

SET-“Y” (Total No. of printed pages : 20)

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

PHD-EE, November-2025

(PHARMACEUTICAL SCIENCES)

10013

Code

A

Sr. No. _____

Time : 1½ Hours

Total Questions : 100

Max. Marks : 100

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

Name : _____ **Date of Birth :** _____

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. All questions are compulsory.
2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour 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.
3. 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.
4. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately 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 students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers **MUST NOT** be ticked in the Question book-let.
6. There will be negative marking and a deduction of 0.25 marks for each wrong answers. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
7. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
8. **BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.**



Question No.	Questions
1.	Which of the following is not a characteristic of research? <div style="display: flex; justify-content: space-between;"> (1) Systematic (2) Logical </div> <div style="display: flex; justify-content: space-between;"> (3) Biased (4) Empirical </div>
2.	Which of the following is not a type of parametric test? <div style="display: flex; justify-content: space-between;"> (1) Chi square test (2) ANOVA </div> <div style="display: flex; justify-content: space-between;"> (3) Correlation coefficient (4) t test </div>
3.	Quarantine for newly received animals is necessary to : <div style="display: flex; flex-direction: column;"> <div>(1) Allow acclimatization and detect infections</div> <div>(2) Reduce housing space</div> <div>(3) Train the animals for experiments</div> <div>(4) Minimize feed consumption</div> </div>
4.	CCSEA recommends that animal housing rooms must be maintained at : <div style="display: flex; flex-direction: column;"> <div>(1) Any convenient temperature</div> <div>(2) Temperature and humidity suitable for each species</div> <div>(3) Low humidity and poor ventilation</div> <div>(4) The same temperature for all animals</div> </div>
5.	Which document preceded and influenced the Declaration of Helsinki? <div style="display: flex; justify-content: space-between;"> (1) Belmont Report (2) Nuremberg Code </div> <div style="display: flex; justify-content: space-between;"> (3) CIOMS Guidelines (4) ICH-GCP Guidelines </div>
6.	The hypothesis which develops while planning the research is : <div style="display: flex; justify-content: space-between;"> (1) Working hypothesis (2) Research hypothesis </div> <div style="display: flex; justify-content: space-between;"> (3) Null hypothesis (4) Complex hypothesis </div>

Question No.	Questions
7.	<p>Pearson correlation coefficient, denoted by r, measures :</p> <p>(1) The scattering strength of data for a statistical series</p> <p>(2) The strength of the correlation between the mean and median</p> <p>(3) The strength of the correlation between two numerical parameters</p> <p>(4) The tendency of simultaneous increase or decrease, or inverse evolution, for two numerical parameters</p>
8.	<p>Hypothesis is a :</p> <p>(1) Statement that can be tested (2) Theory</p> <p>(3) Fact (4) Law</p>
9.	<p>What is the full form of CCSEA?</p> <p>(1) Committee for Control and Supervision of Experiments on Animals</p> <p>(2) Central Committee for Supervision of Ethical Activities</p> <p>(3) Council for Care and Safety of Experimental Animals</p> <p>(4) Committee for Certification of Scientific Animal Experiments</p>
10.	<p>A variable that can be manipulated by the researcher is :</p> <p>(1) Dependent variable (2) Independent variable</p> <p>(3) Controlled variable (4) Extraneous variable</p>
11.	<p>Which of the following is a probability sampling method?</p> <p>(1) Simple random sampling (2) Purposive sampling</p> <p>(3) Convenience sampling (4) Snowball sampling</p>

Question No.	Questions				
12.	<p>A placebo is substance that :</p> <ol style="list-style-type: none"> (1) Has active therapeutic effect (2) Has no therapeutic effect and is used as a control (3) Always cause adverse reactions (4) Is used to increase drug absorption 				
13.	<p>What is full form of SPSS?</p> <ol style="list-style-type: none"> (1) Software Package for Sample Statistics (2) Statistical Program for Social Services (3) Systematic Processing for Statistical Studies (4) Statistical Package for Social Sciences 				
14.	<p>Sampling is :</p> <ol style="list-style-type: none"> (1) Studying the entire population (2) Studying a portion of the population (3) Studying secondary data (4) None of the above 				
15.	<p>When $p < 0.05$, the finding is said to be :</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(1) Statistically significant</td> <td style="width: 50%;">(2) Clinically significant only</td> </tr> <tr> <td>(3) Not significant</td> <td>(4) Randomly significant</td> </tr> </table>	(1) Statistically significant	(2) Clinically significant only	(3) Not significant	(4) Randomly significant
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(3) Not significant	(4) Randomly significant				
16.	<p>The informed consent process must include :</p> <ol style="list-style-type: none"> (1) Purpose, risks, benefits, right to withdraw, and confidentiality details (2) Only name and signature of participant (3) Financial compensation alone (4) Medical history of investigator 				

Question No.	Questions
17.	<p>A normal distribution curve is :</p> <p>(1) Bell-shaped and symmetrical (2) Skewed to the right (3) Skewed to the left (4) Rectangular</p>
18.	<p>From D is related to which of the following :</p> <p>(1) Record of Animals Acquired and Experiments performed (2) Record of Animals bred/acquired (3) Record of Animal sold (4) CCSEA nominee application form</p>
19.	<p>The test statistic used in ANOVA is :</p> <p>(1) t-value (2) z-score (3) χ^2 value (4) F-ratio</p>
20.	<p>What is the use of Regression analysis?</p> <p>(1) Calculate measures of central tendency (2) Determine the frequency of observations (3) Understand the relationship between a dependent variable and one or more independent variables (4) Detect outliers in a dataset</p>
21.	<p>The principle of non-maleficence is best summarized as :</p> <p>(1) Act for the greatest good (2) Respect autonomy (3) First, do no harm (4) Ensure justice</p>
22.	<p>What are the factors affecting sample size?</p> <p>(1) Sampling design and statistical analysis (2) Level of precision and level of confidence (3) Degree of variability and non-response rate (4) All the above</p>

Question No.	Questions
23.	<p>The 3Rs principle advocated by CCSEA stands for :</p> <ol style="list-style-type: none"> (1) Replacement, Reduction, and Refinement (2) Reuse, Regulation, and Reproduction (3) Randomization, Reliability, and Replication (4) Replacement, Reporting, and Recording
24.	<p>The main difference between parametric and non-parametric tests is that :</p> <ol style="list-style-type: none"> (1) Non-parametric tests are always more powerful (2) Parametric tests can be used with any type of data (3) Parametric tests make assumptions about population parameters; non-parametric tests do not (4) Non-parametric tests require normal distribution
25.	<p>Which of the following is incorrect?</p> <ol style="list-style-type: none"> (1) Low p-value indicates that results are statistically significant. (2) High p-value indicates results are not statistically significant. (3) ANOVA assumes null hypothesis is true. (4) None of the above
26.	<p>What are the three major principles laid down by The Belmont Report (1979)?</p> <ol style="list-style-type: none"> (1) Randomization, reproducibility, and reliability (2) Respect for persons, beneficence, and justice (3) Confidentiality, analysis, and documentation (4) Control, intervention, and random sampling

Question No.	Questions
27.	<p>A researcher divides the population into several groups based on geographical regions and then randomly selects a few groups for study. This is an example of a:</p> <p>(1) Simple random sample (2) Systematic sample (3) Cluster sample (4) Stratified sample</p>
28.	<p>The principle of beneficence requires the researcher to :</p> <p>(1) Publish all results immediately (2) Maintain blinding during trials (3) Maximize possible benefits and minimize potential harm (4) Avoid informed consent</p>
29.	<p>According to CCSEA, selection of euthanasia method depends on :</p> <p>(1) Researcher's convenience (2) Animal species, size, age, and purpose of euthanasia (3) Institutional budget (4) Type of publication</p>
30.	<p>According to ICMR, all clinical drug trials in India must be registered with :</p> <p>(1) World Health Organization (2) Food and Drug Administration (3) Clinical Trials Registry-India (4) Central Bureau of Health Research</p>
31.	<p>According to Good clinical Practice (GCP), the investigator must report any serious adverse event (SAE) to the Ethics committee within :</p> <p>(1) 7 days (2) 15 days (3) 24 hours (4) 1 month</p>

Question No.	Questions
32.	<p>ANOVA is used to compare :</p> <ul style="list-style-type: none">(1) The medians of two groups(2) The means of three or more groups(3) The variances of two groups only(4) Proportions in categorical data
33.	<p>The Declaration of Helsinki was developed by which organization?</p> <ul style="list-style-type: none">(1) World Health Organization(2) United Nations(3) World Medical Association(4) International Council for harmonization
34.	<p>Identify the option that is not a characteristic of qualitative research.</p> <ul style="list-style-type: none">(1) Thematic analysis(2) Case study(3) Discourse analysis(4) Survey method
35.	<p>The Nuremberg Code (1947) was developed after :</p> <ul style="list-style-type: none">(1) World War II unethical human experiments(2) The Tuskegee Syphilis Study(3) The Thalidomide tragedy(4) World Health Organization's founding
36.	<p>Medical ethics is primarily based on :</p> <ul style="list-style-type: none">(1) Economic considerations(2) Professional competition(3) Human dignity, rights, and moral duty(4) Institutional politics

Question No.	Questions
37.	<p>Which of the following is not a type of research design?</p> <p>(1) Exploratory (2) Descriptive (3) Experimental (4) Accidental</p>
38.	<p>Euthanasia involves :</p> <p>(1) Intentionally ending life to relieve suffering (2) Providing emotional support to the terminally ill (3) Withholding data publication (4) Ensuring autonomy</p>
39.	<p>Which of the following conditions is not suitable for proper animal housing in a research facility?</p> <p>(1) Provide an escape-proof enclosure that ensures the animal's safety. (2) Provide easy access to food and water. (3) Maintain poor ventilation to minimize air circulation and noise. (4) Keep the animal dry and clean, consistent with species requirements.</p>
40.	<p>According to the Declaration of Helsinki, who is responsible for protecting the life, health, dignity, integrity, and privacy of research subjects?</p> <p>(1) The sponsor (2) The ethics committee (3) The physician or health professional conducting the research (4) The government authority</p>

