

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU
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A

SET-X

PHD-EE-2023-24

Pharmaceutical Science

10025

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

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

Name _____ Date of Birth _____

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1. Pure research is also known as :
 - (1) Fundamental research
 - (2) Exploratory research
 - (3) Action research
 - (4) Explanatory research

2. A formal document that presents the research objectives, design of achieving the objectives, and the expected outcomes/deliverables of the study is called :
 - (1) Research' design
 - (2) Research proposal
 - (3) Research hypothesis
 - (4) Research report

3. An image, perception or concept that is capable of measurement is called :
 - (1) Variable
 - (2) Scale
 - (3) Hypothesis
 - (4) Type

4. A clinical research study is conducted in how many phases ?
 - (1) Five
 - (2) Eight
 - (3) Four
 - (4) One

5. The document mandatory 'to enroll in a clinical research study is :
 - (1) Protocol
 - (2) Investigator's Brochure
 - (3) Case Report Form
 - (4) Informed Consent Form

6. Random sampling is also called as :
- (1) Probation sampling
 - (2) Prospect sampling
 - (3) Probability sampling
 - (4) Availability sampling
7. The review of literature means :
- (1) Documentation' of reference material
 - (2) Overview of the previously published works on specific topic
 - (3) Formation of a theoretical framework .
 - (4) Elucidating and testing hypothesis
8. In a normal distribution, what percentage of data falls within one standard deviation from the mean ?
- (1) 68%
 - (2) 75%
 - (3) 95%
 - (4) 99%
9. What is the range of values for the correlation coefficient ?
- (1) 0 to 1
 - (2) -1 to 1
 - (3) -2 to 2
 - (4) -1 to 0
10. Which of the following is non-probability sampling ?
- (1) Quota sampling
 - (2) Cluster sampling
 - (3) Systematic 'sampling
 - (4) Stratified random sampling

11. What does CCSEA stand for ?
- (1) Council for control and supervision of experiments on animals
 - (2) Committee for control and supervision of experiments on animals
 - (3) Committee for command and supervision of experiments on animals
 - (4) Center for the control and supervision of experiments on animals
12. The member IAEC :
- (1) Biological Scientist
 - (2) Veterinarian
 - (3) Socially aware member
 - (4) All of these
13. SOP stands for :
- (1) Standard operation procedure
 - (2) Standard operating procedure
 - (3) Standard operating protocol
 - (4) Specific operation procedure
14. Goodness of Fit of a distribution is tested by :
- (1) T-test
 - (2) Chi-square test
 - (3) F-test
 - (4) None of the above
15. The probability of finding statistical significance is known as :
- (1) Degree of freedom
 - (2) Standard deviation
 - (3) p-value
 - (4) Standard error of mean

16. The research related to abstract ideas is :
- (1) Qualitative research
 - (2) Quantitative research
 - (3) Conceptual research
 - (4) Empirical research
17. Standard deviation is square root of :
- (1) Mode
 - (2) Regression
 - (3) Variance
 - (4) Standard error
18. The statistical test used to validate the statement "Peoples having high cholesterol suffer more from hypertension" :
- (1) ANOVA
 - (2) Regression analysis
 - (3) Pearson correlation coefficient
 - (4) Student test
19. All of the following are an example of quantitative data except :
- (1) Weight of the patient
 - (2) Systolic blood pressure of the patient
 - (3) Height of the patient
 - (4) Gender of the patient
20. Which graphical representation is best suited for displaying the distribution of a continuous variable in biostatistics ?
- (1) Pie chart
 - (2) Histogram
 - (3) Bar graph
 - (4) Line chart

21. What is the main goal of random sampling in biostatistics ?
- (1) To reduce bias
 - (2) To represent the entire population
 - (3) To simplify the sampling process
 - (4) To include specific groups only
22. What is the purpose of a residual plot in regression analysis ?
- (1) To check for outliers
 - (2) To assess normality assumptions
 - (3) To visualize the relationship between variables
 - (4) To examine the homoscedasticity of residuals
23. Which statistical test is appropriate for comparing the means of two independent groups ?
- (1) t-test
 - (2) ANOVA
 - (3) Chi-square test
 - (4) Mann-Whitney U test
24. If the grading of diabetes is classified as mild, moderate and severe, the scale of measurement used is :
- (1) Nominal
 - (2) Ordinal
 - (3) Interval
 - (4) Ratio
25. Biostatistics can be used for :
- (1) Designing experiment
 - (2) Collecting data
 - (3) Analysis of data
 - (4) All of the above

26. What is nuclear-Zeeman effect in NMR ?
- (1) Transition from lower energy spin state to higher energy spin state
 - (2) Splitting of spin states in applied external magnetic field
 - (3) Splitting of spin states in absence of field
 - (4) Processional motion of nuclei in applied magnetic field
27. In Differential Thermal Analysis (DTA) :
- (1) The temperature difference between the sample and reference are measured as function of temperature.
 - (2) The difference in heat flow into the reference and sample are measured as a function of temperature
 - (3) The change in the mass of the sample is measured as a function of temperature
 - (4) The glass transition is observed as a sharp peak
28. Sodium Dodecyl Sulphate (SDS) used in SDS-PAGE is :
- (1) A cationic detergent
 - (2) A non-ionic detergent
 - (3) A cationic exchanger
 - (4) An anionic detergent
29. Which of the following is the principle of Golay cell, which is used as a detector In IR spectroscopy ?
- (1) Expansion of gas upon heating
 - (2) Increase in resistance due to an increase in temperature and vice-versa
 - (3) Temperature difference gives rise to a potential difference in the material
 - (4) Decrease in resistance due to an increase in in temperature
30. Which of the following types of liquid chromatography uses immobilized biochemical as a stationary phase ?
- (1) Ion exchange chromatography
 - (2) Exclusion chromatography
 - (3) Affinity chromatography
 - (4) Gel permeation chromatography

