

No. of Printed Pages : 8

Question Booklet Code

**A**

**21CHE2S2CLP**

Question Booklet  
Serial Number

**M.Sc. II Semester (NEP) Degree Examination, October - 2023**

**CHEMISTRY**

**RESEARCH METHODOLOGY**

Time : 1 Hour

Maximum Marks : 30

**INSTRUCTIONS TO CANDIDATES**

1. The Question Paper will be given in the form of a Question Booklet. There will be four/two versions of Question Booklets with Question Booklet Code viz. **A, B, C & D / A & B / A** only.
2. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your Question Booklet is un-numbered, please get it replaced by new Question Booklet with same Code.
3. Immediately after the commencement of the examination, the candidate should check that the Question Booklet supplied to him contains all the 30 questions in serial order. The Question Booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same Code. This is most important.
4. A blank sheet of paper is attached to the Question Booklet. This may be used for Rough Work.
5. **Please read carefully all the instructions on the top of the Answer Sheet before marking your answers.**
6. Each question is provided with four choices **(A), (B), (C)** and **(D)** having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using **Black Ball-Point Pen** in the OMR Answer Sheet.
7. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator.
8. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.
9. First fifteen minutes is provided to fill the general information of the Student. Eg. Student Name, Student ID, etc. in the OMR Answer Sheet
10. Without the instruction of the Invigilator do not open the Question Paper Booklet Seal.

**A**



**1**

**21CHE2S2CLP**

1. What is the key objective of qualitative research ?
  - (A) To measure and quantify phenomena.
  - (B) To explore and understand complex social phenomena.
  - (C) To test hypotheses through controlled experiments.
  - (D) To establish causal relationships between variables.
  
2. Which of the following research types involve numerical data and statistical analysis ?
  - (A) Quantitative research
  - (B) Qualitative research
  - (C) Theoretical research
  - (D) Experimental research
  
3. Theoretical research aims to :
  - (A) Develop practical solutions to real-world problems.
  - (B) Test hypotheses through controlled experiments.
  - (C) Expand and refine theoretical frameworks and concepts.
  - (D) Collect and analyze numerical data.
  
4. What differentiates experimental research from theoretical research ?
  - (A) Experimental research focuses on abstract concepts, while theoretical research involves hands-on experiments.
  - (B) Experimental research aims to explore theoretical ideas, while theoretical research involves controlled experiments.
  - (C) Theoretical research involves testing hypotheses, while experimental research aims to develop new theories.
  - (D) Experimental research involves manipulating variables to observe outcomes, while theoretical research is based on existing theories.
  
5. Which of the following is an example of applied research ?
  - (A) Investigating the genetic basis of a rare disease.
  - (B) Analyzing the impact of social media on mental health.
  - (C) Studying the behavior of quantum particles.
  - (D) Exploring the properties of new materials for electronics.
  
6. What is the primary purpose of conducting a literature survey in research ?
  - (A) To develop new research methodologies.
  - (B) To identify potential research problems and gaps in knowledge.
  - (C) To replicate existing research studies.
  - (D) To showcase expertise in a specific field.



7. Which of the following sources is commonly used to gather information for a literature review ?
- (A) Personal opinions and anecdotes.
  - (B) Social media posts.
  - (C) Journals, Conferences and Books.
  - (D) Fictional novels.
8. Which type of sources is usually considered the most reliable for academic research ?
- (A) Wikipedia articles.
  - (B) Blog posts by individuals.
  - (C) Peer-reviewed journal articles.
  - (D) Online forums.
9. Among the options below, which are examples of literature survey engines ?
- (A) Scopus
  - (B) Web of Science
  - (C) Google Scholar
  - (D) All of the above
10. What is the primary purpose of using literature survey engines ?
- (A) To write creative narratives.
  - (B) To search for entertainment content.
  - (C) To find scholarly articles and academic resources.
  - (D) To access social media platforms.
11. What is meant by impact factor of a journal ?
- (A) It measures the number of articles published in a journal.
  - (B) It reflects the popularity of a journal among readers.
  - (C) It assesses the number of citations received by articles in a journal.
  - (D) It indicates the length of time a journal has been in publication.
12. What does the i10 index indicate about a researcher's work ?
- (A) The number of articles they've published.
  - (B) The number of times they've been cited by others.
  - (C) The number of self-citations in their work.
  - (D) The number of articles with at least 10 citations.



