4) Literatures\Humanities

6. 'Ibid.' is used in footnotes to mean :

(1) For example

(2) Incorrect sentence

(3) In the same place

(4) Not here

7. APA citation style stands for :

(1) American Paper Association

(2) American Psychological Association

(3) All Paper Art

(4) Annual Paper Audit

Scanned with CamScanner

8. A 'Null Hypothesis' states :

(1) There is a difference

(2) The theory is false

(3) There is no significant difference

(4) The theory is true

9. Snowball sampling, a non-probability sampling technique in research, is used for :

(1) Hard-to-reach populations

(2) Large populations

(3) Census

(4) Random groups

10. Ethical considerations mean avoiding :

(1) Hard work

(2) Using a computer and Machine learning

(3) Library visits

(4) Harm to participants

Scanned with CamScanner

11. Which of the following is an acceptable way to build upon your own previously published methodology in a new paper ?

(1) Copy and paste the entire method section word-for-word without mentioning the source

(2) Paraphrase the description and explicitly cite your previous publication where the method was first detailed

(3) Claim that the method was invented entirely by another researcher

(4) Omit the methodology section completely

12. The recommended light-dark cycle for standard laboratory animal housing rooms is generally :

(1) 8 hours light and 16 hours dark

(2) Continuous 24-hour light

(3) 18 hours light and 6 hours dark

(4) 12 hours light and 12 hours dark

13. Which committee in an institution must approve all proposals involving experimental animals before studies begin ?

(1) Institutional Ethics Committee (IEC)

(2) Institutional Animal Ethics Committee (IAEC)

(3) Biosafety Committee

(4) CPCSEA Quality Control Cell

Scanned with CamScanner

14. The "3Rs" principle in animal studies represents :

(1) Replacement, Reduction, Refinement

(2) Research, Review, Repeat

(3) Randomisation, Reiteration, Removal.

(4) Restraint, Recovery, Rehabilitation

15. The 'Survey Method' is most commonly associated with :

(1) Experimental research

(2) Case study

(3) Descriptive research

(4) Historical research

16. In medical ethics, providing full, truthful information regarding diagnosis and prognosis to a patient is termed as :

(1) Truth-telling (Veracity)

(2) Referral

(3) Fatality management

(4) Autonomy

17. Which design helps to minimise subject-related variability by making each subject act as their own control ?

(1) Parallel design

(2) Crossover design

(3) Cohort design

(4) Factorial design

Scanned with CamScanner

18. Which characteristic ensures research can be repeated by others ? 2

(1) Replicability (2) Subjectivity

(3) Complexity (4) Ambiguity

19. Validity in research refers to : 2

(1) Consistency

(2) Maximum speed

(3) Accuracy/Measuring what is intended

(4) None of the above

20. Observational research is best for : 2

(1) Testing chemicals

(2) Analysing census data

(3) Studying behaviour in real-time

(4) Studying past events

21. Longitudinal research involves : 2

(1) Study at one point in time (2) Repeated study over time

(3) Study of logs (4) Study of distance

Scanned with CamScanner

22. The term 'degrees of freedom' in a *t*-test is generally related to :

(1) The p-value

(2) The standard deviation

(3) The mean

(4) The sample size

23. Which test would you use to see if the mean height of men is significantly different from the mean height of women ?

(1) Paired *t*-test

(2) Pearson correlation

(3) Independent samples t-test

(4) Chi-square

24. The non-parametric equivalent of the independent t-test is the :

(1) Wilcoxon Signed-Rank Test

(2) Kruskal-Wallis Test

(3) Mann-Whitney U Test

(4) Friedman Test

25. Which of the following is the non-parametric version of Pearson's correlation ?

(1) Multiple Regression

(2) Spearman's Rank Correlation

(3) Partial Correlation

(4) Linear Correlation

Scanned with CamScanner

26. A Type I error occurs when :

(1) We accept a false null hypothesis

(2) We reject a true null hypothesis

(3) The p-value is greater than 0.05

(4) The sample size is too large

27. A correlation coefficient of –0.95 indicates a :

(1) Strong negative relationship

(2) Weak positive relationship

(3) No relationship

(4) Strong positive relationship

28. Research contributes to the 'Body of Knowledge' by :

(1) Deleting old facts

(2) Validating or refuting theories

(3) Promoting the researcher

(4) None of the above

Scanned with CamScanner

29. Standard statistical power (1 – β) in clinical study design is generally targeted at :

(1) 10% to 20%

(2) 50%

(3) 80% to 90%

(4) 100%

30. Active termination of a patient's life by a physician to end severe suffering, performed at the patient's explicit request, is called :

(1) Passive euthanasia

(2) Voluntary active euthanasia

(3) Non-voluntary euthanasia

(4) Palliative sedation

31. Which factor relates to the 'Cost' of research ?

(1) Interest

(2) Novelty

(3) Financial Resources

(4) Relevance

32. A small group meeting for intensive discussion is a :

(1) Seminar

(2) Conference

(3) Both (1) and (2)

(4) None of these

Scanned with CamScanner

33. What is the primary distinguishing feature of a cohort study ?

(1) It compares individuals with a disease to those without the disease to look back at past exposures.

(2) It groups participants based on their exposure status and follows them forward over time to observe the development of an outcome.

(3) It randomly assigns participants to experimental and control groups.

(4) It measures exposure and outcome at a single, exact point in time.

34. Quota sampling technique is a type of :

(1) Scientific method

(2) Probability method

(3) Non-probability method

(4) Random method

35. Any variable other than the independent variable that can influence the dependent variable and potentially confound the results of a study is known as :

(1) Extraneous variables

(2) Dependent variable

(3) Confounding variable

(4) Independent variable

Scanned with CamScanner

36. Focused Group Discussion (FGD) is :

(1) Random

(2) Statistical

(3) Quantitative

(4) Qualitative

37. Which of the following is the square root of the variance ?

(1) Range

(2) Standard deviation

(3) Quartile deviation

(4) Mean deviation

38. If two events are mutually exclusive, the probability of both occurring simultaneously is :

(1) 0 (2) 1

(3) 0.5 (4) None of these

39. An Ogive is a :

(1) Bar chart

(2) Cumulative frequency graph

(3) Pie chart

(4) None of the above

Scanned with CamScanner

40. Which of the following best defines research ?

(1) A random search for facts

(2) An intuitive guess

(3) Copying existing data

(4) A systematic effort to gain new knowledge

41. The goal of 'Basic Research' is primarily :

(1) Immediate application

(2) Expanding theoretical knowledge

(3) Solving a business crisis

(4) Political gain

42. Self-plagiarism is :

(1) Reusing one's own published work without credit

(2) Failing to cite a co-author on a manuscript

(3) Submitting an article to a journal that rejects it

(4) None of the above

Scanned with CamScanner

43. Analysis of Variance (ANOVA) is used to compare the means of :

(1) Exactly two groups

(2) Three or more groups

(3) One group against a constant

(4) None of the above

44. The 'Goodness of Fit' test is a type of :

(1) t-test

(2) ANOVA

(3) Chi-square test

(4) Z-test

45. A Z-test is typically used instead of a t-test when :

(1) The population variance is known, and the sample size is large

(2) The sample size is less than 30

(3) The data is ordinal

(4) The population variance is unknown

46. In a normal distribution, approximately what percentage of data falls within one standard deviation of the mean ?

(1) 50%

(2) 68%

(3) 95%

(4) 99%

Scanned with CamScanner

47. Which measure of central tendency is most affected by extreme values (outliers) ?

(1) Median
(2) Range
(3) Mode
(4) Mean

48. Which distribution is used to model the number of successes in a fixed number of independent trials with two possible outcomes ?