Question No.	Questions
41.	<p>Euthanasia should be adopted in which of the following conditions :</p> <ol style="list-style-type: none">(1) When the animal is paralyzed and is not able to perform its natural functions or it becomes incapable of independent locomotion or it can no longer perceive the environment in an intelligible manner(2) If during the course of experimental procedure the animal has been left with a recurring pain where in the animal exhibits obvious signs of pain and suffering(3) Where the non-termination of the life of the experimental animal will be life threatening to human beings or other animals(4) All the above
42.	<p>Inhalant agents such as carbon dioxide (CO₂) are used for euthanasia because they :</p> <ol style="list-style-type: none">(1) Induce pain before death(2) Require physical restraint for long duration(3) Cause rapid loss of consciousness with minimal distress(4) Are ineffective in small rodents
43.	<p>The CCSEA functions under which Ministry?</p> <ol style="list-style-type: none">(1) Ministry of Health and Family Welfare(2) Ministry of Science and Technology(3) Ministry of Environment, forest and Climate Change(4) Indian Council of Medical Research

Question No.	Questions
44.	<p>The Declaration of Helsinki was developed as a statement of ethical principles for :</p> <ol style="list-style-type: none"> (1) Research on animal only (2) Medical research involving human subjects, including identifiable human material and data (3) Epidemiological research only (4) Social science research involving interviews
45.	<p>Which of the following statements about the literature review is wrong?</p> <ol style="list-style-type: none"> (1) It helps identify gaps in existing research. (2) It provides a theoretical foundation for the current study. (3) It eliminates the need to collect primary data. (4) It helps refine research questions and hypotheses.
46.	<p>In a normal distribution, mean, median, and mode are :</p> <ol style="list-style-type: none"> (1) Equal (2) Unequal (3) Random (4) Independent
47.	<p>Which of the following best describes a conflict of interest in medical research?</p> <ol style="list-style-type: none"> (1) When a researcher's personal or financial interests may influence study outcomes (2) When a study is delayed due to lack of funding (3) When participants withdraw from a study (4) When ethical approval takes longer than expected
48.	<p>The Declaration of Helsinki was first adopted in :</p> <ol style="list-style-type: none"> (1) 1947 (2) 1964 (3) 1975 (4) 1989

Question No.	Questions
49.	In a single-blind study, the person unaware of treatment allocation is : (1) Only the subject (2) Only the investigator (3) Both subject and investigator (4) The ethics committee
50.	Identify the preferred sampling for the population with finite size among the following : (1) Systematic sampling (2) Purposive sampling (3) Cluster sampling (4) Area sampling
51.	Which law relates the absorbance with concentration and path length? (1) Newton's Law (2) Beer-Lambert's Law (3) Ohm's Law (4) Dalton's Law
52.	UV-Visible spectroscopy measures the : (1) Absorption of infrared light (2) Emission of UV light (3) Absorption of UV or visible light (4) Reflection of UV light
53.	In IR spectroscopy, absorption is due to : (1) Electronic transitions (2) Vibration transitions (3) Rotational transitions (4) Nuclear transitions
54.	Coupling constant (J) value : (1) Depends upon magnetic field (2) Is independent of magnetic field (3) Depends on reference standard used (4) Depends on solvent used

Question No.	Questions
55.	When absorption intensity of compound is decreased, the phenomenon is known as : (1) Hyperchromic shift (2) Hypochromic shift (3) Bathochromic Shift (4) None
56.	In aldehyde, the C=O stretching vibration appears approximately at : (1) 1725cm ⁻¹ (2) 1660cm ⁻¹ (3) 2750cm ⁻¹ (4) 3300cm ⁻¹
57.	Which of the following has highest chemical shift value? (1) CH ₃ I (2) CH ₃ Br (3) CH ₃ F (4) CH ₃ Cl
58.	In mass spectrometry ⁸¹ Br containing compounds show : (1) M+1 Peak (2) M+2 Peak (3) M+3 Peak (4) M+4 Peak
59.	All solvents are used to record NMR spectra except : (1) DMSO (2) CDCl ₃ (3) C ₂ H ₅ OH (4) Deuterated benzene
60.	Reverse phase HPLC uses : (1) Non polar solvent/polar column (2) Polar solvent/polar column (3) Polar solvent/Non polar column (4) All
61.	An unequal distribution of color on the surface of tablet is called : (1) Cracking (2) Mottling (3) Picking (4) Chipping

Question No.	Questions
62.	Which of the following is pH sensitive bioerodible polymer : (1) Polymethacrylate (2) HPMC (3) NaCMC (4) None
63.	Magnesium stearate is used as : (1) Antioxidant (2) Antiadherent (3) Binder (4) Film Coating
64.	The most important water-miscible vehicle used in parenteral formulations is : (1) Ethyl alcohol (2) Propylene glycol (3) Liquid polyethylene glycol (4) All of the above
65.	Carr's Index is related to : (1) Flow property (2) Solubility (3) Partition coefficient (4) All of the above
66.	From the dissolution point of view, which of the following dosage forms is least absorbed? (1) Coated tablets (2) Solution (3) Suspension (4) Uncoated tablets
67.	What term describes the separation of solid particles from a suspension over time, leading to the settling of particles at the bottom of the container? (1) Emulsification (2) Sedimentation (3) Precipitation (4) Dissolution
68.	Which of the following is most stable form? (1) Powder (2) Syrup (3) Gel (4) Suspensions

Question No.	Questions
69.	<p>High speed homogenization and atomization of feed into a stream of hot air is associated with :</p> <p>(1) Spray Drying (2) Centrifugal extrusion (3) Spray congealing (4) Multiorifice centrifugal technique</p>
70.	<p>Photodegradation of a drug can be prevented by :</p> <p>(1) Refrigerating the product. (2) Using an in-line filter during administration. (3) Dispensing the drug in an amber-colored or opaque container. (4) Adjusting the pH of the solution.</p>
71.	<p>What is the bond angle in sp hybridization?</p> <p>(1) 109.5° (2) 120° (3) 180° (4) 119.5°</p>
72.	<p>$LiAlH_4$ is not used in reduction of :</p> <p>(1) Alkene double bond (2) Carbonyl Carbon (3) Amide (4) Ester</p>
73.	<p>COMSIA is associated with :</p> <p>(1) Virtual Screening (2) Molecular Docking (3) QSAR (4) ADME Prediction</p>
74.	<p>Stereoisomer of cyclic carbohydrate is known as :</p> <p>(1) Epimer (2) Anomer (3) Enantiomer (4) Diastereomer</p>

Question No.	Questions
75.	Biphenyl show following kind of isomerism : (1) Optical isomer (2) Configurational isomer (3) Atropisomers (4) R and S isomer
76.	Clavulanic acid has beta-lactam ring fused with : (1) Thienyl system (2) Thiadiazole (3) Thiazolidone (4) Oxazolidine
77.	Which of the following is not a synthetic drug? (1) Isoniazid (2) Rifampin (3) Pyrazinamide (4) Ethionamide
78.	What is most logical and molecular approach to drug discovery? (1) Synthetic organic chemistry (2) Structure Based Drug Design (3) QSAR (4) All
79.	At which position penicillin has carboxylic acid group : (1) C-3 (2) C-2 (3) C-6 (4) C-7
80.	Ethosuximide belongs to following chemical class of anticonvulsant : (1) Hydantoin (2) Barbiturate (3) Succinamide (4) Oxazolidinedione
81.	A drug having high affinity but low intrinsic activity is called : (1) Partial agonist (2) Antagonist (3) Non-competitive anatagonism (4) Competitive antagonism

Question No.	Questions				
82.	<p>A high degree of protein binding generally makes a drug long-acting because :</p> <ol style="list-style-type: none"> (1) The bond fraction is rapidly metabolized and excreted (2) The bond fraction is not available for metabolism or excretion (3) Protein binding increases the rate of drug elimination (4) Protein-bound drugs cannot cross biological membranes 				
83.	<p>Neurotransmission refers to :</p> <ol style="list-style-type: none"> (1) Transfer of nerve impulses through chemical messengers (2) Electrical conduction through bone (3) Secretion of hormones by glands (4) Storage of neurotransmitters in muscles 				
84.	<p>Pilocarpine is classified as :</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(1) Cholinesterase inhibitor</td><td style="width: 50%;">(2) Sympathomimetic</td></tr> <tr> <td>(3) Cholinomimetic</td><td>(4) Cholinolytics</td></tr> </table>	(1) Cholinesterase inhibitor	(2) Sympathomimetic	(3) Cholinomimetic	(4) Cholinolytics
(1) Cholinesterase inhibitor	(2) Sympathomimetic				
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85.	<p>Glutamate is primarily involved in :</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(1) Inhibitory transmission</td><td style="width: 50%;">(2) Excitatory transmission</td></tr> <tr> <td>(3) Hormonal signaling</td><td>(4) Protein synthesis</td></tr> </table>	(1) Inhibitory transmission	(2) Excitatory transmission	(3) Hormonal signaling	(4) Protein synthesis
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86.	<p>The primary mechanism by which reserpine depletes monoamines is :</p> <ol style="list-style-type: none"> (1) Inhibition of monoamine oxidase (2) Blockade of vesicular monoamine transporter (VMAT) (3) Inhibition of catechol-O-methyltransferase (4) Blocking dopamine receptors 				

Question No.	Questions
87.	<p>Which pharmacological agent would increase acetylcholine levels at synapses by inhibiting its breakdown?</p> <p>(1) Neostigmine (acetylcholinesterase inhibitor) (2) Propranolol (beta-blocker) (3) Fluoxetine (SSRI) (4) Reserpine (vesicular monoamine transporter inhibitor)</p>
88.	<p>Which class of drugs increases synaptic dopamine by blocking the dopamine transporter?</p> <p>(1) SSRIs (2) DAT inhibitors (e.g., cocaine) (3) MAO inhibitors (4) COMT inhibitors</p>
89.	<p>Cell viability assays are used to assess :</p> <p>(1) DNA sequence (2) Enzyme kinetics (3) Cell survival and cytotoxicity (4) Drug solubility</p>
90.	<p>What happens when a high dose of acetylcholine (ACh) is administered after atropine?</p> <p>(1) Bradycardia and fall in blood pressure due to parasympathetic stimulation (2) Tachycardia and rise in blood pressure due to stimulation of sympathetic ganglia and catecholamine release (3) No cardiovascular effect due to complete muscarinic blockade (4) Fall in blood pressure due to inhibition of sympathetic ganglia</p>