- 13.** What is the purpose of framing a hypothesis in research ?
- (A) To randomly select variables for experimentation.
  - (B) To provide a final conclusion for the research.
  - (C) To establish a clear statement that predicts the outcome of an experiment.
  - (D) To manipulate data to fit the desired outcome.
- 14.** Controlled experiments are designed to :
- (A) Test hypotheses in unpredictable environments.
  - (B) Observe natural events without any intervention.
  - (C) Manipulate variables systematically to assess their effects.
  - (D) Ignore the role of independent variables in research.
- 15.** How does sampling bias affect the reliability of research findings ?
- (A) It ensures unbiased representation of the population.
  - (B) It introduces randomness into the sampling process.
  - (C) It skews the sample in a way that doesn't represent the entire population.
  - (D) It guarantees accurate replication of experiments.
- 16.** What is the importance of independent replicates in experimental research ?
- (A) They minimize the need for controlled experiments.
  - (B) They ensure that only one instance of the experiment is conducted.
  - (C) They increase the likelihood of obtaining consistent and reliable results.
  - (D) They are used to manipulate dependent variables.
- 17.** How does a researcher choose an appropriate sample size for an experiment ?
- (A) By selecting the smallest sample size to save time and resources.
  - (B) By considering the budget allocated for the research.
  - (C) By using a sample size calculator based on statistical principles.
  - (D) By selecting the largest sample size to ensure diverse results.
- 18.** In a well-designed experiment, what is the role of a control group ?
- (A) To ensure that participants are not aware of the experiment.
  - (B) To provide a benchmark for comparison to assess the effect of the independent variable.
  - (C) To introduce bias into the experiment.
  - (D) To manipulate the independent variable.



19. What does the term “correlation” refer to in research ?
- (A) A direct cause-and-effect relationship between variables.
  - (B) A statistical association between two variables, without implying causation.
  - (C) A controlled experiment designed to establish causation.
  - (D) A method for manipulating variables in an experimental setting.
20. Which of the following best describes the concept of “causation” ?
- (A) A situation where two variables have a high correlation.
  - (B) A relationship where one variable directly leads to changes in another.
  - (C) An experimental technique that manipulates data to show a desired outcome.
  - (D) A scenario where confounding variables have no influence on results.
21. Why is safety important in laboratory practices ?
- (A) Safety practices hinder research progress.
  - (B) Laboratories are not risky environments.
  - (C) To prevent accidents, injuries and exposure to hazardous substances.
  - (D) Safety is only relevant in field-based research, not in laboratories.
22. What is the purpose of software tools like ChemDraw and ChemSketch in research ?
- (A) To create artistic drawings for research presentations.
  - (B) To produce colorful visualizations of experimental setups.
  - (C) To assist in drawing chemical structures and reactions accurately.
  - (D) To simulate natural phenomena in a virtual environment.
23. What is the primary role of identifying experimental errors in research ?
- (A) To prevent any inconsistencies from occurring in the data.
  - (B) To recognize and correct factors that might have affected the reliability of results.
  - (C) To ensure the experiment always aligns with the researcher’s expectations.
  - (D) To demonstrate the unpredictability of research outcomes.
24. What distinguishes technical writing from other forms of writing ?
- (A) Using complex vocabulary to confuse the readers.
  - (B) Incorporating personal emotions and feelings.
  - (C) Presenting information in a clear, concise and objective manner.
  - (D) Including fictional narratives to engage the readers.



25. How can Microsoft Excel be useful in data presentation ?
- (A) It can automatically generate research hypotheses.
  - (B) It provides pre-written conclusions for research reports.
  - (C) It offers tools for plotting data and creating various types of charts.
  - (D) It replaces the need for data collection.
26. What is the primary purpose of using bar charts in data presentation ?
- (A) To compare different categories using rectangular bars.
  - (B) To show trends over time using connected data points.
  - (C) To create a visually appealing document.
  - (D) To simulate real-world scenarios in a virtual environment.
27. In research writing, what is the purpose of properly formatting citations ?
- (A) To make the document look visually appealing.
  - (B) To show the researcher's expertise in different citation styles.
  - (C) To ensure that credit is given to the original authors and to avoid plagiarism.
  - (D) To emphasize the researcher's personal opinions.
28. What is the primary objective of technical presentations ?
- (A) To share personal experiences unrelated to research.
  - (B) To create confusion among the audience.
  - (C) To communicate complex research findings effectively to an audience.
  - (D) To impress the audience with artistic visuals.
29. Which test is appropriate for comparing means of two independent groups ?
- (A) ANOVA
  - (B) Chi-square test
  - (C) Correlation test
  - (D) Student's t-test
30. What does the Chi-square test analyze ?
- (A) The correlation between two continuous variables.
  - (B) The variance in a dataset.
  - (C) The relationship between categorical variables.
  - (D) The mean of a dataset.

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**SPACE FOR ROUGH WORK**



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