



I. K. GUJRAL PUNJAB TECHNICAL UNIVERSITY JALANDHAR
QUESTION PAPER Ph.D. ENTRANCE TEST-2024

Time: 120 Minutes

Max Marks: 100

Discipline: Pharmacy

Sr. No.

Name: Father's Name:

Roll Number: Roll No. in words:.....

Discipline:..... Date:.....

Signature of candidate:..... Signature of Invigilator:

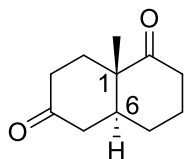
INSTRUCTIONS FOR CANDIDATES

1. Do not open seal before start of exam.
2. Question paper consists of two sections. Section-I is discipline specific and Section-II is of Research Methodology. Each section contains 50 multiple choice questions. Total 100 questions of one mark each.
3. Please check your question paper and answer sheet pages and report for any damaged or missing page, before attempting and report the same to invigilator immediately.
4. Carefully fill all your details in top portion of this question paper. Don't leave any column blank.
5. Use blue/black ball point pen to fill details on question paper and answer sheet. Using pencil is strictly prohibited. Write only in capital letters.
6. Carefully fill all the details and signatures on top portion of answer sheet.
7. Qualifying marks shall be 50% for General Category and 45% for Reserved Categories.
8. All questions are compulsory. No negative marking for wrong answers.
9. There are four alternative answer options (A, B, C and D) for each question out of which only one is correct.
10. Write A or B or C or D or E as answer against the question number as per correct choice on the provided Answer Sheet using pen. If the candidate does not want to attempt the Question, then he/she must mark option (E) in the available choice i.e. Not Attempted.
11. Questions left blank or attempted with two or more options/answers will not be evaluated.
12. Do not use marker or white fluid on the answer sheet.
13. The medium of the examination is English only.
14. No extra sheet will be provided for the rough work. Use the space inside the question paper pages for rough work.
15. Carrying mobile phones, calculators, electronic gadgets, notes or extra papers in examination hall is strictly prohibited.
16. Log tables may be provided for calculation work, if required.
17. Indulging in any form of unfair means, canvassing, impersonation or misbehavior with examination staff will result in disqualification of your candidature.

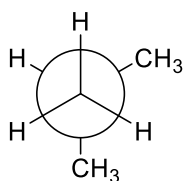
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SECTION I (DISCIPLINE SPECIFIC-PHARMACY)

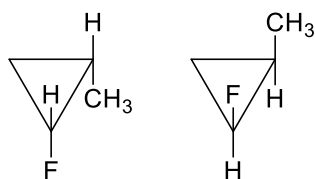
1. The configuration (R, S notation) at C-1 and C—6 of the compound below are



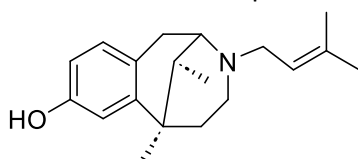
- A. 1S,6S
B. 1S,6R
C. 1R,6R
D. 1R,6S
2. The Newman projection below represents

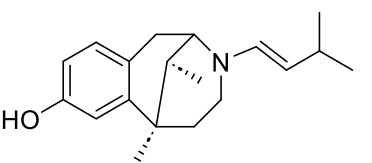
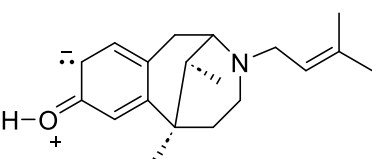
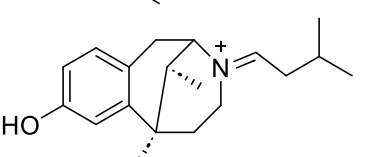
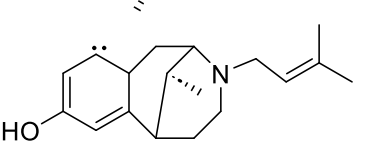


- A. A staggered form of 2-methylpropane
B. A gauche form of butane
C. An eclipsed form of 2-methylpropane
D. A most stable confirmation of 2-methyl butane
3. The molecules are

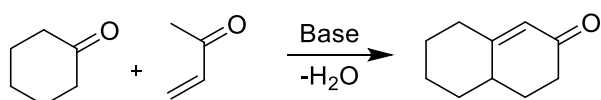


- A. Enantiomers
B. Diastereomers
C. Identical
D. Constitutional isomers
4. A resonance form of pentazocine is