(1) Normal
(2) Poisson
(3) Binomials
(4) Exponential

49. 'Inferential Statistics' are used to :

(1) Make predictions about the population
(2) Collect data
(3) Draw graphs
(4) Describe sample

50. 'Mean, Median, Mode' are measures of :

(1) Dispersion
(2) Central Tendency
(3) Probability
(4) Sampling

Scanned with CamScanner

51. The physical defect of a tablet which is characterised as unequal distribution of colour on the surface of a tablet is known as :

(1) Picking

(2) Capping

(3) Lamination

(4) Mottling

52. The Limulus Amebocyte Lysate (LAL) test is used for parenteral quality control to detect which of the following contamination ?

(1) Particulate matter

(2) Isotonicity level

(3) Pyrogen

(4) Virus

53. According to the Biopharmaceutical Classification System (BCS), high-solubility and low-permeability drugs are classified into which type of class ?

(1) Class 1

(2) Class 4

(3) Class 2

(4) Class 3

54. Which component of a Transdermal Drug Delivery System (TDDS) controls the rate of release of the drug into the systemic circulation in rate-controlling membrane systems ?

(1) Backing layer

(2) Polymer matrix or rate-controlling membrane

(3) Release liner

(4) Pressure-sensitive adhesive

Scanned with CamScanner

55. In preformulation studies, a powder with an Angle of Repose between 45°–50° exhibits which type of flow ?

(1). Excellent
(2) Very Poor
(3) Very Good
(4) Passable

56. According to the Indian Pharmacopoeia (IP), Simple Syrup contains _____ sucrose dissolved in purified water.

(1) 66.7% w/w
(2) 66.7% w/v
(3) 85% w/w
(4) 85% w/v

57. In soft gelatin capsule shell manufacturing, glycerol is added as a plasticiser to enhance which capsule feature ?

(1). Preventing microbial growth
(2) Solubility in gastric fluid
(3) Flexibility and elasticity
(4) Opacity against UV light

58. In the evaluation of suspensions, what value of sedimentation volume (F) is typical for a stable flocculated suspension where the volume of sediment equals the original total volume ?

(1) $F < 0$
(2) $F > 10$
(3) $F = 1.0$
(4) $F = 0.001$

Scanned with CamScanner

59. Which suppository base exhibits a sharp melting point at 37°C temperature and requires temperature control during preparation to prevent transformation into unstable polymorphic forms ?

(1) Cocoa butter

(2) Polyethene glycol (PEG)

(3) Glycerinated gelatin

(4) None of the above

60. What type of degradation reaction in drug stability testing involves the cleavage of chemical bonds by reaction with water molecules, generally seen in esters and amides ?

(1) Racemisation

(2) Oxidation

(3) Hydrolysis

(4) Reduction

61. Which type of drug-receptor interaction is considered the strongest under physiological conditions ?

(1) Covalent interactions

(2) Ionic interactions

(3) Van der Waals interactions

(4) Hydrogen interactions

Scanned with CamScanner

62. Methyl derivative of morphine opioids is known as :

(1) Heroin
(2) Thebaine
(3) Naloxone
(4) Codeine

63. Which compound is used in benzodiazepine poisoning as first aid ?

(1) Barbiturates
(2) Flumazenil
(3) Carbamazepine
(4) Valproic acid

64. Which core nucleus is essential for the pharmacological activity of cephalosporins ?

(1) Thiazolidine ring
(2) Thiazine ring
(3) β-lactam ring
(4) Lactone ring

65. Which of the following anti-tubercular drugs contain a pyridine ring nucleus as core ?

(1) Isoniazid
(2) Ethambutol
(3) Both (1) and (2)
(4) None of these

66. The specific antidote and reversal agent in the acute overdose or poisoning of opioids is known as :

(1) Naloxone
(2) Norepinephrine
(3) Acetylcholine
(4) Phenytoin

Scanned with CamScanner

67. An equimolar mixture of two optical enantiomers that exhibits an optical rotation of zero is known as :

(1) Mesocompound
(2) Racemic Mixture
(3) Enantiomer
(4) Diastereomer

68. What is the main purpose of converting a polar drug into a lipophilic prodrug such as an ester derivative ?

(1) To decrease its oral bioavailability
(2) To enhance permeability across biological membranes
(3) To increase its binding towards blood albumin protein
(4) None of the above

69. Insulin is a classic example of which type of receptor ?

(1) G-protein coupled receptor GPCR
(2) Ligand-gated ion channels
(3) Tyrosine kinase-linked receptor
(4) Nuclear receptor

70. Two pairs of enantiomers are separated by which physical properties ?

(1) Melting and Boiling point
(2) Solubility in a solvent
(3) Ability to rotate the plane of polarised light in opposite directions
(4) Molecular weight

Scanned with CamScanner

71. Which of the following is *not* an example of CYP3A4 Inducers ?

(1) Rifampicin
(2) Carbamazepine
(3) Phenytoin
(4) Paracetamol

72. Which of the following agents act as choline reuptake inhibitors ?

(1) Glutamate
(2) Hemicholinium
(3) Acetylcholine
(4) Catechols

73. Which of the following administration route/dosage forms has 100% bioavailability ?

(1) Oral Route
(2) Intravenous (IV)
(3) Intramuscular
(4) Transdermal Patch

74. Unusual, Unexpected and abnormal drug response that is different from its known pharmacological effect and occurs in a small, genetically susceptible population known as :

(1) Hypersensitivity
(2) Teratogenicity
(3) Idiosyncrasy
(4) Carciogenicity

75. Which of the following drugs is a classic example of zero-order elimination kinetics at therapeutic level ?

(1) Phenytoin
(2) Propranolol
(3) Omeprazole
(4) Verapamil

Scanned with CamScanner

76. Which of the following acts as a natural receptor for the glutamate neurotransmitter ?

(1) μ receptor
(2) muscarinic receptor
(3) NMDA receptor
(4) α receptor

77. Which of the following agents increase the duration of opening of the GABA channel ?

(1) Isoniazid
(2) Benzodiazepine
(3) Cimetidine
(4) Barbiturates

78. Range for acute toxicity studies in preclinical animal screening for a single administered dose is :

(1) 14 days
(2) 90 days
(3) 120 days
(4) 54 days

79. Which of the following drug has a narrower therapeutic index ?

(1) Digoxin
(2) Aspirin
(3) Cetirizine
(4) Ethambutol

80. Which of the following diseases is known for severe dopamine deficiency ?

(1) Polycystic ovarian disease (PCOS)
(2) Parkinson disease
(3) Arrhythmia
(4) Angina pectoris

Scanned with CamScanner

81. Organoleptic evaluation of natural drugs is described as :

(1) Preclinical Screening

(2) Quantitative estimation using HPLC

(3) Evaluation using sensory characteristics

(4) Microbial testing

82. In pharmacognosy and quantitative microscopy, the standard benchmark size and count for a Lycopodium is :

(1) 25 µm and 94000

(2) 30 µm and 84000

(3) 50 µm and 50000

(4) 100 µm and 10000

83. Glandular trichomes are used as a diagnostic feature present in which of the following natural compounds ?

(1) Senna leaf

(2) Nux vomica

(3) Gossypium hirsutum

(4) Mentha piperita

84. Anisocytic stomata are the characteristic feature belonging to which family of natural products ?

(1) Liliaceae

(2) Solanacea

(3) Rubiaceae

(4) None of these

85. What is the primary role of fractionation in phytochemical processing ?

(1) Measuring leaf constants and palisade ratios

(2) Counting spores under a microscope

(3) Evaluating acute animal toxicity

(4) Separating groups of phytoconstituents based on polarity

Scanned with CamScanner

86. What is a key advantage of Microwave-Assisted Extraction (MAE) in phytochemistry ?

(1) Reduced extraction time

(2) Lower solvent consumption using microwave energy

(3) Both (1) and (2)