Question No.	Questions
91.	Intentional adulteration with the purpose of defrauding is termed: (1) Substitution (2) Sophistication (3) Deterioration (4) Spoilage
92.	The Si-OH groups on silica are also known as : (1) Carboxyl groups (2) Hydroxyl groups (3) Phenolic groups (4) Carbonyl groups
93.	Swelling index is determined for : (1) Isphagula (2) Digitalis (3) Clove (4) Aloes
94.	Which of the following crude drug is not used in the treatment of hypertension? (1) Digitalis (2) Rauwolfia (3) Squill (4) Stropanthus
95.	Retention time in HPLC or GC mainly depends on : (1) The detector sensitivity only (2) The interaction of analyte with the stationary phase and mobile phase composition (3) The color of the analyte (4) The sample injection volume only
96.	"Like with like" is the principle of : (1) Homeopathy (2) Ayurveda (3) Unani (4) Siddha

Question No.	Questions										
97.	<p>Eugenol is the plant constituent of :</p> <table border="0"> <tr> <td>(1) Amla</td><td>(2) Hibiscus</td></tr> <tr> <td>(3) Senna</td><td>(4) Clove</td></tr> </table>	(1) Amla	(2) Hibiscus	(3) Senna	(4) Clove						
(1) Amla	(2) Hibiscus										
(3) Senna	(4) Clove										
98.	<p>Match the following natural drugs with their therapeutic uses :</p> <table border="0"> <tr> <td>Drug</td><td>Therapeutic uses</td></tr> <tr> <td>a. Liquorice</td><td>1. CNS stimulant</td></tr> <tr> <td>b. Senna</td><td>2. Expectorant</td></tr> <tr> <td>c. Nux vomica</td><td>3. Laxative</td></tr> <tr> <td>d. Digitalis</td><td>4. Cardiotonic</td></tr> </table> <p>(1) a-1, b-2, c-3, d-4 (2) a-3, b-4, c-2, d-1 (3) a-4, b-1, c-3, d-2 (4) a-2, b-3, c-1, d-4</p>	Drug	Therapeutic uses	a. Liquorice	1. CNS stimulant	b. Senna	2. Expectorant	c. Nux vomica	3. Laxative	d. Digitalis	4. Cardiotonic
Drug	Therapeutic uses										
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99.	<p>Total Ash value in the case of crude drug signifies :</p> <p>(1) Organic content of the drug (2) Cellular content of the drug (3) Inorganic content of the drug (4) Phytoconstituents of the drug</p>										
100.	<p>Organoleptic evaluation is an example of which type of study?</p> <table border="0"> <tr> <td>(1) Microscopic</td><td>(2) Biological</td></tr> <tr> <td>(3) Technical</td><td>(4) Morphological</td></tr> </table>	(1) Microscopic	(2) Biological	(3) Technical	(4) Morphological						
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B

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

Name : _____

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8. BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.



Question No.	Questions
1.	What is the bond angle in sp hybridization? (1) 109.5° (2) 120° (3) 180° (4) 119.5°
2.	$LiAlH_4$ is not used in reduction of : (1) Alkene double bond (2) Carbonyl Carbon (3) Amide (4) Ester
3.	COMSIA is associated with : (1) Virtual Screening (2) Molecular Docking (3) QSAR (4) ADME Prediction
4.	Stereoisomer of cyclic carbohydrate is known as : (1) Epimer (2) Anomer (3) Enantiomer (4) Diastereomer
5.	Biphenyl show following kind of isomerism : (1) Optical isomer (2) Configurational isomer (3) Atropisomers (4) R and S isomer
6.	Clavulanic acid has beta-lactam ring fused with : (1) Thienyl system (2) Thiadiazole (3) Thiazolidone (4) Oxazolidine
7.	Which of the following is not a synthetic drug? (1) Isoniazid (2) Rifampin (3) Pyrazinamide (4) Ethionamide
8.	What is most logical and molecular approach to drug discovery? (1) Synthetic organic chemistry (2) Structure Based Drug Design (3) QSAR (4) All

Question No.	Questions
9.	At which position penicillin has carboxylic acid group : (1) C-3 (2) C-2 (3) C-6 (4) C-7
10.	Ethosuximide belongs to following chemical class of anticonvulsant : (1) Hydantoin (2) Barbiturate (3) Succinamide (4) Oxazolidinedione
11.	Which law relates the absorbance with concentration and path length? (1) Newton's Law (2) Beer-Lambert's Law (3) Ohm's Law (4) Dalton's Law
12.	UV-Visible spectroscopy measures the : (1) Absorption of infrared light (2) Emission of UV light (3) Absorption of UV or visible light (4) Reflection of UV light
13.	In IR spectroscopy, absorption is due to : (1) Electronic transitions (2) Vibration transitions (3) Rotational transitions (4) Nuclear transitions
14.	Coupling constant (J) value : (1) Depends upon magnetic field (2) Is independent of magnetic field (3) Depends on reference standard used (4) Depends on solvent used
15.	When absorption intensity of compound is decreased, the phenomenon is known as : (1) Hyperchromic shift (2) Hypochromic shift (3) Bathochromic Shift (4) None

Question No.	Questions
16.	In aldehyde, the C=O stretching vibration appears approximately at : <div style="display: flex; justify-content: space-between;"> (1) 1725cm⁻¹ (2) 1660cm⁻¹ </div> <div style="display: flex; justify-content: space-between;"> (3) 2750cm⁻¹ (4) 3300cm⁻¹ </div>
17.	Which of the following has highest chemical shift value? <div style="display: flex; justify-content: space-between;"> (1) CH₃I (2) CH₃Br </div> <div style="display: flex; justify-content: space-between;"> (3) CH₃F (4) CH₃Cl </div>
18.	In mass spectrometry ⁸¹ Br containing compounds show : <div style="display: flex; justify-content: space-between;"> (1) M+1 Peak (2) M+2 Peak </div> <div style="display: flex; justify-content: space-between;"> (3) M+3 Peak (4) M+4 Peak </div>
19.	All solvents are used to record NMR spectra except : <div style="display: flex; justify-content: space-between;"> (1) DMSO (2) CDCl₃ </div> <div style="display: flex; justify-content: space-between;"> (3) C₂H₅OH (4) Deuterated benzene </div>
20.	Reverse phase HPLC uses : <div style="display: flex; justify-content: space-between;"> (1) Non polar solvent/polar column </div> <div style="display: flex; justify-content: space-between;"> (2) Polar solvent/polar column </div> <div style="display: flex; justify-content: space-between;"> (3) Polar solvent/Non polar column </div> <div style="display: flex; justify-content: space-between;"> (4) All </div>
21.	According to Good clinical Practice (GCP), the investigator must report any serious adverse event (SAE) to the Ethics committee within : <div style="display: flex; justify-content: space-between;"> (1) 7 days (2) 15 days </div> <div style="display: flex; justify-content: space-between;"> (3) 24 hours (4) 1 month </div>
22.	ANOVA is used to compare : <div style="display: flex; justify-content: space-between;"> (1) The medians of two groups </div> <div style="display: flex; justify-content: space-between;"> (2) The means of three or more groups </div> <div style="display: flex; justify-content: space-between;"> (3) The variances of two groups only </div> <div style="display: flex; justify-content: space-between;"> (4) Proportions in categorical data </div>

Question No.	Questions
23.	The Declaration of Helsinki was developed by which organization? (1) World Health Organization (2) United Nations (3) World Medical Association (4) International Council for harmonization
24.	Identify the option that is not a characteristic of qualitative research. (1) Thematic analysis (2) Case study (3) Discourse analysis (4) Survey method
25.	The Nuremberg Code (1947) was developed after : (1) World War II unethical human experiments (2) The Tuskegee Syphilis Study (3) The Thalidomide tragedy (4) World Health Organization's founding
26.	Medical ethics is primarily based on : (1) Economic considerations (2) Professional competition (3) Human dignity, rights, and moral duty (4) Institutional politics
27.	Which of the following is not a type of research design? (1) Exploratory (2) Descriptive (3) Experimental (4) Accidental
28.	Euthanasia involves : (1) Intentionally ending life to relieve suffering (2) Providing emotional support to the terminally ill (3) Withholding data publication (4) Ensuring autonomy

Question No.	Questions
29.	<p>Which of the following conditions is not suitable for proper animal housing in a research facility?</p> <p>(1) Provide an escape-proof enclosure that ensures the animal's safety.</p> <p>(2) Provide easy access to food and water.</p> <p>(3) Maintain poor ventilation to minimize air circulation and noise.</p> <p>(4) Keep the animal dry and clean, consistent with species requirements.</p>
30.	<p>According to the Declaration of Helsinki, who is responsible for protecting the life, health, dignity, integrity, and privacy of research subjects?</p> <p>(1) The sponsor</p> <p>(2) The ethics committee</p> <p>(3) The physician or health professional conducting the research</p> <p>(4) The government authority</p>
31.	<p>Which of the following is a probability sampling method?</p> <p>(1) Simple random sampling (2) Purposive sampling</p> <p>(3) Convenience sampling (4) Snowball sampling</p>
32.	<p>A placebo is substance that :</p> <p>(1) Has active therapeutic effect</p> <p>(2) Has no therapeutic effect and is used as a control</p> <p>(3) Always cause adverse reactions</p> <p>(4) Is used to increase drug absorption</p>

Question No.	Questions
33.	<p>What is full form of SPSS?</p> <p>(1) Software Package for Sample Statistics</p> <p>(2) Statistical Program for Social Services</p> <p>(3) Systematic Processing for Statistical Studies</p> <p>(4) Statistical Package for Social Sciences</p>
34.	<p>Sampling is :</p> <p>(1) Studying the entire population</p> <p>(2) Studying a portion of the population</p> <p>(3) Studying secondary data</p> <p>(4) None of the above</p>
35.	<p>When $p < 0.05$, the finding is said to be :</p> <p>(1) Statistically significant (2) Clinically significant only</p> <p>(3) Not significant (4) Randomly significant</p>
36.	<p>The informed consent process must include :</p> <p>(1) Purpose, risks, benefits, right to withdraw, and confidentiality details</p> <p>(2) Only name and signature of participant</p> <p>(3) Financial compensation alone</p> <p>(4) Medical history of investigator</p>
37.	<p>A normal distribution curve is :</p> <p>(1) Bell-shaped and symmetrical (2) Skewed to the right</p> <p>(3) Skewed to the left (4) Rectangular</p>