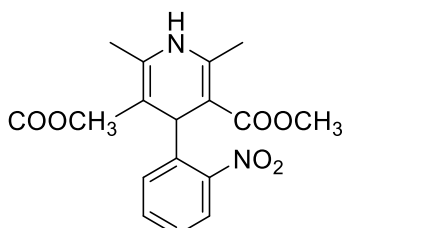
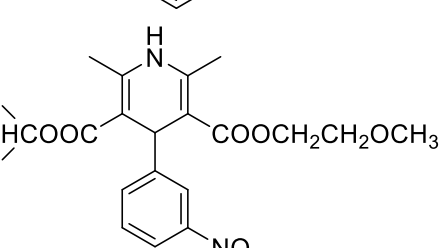
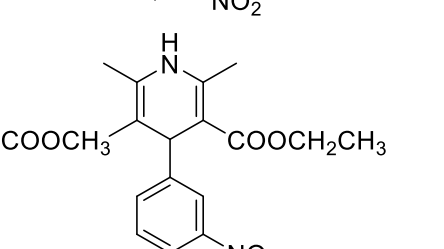


- A. 
- B. 
- C. 
- D. 

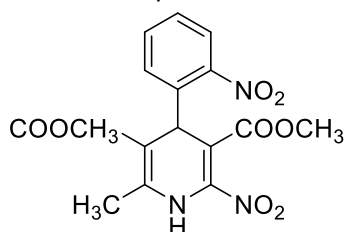
5. The above reaction is the example of



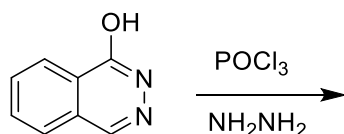
- A. Robinson annulation
 B. Dieckmann condensation
 C. Hoffman rearrangement
 D. Oppenauer oxidation
6. The correct structure of nifedipine is

- A. 
- B. 
- C. 
- D. None of the above

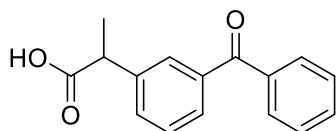
7. Pregabalin is
- R enantiomer of 3-isobutyl GABA
 - Racemic mixture
 - None of the above
 - S enantiomer of 3-isobutyl GABA
8. Rufinamide an anticonvulsant drug is the derivative of
- Triazole
 - Triazine
 - Pyrrolidine
 - Pyrrole
9. Synthesized drug is used in the various type of cardiovascular diseases, according to the name of the product the reaction is said to be



- Hantzsch compound
 - Fischer compound
 - Gabriel compound
 - Birch compound
10. The product of following reaction is a



- Vasoconstrictor
 - Antiarrhythmic
 - Calcium channel blocker
 - Vasodilator
11. Identify the following structure



- Ketoprofen
- Suprofen
- Oxaprozin
- Flurbiprofen

12. Naproxen is synthesized from
- 2-methoxynaphthalene
 - 2-methylnaphthalene
 - 2-hydroxynaphthalene
 - None of the above
13. The hydrolyzed products of sulfasalazine are
- Sulfapyridine and 5 salicylic acid
 - Pyridine and aminosalicic acid
 - Sulfapyridine and 5 aminosalicic acid
 - Sulfapyridine only
14. Prodrug of terbutaline is
- Zafirlukast
 - Bambuterol
 - Salmeterol
 - Phenoxy benzamine
15. Penicillin G is also known as'
- Benzyl penicillin
 - Natural penicillin
 - Both
 - None of the above
16. Cefotetan is
- First generation cephalosporins
 - Second generation cephalosporins
 - Third generation cephalosporins
 - Fourth generation cephalosporins
17. Which among the following is chloroethylnitrosourea
- Lomustine
 - Streptozocine
 - Procarbazine
 - None
18. All currently marketed organoplatinum anticancer agents are
- Pt (II) complex
 - Pt (IV) complex
 - Both
 - None
19. Dactinomycin has
- One pentapeptide lactone attached to an aromatic ring
 - Two pentapeptide lactone attached to an aromatic ring
 - Three pentapeptide lactone attached to an aromatic ring
 - None of the above is correct

20. Which among the following is not pyrimidine antagonist?

- A. Fluorouracil
- B. Floxuridine
- C. Capecitabine
- D. Mercaptopurine

21. Which among the following is known as sydnone imine?

- A. Molsidomine
- B. Nicorandil
- C. Nifedipine
- D. Amlodipine

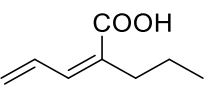
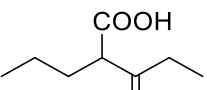
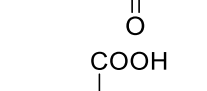
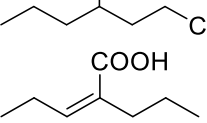
22. The proton signal is influenced by the neighboring ^{13}C nucleus due to

- A. Homonuclear spin coupling
- B. Heteronuclear spin coupling
- C. Homonuclear shielding
- D. Heterogeneous shielding

23. N-Demethylation of temazepam leads to the formation of

- A. oxazepam
- B. Flurazepam
- C. Quazepam
- D. Lorazepam

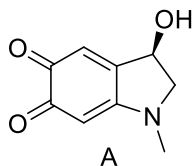
24. Active metabolite of valproic acid is

- A. 
- B. 
- C. 
- D. 