(4) None of the above

87. What is the principal application of Flash column chromatography in phytochemical studies ?

(1) Identification of crude drug adulteration via visual inspection

(2) Purification of complex plant extracts

(3) Permanent conversion of active constituents into synthetic drugs

(4) None of the above

88. In vitro assays such as disc diffusion or broth microdilution methods in phytochemical studies are used for :

(1) Hepatic studies

(2) Antimicrobial studies

(3) Anti-epileptic studies

(4) Diuretic activity

89. Keller-Kiliani Test is used to identify which of the following natural compound ?

(1) Digitalis

(2) Dhatura

(3) Senna

(4) Rauwolfia

90. Picrorhiza kurroa is primarily used as :

(1) Analgesics

(2) Hepatoprotective

(3) Diuretic

(4) Anti-microbial

Scanned with CamScanner

91. Which of the following nuclei has a spin property and is NMR active ?

(1) $^{12}C_6$ (2) $^{16}O_8$

(3) $^{14}N_7$ (4) $^{40}Ca_{20}$

92. Intermolecular hydrogen bonding in alcohols causes which type of O-H stretching band in an IR spectrum ?

(1) Broader and lower-frequency stretching

(2) Sharper and higher-frequency stretching

(3) No change in stretching

(4) None of the above

93. According to Woodward-Fieser rules, what is the base value for a homoannular conjugated diene system ?

(1) 215 nm (2) 253 nm

(3) 245 nm (4) 275 nm

94. What effect does changing from a non-polar solvent to a polar solvent typically have on the $\pi \rightarrow \pi^*$ transition band in UV-Visible spectroscopy ?

(1) Hyperchromic shift

(2) Bathochromic shift (red shift)

(3) Hypsochromic shift (blue shift)

(4) Hypochromic shift

Scanned with CamScanner

95. In which spectroscopy technique is tetramethylsilane (TMS) used as the primary reference substance ?

(1) Nuclear Magnetic Resonance (NMR) Spectroscopy

(2) Infrared (IR) Spectroscopy

(3) Ultraviolet-Visible (UV-Vis) Spectroscopy

(4) Mass Spectrometry (MS)

96. What does the base peak represent in a mass spectrum of any sample ?

(1) The peak with the lowest mass-to-charge ratio

(2) Ion with the greatest relative abundance

(3) Both (1) and (2)

(4) None of the above

97. Which parameter quantifies the efficiency of a chromatographic column based on plate height ?

(1) Separation factor (α)

(2) Retention factor (κ')

(3) Resolution (R_s)

(4) Height equivalent to a theoretical plate (HETP)

Scanned with CamScanner

98. In ion-exchange chromatography, which type of stationary phase is used to separate cations ?

(1) Unmodified silica gel

(2) Cross-linked dextran gel

(3) Acidic cation exchange

(4) Basic anion exchange

99. What is the primary underlying principle of paper chromatography ?

(1) Adsorption chromatography

(2) Ion exchange chromatography

(3) Partition chromatography

(4) Size exclusion chromatography

100. In Infrared (IR) Spectroscopy, the range of the carbonyl group shows the stretching frequency is :

(1) 1650-1800 cm^{-1}

(2) 1100-2100 cm^{-1}

(3) 3000-3500 cm^{-1}

(4) 2200-3900 cm^{-1}

Scanned with CamScanner

Total No. of Printed Pages : 26

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

PH.D.-EE-October, 2026 (Pharmaceutical Sciences)

C

100035

Sr. No. .....

Time : 1¼ Hours **Max. Marks : 100** **Total Questions : 100**

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate) (Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Scanned with CamScanner

1. The "3Rs" principle in animal studies represents :

(1) Replacement, Reduction, Refinement

(2) Research, Review, Repeat

(3) Randomisation, Reiteration, Removal

(4) Restraint, Recovery, Rehabilitation

2. The 'Survey Method' is most commonly associated with :

(1) Experimental research (2) Case study

(3) Descriptive research (4) Historical research

3. In medical ethics, providing full, truthful information regarding diagnosis and prognosis to a patient is termed as :

(1) Truth-telling (Veracity)

(2) Referral

(3) Fatality management

(4) Autonomy

4. Which design helps to minimise subject-related variability by making each subject act as their own control ?

(1) Parallel design (2) Crossover design

(3) Cohort design (4) Factorial design

Scanned with CamScanner

5. Which characteristic ensures research can be repeated by others ?

(1) Replicability (2) Subjectivity

(3) Complexity (4) Ambiguity

6. Validity in research refers to :

(1) Consistency

(2) Maximum speed

(3) Accuracy/Measuring what is intended

(4) None of the above

7. Observational research is best for :

(1) Testing chemicals

(2) Analysing census data

(3) Studying behaviour in real-time

(4) Studying past events

8. Longitudinal research involves :

(1) Study at one point in time (2) Repeated study over time

(3) Study of logs (4) Study of distance

Scanned with CamScanner

9. The term 'degrees of freedom' in a *t*-test is generally related to :

(1) The p-value
(2) The standard deviation
(3) The mean
(4) The sample size

10. Which test would you use to see if the mean height of men is significantly different from the mean height of women ?

(1) Paired *t*-test
(2) Pearson correlation
(3) Independent samples t-test
(4) Chi-square

11. The non-parametric equivalent of the independent t-test is the :

(1) Wilcoxon Signed-Rank Test
(2) Kruskal-Wallis Test
(3) Mann-Whitney U Test
(4) Friedman Test

12. Which of the following is the non-parametric version of Pearson's correlation ?

(1) Multiple Regression
(2) Spearman's Rank Correlation
(3) Partial Correlation
(4) Linear Correlation

Scanned with CamScanner

13. A Type I error occurs when :

(1) We accept a false null hypothesis

(2) We reject a true null hypothesis

(3) The p-value is greater than 0.05

(4) The sample size is too large

14. A correlation coefficient of –0.95 indicates a :

(1) Strong negative relationship

(2) Weak positive relationship

(3) No relationship

(4) Strong positive relationship

15. Research contributes to the 'Body of Knowledge' by :

(1) Deleting old facts

(2) Validating or refuting theories

(3) Promoting the researcher

(4) None of the above

Scanned with CamScanner

16. Standard statistical power $(1 - \beta)$ in clinical study design is generally targeted at :

(1) 10% to 20%
(2) 50%
(3) 80% to 90%
(4) 100%

17. Active termination of a patient's life by a physician to end severe suffering, performed at the patient's explicit request, is called :

(1) Passive euthanasia
(2) Voluntary active euthanasia
(3) Non-voluntary euthanasia
(4) Palliative sedation

18. Which factor relates to the 'Cost' of research ?

(1) Interest
(2) Novelty
(3) Financial Resources
(4) Relevance

19. A small group meeting for intensive discussion is a :

(1) Seminar
(2) Conference
(3) Both (1) and (2)
(4) None of these

Scanned with CamScanner

20. What is the primary distinguishing feature of a cohort study ?

(1) It compares individuals with a disease to those without the disease to look back at past exposures.

(2) It groups participants based on their exposure status and follows them forward over time to observe the development of an outcome.

(3) It randomly assigns participants to experimental and control groups.

(4) It measures exposure and outcome at a single, exact point in time.