31. Which of the following detectors have high sensitivity to all organic compounds ?
- (1) Sulphur Chemiluminescence detector
 - (2) Thermionic emission detector
 - (3) Flame ionization detector
 - (4) Argon ionisation detector
32. The ^{13}C NMR spectrum of a compound A contains two signals and the ^1H NMR spectrum, there is a singlet. The compound is :
- (1) Ethanol
 - (2) Acetone
 - (3) Bromoethane
 - (4) Dichloromethane
33. The most intense peak in the mass spectrum is called :
- (1) Mass peak
 - (2) Base peak
 - (3) Metastable peak
 - (4) M+1 peak
34. Which technique separates charged particles using electric field ?
- (1) Hydrolysis
 - (2) Electrophoresis
 - (3) Protein synthesis
 - (4) Protein denaturing
35. The unit of magnetic field strength in NMR is
- (1) Cycle/second
 - (2) Gauss
 - (3) Pulse/second
 - (4) Debye

36. When is electrophoresis not used ?
- (1) Separation of proteins
 - (2) Separation of amino acids
 - (3) Separation of Lipids
 - (4) Separation of nucleic acids
37. Derivatization techniques in HPLC are intended to enhance :
- (1) Molecular weight
 - (2) Reversibility
 - (3) Detectability
 - (4) Reproducibility
38. Column chromatography is based on the principle of :
- (1) Ion-exchange
 - (2) Exclusion principle
 - (3) Differential adsorption
 - (4) Absorption
39. The most commonly used buffer for agarose gel electrophoresis is :
- (1) Sodium chloride
 - (2) Tris-HCl
 - (3) Phosphate-buffered saline
 - (4) Tris-acetate-EDTA
40. What is the delta value for TMS in NMR ?
- (1) 0
 - (2) 10
 - (3) 5
 - (4) 7

41. Macrogol is the synonym for :
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51. Identify the capsule size, which holds the maximum drug content for human consumption :
- (1) 00
 - (2) 000
 - (3) 0
 - (4) 1
52. Schedule V of Drugs and Cosmetics Act 1940 and Rules 1945 stands for :
- (1) List of drugs marketed under generic names only
 - (2) Particulars to be shown in manufacturing, raw materials and analytical records of drugs
 - (3) Standards for patent or proprietary medicines
 - (4) Standards for cosmetics
53. Numerical designation for the refrigerant 1, 1-difluoroethane is :
- (1) 134a
 - (2) 152
 - (3) 152a
 - (4) 151
54. The phenomenon in which the substance exist in more than one crystalline form is known as :
- (1) Crystallinity
 - (2) Anisotropy
 - (3) Polymorphism
 - (4) Polycrystallinity
55. Which of the following size of needle has the largest diameter ?
- (1) 26 gauge
 - (2) 18 gauge
 - (3) 20 gauge
 - (4) 13 gauge

56. The primary goal of *In Silico* drug designing is to :
- (1) Discover new drugs
 - (2) Optimize existing drugs
 - (3) Predict drug-target interactions
 - (4) All of the above
57. 4-[bis(2-Chloroethyl amino)]-L-phenylalanine is :
- (1) Chlorambucil
 - (2) Cyclophosphamide
 - (3) Melphalan
 - (4) Busulfan
58. The drug having 1,3,4 thiadiazole ring :
- (1) Acetazolamide
 - (2) Cefazolin
 - (3) Megazol
 - (4) All of the above
59. Acreloin toxicity is associated with :
- (1) Cyclophosphamide
 - (2) 6-Mercaptopurin
 - (3) Melphalan
 - (4) Dacarbazine
60. Which antibiotic is also known as ansamycin antibiotics ?
- (1) Polyene
 - (2) Macrolide
 - (3) Rifampin
 - (4) Tetracycline

61. Glycobiarsol is used as :
- (1) Antimalarial
 - (2) Antiamoebic
 - (3) Anticancer
 - (4) Antiashtamatic
62. The IUPAC name of amrinone is :
- (1) 5- amino (3,4'dipyridin)-6-one
 - (2) 4-amino,3-4'dipyridin)-6-one
 - (3) 5-amino (3-'4'dipyridin)-4-one
 - (4) 4-atnino (3-4'dipyridin)-3-one
63. 2,6-Dimethoxy phenyl penicillin is synonym of :
- (1) Methicillin
 - (2) Ampicillin
 - (3) Amoxicillin
 - (4) Carbencillin
64. A six member heterocyclic containing two nitrogen atoms at 1, 3~postion is called :
- (1) Pyridine
 - (2) Pyrazine
 - (3) Piperazine
 - (4) Pyrimidine
65. Trichloromethane is another name for :
- (1) Methyl chloride .
 - (2) Chloroform
 - (3) Carbon tetrachloride
 - (4) Freon

66. The substances having the same molecular formulas but different structural formulas are known as :
- (1) Dimers
 - (2) Isomers
 - (3) Polymers
 - (4) Allotropes
67. The basic ring present in atorvastatin is :
- (1) Indole
 - (2) Pyrrole
 - (3) Naphthalene
 - (4) None of the above
68. What is the chemical name of penicillin V ?
- (1) Benzyl penicillin
 - (2) 2,6-dimethoxyphenyl penicillin
 - (3) D- α -amino-p-hydroxy ethyl penicillin
 - (4) Phenoxy methyl penicillin
69. Which sulfonamides produce "orange yellow color to urine" under alkaline condition ?
- (1) Sulfacetamide
 - (2) Sulfamethoxazole
 - (3) Sulfadiazine
 - (4) Sulfasalazine
70. The number of optically active isomers of tartaric acid is :
- (1) 2
 - (2) 3
 - (3) 4
 - (4) 5