Question No.	Questions
38.	<p>From D is related to which of the following :</p> <p>(1) Record of Animals Acquired and Experiments performed</p> <p>(2) Record of Animals bred/acquired</p> <p>(3) Record of Animal sold</p> <p>(4) CCSEA nominee application form</p>
39.	<p>The test statistic used in ANOVA is :</p> <p>(1) t-value (2) z-score</p> <p>(3) χ^2 value (4) F-ratio</p>
40.	<p>What is the use of Regression analysis?</p> <p>(1) Calculate measures of central tendency</p> <p>(2) Determine the frequency of observations</p> <p>(3) Understand the relationship between a dependent variable and one or more independent variables</p> <p>(4) Detect outliers in a dataset</p>
41.	<p>Intentional adulteration with the purpose of defrauding is termed:</p> <p>(1) Substitution (2) Sophistication</p> <p>(3) Deterioration (4) Spoilage</p>
42.	<p>The Si-OH groups on silica are also known as :</p> <p>(1) Carboxyl groups (2) Hydroxyl groups</p> <p>(3) Phenolic groups (4) Carbonyl groups</p>
43.	<p>Swelling index is determined for :</p> <p>(1) Isphagula (2) Digitalis</p> <p>(3) Clove (4) Aloes</p>

Question No.	Questions										
44.	Which of the following crude drug is not used in the treatment of hypertension? <div style="display: flex; justify-content: space-between;"> (1) Digitalis (2) Rauwolfia </div> <div style="display: flex; justify-content: space-between;"> (3) Squill (4) Stropanthus </div>										
45.	Retention time in HPLC or GC mainly depends on : <div style="display: flex; flex-direction: column;"> <div>(1) The detector sensitivity only</div> <div>(2) The interaction of analyte with the stationary phase and mobile phase composition</div> <div>(3) The color of the analyte</div> <div>(4) The sample injection volume only</div> </div>										
46.	"Like with like" is the principle of : <div style="display: flex; justify-content: space-between;"> (1) Homeopathy (2) Ayurveda </div> <div style="display: flex; justify-content: space-between;"> (3) Unani (4) Siddha </div>										
47.	Eugenol is the plant constituent of : <div style="display: flex; justify-content: space-between;"> (1) Amla (2) Hibiscus </div> <div style="display: flex; justify-content: space-between;"> (3) Senna (4) Clove </div>										
48.	Match the following natural drugs with their therapeutic uses : <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Drug</th><th style="text-align: left; width: 50%;">Therapeutic uses</th></tr> </thead> <tbody> <tr> <td>a. Liquorice</td><td>1. CNS stimulant</td></tr> <tr> <td>b. Senna</td><td>2. Expectorant</td></tr> <tr> <td>c. Nux vomica</td><td>3. Laxative</td></tr> <tr> <td>d. Digitalis</td><td>4. Cardiotonic</td></tr> </tbody> </table> <div style="display: flex; flex-direction: column; margin-top: 10px;"> <div>(1) a-1, b-2, c-3, d-4</div> <div>(2) a-3, b-4, c-2, d-1</div> <div>(3) a-4, b-1, c-3, d-2</div> <div>(4) a-2, b-3, c-1, d-4</div> </div>	Drug	Therapeutic uses	a. Liquorice	1. CNS stimulant	b. Senna	2. Expectorant	c. Nux vomica	3. Laxative	d. Digitalis	4. Cardiotonic
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49.	Total Ash value in the case of crude drug signifies : (1) Organic content of the drug (2) Cellular content of the drug (3) Inorganic content of the drug (4) Phytoconstituents of the drug
50.	Organoleptic evaluation is an example of which type of study? (1) Microscopic (2) Biological (3) Technical (4) Morphological
51.	An unequal distribution of color on the surface of tablet is called : (1) Cracking (2) Mottling (3) Picking (4) Chipping
52.	Which of the following is pH sensitive bioerodible polymer : (1) Polymethacrylate (2) HPMC (3) NaCMC (4) None
53.	Magnesium stearate is used as : (1) Antioxidant (2) Antiadherent (3) Binder (4) Film Coating
54.	The most important water-miscible vehicle used in parenteral formulations is : (1) Ethyl alcohol (2) Propylene glycol (3) Liquid polyethylene glycol (4) All of the above
55.	Carr's Index is related to : (1) Flow property (2) Solubility (3) Partition coefficient (4) All of the above

Question No.	Questions
61.	<p>A drug having high affinity but low intrinsic activity is called :</p> <p>(1) Partial agonist</p> <p>(2) Antagonist</p> <p>(3) Non-competitive anatagonism</p> <p>(4) Competitive antagonism</p>
62.	<p>A high degree of protein binding generally makes a drug long-acting because :</p> <p>(1) The bond fraction is rapidly metabolized and excreted</p> <p>(2) The bond fraction is not available for metabolism or excretion</p> <p>(3) Protein binding increases the rate of drug elimination</p> <p>(4) Protein-bound drugs cannot cross biological membranes</p>
63.	<p>Neurotransmission refers to :</p> <p>(1) Transfer of nerve impulses through chemical messengers</p> <p>(2) Electrical conduction through bone</p> <p>(3) Secretion of hormones by glands</p> <p>(4) Storage of neurotransmitters in muscles</p>
64.	<p>Pilocarpine is classified as :</p> <p>(1) Cholinesterase inhibitor (2) Sympathomimetic</p> <p>(3) Cholinomimetic (4) Cholinolytics</p>
65.	<p>Glutamate is primarily involved in :</p> <p>(1) Inhibitory transmission (2) Excitatory transmission</p> <p>(3) Hormonal signaling (4) Protein synthesis</p>

Questions

Question No.	Questions
66.	<p>The primary mechanism by which reserpine depletes monoamines is :</p> <ol style="list-style-type: none"> (1) Inhibition of monoamine oxidase (2) Blockade of vesicular monoamine transporter (VMAT) (3) Inhibition of catechol-O-methyltransferase (4) Blocking dopamine receptors
67.	<p>Which pharmacological agent would increase acetylcholine levels at synapses by inhibiting its breakdown?</p> <ol style="list-style-type: none"> (1) Neostigmine (acetylcholinesterase inhibitor) (2) Propranolol (beta-blocker) (3) Fluoxetine (SSRI) (4) Reserpine (vesicular monoamine transporter inhibitor)
68.	<p>Which class of drugs increases synaptic dopamine by blocking the dopamine transporter?</p> <ol style="list-style-type: none"> (1) SSRIs (2) DAT inhibitors (e.g., cocaine) (3) MAO inhibitors (4) COMT inhibitors
69.	<p>Cell viability assays are used to assess :</p> <ol style="list-style-type: none"> (1) DNA sequence (2) Enzyme kinetics (3) Cell survival and cytotoxicity (4) Drug solubility

Question No.	Questions
70.	<p>What happens when a high dose of acetylcholine (ACh) is administered after atropine?</p> <ol style="list-style-type: none">(1) Bradycardia and fall in blood pressure due to parasympathetic stimulation(2) Tachycardia and rise in blood pressure due to stimulation of sympathetic ganglia and catecholamine release(3) No cardiovascular effect due to complete muscarinic blockade(4) Fall in blood pressure due to inhibition of sympathetic ganglia
71.	<p>Euthanasia should be adopted in which of the following conditions :</p> <ol style="list-style-type: none">(1) When the animal is paralyzed and is not able to perform its natural functions or it becomes incapable of independent locomotion or it can no longer perceive the environment in an intelligible manner(2) If during the course of experimental procedure the animal has been left with a recurring pain where in the animal exhibits obvious signs of pain and suffering(3) Where the non-termination of the life of the experimental animal will be life threatening to human beings or other animals(4) All the above
72.	<p>Inhalant agents such as carbon dioxide (CO₂) are used for euthanasia because they :</p> <ol style="list-style-type: none">(1) Induce pain before death(2) Require physical restraint for long duration(3) Cause rapid loss of consciousness with minimal distress(4) Are ineffective in small rodents

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73.	<p>The CCSEA functions under which Ministry?</p> <ol style="list-style-type: none"> (1) Ministry of Health and Family Welfare (2) Ministry of Science and Technology (3) Ministry of Environment, forest and Climate Change (4) Indian Council of Medical Research
74.	<p>The Declaration of Helsinki was developed as a statement of ethical principles for :</p> <ol style="list-style-type: none"> (1) Research on animal only (2) Medical research involving human subjects, including identifiable human material and data (3) Epidemiological research only (4) Social science research involving interviews
75.	<p>Which of the following statements about the literature review is wrong?</p> <ol style="list-style-type: none"> (1) It helps identify gaps in existing research. (2) It provides a theoretical foundation for the current study. (3) It eliminates the need to collect primary data. (4) It helps refine research questions and hypotheses.
76.	<p>In a normal distribution, mean, median, and mode are :</p> <ol style="list-style-type: none"> (1) Equal (2) Unequal (3) Random (4) Independent

Question No.	Questions
77.	Which of the following best describes a conflict of interest in medical research? (1) When a researcher's personal or financial interests may influence study outcomes (2) When a study is delayed due to lack of funding (3) When participants withdraw from a study (4) When ethical approval takes longer than expected
78.	The Declaration of Helsinki was first adopted in : (1) 1947 (2) 1964 (3) 1975 (4) 1989
79.	In a single-blind study, the person unaware of treatment allocation is : (1) Only the subject (2) Only the investigator (3) Both subject and investigator (4) The ethics committee
80.	Identify the preferred sampling for the population with finite size among the following : (1) Systematic sampling (2) Purposive sampling (3) Cluster sampling (4) Area sampling
81.	The principle of non-maleficence is best summarized as : (1) Act for the greatest good (2) Respect autonomy (3) First, do no harm (4) Ensure justice

Question No.	Questions
82.	<p>What are the factors affecting sample size?</p> <ol style="list-style-type: none">(1) Sampling design and statistical analysis(2) Level of precision and level of confidence(3) Degree of variability and non-response rate(4) All the above
83.	<p>The 3Rs principle advocated by CCSEA stands for :</p> <ol style="list-style-type: none">(1) Replacement, Reduction, and Refinement(2) Reuse, Regulation, and Reproduction(3) Randomization, Reliability, and Replication(4) Replacement, Reporting, and Recording
84.	<p>The main difference between parametric and non-parametric tests is that :</p> <ol style="list-style-type: none">(1) Non-parametric tests are always more powerful(2) Parametric tests can be used with any type of data(3) Parametric tests make assumptions about population parameters; non-parametric tests do not(4) Non-parametric tests require normal distribution
85.	<p>Which of the following is incorrect?</p> <ol style="list-style-type: none">(1) Low p-value indicates that results are statistically significant.(2) High p-value indicates results are not statistically significant.(3) ANOVA assumes null hypothesis is true.(4) None of the above

