

(6 pages)

Reg. No. :

Code No. : 7394

Sub. Code : HCHE 11

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2015.

First Semester

Chemistry – Main

Elective – RESEARCH METHODOLOGY

(For those who joined in July 2012 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following will not be published in journals?

- (a) Result and discussion
- (b) References
- (c) Experimental section
- (d) Reviewer's comments

2. Which of the following is correct?

- (a) Monograph is a writing on a single subject
- (b) Monographs will be published only by scientific societies
- (c) Monographs contain only diagrams and tables and no text
- (d) Monograph is a serial publication in scientific journal

3. For all atomic absorption spectroscopy the sample must be

- (a) Liquified
- (b) Solidified
- (c) Vaporised
- (d) deposited on a thin film

4. The relationship between the concentration of atoms, the distance of light travelled and the extent of light absorbed is given by _____

- (a) Hookes law
- (b) Braggs Law
- (c) Kirchoff Law
- (d) Beer Lamberts Law

5. The most polar solvent employed in column chromatography for elution is

- (a) Hexane
- (b) Pet ether
- (c) Benzene
- (d) Ethyl acetate

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6. If a substance from unknown mixture travels by 2.5 cm and the solvent front has moved by 5.0 cm, then the retention factor is

(a) 0.5 (b) 2.0
(c) 2.5 (d) 5.0

7. $^{234}\text{Th} \rightarrow ^{234}\text{P}$ process involved the emission of

(a) β - particle (b) α - particle
(c) Positron (d) γ - particle

8. α - particle has a net atomic mass unit of

(a) 1 unit (b) 2 units
(c) 3 units (d) 4 units

9. Which of the following is a not a funding agency for project on chemical sciences?

(a) UGC (b) DST
(c) CSIR (d) NCERT

10. A review article reports a

(a) Preliminary result, which is yet to be finalised
(b) Proposed project for future investigation
(c) Proceedings of conference lecheres
(d) Detailed collection of reported results on a specific subject.

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain how an abstract should reflect the contents of an article.

Or

- (b) Discuss the method of preparing powerpoint slides and effectively present them to reach the audience.

12. (a) Illustrate the use of XRD in nanoparticle analysis.

Or

- (b) Explain the uses of blame atomisers and electrochemical atomisers.

13. (a) Discuss the theory of gas chromatography.

Or

- (b) Give a list of different detectors employed in gas chromatography.

14. (a) Differentiate between isotope carriers and non isotope carriers. Explain in detail.

Or

- (b) It is essential to have special precautions during radiochemical studies. Why? How can that be effected?

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[P.T.O.]



15. (a) Write a note on significance numbers.

Or

- (b) Explain the methodology in writing an acceptable research article.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Indicate the efforts to be taken in projecting the results and the associated discussion in the form of a thesis.

Or

- (b) Describe how to

- (i) Choose a research problem
- (ii) Address the research problem
- (iii) Analyse the research problem
- (iv) Arrive at the result in a research problem and
- (v) Report the research findings.

17. (a) Compare the SEM and TEM techniques.

Or

- (b) Discuss the principle and applications of atomic emission spectroscopy.

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18. (a) Explain the role of HPLC in analysing a mixture of compounds. Provide the working in detail.

Or

- (b) Write notes on:

- (i) Combining mass spectrometers to chromatographic systems.
- (ii) HPLC in quantitative analysis.

19. (a) Explain the importance of isotope dilution analysis in radiochemical methods. Discuss its application in detail.

Or

- (b) Elaborate on the use of G.M. Counter in measuring radioactivity. Discuss the working in detail.

20. (a) Explain 't' test, 'f' test and 'chi' square test in detail.

Or

- (b) List out the reasons for the errors in chemical analysis. Indicate their types. Explain how these errors can be minimized.

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