21. Quota sampling technique is a type of :

(1) Scientific method

(2) Probability method

(3) Non-probability method

(4) Random method

22. Any variable other than the independent variable that can influence the dependent variable and potentially confound the results of a study is known as :

(1) Extraneous variables

(2) Dependent variable

(3) Confounding variable

(4) Independent variable

Scanned with CamScanner

23. Focused Group Discussion (FGD) is :

(1) Random

(2) Statistical

(3) Quantitative

(4) Qualitative

24. Which of the following is the square root of the variance ?

(1) Range

(2) Standard deviation

(3) Quartile deviation

(4) Mean deviation

25. If two events are mutually exclusive, the probability of both occurring simultaneously is :

(1) 0 (2) 1

(3) 0.5 (4) None of these

26. An Ogive is a :

(1) Bar chart

(2) Cumulative frequency graph

(3) Pie chart

(4) None of the above

Scanned with CamScanner

27. Which of the following best defines research ?

(1) A random search for facts

(2) An intuitive guess

(3) Copying existing data

(4) A systematic effort to gain new knowledge

28. The goal of 'Basic Research' is primarily :

(1) Immediate application

(2) Expanding theoretical knowledge

(3) Solving a business crisis

(4) Political gain

29. Self-plagiarism is :

(1) Reusing one's own published work without credit

(2) Failing to cite a co-author on a manuscript

(3) Submitting an article to a journal that rejects it

(4) None of the above

Scanned with CamScanner

30. Analysis of Variance (ANOVA) is used to compare the means of :

(1) Exactly two groups

(2) Three or more groups

(3) One group against a constant

(4) None of the above

31. The 'Goodness of Fit' test is a type of :

(1) *t*-test (2) ANOVA

(3) Chi-square test (4) Z-test

32. A Z-test is typically used instead of a t-test when :

(1) The population variance is known, and the sample size is large

(2) The sample size is less than 30

(3) The data is ordinal

(4) The population variance is unknown

33. In a normal distribution, approximately what percentage of data falls within one standard deviation of the mean ?

(1) 50% (2) 68%

(3) 95% (4) 99%

Scanned with CamScanner

34. Which measure of central tendency is most affected by extreme values (outliers) ?

(1) Median
(2) Range
(3) Mode
(4) Mean

35. Which distribution is used to model the number of successes in a fixed number of independent trials with two possible outcomes ?

(1) Normal
(2) Poisson
(3) Binomials
(4) Exponential

36. 'Inferential Statistics' are used to :

(1) Make predictions about the population
(2) Collect data
(3) Draw graphs
(4) Describe sample

37. 'Mean, Median, Mode' are measures of :

(1) Dispersion
(2) Central Tendency
(3) Probability
(4) Sampling

Scanned with CamScanner

38. In research involving human subjects incapable of giving informed consent, it must be obtained from :

(1) The principal investigator

(2) A legally authorised representative

(3) The ethics committee head alone

(4) No consent is needed

39. According to the Declaration of Helsinki, unproven interventions in clinical practice may be used only when :

(1) Approved by marketing managers

(2) Proven interventions do not exist or have been ineffective and informed consent is obtained

(3) The patient cannot give consent

(4) Recommended by animal experiment results alone

40. The Declaration of Helsinki was developed and promulgated by which global organisation ?

(1) World Health Organisation (WHO)

(2) World Medical Association (WMA)

(3) United Nations Educational, Scientific and Cultural Organisation (UNESCO)

(4) Food and Drug Administration (FDA)

Scanned with CamScanner

41. Scatter Plot shows the :

(1) Various errors

(2) Mean

(3) Correlation between two variables

(4) None of the above

42. Modern Language Association (MLA) is a citation style often used in the field of :

(1) Medicines

(2) Mathematics

(3) Science

(4) Literatures\Humanities

43. 'Ibid.' is used in footnotes to mean :

(1) For example

(2) Incorrect sentence

(3) In the same place

(4) Not here

44. APA citation style stands for :

(1) American Paper Association

(2) American Psychological Association

(3) All Paper Art

(4) Annual Paper Audit

Scanned with CamScanner

45. A 'Null Hypothesis' states :

(1) There is a difference

(2) The theory is false

(3) There is no significant difference

(4) The theory is true

46. Snowball sampling, a non-probability sampling technique in research, is used for :

(1) Hard-to-reach populations

(2) Large populations

(3) Census

(4) Random groups

47. Ethical considerations mean avoiding :

(1) Hard work

(2) Using a computer and Machine learning

(3) Library visits

(4) Harm to participants

Scanned with CamScanner

48. Which of the following is an acceptable way to build upon your own previously published methodology in a new paper ?

(1) Copy and paste the entire method section word-for-word without mentioning the source

(2) Paraphrase the description and explicitly cite your previous publication where the method was first detailed

(3) Claim that the method was invented entirely by another researcher

(4) Omit the methodology section completely

49. The recommended light-dark cycle for standard laboratory animal housing rooms is generally :

(1) 8 hours light and 16 hours dark

(2) Continuous 24-hour light

(3) 18 hours light and 6 hours dark

(4) 12 hours light and 12 hours dark

50. Which committee in an institution must approve all proposals involving experimental animals before studies begin ?

(1) Institutional Ethics Committee (IEC)

(2) Institutional Animal Ethics Committee (IAEC)

(3) Biosafety Committee

(4) CPCSEA Quality Control Cell

Scanned with CamScanner

51. Which of the following is *not* an example of CYP3A4 Inducers ?

(1) Rifampicin
(2) Carbamazepine
(3) Phenytoin
(4) Paracetamol

52. Which of the following agents act as choline reuptake inhibitors ?

(1) Glutamate
(2) Hemicholinium
(3) Acetylcholine
(4) Catechols

53. Which of the following administration route/dosage forms has 100% bioavailability ?

(1) Oral Route
(2) Intravenous (IV)
(3) Intramuscular
(4) Transdermal Patch

54. Unusual, Unexpected and abnormal drug response that is different from its known pharmacological effect and occurs in a small, genetically susceptible population known as :

(1) Hypersensitivity
(2) Teratogenicity
(3) Idiosyncrasy
(4) Carciogenicity

55. Which of the following drugs is a classic example of zero-order elimination kinetics at therapeutic level ?

(1) Phenytoin
(2) Propranolol
(3) Omeprazole
(4) Verapamil

Scanned with CamScanner

56. Which of the following acts as a natural receptor for the glutamate neurotransmitter ?

(1) μ receptor
(2) muscarinic receptor
(3) NMDA receptor
(4) α receptor

57. Which of the following agents increase the duration of opening of the GABA channel ?

(1) Isoniazid
(2) Benzodiazepine
(3) Cimetidine
(4) Barbiturates

58. Range for acute toxicity studies in preclinical animal screening for a single administered dose is :

(1) 14 days
(2) 90 days
(3) 120 days
(4) 54 days

59. Which of the following drug has a narrower therapeutic index ?

(1) Digoxin
(2) Aspirin
(3) Cetirizine
(4) Ethambutol

60. Which of the following diseases is known for severe dopamine deficiency ?

(1) Polycystic ovarian disease (PCOS)
(2) Parkinson disease
(3) Arrhythmia
(4) Angina pectoris

Scanned with CamScanner

61. Organoleptic evaluation of natural drugs is described as :

(1) Preclinical Screening

(2) Quantitative estimation using HPLC

(3) Evaluation using sensory characteristics

(4) Microbial testing

62. In pharmacognosy and quantitative microscopy, the standard benchmark size and count for a Lycopodium is :

(1) 25 µm and 94000

(2) 30 µm and 84000

(3) 50 µm and 50000

(4) 100 µm and 10000

63. Glandular trichomes are used as a diagnostic feature present in which of the following natural compounds ?

(1) Senna leaf

(2) Nux vomica

(3) Gossypium hirsutum

(4) Mentha piperita

64. Anisocytic stomata are the characteristic feature belonging to which family of natural products ?

(1) Liliaceae

(2) Solanacea

(3) Rubiaceae

(4) None of these

65. What is the primary role of fractionation in phytochemical processing ?

(1) Measuring leaf constants and palisade ratios

(2) Counting spores under a microscope

(3) Evaluating acute animal toxicity

(4) Separating groups of phytoconstituents based on polarity

Scanned with CamScanner

66. What is a key advantage of Microwave-Assisted Extraction (MAE) in phytochemistry ?

(1) Reduced extraction time

(2) Lower solvent consumption using microwave energy

(3) Both (1) and (2)

