(6 pages)

Reg. No. :

Code No.: 5875 Sub. Code : PCHE11

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2020.

First Semester

 ${\rm Chemistry}-{\rm Core}$

 $\label{eq:elective} \text{Elective} - \text{ADVANCED TOPICS IN CHEMISTRY} - \text{I}$

(For those who joined in July 2017 onwards)

Time : Three hours Maximum : 75 marks

PART A — $(10 \times 1 = 10 \text{ marks})$

Answer ALL questions.

Choose the correct answer :

- Polar solvents couple well with microwaves and reach <u>temperature</u> in a <u>time</u>.
 - (a) Low, long (b) High, long
 - (c) High, short (d) Low, short

2. Identify 'X' in the reaction



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- 6. Difficult to monitor and very dangerous form of corrosion is _____
 - (a) Galvanic (b) Pitting
 - (c) Crevice (d) Stress
- 7. HPLC stands for
 - (a) High Pressure Liquid Chromatography
 - (b) High Performance Liquid Chromatography
 - (c) Both (a) and (b)
 - (d) Highly Placed Liquid Chromatography
- 8. Which of the following forms of electrochemistry seeks to obtain the condition of full polarization?
 - (a) Ohmetry (b) Coulometry
 - (c) Voltametry (d) Potentiometry
- 9. A fuel cell is used to convert chemical energy into
 - (a) Solar energy (b) Electrical energy
 - (c) Potential energy (d) Mechanical energy
- 10. Reactors used for electricity generation are called
 - (a) Electron reactors

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- (b) Power reactors
- (c) Production reactors
- (d) Research and development reactors

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PART B — $(5 \times 5 = 25 \text{ marks})$

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

Each answer should not exceed 250 words.

11. (a) Write briefly on need of green chemistry.

Or

- (b) Explain briefly any three green reactions.
- 12. (a) Narrate any two chemical methods for the synthesis of nanoparticles.

Or

- (b) Write short notes on nano structural materials.
- 13. (a) Explain briefly the principles of corrosion.

Or

- (b) Describe the mechanism of inhibitor action in acidic medium.
- 14. (a) Discuss the characteristics of interfacing GC with mass spectrometer.

Or

(b) Explain the principle involved in HPLC.

Page 4 Code No. : 5875 [P.T.O.] 15. (a) Write a note on stealing the sun.

Or

(b) Give an account of fuel from sun light.

PART C — $(5 \times 8 = 40 \text{ marks})$

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

Each answer should not exceed 600 words.

16. (a) Narrate the superiority of microwave exposure over thermal reactions.

Or

- (b) Enumerate and explain the twelve principles of green chemistry.
- 17. (a) Discuss in detail the optical and electronic properties of nano materials.

Or

- (b) Describe any three physical approaches for the synthesis of nano particles.
- 18. (a) Explain briefly any four important corrosion monitoring methods.

Or

- (b) Write notes on :
 - (i) Electrochemical principles of corrosion
 - (ii) Classification of inhibitors based on electrode process.
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19. (a) Discuss the basis of amperometric titrations. Illustrate taking suitable examples.

 \mathbf{Or}

- (b) Describe any four applications of atomic absorption spectrophotometry.
- 20. (a) Give a detailed account on hydrogen storage materials.

Or

- (b) Write briefly on :
 - (i) Solar energy
 - (ii) Hydrogen as fuel in the future.

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