Question No.	Questions
86.	<p>What are the three major principles laid down by The Belmont Report (1979)?</p> <p>(1) Randomization, reproducibility, and reliability (2) Respect for persons, beneficence, and justice (3) Confidentiality, analysis, and documentation (4) Control, intervention, and random sampling</p>
87.	<p>A researcher divides the population into several groups based on geographical regions and then randomly selects a few groups for study. This is an example of a:</p> <p>(1) Simple random sample (2) Systematic sample (3) Cluster sample (4) Stratified sample</p>
88.	<p>The principle of beneficence requires the researcher to :</p> <p>(1) Publish all results immediately (2) Maintain blinding during trials (3) Maximize possible benefits and minimize potential harm (4) Avoid informed consent</p>
89.	<p>According to CCSEA, selection of euthanasia method depends on :</p> <p>(1) Researcher's convenience (2) Animal species, size, age, and purpose of euthanasia (3) Institutional budget (4) Type of publication</p>
90.	<p>According to ICMR, all clinical drug trials in India must be registered with :</p> <p>(1) World Health Organization (2) Food and Drug Administration (3) Clinical Trials Registry-India (4) Central Bureau of Health Research</p>

Question No.	Questions
91.	Which of the following is not a characteristic of research? <div> <div>(1) Systematic</div> <div>(2) Logical</div> <div>(3) Biased</div> <div>(4) Empirical</div> </div>
92.	Which of the following is not a type of parametric test? <div> <div>(1) Chi square test</div> <div>(2) ANOVA</div> <div>(3) Correlation coefficient</div> <div>(4) t test</div> </div>
93.	Quarantine for newly received animals is necessary to : <div> <div>(1) Allow acclimatization and detect infections</div> <div>(2) Reduce housing space</div> <div>(3) Train the animals for experiments</div> <div>(4) Minimize feed consumption</div> </div>
94.	CCSEA recommends that animal housing rooms must be maintained at : <div> <div>(1) Any convenient temperature</div> <div>(2) Temperature and humidity suitable for each species</div> <div>(3) Low humidity and poor ventilation</div> <div>(4) The same temperature for all animals</div> </div>
95.	Which document preceded and influenced the Declaration of Helsinki? <div> <div>(1) Belmont Report</div> <div>(2) Nuremberg Code</div> <div>(3) CIOMS Guidelines</div> <div>(4) ICH-GCP Guidelines</div> </div>
96.	The hypothesis which develops while planning the research is : <div> <div>(1) Working hypothesis</div> <div>(2) Research hypothesis</div> <div>(3) Null hypothesis</div> <div>(4) Complex hypothesis</div> </div>

Question No.	Questions
97.	<p>Pearson correlation coefficient, denoted by r, measures :</p> <ul style="list-style-type: none">(1) The scattering strength of data for a statistical series(2) The strength of the correlation between the mean and median(3) The strength of the correlation between two numerical parameters(4) The tendency of simultaneous increase or decrease, or inverse evolution, for two numerical parameters
98.	<p>Hypothesis is a :</p> <ul style="list-style-type: none">(1) Statement that can be tested (2) Theory(3) Fact (4) Law
99.	<p>What is the full form of CCSEA?</p> <ul style="list-style-type: none">(1) Committee for Control and Supervision of Experiments on Animals(2) Central Committee for Supervision of Ethical Activities(3) Council for Care and Safety of Experimental Animals(4) Committee for Certification of Scientific Animal Experiments
100.	<p>A variable that can be manipulated by the researcher is :</p> <ul style="list-style-type: none">(1) Dependent variable (2) Independent variable(3) Controlled variable (4) Extraneous variable

SET-“Y” (Total No. of printed pages : 20)

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PHD-EE, November-2025

(PHARMACEUTICAL SCIENCES)

Code



Sr. No. **10043**

Time : 1½ Hours

Total Questions : 100

Max. Marks : 100

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

Name : _____

Date of Birth : _____

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. All questions are compulsory.
2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour 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.
3. 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.
4. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately 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 students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
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9.	<p>In a single-blind study, the person unaware of treatment allocation is :</p> <p>(1) Only the subject</p> <p>(2) Only the investigator</p> <p>(3) Both subject and investigator</p> <p>(4) The ethics committee</p>
10.	<p>Identify the preferred sampling for the population with finite size among the following :</p> <p>(1) Systematic sampling (2) Purposive sampling</p> <p>(3) Cluster sampling (4) Area sampling</p>
11.	<p>The principle of non-maleficence is best summarized as :</p> <p>(1) Act for the greatest good (2) Respect autonomy</p> <p>(3) First, do no harm (4) Ensure justice</p>
12.	<p>What are the factors affecting sample size?</p> <p>(1) Sampling design and statistical analysis</p> <p>(2) Level of precision and level of confidence</p> <p>(3) Degree of variability and non-response rate</p> <p>(4) All the above</p>
13.	<p>The 3Rs principle advocated by CCSEA stands for :</p> <p>(1) Replacement, Reduction, and Refinement</p> <p>(2) Reuse, Regulation, and Reproduction</p> <p>(3) Randomization, Reliability, and Replication</p> <p>(4) Replacement, Reporting, and Recording</p>

Question No.	Questions
14.	<p>The main difference between parametric and non-parametric tests is that :</p> <ul style="list-style-type: none">(1) Non-parametric tests are always more powerful(2) Parametric tests can be used with any type of data(3) Parametric tests make assumptions about population parameters; non-parametric tests do not(4) Non-parametric tests require normal distribution
15.	<p>Which of the following is incorrect?</p> <ul style="list-style-type: none">(1) Low p-value indicates that results are statistically significant.(2) High p-value indicates results are not statistically significant.(3) ANOVA assumes null hypothesis is true.(4) None of the above
16.	<p>What are the three major principles laid down by The Belmont Report (1979)?</p> <ul style="list-style-type: none">(1) Randomization, reproducibility, and reliability(2) Respect for persons, beneficence, and justice(3) Confidentiality, analysis, and documentation(4) Control, intervention, and random sampling
17.	<p>A researcher divides the population into several groups based on geographical regions and then randomly selects a few groups for study. This is an example of a:</p> <ul style="list-style-type: none">(1) Simple random sample(2) Systematic sample(3) Cluster sample(4) Stratified sample

Question No.	Questions
18.	<p>The principle of beneficence requires the researcher to :</p> <ul style="list-style-type: none">(1) Publish all results immediately(2) Maintain blinding during trials(3) Maximize possible benefits and minimize potential harm(4) Avoid informed consent
19.	<p>According to CCSEA, selection of euthanasia method depends on :</p> <ul style="list-style-type: none">(1) Researcher's convenience(2) Animal species, size, age, and purpose of euthanasia(3) Institutional budget(4) Type of publication
20.	<p>According to ICMR, all clinical drug trials in India must be registered with :</p> <ul style="list-style-type: none">(1) World Health Organization(2) Food and Drug Administration(3) Clinical Trials Registry-India(4) Central Bureau of Health Research
21.	<p>Which of the following is not a characteristic of research?</p> <ul style="list-style-type: none">(1) Systematic(2) Logical(3) Biased(4) Empirical
22.	<p>Which of the following is not a type of parametric test?</p> <ul style="list-style-type: none">(1) Chi square test(2) ANOVA(3) Correlation coefficient(4) t test

Question No.	Questions				
23.	<p>Quarantine for newly received animals is necessary to :</p> <ol style="list-style-type: none"> (1) Allow acclimatization and detect infections (2) Reduce housing space (3) Train the animals for experiments (4) Minimize feed consumption 				
24.	<p>CCSEA recommends that animal housing rooms must be maintained at :</p> <ol style="list-style-type: none"> (1) Any convenient temperature (2) Temperature and humidity suitable for each species (3) Low humidity and poor ventilation (4) The same temperature for all animals 				
25.	<p>Which document preceded and influenced the Declaration of Helsinki?</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(1) Belmont Report</td> <td style="width: 50%;">(2) Nuremberg Code</td> </tr> <tr> <td>(3) CIOMS Guidelines</td> <td>(4) ICH-GCP Guidelines</td> </tr> </table>	(1) Belmont Report	(2) Nuremberg Code	(3) CIOMS Guidelines	(4) ICH-GCP Guidelines
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26.	<p>The hypothesis which develops while planning the research is :</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(1) Working hypothesis</td> <td style="width: 50%;">(2) Research hypothesis</td> </tr> <tr> <td>(3) Null hypothesis</td> <td>(4) Complex hypothesis</td> </tr> </table>	(1) Working hypothesis	(2) Research hypothesis	(3) Null hypothesis	(4) Complex hypothesis
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27.	<p>Pearson correlation coefficient, denoted by r, measures :</p> <ol style="list-style-type: none"> (1) The scattering strength of data for a statistical series (2) The strength of the correlation between the mean and median (3) The strength of the correlation between two numerical parameters (4) The tendency of simultaneous increase or decrease, or inverse evolution, for two numerical parameters 				

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28.	<p>Hypothesis is a :</p> <p>(1) Statement that can be tested (2) Theory</p> <p>(3) Fact (4) Law</p>
29.	<p>What is the full form of CCSEA?</p> <p>(1) Committee for Control and Supervision of Experiments on Animals</p> <p>(2) Central Committee for Supervision of Ethical Activities</p> <p>(3) Council for Care and Safety of Experimental Animals</p> <p>(4) Committee for Certification of Scientific Animal Experiments</p>
30.	<p>A variable that can be manipulated by the researcher is :</p> <p>(1) Dependent variable (2) Independent variable</p> <p>(3) Controlled variable (4) Extraneous variable</p>
31.	<p>Intentional adulteration with the purpose of defrauding is termed:</p> <p>(1) Substitution (2) Sophistication</p> <p>(3) Deterioration (4) Spoilage</p>
32.	<p>The Si-OH groups on silica are also known as :</p> <p>(1) Carboxyl groups (2) Hydroxyl groups</p> <p>(3) Phenolic groups (4) Carbonyl groups</p>
33.	<p>Swelling index is determined for :</p> <p>(1) Isphagula (2) Digitalis</p> <p>(3) Clove (4) Aloes</p>
34.	<p>Which of the following crude drug is not used in the treatment of hypertension?</p> <p>(1) Digitalis (2) Rauwolfia</p> <p>(3) Squill (4) Stropanthus</p>