25. Acidic nature of the barbiturates is due to

- A. Lactam-lactim rearrangement
- B. keto-enol tautomerism
- C. Amine-imine rearrangement
- D. Beckmann rearrangement

26. The adrenochrome (A) is an oxidized product of



- A. Epinephrine
 - B. Norepinephrine
 - C. Isoproterenol
 - D. Dopamine
27. The lethal effect of moist heat on microbes is due to the
- A. Oxidation of essential molecules
 - B. Denaturation of structural proteins
 - C. Hydrolysis of essential molecules
 - D. None of the above
28. Tyndallisation refers to the heating
- A. 100°C for 30 minutes
 - B. 80°C at 1 hour
 - C. 80°C at 1 hour or 100°C for less time on three successive days
 - D. None of the above
29. Which of these vaccines contain living or attenuated virus
- A. Smallpox
 - B. Polio myelitis
 - C. Rabies
 - D. BCG
30. Alkaptonuria is due to the deficiency of
- A. Phenyl hydroxylase
 - B. Tyrosine
 - C. Homogentisic acid oxidase
 - D. All of the above
31. Reducing sugars are identified by the
- A. Benedict test + Barford's test
 - B. Fehling's test + Benedict test
 - C. Fehling test + Barford's test
 - D. All of the above
32. Pigmentation of skin is caused by the
- A. TSH
 - B. LH
 - C. MSH
 - D. Prolactin

33. Rectified spirit contains
- A. 100% v/v of ethanol
 - B. 95% v/v of ethanol
 - C. 85% v/v of ethanol
 - D. 70% v/v of ethanol
34. Alcohol strength is determined by using
- A. Infrared spectroscopy
 - B. Ostwald viscometer
 - C. Proof meter
 - D. Sykes hygrometer
35. Drug of choice in acute attack of migraine is
- A. Methysergide
 - B. Ergotamine tartrate
 - C. Serotonin
 - D. Nicotine
36. Which of the following autocooids is implicated in migraine?
- A. Histamine
 - B. 5-HT
 - C. Angiotensin
 - D. Leukotrienes
37. Zidovudine resistant can be treated with
- A. Acyclovir
 - B. Ribavarin
 - C. Dideoxycytidine
 - D. None of the above
38. The statutory All India Council for Technical Education was established on
- A. May 12, 1989
 - B. May 12, 1988
 - C. May 12, 1987
 - D. March 12, 1987
39. Clinical trial is related to which schedule
- A. Schedule Y
 - B. Schedule C
 - C. Schedule B1
 - D. Schedule M
40. Neuropathy is caused by
- A. Ethambutol
 - B. Isoniazid
 - C. Pyrazinamide
 - D. None of the above

41. Pyridoxine is
- A. Vitamin B6
 - B. Vitamin A
 - C. Vitamin B1
 - D. Vitamin K
42. Creatinine clearance is used as measurement of
- A. Passive renal absorption
 - B. Glomerular filtration rate
 - C. Drug metabolism rate
 - D. Renal excretion rate
43. Water attack test is generally performed for
- A. USP type I Glass
 - B. USP type II Glass
 - C. USP type III Glass
 - D. All of the above
44. Right skeleton for the cinchona alkaloids---
- A. Rubanol
 - B. Tropane
 - C. Isoquinoline
 - D. Dammarane
45. Which of the following alkaloids are derived from lysine?
- A. Emetine
 - B. Lobeline
 - C. Cinchonidine
 - D. Brucine
46. The HLB value of wetting agent is--
- A. 1-3
 - B. 3-7
 - C. 3-8
 - D. 8-16
47. Membrane filter is made up of--
- A. Cellulose
 - B. Cellulose nitrate
 - C. PEG
 - D. PVP
48. Choose the right test for identification of anthraquinone
- A. Marquis test
 - B. Murexide test
 - C. Liebermann-Burchard test
 - D. Borntrager test

49. Vitamins are sterilized by--

- A. Autoclaving
- B. Gaseous sterilization
- C. Gamma radiation
- D. None of the above

