

**Govt. M.H. College of Home Science & Science for women, Autonomous
Jabalpur M.P.**

Code No. OBS/401/C/2020

M.Sc. IV Semester Main & ATKT Examination September 2020

Subject : Chemistry

Paper-I : Inorganic Chemistry

Maximum Marks : 35

**Note : Attempt all questions in about 250 to 300 words.
All questions carry equal marks.**

- Q.1 What is the difference between hyperfine and super hyperfine splitting in ESR? Explain with suitable examples?**
- Q.2 Discuss the basic principle and applications of Mossbauer spectroscopy in brief.**
- Q.3 Illustrate various modes of vibrations in trigonal bipyramidal XY_5 type molecules.**
- Q.4 Explain the function of Photosystem I and Photosystem II in cleavage of water.**
- Q.5 What is nitrogen fixation? How is it carried out using nitrogenase enzyme ? give its mechanism?**



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Subject : Chemistry

Paper-II : Organic Chemistry

Maximum Marks : 35

**Note : Attempt all questions in about 250 to 300 words.
All questions carry equal marks.**

- Q.1 Explain COSY with a suitable example.**
- Q.2 Describe CI and FAB techniques of ion production in mass spectrometry and also discuss their advantages and limitations.**
- Q.3 Describe the following in mass spectrometry-**
(a) Nitrogen rule.
(b) McLafferty rearrangement.
- Q.4 Discuss the stereoselectivity, stereospecificity and regioselectivity of E2 reactions.**
- Q.5 Describe the following-**
(a) Michaelis Menten equation
(b) Immobilization of enzymes and its effect on enzymatic activity.



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Subject : Chemistry

Paper-III : Physical Chemistry

Maximum Marks : 35

**Note : Attempt all questions in about 250 to 300 words.
All questions carry equal marks.**

- Q.1 Illustrate shielding and deshielding of magnetic nuclei.**
- Q.2 What is meant by 'g' value? Discuss the factors affecting it.**
- Q.3 Give a detailed account of various laws of photochemistry.**
- Q.4 Highlight various types of steric strain and their influence on reactivity in substituted cyclohexane.**
- Q.5 Write a note on primary and secondary kinetic isotope effect.**

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Subject : Chemistry

Paper-IV : Polymer Chemistry

Maximum Marks : 35

**Note : Attempt all questions in about 250 to 300 words.
All questions carry equal marks.**

- Q.1 Describe Cationic and anionic polymerization.**
- Q.2 Differentiate between number average and weight average molecular weight of polymer. Explain how number average molecular weight is determined by viscosity method.**
- Q.3 Write short notes on-**
(a) Glass transition Temperature
(b) Chain Topology
- Q.4 Discuss different types of moulding in the processing Techniques of polymer.**
- Q.5 Write a note on - Biomedical polymers.**



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Subject : Chemistry

Paper-V : Chemistry of Natural Products

Maximum Marks : 35

Note : Attempt all questions in about 250 to 300 words.

All questions carry equal marks.

- Q.1 Describe the structure and one synthesis method for citral.**
- Q.2 Discuss the structure of Ephedrine and give one method of its synthesis.**
- Q.3 Describe the chemical constitution and synthesis of testosterone.**
- Q.4 What is difference between terms-Anthocyanin and Anthocyanidin? Describe the general methods for structure elucidation of anthocyanins.**
- Q.5 (a) Write the names of diseases caused by the deficiency of the following vitamins.**
(i) Vitamin B₁
(ii) Vitamin B₆
(b) Describe the structure of chloramphenicol.