A

71. Deficiency of dopamine causes :
- (1) Depression
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 - (3) Attention deficit hyperactivity disorder
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79. Which is the major inhibitory neurotransmitter in the central nervous system ?
- (1) GABA
 - (2) Acetylcholine
 - (3) Cytokines
 - (4) 5HT-3
80. Which type of cell culture has a finite lifespan ?
- (1) Fungal cell culture
 - (2) Bacterial cell culture
 - (3) Immortalized cell culture
 - (4) Primary cell culture

81. The value of association constant (K_a) and number of binding sites (N) can be obtained by :
- (1) Direct plot
 - (2) Scatchard plot
 - (3) Klotz plot
 - (4) All of the above
82. The drug concentration between the Minimum Effective Concentration and Maximum Safe Concentrations called :
- (1) Therapeutic range
 - (2) Area under curve
 - (3) Peak response
 - (4) Pharmacological response
83. Drug having high affinity but zero intrinsic activity is called :
- (1) Partial agonist
 - (2) Antagonist
 - (3) Agonist
 - (4) None of the above
84. Muscarinic receptor M_4 are mainly located at :
- (1) Exocrine gland
 - (2) Cerebral cortex
 - (3) Heart
 - (4) CNS
85. Pharmacodynamics involves the study of :
- (1) Mechanisms of drug action
 - (2) Biotransformation of drugs in the organism
 - (3) Distribution of drugs in the organism
 - (4) Excretion of drug from the organism

86. Foxglove leaves belong to the chemical class of :
- (1) Flavone glycosides
 - (2) Cardiac glycosides
 - (3) Anthraquinone glycosides
 - (4) Pentacyclic triterpenoids
87. Which of the following is *not* present in cinchona bark ?
- (1) Quinine
 - (2) Cinchonine
 - (3) Quinidine
 - (4) Quinovin
88. Stomatal number is defined as :
- (1) Average number of stomata per square mm of leaf epidermis,
 - (2) Average number of stomata per square cm of leaf epidermis
 - (3) Average number of stomata per square mm on midrib of lower epidermis
 - (4) Average number of stomata per square cm on midrib of lower epidermis
89. In fennel fruit microscopy, the pericarp consists of :
- (1) Testa, endosperm and embryo
 - (2) Collapsed parenchyma, aleurone grains and fat oil globules
 - (3) Stylopod, carpophores and pedicle
 - (4) Epicarp, mesocarp and endocarp
90. Suspending agent, used for detection of foreign matter using lycopodium spore method includes the combination of :
- (1) Glycerine, Tragacanth Mucilage and Water (ratio of 2 : 1 : 2)
 - (2) Gum acacia, Glycerine and Alcohol (ratio of 3:1 : 2.5)
 - (3) Xanthan gum, Water and Gelatin (ratio of 4 : 1 : 0.5)
 - (4) Agar, Glycerine and Water (ratio of 3:1 : 2.5)

A

91. Fractional liberation is a technique aim for :
- (1) Purification by precipitating the compounds from mixture
 - (2) Separation of like charge substances
 - (3) Isolation of primary metabolites
 - (4) Separating residual aqueous fraction from crude drug
92. Camera lucida was invented by :
- (1) Rosalind Franklin
 - (2) William Hyde Wollaston
 - (3) Mary Anning
 - (4) Erwin Chargaff
93. Carrageenan is :
- (1) Polysaccharides derived from *Chondrus crispus*
 - (2) Emulsifier obtained from *Sagina sabulata*
 - (3) Complex polysaccharide obtained from *Actinopyga agassizi*
 - (4) Resinous substance derived from *Kerria lacca*
94. Mesophyll cells are composed of :
- (1) Bundle sheath cells and calcium oxalate crystals
 - (2) Palisade cells and spongy parenchyma
 - (3) Vascular bundles and sclerenchyma cells
 - (4) Upper epidermis, vascular bundles and collenchyma cells
95. Selivanoff's test is used to indicate :
- (1) Aldohexose and ketohexose
 - (2) Diterpene alkaloids
 - (3) Gallotannins and ellagitannins
 - (4) Glycoresins

96. Arjuna belongs to family :
- (1) Combretaceae
 - (2) Liliaceae
 - (3) Rubiaceae
 - (4) Solanaceae
97. Solvent extraction is governed by which law ?
- (1) Boyle's law
 - (2) Ostwald dilution law
 - (3) Nernst's distribution law
 - (4) Beer's law
98. Absorption in chromatography is a process of :
- (1) Partitioning
 - (2) Attenuation
 - (3) Bulk phenomenon
 - (4) Surface property
99. Schizolysigenous oil glands in clove are present in :
- (1) Style
 - (2) Hypanthium
 - (3) Crown
 - (4) Petal
100. One of the reagents used in the Vitali Morin test is :
- (1) KCl
 - (2) Menthol
 - (3) Bromine water
 - (4) Methanolic KOH

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20. Which type of cell culture has a finite lifespan ?
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21. Fractional liberation is a technique aim for :
- (1) Purification by precipitating the compounds from mixture
 - (2) Separation of like charge substances
 - (3) Isolation of primary metabolites
 - (4) Separating residual aqueous fraction from crude drug
22. Camera lucida was invented by :
- (1) Rosalind Franklin
 - (2) William Hyde Wollaston
 - (3) Mary Anning
 - (4) Erwin Chargaff
23. Carrageenan is :
- (1) Polysaccharides derived from *Chondrus crispus*
 - (2) Emulsifier obtained from *Sagina sabulata*
 - (3) Complex polysaccharide obtained from *Actinopyga agassizi*
 - (4) Resinous substance derived from *Kerria lacca*
24. Mesophyll cells are composed of :
- (1) Bundle sheath cells and calcium oxalate crystals
 - (2) Palisade cells and spongy parenchyma
 - (3) Vascular bundles and sclerenchyma cells
 - (4) Upper epidermis, vascular bundles and collenchyma cells
25. Selivanoff's test is used to indicate :
- (1) Aldohehexose and.ketohehexose
 - (2) Diterpene alkaloids
 - (3) Gallotannins and ellagitannins
 - (4) Glycoresins