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35.	Retention time in HPLC or GC mainly depends on : (1) The detector sensitivity only (2) The interaction of analyte with the stationary phase and mobile phase composition (3) The color of the analyte (4) The sample injection volume only										
36.	"Like with like" is the principle of : (1) Homeopathy (2) Ayurveda (3) Unani (4) Siddha										
37.	Eugenol is the plant constituent of : (1) Amla (2) Hibiscus (3) Senna (4) Clove										
38.	Match the following natural drugs with their therapeutic uses : <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Drug</td><td style="width: 50%;">Therapeutic uses</td></tr> <tr> <td>a. Liquorice</td><td>1. CNS stimulant</td></tr> <tr> <td>b. Senna</td><td>2. Expectorant</td></tr> <tr> <td>c. Nux vomica</td><td>3. Laxative</td></tr> <tr> <td>d. Digitalis</td><td>4. Cardiotonic</td></tr> </table> (1) a-1, b-2, c-3, d-4 (2) a-3, b-4, c-2, d-1 (3) a-4, b-1, c-3, d-2 (4) a-2, b-3, c-1, d-4	Drug	Therapeutic uses	a. Liquorice	1. CNS stimulant	b. Senna	2. Expectorant	c. Nux vomica	3. Laxative	d. Digitalis	4. Cardiotonic
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39.	Total Ash value in the case of crude drug signifies : (1) Organic content of the drug (2) Cellular content of the drug (3) Inorganic content of the drug (4) Phytoconstituents of the drug										

Question No.	Questions
40.	<p>Organoleptic evaluation is an example of which type of study?</p> <p>(1) Microscopic (2) Biological</p> <p>(3) Technical (4) Morphological</p>
41.	<p>An unequal distribution of color on the surface of tablet is called :</p> <p>(1) Cracking (2) Mottling</p> <p>(3) Picking (4) Chipping</p>
42.	<p>Which of the following is pH sensitive bioerodible polymer :</p> <p>(1) Polymethacrylate (2) HPMC</p> <p>(3) NaCMC (4) None</p>
43.	<p>Magnesium stearate is used as :</p> <p>(1) Antioxidant (2) Antiadherent</p> <p>(3) Binder (4) Film Coating</p>
44.	<p>The most important water-miscible vehicle used in parenteral formulations is :</p> <p>(1) Ethyl alcohol (2) Propylene glycol</p> <p>(3) Liquid polyethylene glycol (4) All of the above</p>
45.	<p>Carr's Index is related to :</p> <p>(1) Flow property (2) Solubility</p> <p>(3) Partition coefficient (4) All of the above</p>
46.	<p>From the dissolution point of view, which of the following dosage forms is least absorbed?</p> <p>(1) Coated tablets (2) Solution</p> <p>(3) Suspension (4) Uncoated tablets</p>

[illegible]

Question No.	Questions
52.	ANOVA is used to compare : (1) The medians of two groups (2) The means of three or more groups (3) The variances of two groups only (4) Proportions in categorical data
53.	The Declaration of Helsinki was developed by which organization? (1) World Health Organization (2) United Nations (3) World Medical Association (4) International Council for harmonization
54.	Identify the option that is not a characteristic of qualitative research. (1) Thematic analysis (2) Case study (3) Discourse analysis (4) Survey method
55.	The Nuremberg Code (1947) was developed after : (1) World War II unethical human experiments (2) The Tuskegee Syphilis Study (3) The Thalidomide tragedy (4) World Health Organization's founding
56.	Medical ethics is primarily based on : (1) Economic considerations (2) Professional competition (3) Human dignity, rights, and moral duty (4) Institutional politics

Question No.	Questions
57.	Which of the following is not a type of research design? (1) Exploratory (2) Descriptive (3) Experimental (4) Accidental
58.	Euthanasia involves : (1) Intentionally ending life to relieve suffering (2) Providing emotional support to the terminally ill (3) Withholding data publication (4) Ensuring autonomy
59.	Which of the following conditions is not suitable for proper animal housing in a research facility? (1) Provide an escape-proof enclosure that ensures the animal's safety. (2) Provide easy access to food and water. (3) Maintain poor ventilation to minimize air circulation and noise. (4) Keep the animal dry and clean, consistent with species requirements.
60.	According to the Declaration of Helsinki, who is responsible for protecting the life, health, dignity, integrity, and privacy of research subjects? (1) The sponsor (2) The ethics committee (3) The physician or health professional conducting the research (4) The government authority

Question No.	Questions
61.	What is the bond angle in sp hybridization? (1) 109.5° (2) 120° (3) 180° (4) 119.5°
62.	LiAlH ₄ is not used in reduction of : (1) Alkene double bond (2) Carbonyl Carbon (3) Amide (4) Ester
63.	COMSIA is associated with : (1) Virtual Screening (2) Molecular Docking (3) QSAR (4) ADME Prediction
64.	Stereoisomer of cyclic carbohydrate is known as : (1) Epimer (2) Anomer (3) Enantiomer (4) Diastereomer
65.	Biphenyl show following kind of isomerism : (1) Optical isomer (2) Configurational isomer (3) Atropisomers (4) R and S isomer
66.	Clavulanic acid has beta-lactam ring fused with : (1) Thienyl system (2) Thiadiazole (3) Thiazolidone (4) Oxazolidine
67.	Which of the following is not a synthetic drug? (1) Isoniazid (2) Rifampin (3) Pyrazinamide (4) Ethionamide
68.	What is most logical and molecular approach to drug discovery? (1) Synthetic organic chemistry (2) Structure Based Drug Design (3) QSAR (4) All

Question No.	Questions
69.	At which position penicillin has carboxylic acid group : (1) C-3 (2) C-2 (3) C-6 (4) C-7
70.	Ethosuximide belongs to following chemical class of anticonvulsant : (1) Hydantoin (2) Barbiturate (3) Succinamide (4) Oxazolidinedione
71.	A drug having high affinity but low intrinsic activity is called : (1) Partial agonist (2) Antagonist (3) Non-competitive antagonism (4) Competitive antagonism
72.	A high degree of protein binding generally makes a drug long-acting because : (1) The bound fraction is rapidly metabolized and excreted (2) The bound fraction is not available for metabolism or excretion (3) Protein binding increases the rate of drug elimination (4) Protein-bound drugs cannot cross biological membranes
73.	Neurotransmission refers to : (1) Transfer of nerve impulses through chemical messengers (2) Electrical conduction through bone (3) Secretion of hormones by glands (4) Storage of neurotransmitters in muscles
74.	Pilocarpine is classified as : (1) Cholinesterase inhibitor (2) Sympathomimetic (3) Cholinomimetic (4) Cholinolytics

Question No.	Questions
75.	<p>Glutamate is primarily involved in :</p> <p>(1) Inhibitory transmission (2) Excitatory transmission</p> <p>(3) Hormonal signaling (4) Protein synthesis</p>
76.	<p>The primary mechanism by which reserpine depletes monoamines is :</p> <p>(1) Inhibition of monoamine oxidase</p> <p>(2) Blockade of vesicular monoamine transporter (VMAT)</p> <p>(3) Inhibition of catechol-O-methyltransferase</p> <p>(4) Blocking dopamine receptors</p>
77.	<p>Which pharmacological agent would increase acetylcholine levels at synapses by inhibiting its breakdown?</p> <p>(1) Neostigmine (acetylcholinesterase inhibitor)</p> <p>(2) Propranolol (beta-blocker)</p> <p>(3) Fluoxetine (SSRI)</p> <p>(4) Reserpine (vesicular monoamine transporter inhibitor)</p>
78.	<p>Which class of drugs increases synaptic dopamine by blocking the dopamine transporter?</p> <p>(1) SSRIs (2) DAT inhibitors (e.g., cocaine)</p> <p>(3) MAO inhibitors (4) COMT inhibitors</p>
79.	<p>Cell viability assays are used to assess :</p> <p>(1) DNA sequence</p> <p>(2) Enzyme kinetics</p> <p>(3) Cell survival and cytotoxicity</p> <p>(4) Drug solubility</p>

Question No.	Questions
80.	<p>What happens when a high dose of acetylcholine (ACh) is administered after atropine?</p> <p>(1) Bradycardia and fall in blood pressure due to parasympathetic stimulation</p> <p>(2) Tachycardia and rise in blood pressure due to stimulation of sympathetic ganglia and catecholamine release</p> <p>(3) No cardiovascular effect due to complete muscarinic blockade</p> <p>(4) Fall in blood pressure due to inhibition of sympathetic ganglia</p>
81.	<p>Which of the following is a probability sampling method?</p> <p>(1) Simple random sampling (2) Purposive sampling</p> <p>(3) Convenience sampling (4) Snowball sampling</p>
82.	<p>A placebo is substance that :</p> <p>(1) Has active therapeutic effect</p> <p>(2) Has no therapeutic effect and is used as a control</p> <p>(3) Always cause adverse reactions</p> <p>(4) Is used to increase drug absorption</p>
83.	<p>What is full form of SPSS?</p> <p>(1) Software Package for Sample Statistics</p> <p>(2) Statistical Program for Social Services</p> <p>(3) Systematic Processing for Statistical Studies</p> <p>(4) Statistical Package for Social Sciences</p>
84.	<p>Sampling is :</p> <p>(1) Studying the entire population</p> <p>(2) Studying a portion of the population</p> <p>(3) Studying secondary data</p> <p>(4) None of the above</p>

Question No.	Questions
85.	When $p < 0.05$, the finding is said to be : (1) Statistically significant (2) Clinically significant only (3) Not significant (4) Randomly significant
86.	The informed consent process must include : (1) Purpose, risks, benefits, right to withdraw, and confidentiality details (2) Only name and signature of participant (3) Financial compensation alone (4) Medical history of investigator
87.	A normal distribution curve is : (1) Bell-shaped and symmetrical (2) Skewed to the right (3) Skewed to the left (4) Rectangular
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91.	Which law relates the absorbance with concentration and path length? (1) Newton's Law (2) Beer-Lambert's Law (3) Ohm's Law (4) Dalton's Law
92.	UV-Visible spectroscopy measures the : (1) Absorption of infrared light (2) Emission of UV light (3) Absorption of UV or visible light (4) Reflection of UV light
93.	In IR spectroscopy, absorption is due to : (1) Electronic transitions (2) Vibration transitions (3) Rotational transitions (4) Nuclear transitions
94.	Coupling constant (J) value : (1) Depends upon magnetic field (2) Is independent of magnetic field (3) Depends on reference standard used (4) Depends on solvent used
95.	When absorption intensity of compound is decreased, the phenomenon is known as : (1) Hyperchromic shift (2) Hypochromic shift (3) Bathochromic Shift (4) None
96.	In aldehyde, the C=O stretching vibration appears approximately at : (1) 1725cm^{-1} (2) 1660cm^{-1} (3) 2750cm^{-1} (4) 3300cm^{-1}

