RW-6400 **596101**

M.Phil. DEGREE EXAMINATION, DECEMBER 2010

Chemistry

RESEARCH METHODOLOGY IN CHEMISTRY

(CBCS–2008 onwards)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions.

(5 × 15 = 75)

1. (a) Discuss the use of various primary sources in literature survey.

(*Or*)

(b) How will you carryout literature search through computers and internet ?

2. (a) Discuss the principle and applications of gas chromatography.

(*Or*)

(b) Write a detailed note on atomic emission spectroscopy

3. (a) Discuss the theory, instrumentation and applications of Mass spectroscopy.

(*Or*)

(b) Write notes on ^{13}C NMR spectroscopy.

4. (a) Write the theory, instrumentation and applications of STM.

(*Or*)

(b) Write notes on EQCM.

5. (a) Differentiate :

(i) Precision and accuracy. (5)

(ii) Students t-distribution and t-test. (5)

(iii) Linear regression and multiple linear regression. (5)

(*Or*)

(b) Write notes on :

(i) Random and normal errors (5)

(ii) Mean and standard deviation. (5)

(iii) Correlation coefficient. (5)

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RW-6401 596102

M.Phil. DEGREE EXAMINATION, DECEMBER 2010

Chemistry

AREA OF SPECIALIZATION IN CHEMISTRY

(CBCS—2008 onwards)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions. (5 × 15 = 75)

1. (a) (i) Write electrochemical reaction and performance characteristics of Lead-Acid battery.

(8)

(ii) Explain the principle and mechanism of water activated battery.

(7)

(*Or*)

(b) Elaborate the working mechanism of Fuel cells using (i) Phosphoric acid, and (ii) Solid oxide.

(7½ + 7½ = 15)

2. (a) (i) Give the importance of EMF and Galvanic series in corrosion.

(6)

(ii) Explain the electrochemical method of protection from corrosion by anodic protection.

(9)

(*Or*)

(b) Describe the process of (i) Alloy plating of Brass and (ii) Chromating and Anodising.

(3 × 5 = 15)

3. (a) (i) Write about the intermediates obtained from benzene and phenol.

(3 + 3)

(ii) What are the dyes obtained from Aniline ? Write with reaction for two dyes.

[3 + (3 + 3)]

(*Or*)

(b) Enumerate the preparation and application of Fluorescent brightening agent and Blueing agent.

(7½ + 7½ = 15)

4. (a) (i) Describe, how polyester polymer is obtained.

(7)

(ii) Explain the mechanism of dyeing of direct dye on cotton.

(8)

(*Or*)

(b) (i) Discuss the factors affecting dyeing.

(3)

(ii) Explain the method of determination of fastness properties of reactive dye, vat dye and sulphur dye.

(3 × 4 = 12)

5. (a) (i) Write the special features of conducting polymer and thermally stable polymer.

(4 + 4)

(ii) Describe the mechanism of bio-degradable polymers.

(7)

(*Or*)

(b) (i) Justify the importance of glass transition temperature in polymers.

(7)

(ii) Describe the effect of crystallinity on the properties of polymers.

(8)

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RW-6402 **596103**

M.Phil. DEGREE EXAMINATION, DECEMBER 2010

Chemistry

GENERAL SKILLS FOR CHEMISTRY

(CBCS–2008 onwards)

Time : 3 Hours Maximum : 75 Marks

(5 ×15 = 75)

Answer **all** questions.

1. (a) Explain in detail about the uses of Application Software in Research.

(*Or*)

(b) As a Research Scholar how would you effectively utilize Internet for your Research Programme. List out important website addresses related to your Research.

2. (a) Write short notes on :

(i) C++ Programme.

(ii) Integrated office applications.

(iii) Deleting and Un-Deleting documents.

(*Or*)

(b) Explain in detail about 'MS Office' with suitable examples.

3. (a) What do you mean by Career Skills ? Prepare your Curriculum Vitae and write a covering letter to send the Curriculum Vitae for the post of Scientist in any national research institutions.

(*Or*)

(b) Define 'Communication Skill'. Prepare a conversation about your research proposal in Chemistry with experts.

4. (a) Explain in detail about Micro-Teaching with special reference to skill of stimulus variation and draw the Flow Chart of Micro-Teaching Cycle.

(*Or*)

(b) Differentiate :– Curriculum and Syllabus and explain in detail about the models of curriculum development.

5. (a) Write an account on preparation of teaching materials in Chemistry.

(*Or*)

(b) Write a short note on :

(i) Curriculum plan for Organic Chemistry at U.G. level.

(ii) Construction of Time-Table at P.G. level.

(iii) Defects in the Present Examination System.

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