26. Arjuna belongs to family :
- (1) Combretaceae
 - (2) Liliaceae
 - (3) Rubiaceae
 - (4) Solanaceae
27. Solvent extraction is governed by which law ?
- (1) Boyle's law
 - (2) Ostwald dilution law
 - (3) Nens's distribution law
 - (4) Beer's law
28. Absorption in chromatography is a process of :
- (1) Partitioning
 - (2) Attenuation
 - (3) Bulk phenomenon
 - (4) Surface property
29. Schizolysigenous oil glands in clove are present in :
- (1) Style
 - (2) Hypanthium
 - (3) Crown
 - (4) Petal
30. One of the reagents used in the Vitali Morin test is :
- (1) KCl
 - (2) Menthol
 - (3) Bromine water
 - (4) Methanolic KOH

31. Pure research is also known as :
- (1) Fundamental research
 - (2) Exploratory research
 - (3) Action research
 - (4) Explanatory research
32. A formal document that presents the research objectives, design of achieving the objectives, and the expected outcomes/deliverables of the study is called :
- (1) Research' design
 - (2) Research proposal
 - (3) Research hypothesis
 - (4) Research report
33. An image, perception or concept that is capable of measurement is called :
- (1) Variable
 - (2) Scale
 - (3) Hypothesis
 - (4) Type
34. A clinical research study is conducted in how many phases ?
- (1) Five
 - (2) Eight
 - (3) Four
 - (4) One
35. The document mandatory 'to enroll in a clinical research study is :
- (1) Protocol
 - (2) Investigator's Brochure
 - (3) Case Report Form
 - (4) Informed Consent Form

- 36.** Random sampling is also called as :
- (1) Probation sampling
 - (2) Prospect sampling
 - (3) Probability sampling
 - (4) Availability sampling
- 37.** The review of literature means :
- (1) Documentation' of reference material
 - (2) Overview of the previously published works on specific topic
 - (3) Formation of a theoretical framework
 - (4) Elucidating and testing hypothesis
- 38.** In a normal distribution, what percentage of data falls within one standard deviation from the mean ?
- (1) 68%
 - (2) 75%
 - (3) 95%
 - (4) 99%
- 39.** What is the range of values for the correlation coefficient ?
- (1) 0 to 1
 - (2) -1 to 1
 - (3) -2 to 2
 - (4) -1 to 0
- 40.** Which of the following is non-probability sampling ?
- (1) Quota sampling
 - (2) Cluster sampling
 - (3) Systematic 'sampling
 - (4) Stratified random sampling

41. Identify the capsule size, which holds the maximum drug content for human consumption :
- (1) 00
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50. Which antibiotic is also known as ansamycin antibiotics ?
- (1) Polyene
 - (2) Macrolide
 - (3) Rifampin
 - (4) Tetracycline

51. Glycobiarsol is used as :
- (1) Antimalarial
 - (2) Antiamoebic
 - (3) Anticancer
 - (4) Antiashtamatic
52. The IUPAC name of amrinone is :
- (1) 5- amino (3,4'dipyridin)-6-one
 - (2) 4-amino,3-4'dipyridin)-6-one
 - (3) 5-amino (3-'4'dipyridin)-4-one
 - (4) 4-atnino (3-4'dipyridin)-3-one
53. 2,6-Dimethoxy phenyl penicillin is synonym of :
- (1) Methicillin
 - (2) Ampicillin
 - (3) Amoxicillin
 - (4) Carbencillin
54. A six member heterocyclic containing two nitrogen atoms at 1, 3~postion is called :
- (1) Pyridine
 - (2) Pyrazine
 - (3) Piperazine
 - (4) Pyrimidine
55. Trichloromethane is another name for :
- (1) Methyl chloride .
 - (2) Chloroform
 - (3) Carbon tetrachloride
 - (4) Freon

56. The substances having the same molecular formulas but different structural formulas are known as :
- (1) Dimers
 - (2) Isomers
 - (3) Polymers
 - (4) Allotropes
57. The basic ring present in atorvastatin is :
- (1) Indole
 - (2) Pyrrole
 - (3) Naphthalene
 - (4) None of the above
58. What is the chemical name of penicillin V ?
- (1) Benzyl penicillin
 - (2) 2,6-dimethoxyphenyl penicillin
 - (3) D- α -amino-p-hydroxy ethyl penicillin
 - (4) Phenoxy methyl penicillin
59. Which sulfonamides produce "orange yellow color to urine" under alkaline condition ?
- (1) Sulfacetamide
 - (2) Sulfamethoxazole
 - (3) Sulfadiazine
 - (4) Sulfasalazine
60. The number of optically active isomers of tartaric acid is :
- (1) 2
 - (2) 3
 - (3) 4
 - (4) 5

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75. The probability of finding statistical significance is known as :
- (1) Degree of freedom
 - (2) Standard deviation
 - (3) p-value
 - (4) Standard error of mean

76. The research related to abstract ideas is :
- (1) Qualitative research
 - (2) Quantitative research
 - (3) Conceptual research
 - (4) Empirical research
77. Standard deviation is square root of :
- (1) Mode
 - (2) Regression
 - (3) Variance
 - (4) Standard error
78. The statistical test used to validate the statement "Peoples having high cholesterol suffer more from hypertension" :
- (1) ANOVA
 - (2) Regression analysis
 - (3) Pearson correlation coefficient
 - (4) Student test
79. All of the following are an example of quantitative data except :
- (1) Weight of the patient
 - (2) Systolic blood pressure of the patient
 - (3) Height of the patient
 - (4) Gender of the patient
80. Which graphical representation is best suited for displaying the distribution of a continuous variable in biostatistics ?
- (1) Pie chart
 - (2) Histogram
 - (3) Bar graph
 - (4) Line chart