(4) None of the above

67. What is the principal application of Flash column chromatography in phytochemical studies ?

(1) Identification of crude drug adulteration via visual inspection

(2) Purification of complex plant extracts

(3) Permanent conversion of active constituents into synthetic drugs

(4) None of the above

68. In vitro assays such as disc diffusion or broth microdilution methods in phytochemical studies are used for :

(1) Hepatic studies

(2) Antimicrobial studies

(3) Anti-epileptic studies

(4) Diuretic activity

69. Keller-Kiliani Test is used to identify which of the following natural compound ?

(1) Digitalis

(2) Dhatura

(3) Senna

(4) Rauwolfia

70. Picrorhiza kurroa is primarily used as :

(1) Analgesics

(2) Hepatoprotective

(3) Diuretic

(4) Anti-microbial

Scanned with CamScanner

71. Which of the following nuclei has a spin property and is NMR active ?

(1) $^{12}C_6$

(2) $^{16}O_8$

(3) $^{14}N_7$

(4) $^{40}Ca_{20}$

72. Intermolecular hydrogen bonding in alcohols causes which type of O-H stretching band in an IR spectrum ?

(1) Broader and lower-frequency stretching

(2) Sharper and higher-frequency stretching

(3) No change in stretching

(4) None of the above

73. According to Woodward-Fieser rules, what is the base value for a homoannular conjugated diene system ?

(1) 215 nm

(2) 253 nm

(3) 245 nm

(4) 275 nm

74. What effect does changing from a non-polar solvent to a polar solvent typically have on the $\pi \rightarrow \pi^*$ transition band in UV-Visible spectroscopy ?

(1) Hyperchromic shift

(2) Bathochromic shift (red shift)

(3) Hypsochromic shift (blue shift)

(4) Hypochromic shift

Scanned with CamScanner

75. In which spectroscopy technique is tetramethylsilane (TMS) used as the primary reference substance ?

(1) Nuclear Magnetic Resonance (NMR) Spectroscopy

(2) Infrared (IR) Spectroscopy

(3) Ultraviolet-Visible (UV-Vis) Spectroscopy

(4) Mass Spectrometry (MS)

76. What does the base peak represent in a mass spectrum of any sample ?

(1) The peak with the lowest mass-to-charge ratio

(2) Ion with the greatest relative abundance

(3) Both (1) and (2)

(4) None of the above

77. Which parameter quantifies the efficiency of a chromatographic column based on plate height ?

(1) Separation factor (α)

(2) Retention factor (κ')

(3) Resolution (R_s)

(4) Height equivalent to a theoretical plate (HETP)

Scanned with CamScanner

78. In ion-exchange chromatography, which type of stationary phase is used to separate cations ?

(1) Unmodified silica gel

(2) Cross-linked dextran gel

(3) Acidic cation exchange

(4) Basic anion exchange

79. What is the primary underlying principle of paper chromatography ?

(1) Adsorption chromatography

(2) Ion exchange chromatography

(3) Partition chromatography

(4) Size exclusion chromatography

80. In Infrared (IR) Spectroscopy, the range of the carbonyl group shows the stretching frequency is :

(1) 1650-1800 cm^{-1}

(2) 1100-2100 cm^{-1}

(3) 3000-3500 cm^{-1}

(4) 2200-3900 cm^{-1}

Scanned with CamScanner

81. The physical defect of a tablet which is characterised as unequal distribution of colour on the surface of a tablet is known as :

(1) Picking
(2) Capping
(3) Lamination
(4) Mottling

82. The Limulus Amebocyte Lysate (LAL) test is used for parenteral quality control to detect which of the following contamination ?

(1) Particulate matter
(2) Isotonicity level
(3) Pyrogen
(4) Virus

83. According to the Biopharmaceutical Classification System (BCS), high-solubility and low-permeability drugs are classified into which type of class ?

(1) Class 1
(2) Class 4
(3) Class 2
(4) Class 3

84. Which component of a Transdermal Drug Delivery System (TDDS) controls the rate of release of the drug into the systemic circulation in rate-controlling membrane systems ?

(1) Backing layer
(2) Polymer matrix or rate-controlling membrane
(3) Release liner
(4) Pressure-sensitive adhesive

Scanned with CamScanner

85. In preformulation studies, a powder with an Angle of Repose between 45°–50° exhibits which type of flow ?

(1) Excellent
(2) Very Poor
(3) Very Good
(4) Passable

86. According to the Indian Pharmacopoeia (IP), Simple Syrup contains _____ sucrose dissolved in purified water.

(1) 66.7% w/w
(2) 66.7% w/v
(3) 85% w/w
(4) 85% w/v

87. In soft gelatin capsule shell manufacturing, glycerol is added as a plasticiser to enhance which capsule feature ?

(1) Preventing microbial growth
(2) Solubility in gastric fluid
(3) Flexibility and elasticity
(4) Opacity against UV light

88. In the evaluation of suspensions, what value of sedimentation volume (F) is typical for a stable flocculated suspension where the volume of sediment equals the original total volume ?

(1) $F < 0$
(2) $F > 10$
(3) $F = 1.0$
(4) $F = 0.001$

Scanned with CamScanner

89. Which suppository base exhibits a sharp melting point at 37°C temperature and requires temperature control during preparation to prevent transformation into unstable polymorphic forms ?

(1) Cocoa butter

(2) Polyethene glycol (PEG)

(3) Glycerinated gelatin

(4) None of the above

90. What type of degradation reaction in drug stability testing involves the cleavage of chemical bonds by reaction with water molecules, generally seen in esters and amides ?

(1) Racemisation

(2) Oxidation

(3) Hydrolysis

(4) Reduction

91. Which type of drug-receptor interaction is considered the strongest under physiological conditions ?

(1) Covalent interactions

(2) Ionic interactions

(3) Van der Waals interactions

(4) Hydrogen interactions

Scanned with CamScanner

92. Methyl derivative of morphine opioids is known as :

(1) Heroin
(2) Thebaine
(3) Naloxone
(4) Codeine

93. Which compound is used in benzodiazepine poisoning as first aid ?

(1) Barbiturates
(2) Flumazenil
(3) Carbamazepine
(4) Valproic acid

94. Which core nucleus is essential for the pharmacological activity of cephalosporins ?

(1) Thiazolidine ring
(2) Thiazine ring
(3) β-lactam ring
(4) Lactone ring

95. Which of the following anti-tubercular drugs contain a pyridine ring nucleus as core ?

(1) Isoniazid
(2) Ethambutol
(3) Both (1) and (2)
(4) None of these

96. The specific antidote and reversal agent in the acute overdose or poisoning of opioids is known as :

(1) Naloxone
(2) Norepinephrine
(3) Acetylcholine
(4) Phenytoin

Scanned with CamScanner

97. An equimolar mixture of two optical enantiomers that exhibits an optical rotation of zero is known as :

(1) Mesocompound
(2) Racemic Mixture
(3) Enantiomer
(4) Diastereomer

98. What is the main purpose of converting a polar drug into a lipophilic prodrug such as an ester derivative ?

(1) To decrease its oral bioavailability
(2) To enhance permeability across biological membranes
(3) To increase its binding towards blood albumin protein
(4) None of the above

99. Insulin is a classic example of which type of receptor ?

(1) G-protein coupled receptor GPCR
(2) Ligand-gated ion channels
(3) Tyrosine kinase-linked receptor
(4) Nuclear receptor

100. Two pairs of enantiomers are separated by which physical properties ?

(1) Melting and Boiling point
(2) Solubility in a solvent
(3) Ability to rotate the plane of polarised light in opposite directions
(4) Molecular weight

Scanned with CamScanner

(For Rough Work Only)

Scanned with CamScanner

Total No. of Printed Pages : 26

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

PH.D.-EE-October, 2026 (Pharmaceutical Sciences)

D

Sr. No. 100036

Time : 1¼ Hours | Max. Marks : 100 | Total Questions : 100

Roll No. _____ (in figure) _____ (in words)

Name _____ Father's Name _____

Mother's Name _____ Date of Examination _____

(Signature of the Candidate) (Signature of the Invigilator)

SEAL

CANDIDATES MUST READ THE FOLLOWING INFORMATION/ INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

1. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Discrepancy, if any, should be immediately reported to the invigilator and should ask for replacement of Question booklet / OMR Answer Sheet. **Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after start of the examination.**
2. All questions are compulsory. There will be no negative marking. Each correct answer will be awarded one full mark.
3. For each question, four suggested answers (1), (2), (3), (4) are given. The candidate is to choose only one answer which he / she considers the correct or best one. If the candidate darkens more than one circle or cutting / over writing / erasing, then such answer(s) shall not be evaluated.
4. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the space provided in the end of question booklet. Answers **MUST NOT** be ticked in the Question book-let.
5. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
6. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
7. Question Booklet(s) along with answer key(s) of all the A, B, C & D codes will be got uploaded on the university website after the conduct of Entrance Examination. Candidates may raise valid objection / complaint, if any, with regard to discrepancy in the question booklet / answer key within 24 hours of uploading the same on the University website. The complaint be sent by the student to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
8. The candidates must return the Question booklet as well as Original OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / misbehavior will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.

