



MAR IVANIOS COLLEGE (AUTONOMOUS)
THIRUVANANTHAPURAM

Reg. No. :.....

Name :.....

Second Semester B.Sc. Degree Examination, June 2016

First Degree Programme under CBCSS

Foundation Course – II: (for Chemistry)

AUCH221: Methodology and Perspectives of Sciences and General Informatics

Time: 3 Hours

Max. Marks: 80

SECTION – A

Answer ALL questions in one or two sentences.

1. Define the term *hypothesis* in the context of science.
2. Write the general expression for the acceleration of an object in terms of mass, length or time (dimension).
3. Write one global challenge that humans face in 21st century. What is its possible scientific solution ?
4. Mention any two television channels which assist you in scientific knowledge transfer process.
5. Who is considered as the father of modern chemistry ?
6.then came the era of Organic chemistry. It was developed by Justus von Liebig and others, following X 's synthesis of urea which proved that living organisms were, in theory, reducible to chemistry.... Who is this X ?
7. Write the expansion for DNS.
8. What are *bugs* in the context of computers ?
9. Find the *mode* of the sample [1, 3, 6, 6, 6, 6, 7, 7, 12, 12, 12, 17].
10. What do you mean by experimental bias ?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **EIGHT** questions, each in a short paragraph not exceeding 50 words.

11. Define the term *scientific law* with an example. Mention its characteristics.
12. Explain the major point of difference between precision and accuracy.
13. What do you mean by inductive reasoning ?
14. Write a note on knowledge dissemination and utilization in modern era.
15. Enumerate the major limitations of Bohr's atom model.
16. Explain the contribution of Alchemists in the evolution of chemistry.
17. Expand NPTEL. What are its major objectives ?
18. State whether the following assertion is true or false:

The Internet has no centralized governance in either technological implementation or policies for access and usage; each constituent network sets its own policies.
Explain your answer.

19. Read the following abstract of a research paper. Write any four keywords suitable for this abstract:

The chemistry of aqueous systems has undergone profound changes over the course of geological time in response to the global climate change. It is observed that deviations in hydrochemical parameters of the aqueous environment indirectly affect the rate of biological calcification and shell formation in molluscs and consequently their populations. In this paper the factors controlling the biochemistry of calcification by molluscs in a selected tropical brackish water region is studied using empirical data. Observations in the field suggest that once the thermodynamic feasibility of calcium carbonate precipitation is prevented in a given aqueous environment due to the direct influence of climate change or the consequent effects in hydrochemical parameters the populations of molluscs may face extirpation or local extinction in those geographic zones.

20. Mention the names of any two international publishers dealing with chemistry.
21. Define Cheminformatics.
22. What is the use of standard deviation in research ?

(8 × 2 = 16 Marks)

SECTION – C

Answer any SIX questions, each in a paragraph not exceeding 120 words.

23. Taking Rutherford's atom model as example, explain scientific methods such as formulation of hypothesis, experimentation, observation and falsification.
24. Is the progress of science related to globalization ? Elaborate your response.
25. Discuss the major contributions of Marie Skłodowska Curie to modern science.
26. Discuss plagiarism as an ethical offense in scientific writing.
27. Write a note on INFLIBNET.
28. "Good scientific writing is a not a matter of life and death; it is much more serious than that..." Explain this in terms of research in chemistry.
29. Write short note on material safety data sheets.
30. What do you mean by i). Sampling and ii). Experimental bias ?
31. Discuss the importance of falsification of hypothesis in scientific theory.

(6 × 4 = 24 Marks)

SECTION – D

Answer any TWO questions, not exceeding four pages.

32. What is a scientific model ? Discuss the significance of hardware and software models in science.
33. Trace the development of scientific creativity with special reference to deductive and inductive methods. How does the integration approach of these methods appear in modern scientific enquiry ?
34. Discuss the role of chemistry as a central science connecting physics, biology and other branches of science.
35. i). Write a note on CML and PDB file formats in cheminformatics.
ii). Explain SYBYL Line Notation (SLN).
iii). Write the SMILES for benzene and ethyl alcohol molecules.

(2 × 15 = 30 Marks)

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