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91. Which of the following detectors have high sensitivity to all organic compounds ?
- (1) Sulphur Chemiluminescence detector
 - (2) Thermionic emission detector
 - (3) Flame ionization detector
 - (4) Argon ionisation detector
92. The ^{13}C NMR spectrum of a compound A contains two signals and the ^1H NMR spectrum, there is a singlet. The compound is :
- (1) Ethanol
 - (2) Acetone
 - (3) Bromoethane
 - (4) Dichloromethane
93. The most intense peak in the mass spectrum is called :
- (1) Mass peak
 - (2) Base peak
 - (3) Metastable peak
 - (4) M+1 peak
94. Which technique separates charged particles using electric field ?
- (1) Hydrolysis
 - (2) Electrophoresis
 - (3) Protein synthesis
 - (4) Protein denaturing
95. The unit of magnetic field strength in NMR is :
- (1) Cycle/second
 - (2) Gauss
 - (3) Pulse/second
 - (4) Debye

- 96.** When is electrophoresis not used ?
- (1) Separation of proteins
 - (2) Separation of amino acids
 - (3) Separation of Lipids
 - (4) Separation of nucleic acids
- 97.** Derivatization techniques in HPLC are intended to enhance :
- (1) Molecular weight
 - (2) Reversibility
 - (3) Detectability
 - (4) Reproducibility
- 98.** Column chromatography is based on the principle of :
- (1) Ion-exchange
 - (2) Exclusion principle
 - (3) Differential adsorption
 - (4) Absorption
- 99.** The most commonly used buffer for agarose gel electrophoresis is :
- (1) Sodium chloride
 - (2) Tris-HCl
 - (3) Phosphate-buffered saline
 - (4) Tris-acetate-EDTA
- 100.** What is the delta value for TMS in NMR ?
- (1) 0
 - (2) 10
 - (3) 5
 - (4) 7

Total No. of Printed Pages : 21

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ARE ASKED TO DO SO)

C

SET-X

PHD-EE-2023-24

Pharmaceutical Science

10039

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

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

Name _____ Date of Birth _____

Father's Name _____ Mother's Name _____

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(Signature of the Candidate)

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

1. **All questions are compulsory.**
2. The candidates **must return** the question booklet 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 & 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 booklet itself. Answers **must not** be ticked in the question booklet.
6. **There will be no negative marking. Each correct answer will be awarded one full mark. 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 booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

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SEAL

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31. Deficiency of dopamine causes :
- (1) Depression
 - (2) Parkinson's disease
 - (3) Attention deficit hyperactivity disorder
 - (4) All of the above
32. Which of the following neurotransmitters is locally degraded ?
- (1) Noradrenaline
 - (2) Gamma amino butyric acid
 - (3) Acetylcholine
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33. The term bioavailability refers to the :
- (1) Relationship between the physical and the chemical properties of a drug and the systemic absorption of drug
 - (2) Measurement of the rate and extent of therapeutically drug that reaches the systemic circulation
 - (3) Movement of drug into the body tissues over time
 - (4) Dissolution of a drug in the GIT
34. Glutamate is involved in :
- (1) Long-term potentiation
 - (2) Transmission of pain
 - (3) Learning and memory
 - (4) All of the above
35. Histamine plays an important role in initiating the body's immune response to the presence of foreign antigens & pathogens. A primary source of histamine released during inflammatory conditions are :
- | | |
|----------------|---------------------------------|
| (1) B cells | (2) Presynaptic nerve terminals |
| (3) Mast cells | (4) T lymphocytes |

- 36.** The volume of distribution (V_d) is :
- (1) The amount of a drug in the body to the concentration of a drug in plasma
 - (2) The uncharged drug reaching the systemic circulation
 - (3) The single to a daily dose of an administrated drug
 - (4) The administrated dose to a body weight
- 37.** Phase I reactions include all except :
- (1) Oxidative reactions
 - (2) Glucuronide conjugation
 - (3) Reduction reactions
 - (4) Hydrolysis reactions
- 38.** Antihistamines are drugs that are useful in the treatment of :
- (1) Heart attack
 - (2) Abnormal blood clotting
 - (3) Allergies
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- (1) Degree of freedom
 - (2) Standard deviation
 - (3) p-value
 - (4) Standard error of mean

46. The research related to abstract ideas is :
- (1) Qualitative research
 - (2) Quantitative research
 - (3) Conceptual research
 - (4) Empirical research
47. Standard deviation is square root of :
- (1) Mode
 - (2) Regression
 - (3) Variance
 - (4) Standard error
48. The statistical test used to validate the statement "Peoples having high cholesterol suffer more from hypertension" :
- (1) ANOVA
 - (2) Regression analysis
 - (3) Pearson correlation coefficient
 - (4) Student test
49. All of the following are an example of quantitative data except :
- (1) Weight of the patient
 - (2) Systolic blood pressure of the patient
 - (3) Height of the patient
 - (4) Gender of the patient
50. Which graphical representation is best suited for displaying the distribution of a continuous variable in biostatistics ?
- (1) Pie chart
 - (2) Histogram
 - (3) Bar graph
 - (4) Line chart

51. Which of the following detectors have high sensitivity to all organic compounds ?
- (1) Sulphur Chemiluminescence detector
 - (2) Thermionic emission detector
 - (3) Flame ionization detector
 - (4) Argon ionisation detector
52. The ^{13}C NMR spectrum of a compound A contains two signals and the ^1H NMR spectrum, there is a singlet. The compound is :
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- (1) Mass peak
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54. Which technique separates charged particles using electric field ?
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 - (3) Protein synthesis
 - (4) Protein denaturing
55. The unit of magnetic field strength in NMR is :
- (1) Cycle/second
 - (2) Gauss
 - (3) Pulse/second
 - (4) Debye