50. The largest size of capsule is

- A. 000
- B. 00
- C. 1
- D. 5

SECTION II (RESEARCH METHODOLOGY)

51. Research is underpinned by:
- A) A framework of philosophy
 - B) Methods that have been tested for validity and reliability
 - C) Ethical frameworks
 - D) All of the above
52. Which of the following is not a characteristic or requirement for the research process?
- A) Controlled.
 - B) Empirical.
 - C) Radical.
 - D) Critical
53. Which option is least related to a qualitative research
- A) Open
 - B) Unstructured
 - C) Flexible
 - D) Numerical
54. Which option is not associated with a quantitative approach?
- A) Rigid
 - B) Narrative
 - C) Predetermined
 - D) Structured
55. In _____ the main purpose is to formulate a problem for more precise investigation
- A) Descriptive Study
 - B) Diagnostic Study
 - C) Exploratory Study
 - D) None of the above
56. _____ prevent a researcher from blind research and intellectual wandering
- A) Research Design
 - B) Research Tools
 - C) Data
 - D) Sample

57. Data related to geophysical characteristic is called
- A) Organizational Data
 - B) Demographic Data
 - C) Territorial Data
 - D) Personal Data
58. The aggregate of all the units pertaining to a study is called
- A) Frame
 - B) Sample
 - C) Unit
 - D) Population
59. A statistical measure based upon the entire population is called parameter while measure based upon the sample is called
- A) Sample Parameter
 - B) Inference
 - C) Statistic
 - D) None of the above
60. Survey study aims at
- i) Knowing Facts about the two existing situations
 - ii) Comparing the present status with the standard norms
 - iii) Criticizing the existing situation
 - iv) Identifying the means of improving the existing situation
- A) i) and ii) only
 - B) i), ii) and iii) only
 - C) i), ii), iii) and iv)
 - D) ii) and iii) only

61. The independent variable refers to
- A) A variable which serves as the aim of an experiment
 - B) The variable being manipulated or varied in some way by the researcher
 - C) The variable which is only used in the control condition
 - D) The variable which shows us the effect of the manipulation
62. Which of the following statements is correct?
- A) Variability is the source of the problem
 - B) Researcher must possess analytical ability
 - C) Objectives of the research are stated in the first chapter of the thesis
 - D) All the above
63. In the process of conducting research “Formulation of Hypothesis” is followed by
- A) Analysis of data
 - B) Collection of data
 - C) Statement of objectives
 - D) Selection of research tools
64. If in a research independent variable cannot be manipulated then it is known as
- A) Experimental research
 - B) Non-experimental research
 - C) Pure or fundamental research
 - D) Exploratory research
65. If a researcher is studying the effect of using laptops in his classroom to ascertain their merit and worth; he is likely conducting which of the following types of research?
- A) Experimental
 - B) Applied
 - C) Basic
 - D) Evaluation

66. A measure is reliable if it provides consistent _____
- A) Hypothesis
 - B) Results
 - C) Procedure
 - D) Sensitivity
67. “Officers in my organization have higher than average level of commitment” such a hypothesis is an example of
- A) Descriptive hypothesis
 - B) Directional hypothesis
 - C) Relational hypothesis
 - D) All of the above
68. Formulation of hypothesis may not be necessary in
- A) Survey studies
 - B) Fact finding (historical) studies
 - C) Experimental studies
 - D) Normative studies
69. is concerned with discovering and testing certain variables with respect to their association or disassociation
- A) Exploratory
 - B) Descriptive
 - C) Diagnostic
 - D) Descriptive and diagnostic
70. The main objective of study's to acquire knowledge
- A) Exploratory
 - B) Descriptive
 - C) Diagnostic
 - D) Descriptive and Diagnostic

71. A statement of the quantitative research question should:
- A) Extend the statement of purpose by specifying exactly the question (s the researcher will address
 - B) Help the research in selecting appropriate participants, research methods, measures, and materials
 - C) Specify the variables of interest
 - D) All the above
72. A _____ is a subset of a _____.
- A) Sample, population
 - B) Population, sample
 - C) Statistic, parameter
 - D) Parameter, statistic
73. A good hypothesis should be
- A) Precise, specific and consistent with known facts
 - B) Formulated in such a way that it can be tested by the data
 - C) Limited scope and should not have global significance
 - D) All of these
74. Which of the following is true regarding research objectives?
- A) Research objectives, when achieved, will provide sufficient earnings to obtain a reasonable return on investment.
 - B) Research objectives, when obtained, will ensure the viability of the marketing research department.
 - C) Research objectives, when achieved, provide the information necessary to solve the problem.
 - D) Research objectives are seldom achieved but should be stated as goals to be sought.