Scanned with CamScanner

1. Standard statistical power $(1 - \beta)$ in clinical study design is generally targeted at :

(1) 10% to 20%
(2) 50%
(3) 80% to 90%
(4) 100%

2. Active termination of a patient's life by a physician to end severe suffering, performed at the patient's explicit request, is called :

(1) Passive euthanasia
(2) Voluntary active euthanasia
(3) Non-voluntary euthanasia
(4) Palliative sedation

3. Which factor relates to the 'Cost' of research ?

(1) Interest
(2) Novelty
(3) Financial Resources
(4) Relevance

4. A small group meeting for intensive discussion is a :

(1) Seminar
(2) Conference
(3) Both (1) and (2)
(4) None of these

Scanned with CamScanner

5. What is the primary distinguishing feature of a cohort study ?

(1) It compares individuals with a disease to those without the disease to look back at past exposures.

(2) It groups participants based on their exposure status and follows them forward over time to observe the development of an outcome.

(3) It randomly assigns participants to experimental and control groups.

(4) It measures exposure and outcome at a single, exact point in time.

6. Quota sampling technique is a type of :

(1) Scientific method

(2) Probability method

(3) Non-probability method

(4) Random method

7. Any variable other than the independent variable that can influence the dependent variable and potentially confound the results of a study is known as :

(1) Extraneous variables

(2) Dependent variable

(3) Confounding variable

(4) Independent variable

Scanned with CamScanner

8. Focused Group Discussion (FGD) is :

(1) Random

(2) Statistical

(3) Quantitative

(4) Qualitative

9. Which of the following is the square root of the variance ?

(1) Range

(2) Standard deviation

(3) Quartile deviation

(4) Mean deviation

10. If two events are mutually exclusive, the probability of both occurring simultaneously is :

(1) 0 (2) 1

(3) 0.5 (4) None of these

11. An Ogive is a :

(1) Bar chart

(2) Cumulative frequency graph

(3) Pie chart

(4) None of the above

Scanned with CamScanner

12. Which of the following best defines research ?

(1) A random search for facts

(2) An intuitive guess

(3) Copying existing data

(4) A systematic effort to gain new knowledge

13. The goal of 'Basic Research' is primarily :

(1) Immediate application

(2) Expanding theoretical knowledge

(3) Solving a business crisis

(4) Political gain

14. Self-plagiarism is :

(1) Reusing one's own published work without credit

(2) Failing to cite a co-author on a manuscript

(3) Submitting an article to a journal that rejects it

(4) None of the above

Scanned with CamScanner

15. Analysis of Variance (ANOVA) is used to compare the means of :

(1) Exactly two groups

(2) Three or more groups

(3) One group against a constant

(4) None of the above

16. The 'Goodness of Fit' test is a type of :

(1) *t*-test

(2) ANOVA

(3) Chi-square test

(4) Z-test

17. A Z-test is typically used instead of a t-test when :

(1) The population variance is known, and the sample size is large

(2) The sample size is less than 30

(3) The data is ordinal

(4) The population variance is unknown

18. In a normal distribution, approximately what percentage of data falls within one standard deviation of the mean ?

(1) 50%

(2) 68%

(3) 95%

(4) 99%

Scanned with CamScanner

19. Which measure of central tendency is most affected by extreme values (outliers) ?

(1) Median
(2) Range
(3) Mode
(4) Mean

20. Which distribution is used to model the number of successes in a fixed number of independent trials with two possible outcomes ?

(1) Normal
(2) Poisson
(3) Binomials
(4) Exponential

21. 'Inferential Statistics' are used to :

(1) Make predictions about the population
(2) Collect data
(3) Draw graphs
(4) Describe sample

22. 'Mean, Median, Mode' are measures of :

(1) Dispersion
(2) Central Tendency
(3) Probability
(4) Sampling

Scanned with CamScanner

23. In research involving human subjects incapable of giving informed consent, it must be obtained from :

(1) The principal investigator

(2) A legally authorised representative

(3) The ethics committee head alone

(4) No consent is needed

24. According to the Declaration of Helsinki, unproven interventions in clinical practice may be used only when :

(1) Approved by marketing managers

(2) Proven interventions do not exist or have been ineffective and informed consent is obtained

(3) The patient cannot give consent

(4) Recommended by animal experiment results alone

25. The Declaration of Helsinki was developed and promulgated by which global organisation ?

(1) World Health Organisation (WHO)

(2) World Medical Association (WMA)

(3) United Nations Educational, Scientific and Cultural Organisation (UNESCO)

(4) Food and Drug Administration (FDA)

Scanned with CamScanner

26. Scatter Plot shows the :

(1) Various errors

(2) Mean

(3) Correlation between two variables

(4) None of the above

27. Modern Language Association (MLA) is a citation style often used in the field of :

(1) Medicines

(2) Mathematics

(3) Science

(4) Literatures\Humanities

28. 'Ibid.' is used in footnotes to mean :

(1) For example

(2) Incorrect sentence

(3) In the same place

(4) Not here

29. APA citation style stands for :

(1) American Paper Association

(2) American Psychological Association

(3) All Paper Art

(4) Annual Paper Audit

Scanned with CamScanner

30. A 'Null Hypothesis' states :

(1) There is a difference

(2) The theory is false

(3) There is no significant difference

(4) The theory is true

31. Snowball sampling, a non-probability sampling technique in research, is used for :

(1) Hard-to-reach populations

(2) Large populations

(3) Census

(4) Random groups

32. Ethical considerations mean avoiding :

(1) Hard work

(2) Using a computer and Machine learning

(3) Library visits

(4) Harm to participants

Scanned with CamScanner

33. Which of the following is an acceptable way to build upon your own previously published methodology in a new paper ?

(1) Copy and paste the entire method section word-for-word without mentioning the source

(2) Paraphrase the description and explicitly cite your previous publication where the method was first detailed

(3) Claim that the method was invented entirely by another researcher

(4) Omit the methodology section completely

34. The recommended light-dark cycle for standard laboratory animal housing rooms is generally :

(1) 8 hours light and 16 hours dark

(2) Continuous 24-hour light

(3) 18 hours light and 6 hours dark

(4) 12 hours light and 12 hours dark

35. Which committee in an institution must approve all proposals involving experimental animals before studies begin ?

(1) Institutional Ethics Committee (IEC)

(2) Institutional Animal Ethics Committee (IAEC)

(3) Biosafety Committee

(4) CPCSEA Quality Control Cell

Scanned with CamScanner

36. The "3Rs" principle in animal studies represents :

(1) Replacement, Reduction, Refinement

(2) Research, Review, Repeat

(3) Randomisation, Reiteration, Removal

(4) Restraint, Recovery, Rehabilitation

37. The 'Survey Method' is most commonly associated with :

(1) Experimental research (2) Case study

(3) Descriptive research (4) Historical research

38. In medical ethics, providing full, truthful information regarding diagnosis and prognosis to a patient is termed as :

(1) Truth-telling (Veracity)