56. When is electrophoresis not used ?

- (1) Separation of proteins
- (2) Separation of amino acids
- (3) Separation of Lipids
- (4) Separation of nucleic acids

57. Derivatization techniques in HPLC are intended to enhance :

- | | |
|----------------------|---------------------|
| (1) Molecular weight | (2) Reversibility |
| (3) Detectability | (4) Reproducibility |

58. Column chromatography is based on the principle of :

- (1) Ion-exchange
- (2) Exclusion principle
- (3) Differential adsorption
- (4) Absorption

59. The most commonly used buffer for agarose gel electrophoresis is :

- (1) Sodium chloride
- (2) Tris-HCl
- (3) Phosphate-buffered saline
- (4) Tris-acetate-EDTA

60. What is the delta value for TMS in NMR ?

- (1) 0
- (2) 10
- (3) 5
- (4) 7

61. Pure research is also known as :
- (1) Fundamental research
 - (2) Exploratory research
 - (3) Action research
 - (4) Explanatory research
62. A formal document that presents the research objectives, design of achieving the objectives, and the expected outcomes/deliverables of the study is called :
- (1) Research' design
 - (2) Research proposal
 - (3) Research hypothesis
 - (4) Research report
63. An image, perception or concept that is capable of measurement is called :
- (1) Variable
 - (2) Scale
 - (3) Hypothesis
 - (4) Type
64. A clinical research study is conducted in how many phases ?
- (1) Five
 - (2) Eight
 - (3) Four
 - (4) One
65. The document mandatory 'to enroll in a clinical research study is :
- (1) Protocol
 - (2) Investigator's Brochure
 - (3) Case Report Form
 - (4) Informed Consent Form

66. Random sampling is also called as :
- (1) Probation sampling
 - (2) Prospect sampling
 - (3) Probability sampling
 - (4) Availability sampling
67. The review of literature means :
- (1) Documentation' of reference material
 - (2) Overview of the previously published works on specific topic
 - (3) Formation of a theoretical framework
 - (4) Elucidating and testing hypothesis
68. In a normal distribution, what percentage of data falls within one standard deviation from the mean ?
- (1) 68%
 - (2) 75%
 - (3) 95%
 - (4) 99%
69. What is the range of values for the correlation coefficient ?
- (1) 0 to 1
 - (2) -1 to 1
 - (3) -2 to 2
 - (4) -1 to 0
70. Which of the following is non-probability sampling ?
- (1) Quota sampling
 - (2) Cluster sampling
 - (3) Systematic 'sampling
 - (4) Stratified random sampling

71. Macrogol is the synonym for :

- (1) PEG
- (2) PPG
- (3) Span
- (4) SLS

72. HLB system was developed by :

- (1) Stokes
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- (3) Griffin
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73. Gelsication is the term used for :

- (1) Rotary drying
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- (3) Vacuum drying
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74. Eudragit L100 is a type of :

- (1) Cellulose polymer
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- (1) KCl
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 - (3) Piperazine
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95. Trichloromethane is another name for :
- (1) Methyl chloride .
 - (2) Chloroform
 - (3) Carbon tetrachloride
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96. The substances having the same molecular formulas but different structural formulas are known as :
- (1) Dimers
 - (2) Isomers
 - (3) Polymers
 - (4) Allotropes
97. The basic ring present in atorvastatin is :
- (1) Indole
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 - (4) None of the above
98. What is the chemical name of penicillin V ?
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Total No. of Printed Pages : 21

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D

SET-X

PHD-EE-2023-24

Pharmaceutical Science

10040

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (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.**
- The candidates **must return** the question booklet 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.
- 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.
- Question Booklet along with answer key of all the A, B, C & 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.
- 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 booklet itself. Answers **must not** be ticked in the question booklet.
- There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
- Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
- Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

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21. Deficiency of dopamine causes :
- (1) Depression
 - (2) Parkinson's disease
 - (3) Attention deficit hyperactivity disorder
 - (4) All of the above
22. Which of the following neurotransmitters is locally degraded ?
- (1) Noradrenaline
 - (2) Gamma amino butyric acid
 - (3) Acetylcholine
 - (4) None of the above
23. The term bioavailability refers to the :
- (1) Relationship between the physical and the chemical properties of a drug and the systemic absorption of drug
 - (2) Measurement of the rate and extent of therapeutically drug that reaches the systemic circulation
 - (3) Movement of drug into the body tissues over time
 - (4) Dissolution of a drug in the GIT
24. Glutamate is involved in :
- (1) Long-term potentiation
 - (2) Transmission of pain
 - (3) Learning and memory
 - (4) All of the above
25. Histamine plays an important role in initiating the body's immune response to the presence of foreign antigens & pathogens. A primary source of histamine released during inflammatory conditions are :
- (1) B cells
 - (2) Presynaptic nerve terminals
 - (3) Mast cells
 - (4) T lymphocytes

26. The volume of distribution (V_d) is :
- (1) The amount of a drug in the body to the concentration of a drug in plasma
 - (2) The uncharged drug reaching the systemic circulation
 - (3) The single to a daily dose of an administered drug
 - (4) The administered dose to a body weight
27. Phase I reactions include all except :
- (1) Oxidative reactions
 - (2) Glucuronide conjugation
 - (3) Reduction reactions
 - (4) Hydrolysis reactions
28. Antihistamines are drugs that are useful in the treatment of :
- (1) Heart attack
 - (2) Abnormal blood clotting
 - (3) Allergies
 - (4) Bacterial infection
29. Which is the major inhibitory neurotransmitter in the central nervous system ?
- (1) GABA
 - (2) Acetylcholine
 - (3) Cytokines
 - (4) 5HT-3
30. Which type of cell culture has a finite lifespan ?
- (1) Fungal cell culture
 - (2) Bacterial cell culture
 - (3) Immortalized cell culture
 - (4) Primary cell culture