Question No.	Questions
97.	Which of the following has highest chemical shift value? <div style="display: flex; justify-content: space-between;"> (1) CH_3I (2) CH_3Br </div> <div style="display: flex; justify-content: space-between;"> (3) CH_3F (4) CH_3Cl </div>
98.	In mass spectrometry ^{81}Br containing compounds show : <div style="display: flex; justify-content: space-between;"> (1) M+1 Peak (2) M+2 Peak </div> <div style="display: flex; justify-content: space-between;"> (3) M+3 Peak (4) M+4 Peak </div>
99.	All solvents are used to record NMR spectra except : <div style="display: flex; justify-content: space-between;"> (1) DMSO (2) CDCl_3 </div> <div style="display: flex; justify-content: space-between;"> (3) $\text{C}_2\text{H}_5\text{OH}$ (4) Deuterated benzene </div>
100.	Reverse phase HPLC uses : <div style="display: flex; flex-direction: column;"> <div>(1) Non polar solvent/polar column</div> <div>(2) Polar solvent/polar column</div> <div>(3) Polar solvent/Non polar column</div> <div>(4) All</div> </div>

SET-“Y” (Total No. of printed pages : 20)

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PHD-EE, November-2025

(PHARMACEUTICAL SCIENCES)

10044

Sr. No. _____

Code

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Time : 1¼ Hours

Total Questions : 100

Max. Marks : 100

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

Name : _____

Date of Birth : _____

Father's Name : _____

Mother's Name : _____

Date of Examination : _____

(Signature of the candidate)

(Signature of the Invigilator)

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1. All questions are compulsory.
2. The candidates must return the Question book-let as well as OMR answer-sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour 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.
3. 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.
4. Question Booklet along-with answer key of all the A,B,C and D code shall be got uploaded on the University Website immediately 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 students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case will be considered.
5. The candidate **MUST NOT** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question book-let itself. Answers **MUST NOT** be ticked in the Question book-let.
6. There will be negative marking and a deduction of 0.25 marks for each wrong answers. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
7. Use only Black or Blue **BALL POINT PEN** of good quality in the OMR Answer-Sheet.
8. **BEFORE ANSWERING THE QUESTIONS, THE CANDIDATES SHOULD ENSURE THAT THEY HAVE BEEN SUPPLIED CORRECT AND COMPLETE BOOK-LET. COMPLAINTS, IF ANY, REGARDING MISPRINTING ETC. WILL NOT BE ENTERTAINED 30 MINUTES AFTER STARTING OF THE EXAMINATION.**



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23.	<p>COMSIA is associated with :</p> <p>(1) Virtual Screening (2) Molecular Docking</p> <p>(3) QSAR (4) ADME Prediction</p>
24.	<p>Stereoisomer of cyclic carbohydrate is known as :</p> <p>(1) Epimer (2) Anomer</p> <p>(3) Enantiomer (4) Diastereomer</p>
25.	<p>Biphenyl show following kind of isomerism :</p> <p>(1) Optical isomer (2) Configurational isomer</p> <p>(3) Atropisomers (4) R and S isomer</p>
26.	<p>Clavulanic acid has beta-lactam ring fused with :</p> <p>(1) Thienyl system (2) Thiadiazole</p> <p>(3) Thiazolidone (4) Oxazolidine</p>
27.	<p>Which of the following is not a synthetic drug?</p> <p>(1) Isoniazid (2) Rifampin</p> <p>(3) Pyrazinamide (4) Ethionamide</p>
28.	<p>What is most logical and molecular approach to drug discovery?</p> <p>(1) Synthetic organic chemistry</p> <p>(2) Structure Based Drug Design</p> <p>(3) QSAR</p> <p>(4) All</p>

Question No.	Questions
29.	At which position penicillin has carboxylic acid group : (1) C-3 (2) C-2 (3) C-6 (4) C-7
30.	Ethosuximide belongs to following chemical class of anticonvulsant : (1) Hydantoin (2) Barbiturate (3) Succinamide (4) Oxazolidinedione
31.	Which law relates the absorbance with concentration and path length? (1) Newton's Law (2) Beer-Lambert's Law (3) Ohm's Law (4) Dalton's Law
32.	UV-Visible spectroscopy measures the : (1) Absorption of infrared light (2) Emission of UV light (3) Absorption of UV or visible light (4) Reflection of UV light
33.	In IR spectroscopy, absorption is due to : (1) Electronic transitions (2) Vibration transitions (3) Rotational transitions (4) Nuclear transitions
34.	Coupling constant (J) value : (1) Depends upon magnetic field (2) Is independent of magnetic field (3) Depends on reference standard used (4) Depends on solvent used
35.	When absorption intensity of compound is decreased, the phenomenon is known as : (1) Hyperchromic shift (2) Hypochromic shift (3) Bathochromic Shift (4) None

Question No.	Questions
36.	In aldehyde, the C=O stretching vibration appears approximately at : (1) 1725cm ⁻¹ (2) 1660cm ⁻¹ (3) 2750cm ⁻¹ (4) 3300cm ⁻¹
37.	Which of the following has highest chemical shift value? (1) CH ₃ I (2) CH ₃ Br (3) CH ₃ F (4) CH ₃ Cl
38.	In mass spectrometry ⁸¹ Br containing compounds show : (1) M+1 Peak (2) M+2 Peak (3) M+3 Peak (4) M+4 Peak
39.	All solvents are used to record NMR spectra except : (1) DMSO (2) CDCl ₃ (3) C ₂ H ₅ OH (4) Deuterated benzene
40.	Reverse phase HPLC uses : (1) Non polar solvent/polar column (2) Polar solvent/polar column (3) Polar solvent/Non polar column (4) All
41.	According to Good clinical Practice (GCP), the investigator must report any serious adverse event (SAE) to the Ethics committee within : (1) 7 days (2) 15 days (3) 24 hours (4) 1 month
42.	ANOVA is used to compare : (1) The medians of two groups (2) The means of three or more groups (3) The variances of two groups only (4) Proportions in categorical data

Question No.	Questions
43.	The Declaration of Helsinki was developed by which organization? (1) World Health Organization (2) United Nations (3) World Medical Association (4) International Council for harmonization
44.	Identify the option that is not a characteristic of qualitative research. (1) Thematic analysis (2) Case study (3) Discourse analysis (4) Survey method
45.	The Nuremberg Code (1947) was developed after : (1) World War II unethical human experiments (2) The Tuskegee Syphilis Study (3) The Thalidomide tragedy (4) World Health Organization's founding
46.	Medical ethics is primarily based on : (1) Economic considerations (2) Professional competition (3) Human dignity, rights, and moral duty (4) Institutional politics
47.	Which of the following is not a type of research design? (1) Exploratory (2) Descriptive (3) Experimental (4) Accidental
48.	Euthanasia involves : (1) Intentionally ending life to relieve suffering (2) Providing emotional support to the terminally ill (3) Withholding data publication (4) Ensuring autonomy

Question No.	Questions
49.	<p>Which of the following conditions is not suitable for proper animal housing in a research facility?</p> <p>(1) Provide an escape-proof enclosure that ensures the animal's safety.</p> <p>(2) Provide easy access to food and water.</p> <p>(3) Maintain poor ventilation to minimize air circulation and noise.</p> <p>(4) Keep the animal dry and clean, consistent with species requirements.</p>
50.	<p>According to the Declaration of Helsinki, who is responsible for protecting the life, health, dignity, integrity, and privacy of research subjects?</p> <p>(1) The sponsor</p> <p>(2) The ethics committee</p> <p>(3) The physician or health professional conducting the research</p> <p>(4) The government authority</p>
51.	<p>The principle of non-maleficence is best summarized as :</p> <p>(1) Act for the greatest good (2) Respect autonomy</p> <p>(3) First, do no harm (4) Ensure justice</p>
52.	<p>What are the factors affecting sample size?</p> <p>(1) Sampling design and statistical analysis</p> <p>(2) Level of precision and level of confidence</p> <p>(3) Degree of variability and non-response rate</p> <p>(4) All the above</p>

Question No.	Questions
53.	<p>The 3Rs principle advocated by CCSEA stands for :</p> <ol style="list-style-type: none"> (1) Replacement, Reduction, and Refinement (2) Reuse, Regulation, and Reproduction (3) Randomization, Reliability, and Replication (4) Replacement, Reporting, and Recording
54.	<p>The main difference between parametric and non-parametric tests is that :</p> <ol style="list-style-type: none"> (1) Non-parametric tests are always more powerful (2) Parametric tests can be used with any type of data (3) Parametric tests make assumptions about population parameters; non-parametric tests do not (4) Non-parametric tests require normal distribution
55.	<p>Which of the following is incorrect?</p> <ol style="list-style-type: none"> (1) Low p-value indicates that results are statistically significant. (2) High p-value indicates results are not statistically significant. (3) ANOVA assumes null hypothesis is true. (4) None of the above
56.	<p>What are the three major principles laid down by The Belmont Report (1979)?</p> <ol style="list-style-type: none"> (1) Randomization, reproducibility, and reliability (2) Respect for persons, beneficence, and justice (3) Confidentiality, analysis, and documentation (4) Control, intervention, and random sampling

Question No.	Questions
57.	<p>A researcher divides the population into several groups based on geographical regions and then randomly selects a few groups for study. This is an example of a:</p> <p>(1) Simple random sample (2) Systematic sample (3) Cluster sample (4) Stratified sample</p>
58.	<p>The principle of beneficence requires the researcher to :</p> <p>(1) Publish all results immediately (2) Maintain blinding during trials (3) Maximize possible benefits and minimize potential harm (4) Avoid informed consent</p>
59.	<p>According to CCSEA, selection of euthanasia method depends on :</p> <p>(1) Researcher's convenience (2) Animal species, size, age, and purpose of euthanasia (3) Institutional budget (4) Type of publication</p>
60.	<p>According to ICMR, all clinical drug trials in India must be registered with :</p> <p>(1) World Health Organization (2) Food and Drug Administration (3) Clinical Trials Registry-India (4) Central Bureau of Health Research</p>