(2) Referral

(3) Fatality management

(4) Autonomy

39. Which design helps to minimise subject-related variability by making each subject act as their own control ?

(1) Parallel design (2) Crossover design

(3) Cohort design (4) Factorial design

Scanned with CamScanner

40. Which characteristic ensures research can be repeated by others ?

(1) Replicability
(2) Subjectivity
(3) Complexity
(4) Ambiguity

41. Validity in research refers to :

(1) Consistency
(2) Maximum speed
(3) Accuracy/Measuring what is intended
(4) None of the above

42. Observational research is best for :

(1) Testing chemicals
(2) Analysing census data
(3) Studying behaviour in real-time
(4) Studying past events

43. Longitudinal research involves :

(1) Study at one point in time
(2) Repeated study over time
(3) Study of logs
(4) Study of distance

Scanned with CamScanner

44. The term 'degrees of freedom' in a *t*-test is generally related to :

(1) The p-value

(2) The standard deviation

(3) The mean

(4) The sample size

45. Which test would you use to see if the mean height of men is significantly different from the mean height of women ?

(1) Paired *t*-test

(2) Pearson correlation

(3) Independent samples t-test

(4) Chi-square

46. The non-parametric equivalent of the independent t-test is the :

(1) Wilcoxon Signed-Rank Test

(2) Kruskal-Wallis Test

(3) Mann-Whitney U Test

(4) Friedman Test

47. Which of the following is the non-parametric version of Pearson's correlation ?

(1) Multiple Regression

(2) Spearman's Rank Correlation

(3) Partial Correlation

(4) Linear Correlation

Scanned with CamScanner

48. A Type I error occurs when :

(1) We accept a false null hypothesis

(2) We reject a true null hypothesis

(3) The p-value is greater than 0.05

(4) The sample size is too large

49. A correlation coefficient of –0.95 indicates a :

(1) Strong negative relationship

(2) Weak positive relationship

(3) No relationship

(4) Strong positive relationship

50. Research contributes to the 'Body of Knowledge' by :

(1) Deleting old facts

(2) Validating or refuting theories

(3) Promoting the researcher

(4) None of the above

Scanned with CamScanner

51. Organoleptic evaluation of natural drugs is described as :

(1) Preclinical Screening

(2) Quantitative estimation using HPLC

(3) Evaluation using sensory characteristics

(4) Microbial testing

52. In pharmacognosy and quantitative microscopy, the standard benchmark size and count for a Lycopodium is :

(1) 25 µm and 94000

(2) 30 µm and 84000

(3) 50 µm and 50000

(4) 100 µm and 10000

53. Glandular trichomes are used as a diagnostic feature present in which of the following natural compounds ?

(1) Senna leaf

(2) Nux vomica

(3) Gossypium hirsutum

(4) Mentha piperita

54. Anisocytic stomata are the characteristic feature belonging to which family of natural products ?

(1) Liliaceae

(2) Solanacea

(3) Rubiaceae

(4) None of these

55. What is the primary role of fractionation in phytochemical processing ?

(1) Measuring leaf constants and palisade ratios

(2) Counting spores under a microscope

(3) Evaluating acute animal toxicity

(4) Separating groups of phytoconstituents based on polarity

Scanned with CamScanner

56. What is a key advantage of Microwave-Assisted Extraction (MAE) in phytochemistry ?

(1) Reduced extraction time

(2) Lower solvent consumption using microwave energy

(3) Both (1) and (2)

(4) None of the above

57. What is the principal application of Flash column chromatography in phytochemical studies ?

(1) Identification of crude drug adulteration via visual inspection

(2) Purification of complex plant extracts

(3) Permanent conversion of active constituents into synthetic drugs

(4) None of the above

58. In vitro assays such as disc diffusion or broth microdilution methods in phytochemical studies are used for :

(1) Hepatic studies

(2) Antimicrobial studies

(3) Anti-epileptic studies

(4) Diuretic activity

59. Keller-Kiliani Test is used to identify which of the following natural compound ?

(1) Digitalis

(2) Dhatura

(3) Senna

(4) Rauwolfia

60. Picrorhiza kurroa is primarily used as :

(1) Analgesics

(2) Hepatoprotective

(3) Diuretic

(4) Anti-microbial

Scanned with CamScanner

61. Which of the following nuclei has a spin property and is NMR active ?

(1) $^{12}C_6$ (2) $^{16}O_8$

(3) $^{14}N_7$ (4) $^{40}Ca_{20}$

62. Intermolecular hydrogen bonding in alcohols causes which type of O-H stretching band in an IR spectrum ?

(1) Broader and lower-frequency stretching

(2) Sharper and higher-frequency stretching

(3) No change in stretching

(4) None of the above

63. According to Woodward-Fieser rules, what is the base value for a homoannular conjugated diene system ?

(1) 215 nm (2) 253 nm

(3) 245 nm (4) 275 nm

64. What effect does changing from a non-polar solvent to a polar solvent typically have on the $\pi \rightarrow \pi^*$ transition band in UV-Visible spectroscopy ?

(1) Hyperchromic shift

(2) Bathochromic shift (red shift)

(3) Hypsochromic shift (blue shift)

(4) Hypochromic shift

Scanned with CamScanner

65. In which spectroscopy technique is tetramethylsilane (TMS) used as the primary reference substance ?

(1) Nuclear Magnetic Resonance (NMR) Spectroscopy

(2) Infrared (IR) Spectroscopy

(3) Ultraviolet-Visible (UV-Vis) Spectroscopy

(4) Mass Spectrometry (MS)

66. What does the base peak represent in a mass spectrum of any sample ?

(1) The peak with the lowest mass-to-charge ratio

(2) Ion with the greatest relative abundance

(3) Both (1) and (2)

(4) None of the above

67. Which parameter quantifies the efficiency of a chromatographic column based on plate height ?

(1) Separation factor (α)

(2) Retention factor (κ')

(3) Resolution (R_s)

(4) Height equivalent to a theoretical plate (HETP)

Scanned with CamScanner

68. In ion-exchange chromatography, which type of stationary phase is used to separate cations ?

(1) Unmodified silica gel

(2) Cross-linked dextran gel

(3) Acidic cation exchange

(4) Basic anion exchange

69. What is the primary underlying principle of paper chromatography ?

(1) Adsorption chromatography

(2) Ion exchange chromatography

(3) Partition chromatography

(4) Size exclusion chromatography

70. In Infrared (IR) Spectroscopy, the range of the carbonyl group shows the stretching frequency is :

(1) 1650-1800 cm^{-1}

(2) 1100-2100 cm^{-1}

(3) 3000-3500 cm^{-1}

(4) 2200-3900 cm^{-1}

Scanned with CamScanner

71. The physical defect of a tablet which is characterised as unequal distribution of colour on the surface of a tablet is known as :

(1) Picking
(2) Capping
(3) Lamination
(4) Mottling

72. The Limulus Amebocyte Lysate (LAL) test is used for parenteral quality control to detect which of the following contamination ?

(1) Particulate matter
(2) Isotonicity level
(3) Pyrogen
(4) Virus

73. According to the Biopharmaceutical Classification System (BCS), high-solubility and low-permeability drugs are classified into which type of class ?

(1) Class 1
(2) Class 4
(3) Class 2
(4) Class 3

74. Which component of a Transdermal Drug Delivery System (TDDS) controls the rate of release of the drug into the systemic circulation in rate-controlling membrane systems ?

(1) Backing layer
(2) Polymer matrix or rate-controlling membrane
(3) Release liner
(4) Pressure-sensitive adhesive

Scanned with CamScanner

75. In preformulation studies, a powder with an Angle of Repose between 45°–50° exhibits which type of flow ?

(1) Excellent
(2) Very Poor
(3) Very Good
(4) Passable

76. According to the Indian Pharmacopoeia (IP), Simple Syrup contains _____ sucrose dissolved in purified water.

(1) 66.7% w/w
(2) 66.7% w/v
(3) 85% w/w
(4) 85% w/v

77. In soft gelatin capsule shell manufacturing, glycerol is added as a plasticiser to enhance which capsule feature ?

(1) Preventing microbial growth
(2) Solubility in gastric fluid
(3) Flexibility and elasticity
(4) Opacity against UV light

78. In the evaluation of suspensions, what value of sedimentation volume (F) is typical for a stable flocculated suspension where the volume of sediment equals the original total volume ?