31. What is the main goal of random sampling in biostatistics ?
- (1) To reduce bias
 - (2) To represent the entire population
 - (3) To simplify the sampling process
 - (4) To include specific groups only
32. What is the purpose of a residual plot in regression analysis ?
- (1) To check for outliers
 - (2) To assess normality assumptions
 - (3) To visualize the relationship between variables
 - (4) To examine the homoscedasticity of residuals
33. Which statistical test is appropriate for comparing the means of two independent groups ?
- (1) t-test
 - (2) ANOVA
 - (3) Chi-square test
 - (4) Mann-Whitney U test
34. If the grading of diabetes is classified as mild, moderate and severe, the scale of measurement used is :
- (1) Nominal
 - (2) Ordinal
 - (3) Interval
 - (4) Ratio
35. Biostatistics can be used for :
- (1) Designing experiment
 - (2) Collecting data
 - (3) Analysis of data
 - (4) All of the above

36. What is nuclear-Zeeman effect in NMR ?
- (1) Transition from lower energy spin state to higher energy spin state
 - (2) Splitting of spin states in applied external magnetic field
 - (3) Splitting of spin states in absence of field
 - (4) Processional motion of nuclei in applied magnetic field
37. In Differential Thermal Analysis (DTA) :
- (1) The temperature difference between the sample and reference are measured as function of temperature.
 - (2) The difference in heat flow into the reference and sample are measured as a function of temperature
 - (3) The change in the mass of the sample is measured as a function of temperature
 - (4) The glass transition is observed as a sharp peak
38. Sodium Docedyl Sulphate (SDS) used in SDS-PAGE is :
- (1) A cationic detergent
 - (2) A non-ionic detergent
 - (3) A cationic exchanger
 - (4) An anionic detergent
39. Which of the following is the principle of Golay cell, which is used as a detector In IR spectroscopy ?
- (1) Expansion of gas upon heating
 - (2) Increase in resistance due to an increase in temperature and vice-versa
 - (3) Temperature difference gives rise to a potential difference in the material
 - (4) Decrease in resistance due to an increase in in temperature
40. Which of the following types of liquid chromatography uses immobilized biochemical as a stationary phase ?
- (1) Ion exchange chromatography
 - (2) Exclusion chromatography
 - (3) Affinity chromatography
 - (4) Gel permeation chromatography

41. Glycobiarsol is used as :
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51. The value of association constant (K_a) and number of binding sites (N) can be obtained by :
- (1) Direct plot
 - (2) Scatchard plot
 - (3) Klotz plot
 - (4) All of the above
52. The drug concentration between the Minimum Effective Concentration and Maximum Safe Concentrations called :
- (1) Therapeutic range
 - (2) Area under curve
 - (3) Peak response
 - (4) Pharmacological response
53. Drug having high affinity but zero intrinsic activity is called :
- (1) Partial agonist
 - (2) Antagonist
 - (3) Agonist
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54. Muscarinic receptor M_4 are mainly located at :
- (1) Exocrine gland
 - (2) Cerebral cortex
 - (3) Heart
 - (4) CNS
55. Pharmacodynamics involves the study of :
- (1) Mechanisms of drug action
 - (2) Biotransformation of drugs in the organism
 - (3) Distribution of drugs in the organism
 - (4) Excretion of drug from the organism

56. Foxglove leaves belong to the chemical class of :
- (1) Flavone glycosides
 - (2) Cardiac glycosides
 - (3) Anthraquinone glycosides
 - (4) Pentacyclic triterpenoids
57. Which of the following is *not* present in cinchona bark ?
- (1) Quinine
 - (2) Cinchonine
 - (3) Quinidine
 - (4) Quinovin
58. Stomatal number is defined as :
- (1) Average number of stomata per square mm of leaf epidermis,
 - (2) Average number of stomata per square cm of leaf epidermis
 - (3) Average number of stomata per square mm on midrib of lower epidermis
 - (4) Average number of stomata per square cm on midrib of lower epidermis
59. In fennel fruit microscopy, the pericarp consists of :
- (1) Testa, endosperm and embryo
 - (2) Collapsed parenchyma, aleurone grains and fat oil globules
 - (3) Stylopod, carpophores and pedicle
 - (4) Epicarp, mesocarp and endocarp
60. Suspending agent, used for detection of foreign matter using lycopodium spore method includes the combination of :
- (1) Glycerine, Tragacanth Mucilage and Water (ratio of 2 : 1 : 2)
 - (2) Gum acacia, Glycerine and Alcohol (ratio of 3:1 : 2.5)
 - (3) Xanthan gum, Water and Gelatin (ratio of 4 : 1 : 0.5)
 - (4) Agar, Glycerine and Water (ratio of 3:1 : 2.5)

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71. Identify the capsule size, which holds the maximum drug content for human consumption :
- (1) 00
 - (2) 000
 - (3) 0
 - (4) 1
72. Schedule V of Drugs and Cosmetics Act 1940 and Rules 1945 stands for :
- (1) List of drugs marketed under generic names only
 - (2) Particulars to be shown in manufacturing, raw materials and analytical records of drugs
 - (3) Standards for patent or proprietary medicines
 - (4) Standards for cosmetics
73. Numerical designation for the refrigerant 1, 1-difluoroethane is :
- (1) 134a
 - (2) 152
 - (3) 152a
 - (4) 151
74. The phenomenon in which the substance exist in more than one crystalline form is known as :
- (1) Crystallinity
 - (2) Anisotropy
 - (3) Polymorphism
 - (4) Polycrystallinity
75. Which of the following size of needle has the largest diameter ?
- (1) 26 gauge
 - (2) 18 gauge
 - (3) 20 gauge
 - (4) 13 gauge