Question No.	Questions
61.	<p>Euthanasia should be adopted in which of the following conditions :</p> <ol style="list-style-type: none"> (1) When the animal is paralyzed and is not able to perform its natural functions or it becomes incapable of independent locomotion or it can no longer perceive the environment in an intelligible manner (2) If during the course of experimental procedure the animal has been left with a recurring pain where in the animal exhibits obvious signs of pain and suffering (3) Where the non-termination of the life of the experimental animal will be life threatening to human beings or other animals (4) All the above
62.	<p>Inhalant agents such as carbon dioxide (CO₂) are used for euthanasia because they :</p> <ol style="list-style-type: none"> (1) Induce pain before death (2) Require physical restraint for long duration (3) Cause rapid loss of consciousness with minimal distress (4) Are ineffective in small rodents
63.	<p>The CCSEA functions under which Ministry?</p> <ol style="list-style-type: none"> (1) Ministry of Health and Family Welfare (2) Ministry of Science and Technology (3) Ministry of Environment, forest and Climate Change (4) Indian Council of Medical Research

Question No.	Questions
64.	<p>The Declaration of Helsinki was developed as a statement of ethical principles for :</p> <ul style="list-style-type: none"> (1) Research on animal only (2) Medical research involving human subjects, including identifiable human material and data (3) Epidemiological research only (4) Social science research involving interviews
65.	<p>Which of the following statements about the literature review is wrong?</p> <ul style="list-style-type: none"> (1) It helps identify gaps in existing research. (2) It provides a theoretical foundation for the current study. (3) It eliminates the need to collect primary data. (4) It helps refine research questions and hypotheses.
66.	<p>In a normal distribution, mean, median, and mode are :</p> <ul style="list-style-type: none"> (1) Equal (2) Unequal (3) Random (4) Independent
67.	<p>Which of the following best describes a conflict of interest in medical research?</p> <ul style="list-style-type: none"> (1) When a researcher's personal or financial interests may influence study outcomes (2) When a study is delayed due to lack of funding (3) When participants withdraw from a study (4) When ethical approval takes longer than expected
68.	<p>The Declaration of Helsinki was first adopted in :</p> <ul style="list-style-type: none"> (1) 1947 (2) 1964 (3) 1975 (4) 1989

Question No.	Questions
69.	In a single-blind study, the person unaware of treatment allocation is : (1) Only the subject (2) Only the investigator (3) Both subject and investigator (4) The ethics committee
70.	Identify the preferred sampling for the population with finite size among the following : (1) Systematic sampling (2) Purposive sampling (3) Cluster sampling (4) Area sampling
71.	An unequal distribution of color on the surface of tablet is called : (1) Cracking (2) Mottling (3) Picking (4) Chipping
72.	Which of the following is pH sensitive bioerodible polymer : (1) Polymethacrylate (2) HPMC (3) NaCMC (4) None
73.	Magnesium stearate is used as : (1) Antioxidant (2) Antiadherent (3) Binder (4) Film Coating
74.	The most important water-miscible vehicle used in parenteral formulations is : (1) Ethyl alcohol (2) Propylene glycol (3) Liquid polyethylene glycol (4) All of the above
75.	Carr's Index is related to : (1) Flow property (2) Solubility (3) Partition coefficient (4) All of the above

Question No.	Questions
76.	From the dissolution point of view, which of the following dosage forms is least absorbed? (1) Coated tablets (2) Solution (3) Suspension (4) Uncoated tablets
77.	What term describes the separation of solid particles from a suspension over time, leading to the settling of particles at the bottom of the container? (1) Emulsification (2) Sedimentation (3) Precipitation (4) Dissolution
78.	Which of the following is most stable form? (1) Powder (2) Syrup (3) Gel (4) Suspensions
79.	High speed homogenization and atomization of feed into a stream of hot air is associated with : (1) Spray Drying (2) Centrifugal extrusion (3) Spray congealing (4) Multiorifice centrifugal technique
80.	Photodegradation of a drug can be prevented by : (1) Refrigerating the product. (2) Using an in-line filter during administration. (3) Dispensing the drug in an amber-colored or opaque container. (4) Adjusting the pH of the solution.

Question No.	Questions
81.	Which of the following is not a characteristic of research? (1) Systematic (2) Logical (3) Biased (4) Empirical
82.	Which of the following is not a type of parametric test? (1) Chi square test (2) ANOVA (3) Correlation coefficient (4) t test
83.	Quarantine for newly received animals is necessary to : (1) Allow acclimatization and detect infections (2) Reduce housing space (3) Train the animals for experiments (4) Minimize feed consumption
84.	CCSEA recommends that animal housing rooms must be maintained at : (1) Any convenient temperature (2) Temperature and humidity suitable for each species (3) Low humidity and poor ventilation (4) The same temperature for all animals
85.	Which document preceded and influenced the Declaration of Helsinki? (1) Belmont Report (2) Nuremberg Code (3) CIOMS Guidelines (4) ICH-GCP Guidelines
86.	The hypothesis which develops while planning the research is : (1) Working hypothesis (2) Research hypothesis (3) Null hypothesis (4) Complex hypothesis

Question No.	Questions
87.	<p>Pearson correlation coefficient, denoted by r, measures :</p> <ul style="list-style-type: none"> (1) The scattering strength of data for a statistical series (2) The strength of the correlation between the mean and median (3) The strength of the correlation between two numerical parameters (4) The tendency of simultaneous increase or decrease, or inverse evolution, for two numerical parameters
88.	<p>Hypothesis is a :</p> <ul style="list-style-type: none"> (1) Statement that can be tested (2) Theory (3) Fact (4) Law
89.	<p>What is the full form of CCSEA?</p> <ul style="list-style-type: none"> (1) Committee for Control and Supervision of Experiments on Animals (2) Central Committee for Supervision of Ethical Activities (3) Council for Care and Safety of Experimental Animals (4) Committee for Certification of Scientific Animal Experiments
90.	<p>A variable that can be manipulated by the researcher is :</p> <ul style="list-style-type: none"> (1) Dependent variable (2) Independent variable (3) Controlled variable (4) Extraneous variable
91.	<p>A drug having high affinity but low intrinsic activity is called :</p> <ul style="list-style-type: none"> (1) Partial agonist (2) Antagonist (3) Non-competitive antagonism (4) Competitive antagonism

Question No.	Questions				
92.	<p>A high degree of protein binding generally makes a drug long-acting because :</p> <ol style="list-style-type: none"> (1) The bond fraction is rapidly metabolized and excreted (2) The bond fraction is not available for metabolism or excretion (3) Protein binding increases the rate of drug elimination (4) Protein-bound drugs cannot cross biological membranes 				
93.	<p>Neurotransmission refers to :</p> <ol style="list-style-type: none"> (1) Transfer of nerve impulses through chemical messengers (2) Electrical conduction through bone (3) Secretion of hormones by glands (4) Storage of neurotransmitters in muscles 				
94.	<p>Pilocarpine is classified as :</p> <table border="0"> <tr> <td>(1) Cholinesterase inhibitor</td><td>(2) Sympathomimetic</td></tr> <tr> <td>(3) Cholinomimetic</td><td>(4) Cholinolytics</td></tr> </table>	(1) Cholinesterase inhibitor	(2) Sympathomimetic	(3) Cholinomimetic	(4) Cholinolytics
(1) Cholinesterase inhibitor	(2) Sympathomimetic				
(3) Cholinomimetic	(4) Cholinolytics				
95.	<p>Glutamate is primarily involved in :</p> <table border="0"> <tr> <td>(1) Inhibitory transmission</td><td>(2) Excitatory transmission</td></tr> <tr> <td>(3) Hormonal signaling</td><td>(4) Protein synthesis</td></tr> </table>	(1) Inhibitory transmission	(2) Excitatory transmission	(3) Hormonal signaling	(4) Protein synthesis
(1) Inhibitory transmission	(2) Excitatory transmission				
(3) Hormonal signaling	(4) Protein synthesis				
96.	<p>The primary mechanism by which reserpine depletes monoamines is :</p> <ol style="list-style-type: none"> (1) Inhibition of monoamine oxidase (2) Blockade of vesicular monoamine transporter (VMAT) (3) Inhibition of catechol-O-methyltransferase (4) Blocking dopamine receptors 				

Question No.	Questions
97.	<p>Which pharmacological agent would increase acetylcholine levels at synapses by inhibiting its breakdown?</p> <p>(1) Neostigmine (acetylcholinesterase inhibitor) (2) Propranolol (beta-blocker) (3) Fluoxetine (SSRI) (4) Reserpine (vesicular monoamine transporter inhibitor)</p>
98.	<p>Which class of drugs increases synaptic dopamine by blocking the dopamine transporter?</p> <p>(1) SSRIs (2) DAT inhibitors (e.g., cocaine) (3) MAO inhibitors (4) COMT inhibitors</p>
99.	<p>Cell viability assays are used to assess :</p> <p>(1) DNA sequence (2) Enzyme kinetics (3) Cell survival and cytotoxicity (4) Drug solubility</p>
100.	<p>What happens when a high dose of acetylcholine (ACh) is administered after atropine?</p> <p>(1) Bradycardia and fall in blood pressure due to parasympathetic stimulation (2) Tachycardia and rise in blood pressure due to stimulation of sympathetic ganglia and catecholamine release (3) No cardiovascular effect due to complete muscarinic blockade (4) Fall in blood pressure due to inhibition of sympathetic ganglia</p>

Answer keys of Ph.D. (Pharmaceutical Sciences) entrance exam dated 21.11.2025

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

Rakesh Chandra
21/11/25

Pooja
21/11/25

H
21/11/25

noorjahan
21/11/25

Answer keys of Ph.D. (Pharmaceutical Sciences) entrance exam dated 21.11.2025

Q. NO.	A	B	C	D
51	2	2	3	3
52	3	1	2	4
53	2	2	3	1
54	2	4	4	3
55	2	1	1	4
56	1	1	3	2
57	1	2	4	3
58	2	1	1	3
59	3	1	3	2
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85	2	4	1	2
86	2	2	1	1
87	1	3	1	3
88	2	3	1	1
89	3	2	4	1
90	2	3	3	2
91	2	3	2	1
92	2	1	3	2
93	1	1	2	1
94	3	2	2	3
95	2	2	2	2
96	1	1	1	2
97	4	3	1	1
98	4	1	2	2
99	3	1	3	3
100	4	2	3	2

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