(1) $F < 0$
(2) $F > 10$
(3) $F = 1.0$
(4) $F = 0.001$

Scanned with CamScanner

79. Which suppository base exhibits a sharp melting point at 37°C temperature and requires temperature control during preparation to prevent transformation into unstable polymorphic forms ?

(1) Cocoa butter

(2) Polyethene glycol (PEG)

(3) Glycerinated gelatin

(4) None of the above

80. What type of degradation reaction in drug stability testing involves the cleavage of chemical bonds by reaction with water molecules, generally seen in esters and amides ?

(1) Racemisation

(2) Oxidation

(3) Hydrolysis

(4) Reduction

81. Which type of drug-receptor interaction is considered the strongest under physiological conditions ?

(1) Covalent interactions

(2) Ionic interactions

(3) Van der Waals interactions

(4) Hydrogen interactions

Scanned with CamScanner

82. Methyl derivative of morphine opioids is known as :

(1) Heroin
(2) Thebaine
(3) Naloxone
(4) Codeine

83. Which compound is used in benzodiazepine poisoning as first aid ?

(1) Barbiturates
(2) Flumazenil
(3) Carbamazepine
(4) Valproic acid

84. Which core nucleus is essential for the pharmacological activity of cephalosporins ?

(1) Thiazolidine ring
(2) Thiazine ring
(3) β-lactam ring
(4) Lactone ring

85. Which of the following anti-tubercular drugs contain a pyridine ring nucleus as core ?

(1) Isoniazid
(2) Ethambutol
(3) Both (1) and (2)
(4) None of these

86. The specific antidote and reversal agent in the acute overdose or poisoning of opioids is known as :

(1) Naloxone
(2) Norepinephrine
(3) Acetylcholine
(4) Phenytoin

Scanned with CamScanner

87. An equimolar mixture of two optical enantiomers that exhibits an optical rotation of zero is known as :

(1) Mesocompound
(2) Racemic Mixture
(3) Enantiomer
(4) Diastereomer

88. What is the main purpose of converting a polar drug into a lipophilic prodrug such as an ester derivative ?

(1) To decrease its oral bioavailability
(2) To enhance permeability across biological membranes
(3) To increase its binding towards blood albumin protein
(4) None of the above

89. Insulin is a classic example of which type of receptor ?

(1) G-protein coupled receptor GPCR
(2) Ligand-gated ion channels
(3) Tyrosine kinase-linked receptor
(4) Nuclear receptor

90. Two pairs of enantiomers are separated by which physical properties ?

(1) Melting and Boiling point
(2) Solubility in a solvent
(3) Ability to rotate the plane of polarised light in opposite directions
(4) Molecular weight

Scanned with CamScanner

91. Which of the following is *not* an example of CYP3A4 Inducers ?

(1) Rifampicin
(2) Carbamazepine
(3) Phenytoin
(4) Paracetamol

92. Which of the following agents act as choline reuptake inhibitors ?

(1) Glutamate
(2) Hemicholinium
(3) Acetylcholine
(4) Catechols

93. Which of the following administration route/dosage forms has 100% bioavailability ?

(1) Oral Route
(2) Intravenous (IV)
(3) Intramuscular
(4) Transdermal Patch

94. Unusual, Unexpected and abnormal drug response that is different from its known pharmacological effect and occurs in a small, genetically susceptible population known as :

(1) Hypersensitivity
(2) Teratogenicity
(3) Idiosyncrasy
(4) Carciogenicity

95. Which of the following drugs is a classic example of zero-order elimination kinetics at therapeutic level ?

(1) Phenytoin
(2) Propranolol
(3) Omeprazole
(4) Verapamil

Scanned with CamScanner

96. Which of the following acts as a natural receptor for the glutamate neurotransmitter ?

(1) μ receptor
(2) muscarinic receptor
(3) NMDA receptor
(4) α receptor

97. Which of the following agents increase the duration of opening of the GABA channel ?

(1) Isoniazid
(2) Benzodiazepine
(3) Cimetidine
(4) Barbiturates

98. Range for acute toxicity studies in preclinical animal screening for a single administered dose is :

(1) 14 days
(2) 90 days
(3) 120 days
(4) 54 days

99. Which of the following drug has a narrower therapeutic index ?

(1) Digoxin
(2) Aspirin
(3) Cetirizine
(4) Ethambutol

100. Which of the following diseases is known for severe dopamine deficiency ?

(1) Polycystic ovarian disease (PCOS)
(2) Parkinson disease
(3) Arrhythmia
(4) Angina pectoris

Scanned with CamScanner

(For Rough Work Only)

Scanned with CamScanner

Answer keys for Ph.D (PHARMACEUTICAL SCIENCES) entrance exam held on 23.10.2026				
Q. NO.	A	B	C	D
1	4	2	1	3
2	2	2	3	2
3	1	2	1	3
4	2	3	2	1
5	3	4	1	2
6	1	3	3	3
7	2	2	3	1
8	4	3	2	4
9	3	1	4	2
10	1	4	3	1
11	2	2	3	2
12	2	4	2	4
13	2	2	4	2
14	2	1	1	1
15	3	3	2	2
16	4	1	3	3
17	3	2	2	1
18	2	1	3	2
19	3	3	1	4
20	1	3	2	3
21	4	2	3	1
22	2	4	1	2
23	4	3	4	2
24	2	3	2	2
25	1	2	1	2
26	3	4	2	3
27	1	1	4	4
28	2	2	2	3
29	1	3	1	2
30	3	2	2	3
31	3	3	3	1
32	2	1	1	4
33	4	2	2	2
34	3	3	4	4
35	3	1	3	2
36	2	4	1	1
37	4	2	2	3
38	1	1	2	1
39	2	2	2	2
40	3	4	2	1
41	2	2	3	3
42	3	1	4	3
43	1	2	3	2
44	2	3	2	4
45	3	1	3	3
46	1	2	1	3
47	4	4	4	2
48	2	3	2	4
49	1	1	4	1
50	2	2	2	2

23.10.26 23/10/26 23/10/26

Answer keys for Ph.D (PHARMACEUTICAL SCIENCES) entrance exam held on 23.10.2026				
Q. NO.	A	B	C	D
51	3	4	4	3
52	1	3	2	1
53	2	4	2	4
54	2	2	3	2
55	1	2	1	4
56	2	1	3	3
57	4	3	4	2
58	3	3	1	2
59	3	1	1	1
60	1	3	2	2
61	4	1	3	3
62	3	4	1	1
63	4	2	4	2
64	2	3	2	2
65	2	1	4	1
66	1	1	3	2
67	3	2	2	4
68	3	2	2	3
69	1	3	1	3
70	3	3	2	1
71	1	4	3	4
72	4	2	1	3
73	2	2	2	4
74	3	3	2	2
75	1	1	1	2
76	1	3	2	1
77	2	4	4	3
78	2	1	3	3
79	3	1	3	1
80	3	2	1	3
81	4	3	4	1
82	2	1	3	4
83	2	4	4	2
84	3	2	2	3
85	1	4	2	1
86	3	3	1	1
87	4	2	3	2
88	1	2	3	2
89	1	1	1	3
90	2	2	3	3
91	3	3	1	4
92	1	1	4	2
93	4	2	2	2
94	2	2	3	3
95	4	1	1	1
96	3	2	1	3
97	2	4	2	4
98	2	3	2	1
99	1	3	3	1
100	2	1	3	2

23.10.26

23/10/26