76. The primary goal of *In Silico* drug designing is to :
- (1) Discover new drugs
 - (2) Optimize existing drugs
 - (3) Predict drug-target interactions
 - (4) All of the above
77. 4-[bis(2-Chloroethyl amino)]-L-phenylalanine is :
- (1) Chlorambucil
 - (2) Cyclophosphamide
 - (3) Melphalan
 - (4) Busulfan
78. The drug having 1,3,4 thiadiazole ring :
- (1) Acetazolamide
 - (2) Cefazolin
 - (3) Megazol
 - (4) All of the above
79. Acreloin toxicity is associated with :
- (1) Cyclophosphamide
 - (2) 6-Mercaptopurin
 - (3) Melphalan
 - (4) Dacarbazine
80. Which antibiotic is also known as ansamycin antibiotics ?
- (1) Polyene
 - (2) Macrolide
 - (3) Rifampin
 - (4) Tetracycline

81. Pure research is also known as :
- (1) Fundamental research
 - (2) Exploratory research
 - (3) Action research
 - (4) Explanatory research
82. A formal document that presents the research objectives, design of achieving the objectives, and the expected outcomes/deliverables of the study is called :
- (1) Research' design
 - (2) Research proposal
 - (3) Research hypothesis
 - (4) Research report
83. An image, perception or concept that is capable of measurement is called :
- (1) Variable
 - (2) Scale
 - (3) Hypothesis
 - (4) Type
84. A clinical research study is conducted in how many phases ?
- (1) Five
 - (2) Eight
 - (3) Four
 - (4) One
85. The document mandatory 'to enroll in a clinical research study is :
- (1) Protocol
 - (2) Investigator's Brochure
 - (3) Case Report Form
 - (4) Informed Consent Form

- 86.** Random sampling is also called as :
- (1) Probation sampling
 - (2) Prospect sampling
 - (3) Probability sampling
 - (4) Availability sampling
- 87.** The review of literature means :
- (1) Documentation' of reference material
 - (2) Overview of the previously published works on specific topic
 - (3) Formation of a theoretical framework .
 - (4) Elucidating and testing hypothesis
- 88.** In a normal distribution, what percentage of data falls within one standard deviation from the mean ?
- (1) 68%
 - (2) 75%
 - (3) 95%
 - (4) 99%
- 89.** What is the range of values for the correlation coefficient ?
- (1) 0 to 1
 - (2) -1 to 1
 - (3) -2 to 2
 - (4) -1 to 0
- 90.** Which of the following is non-probability sampling ?
- (1) Quota sampling
 - (2) Cluster sampling
 - (3) Systematic 'sampling
 - (4) Stratified random sampling

91. What does CCSEA stand for ?
- (1) Council for control and supervision of experiments on animals
 - (2) Committee for control and supervision of experiments on animals
 - (3) Committee for command and supervision of experiments on animals
 - (4) Center for the control and supervision of experiments on animals
92. The member IAEC :
- (1) Biological Scientist
 - (2) Veterinarian
 - (3) Socially aware member
 - (4) All of these
93. SOP stands for :
- (1) Standard operation procedure
 - (2) Standard operating procedure
 - (3) Standard operating protocol
 - (4) Specific operation procedure
94. Goodness of Fit of a distribution is tested by :
- (1) T-test
 - (2) Chi-square test
 - (3) F-test
 - (4) None of the above
95. The probability of finding statistical significance is known as :
- (1) Degree of freedom
 - (2) Standard deviation
 - (3) p-value
 - (4) Standard error of mean

96. The research related to abstract ideas is :
- (1) Qualitative research
 - (2) Quantitative research
 - (3) Conceptual research
 - (4) Empirical research
97. Standard deviation is square root of :
- (1) Mode
 - (2) Regression
 - (3) Variance
 - (4) Standard error
98. The statistical test used to validate the statement "Peoples having high cholesterol suffer more from hypertension" :
- (1) ANOVA
 - (2) Regression analysis
 - (3) Pearson correlation coefficient
 - (4) Student test
99. All of the following are an example of quantitative data except :
- (1) Weight of the patient
 - (2) Systolic blood pressure of the patient
 - (3) Height of the patient
 - (4) Gender of the patient
100. Which graphical representation is best suited for displaying the distribution of a continuous variable in biostatistics ?
- (1) Pie chart
 - (2) Histogram
 - (3) Bar graph
 - (4) Line chart

Answer keys of PHD-EE-2023-24 (PHARMACEUTICAL SCIENCES) entrance exam dated 22.03.2024

Q. NO.	A	B	C	D
1	1	1	2	1
2	2	3	4	2
3	1	4	1	1
4	3	4	2	2
5	4	1	4	1
6	3	4	2	1
7	2	4	1	3
8	1	3	4	1
9	2	3	1	2
10	1	1	3	4
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12	4	3	3	2
13	2	2	3	2
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37	3	2	2	1
38	3	1	3	4
39	4	2	1	1
40	1	1	4	3
41	1	2	2	2
42	3	3	4	1
43	4	3	2	1
44	4	3	2	4
45	1	4	3	3
46	4	4	3	2
47	4	3	3	2
48	3	4	3	4
49	3	1	4	4
50	1	3	2	1

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Answer keys of PHD-EE-2023-24 (PHARMACEUTICAL SCIENCES) entrance exam dated 22.03.2024

Q. NO.	A	B	C	D
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53	3	1	2	2
54	3	4	2	4
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87	4	4	3	2
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89	4	4	2	2
90	1	1	4	1
91	1	3	2	2
92	2	2	1	4
93	1	2	1	2
94	2	2	4	2
95	1	2	3	3
96	1	3	2	3
97	3	3	2	3
98	1	3	4	3
99	2	4	4	4
100	4	1	1	2

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