75. Your colleague is confused about using the marketing research process, as he knows that something is wrong but is not sure of the specific causes to investigate. He seems to be having problems with _____, which is often the hardest step to take.
- A) Developing the research plan
 - B) Determining a research approach
 - C) Defining the problem and research objectives
 - D) Selecting a research agency
76. What is the primary goal of data visualization?
- A) To collect more data
 - B) To represent data accurately
 - C) To make data more accessible and understandable
 - D) To hide data from the audience
77. Which of the following is NOT a common visual element used in data visualization?
- A) Bar chart
 - B) Line chart
 - C) Data table
 - D) Pie chart
78. Which type of data visualization is best suited for showing the distribution of a single numerical variable?
- A) Bar chart
 - B) Line chart
 - C) Scatter plot
 - D) Pie chart
79. Which data visualization is commonly used to show the relationship between two numerical variables?
- A) Bar chart
 - B) Line chart
 - C) Scatter plot
 - D) Pie chart

80. What is the purpose of “legend” in data visualization?
- A) Explain the meaning of colours or symbols in a chart
 - B) Provides data context
 - C) Represent the main context
 - D) Adds decorative elements
81. What type of chart is useful for showing trends or changes over time?
- A) Pie chart
 - B) Column chart
 - C) Line chart
 - D) Dot graph
82. If the mean of five observations is 20, and one of them is 24, what is the mean of the remaining four observations?
- A) 16
 - B) 18
 - C) 20
 - D) 22
83. The sum of deviations of a set of observations from their mean is always:
- A) Zero
 - B) Negative
 - C) Positive
 - D) Undefined
84. The value which occurs most frequently in a set of observations is called:
- A) Mean
 - B) Mode
 - C) Median
 - D) None of the above

85. The formula to find the median of a set of observations is:
- A) $\frac{(n+1)}{2}$
 - B) $\frac{(n-1)}{2}$
 - C) $\frac{n}{2}$
 - D) None of the above
86. The interquartile range is defined as the difference between:
- A) The third and first quartiles
 - B) The maximum and minimum values
 - C) The mean and median
 - D) The second and third quartiles
87. The coefficient of variation is the ratio of the standard deviation to the:
- A) Arithmetic mean
 - B) Geometric mean
 - C) Harmonic mean
 - D) Median
88. The range of a data set is:
- A) The difference between the largest and smallest values in the set
 - B) The sum of all the values in the set
 - C) The product of all the values in the set
 - D) None of the above
89. If the mode of a data set is 10, and the mean is 15, what can be said about the shape of the distribution?
- A) Skewed left
 - B) Skewed right
 - C) Symmetrical
 - D) Cannot be determined
90. The abscissa of the point of intersection of the less than type and of the more than type cumulative frequency of a grouped data gives its:
- A) Mean
 - B) Median
 - C) Mode
 - D) All of these

91. If the mean of first n natural numbers is $5n/9$, then $n = ?$
- A) 6
 - B) 7
 - C) 9
 - D) 10
92. If 35 is removed from the data, 30, 34, 35, 36, 37, 38, 39, 40 then the median increases by:
- A) 2
 - B) 1.5
 - C) 1
 - D) 0.5
93. The Median when it is given that mode and mean are 8 and 9 respectively, is:
- A) 8.57
 - B) 8.67
 - C) 8.97
 - D) 9.24
94. There are lottery tickets labelled with numbers from 1 to 500. I want to find the number which is most common in lottery tickets. What quantity do I need to use?
- A) Mode
 - B) Mean
 - C) Median
 - D) None of the above
95. Which of the following is not a measure of central tendency?
- A) Mode
 - B) Range
 - C) Median
 - D) Mean
96. The mean of 4 numbers is 37. The mean of the smallest three of them is 34. If the range of data is 15, what is the mean of largest three?
- A) 41
 - B) 38
 - C) 40
 - D) 39

97. Which of the following can not be determined graphically?
- A) Mean
 - B) Median
 - C) Mode
 - D) None of these
98. The median of set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set
- A) is increased by 2
 - B) is decreased by 2
 - C) is two times of the original number
 - D) Remains the same as that of the original set.
99. Let $a, b \in R$. Let the mean and variance of 6 observations -3, 4, 7, -6, a, b be 2 and 23, respectively. The mean deviation about the mean of these 6 observations is:
- A) $13/3$
 - B) $16/3$
 - C) $11/3$
 - D) $14/3$
100. If mean of 25, 29, 25, 32, 24 and x is 27, then what will be the median?
- A) 32
 - B) 27
 - C) 26
 - D) 25