

- (b) Find the median from the following results of six replicate acid base titration performed by a student 10.08; 10.11; 10.09; 10.10; 9.80; 10.12 mL.
- (c) In a novel method developed for the detection of urea in milk samples, following results were obtained for the milk sample spiked with 50 µg/mL (true value) of urea. - 50.4; 50.7; 49.1; 49.0; 51.1 µg/mL using t-test of significance determine if Null Hypothesis is retained or rejected 'Critical value from t table: $t_4 = 2.78$ ($P=0.05$). (5,5,5)

8. (a) Match the following :

- | | |
|---------------|----------------------------------|
| (i) LaTeX | (a) Reference style |
| (ii) APA | (b) Test of significance |
| (iii) Mandley | (c) Thesis writing software tool |
| (iv) ANOVA | (d) Publication ethics |
| (v) COPE | (e) Reference management tool |

(b) Write a detailed note on Predatory Publishers and Predatory Journals.

(c) What is the significance of literature review in formulation of hypothesis? (5,5,5)

(1000)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 9896

K

Unique Paper Code : 2173522013

Name of the Paper : DSE : Research Methodology for Chemists

Name of the Course : B.Sc. (Prog.) Physical Science / Life Science

Semester : VII

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
 2. Attempt any six questions.
 3. All questions carry equal marks.
 4. Use of a non-programmable calculator is allowed.
-
1. (a) Differentiate between research methods and research methodology with suitable examples of each type.
 - (b) What is citation? What is the purpose of citation management tool in scientific paper writing? Name any two citation management tools.

P.T.O.

- (c) What is the purpose and significance of research in Chemistry? (5,5,5)
2. Write a detailed note on *any three* of the following :
- (a) h- index and i-10 index.
- (b) Characteristics of good research journal.
- (c) Chem sketch.
- (d) F-Test of significance. (3×5=15)
3. (a) Explain the various types of database used for online search for scientific documents.
- (b) Discuss ethical misconduct in research with reference to plagiarism. Name any two- plagiarism detection software.
- (c) How are the information sources categorized? Describe each type with appropriate example. (5,5,5)
4. (a) Outline the general structure of a chemistry research paper, mentioning its main sections.
- (b) Name any three publishers for chemistry journals and two publishing houses for chemistry books.
- (c) What are the core practices of Committee on Publication Ethics (COPE). (5,5,5)

5. (a) Why is impact factor of journals important? Calculate the impact factor of the journal for 2024 with the following available information :
- Total number of publications in the year 2022 are 880
Total number of publications in the year 2023 are 902
Total citation of papers published during 2022-2023 are 18500.
- (b) Discuss the effective strategies for conducting online literature searches, focusing on the use of Field and Boolean operators.
- (c) Explain any two types of technical documents with suitable examples. (5,5,5)
6. (a) Write a short note on following author identifiers (**any two**) :
- (i) ORCID (ii) VIDWAN (iii) Google Scholar
- (b) What are Intellectual Property Rights (IPR) and why are they important?
- (c) Explain the role of software tools and visual aids in enhancing the quality of scientific presentations. (5,5,5)
7. (a) Six replicate analysis of the concentration of zinc in a commercial sample gave the following results 13.8; 14.0; 13.2; 11.9; 12.0; 12.1 mg/mL. Calculate the standard deviation.