Sadhu Vaswani (Autonomous) College
Bairagarh, Bhopal-462030, M.P.

Model Question Papers

B.Sc. Chemistry

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

B.Sc. -1 Year
Subject-Chemistry (Major-I)
Fundamental of Chemistry

Maximum Marks: -70 Minimum Marks: -25
Duration : Three hours

All Questions are compulsory
सभी प्रश्न अनिवार्य है।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct options: सही विकल्प चुनिए ।

I. On which of the following metal Nagarjun did maximum work?
निम्न में से किस धातु पर नागार्जुन ने अधिकतम कार्य किया था ?
(i) Gold स्वर्ण (ii) Silver रजत
(iii) Mercury पारद (iv) Copper ताम्र

II. pH value of human blood is –
मानव रक्त का pH मान होता है-
(a) 3.74 (b) 4.37 (c) 6.84 (d) 7.4

III. Which conformation of cyclohexane has highest energy –
साइक्लोहेक्सेन में कौन से संरूपण की ऊर्जा सबसे अधिक होती है-
(a) Twisted chair form ऐठन कुर्सी रूप
(b) Twisted boat form ऐठन नौका रूप
(c) Chair form कुर्सी रूप
(d) Boat form नौका रूप

Section-'B' / खण्ड 'ब'

Short answer type question / लघु उत्तरीय प्रश्न **4x9=36**

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए

Q.2 (i) Discuss Aufbau principle in detail.
आफबाऊ सिद्धांत का विस्तारपूर्वक वर्णन कीजिये।
(ii) Describe Charak Sanhita briefly.
चरक संहिता को संक्षिप्त में समझाइये।

Q.3 (i) Explain periodicity of ionization potential.

आयनन विभव की आवर्तिता को समझाइये।

(ii) Explain the changes in electro negativity and electron affinity in any group of periodic table.
आवर्त सारणी में किसी एक समूह में विद्युत ऋणात्मकता एवं इलेक्ट्रॉन बंधुता में क्रमिक परिवर्तन को स्पष्ट कीजिये।

Q.4 Write short note on contribution of ancient Indian scientist in Ayurveda?
प्राचीन भारतीय वैज्ञानिकों के आयुर्वेद में योगदान पर संक्षिप्त टिप्पणी लिखिए।

Q.5 (i) Give the Arrhenius concept of acid-base.
आरहीनियस के अम्ल-क्षार धारणा को समझाइये।

(ii) What are indicators? Discuss their applications.
सूचक किसे कहते है ? इनके उपयोगो की व्याख्या कीजिये।

Q.6 (i) What do you understand by bond Fission? Write products obtained form cleavage with suitable examples in brief.
बंध विदलन से आप क्या समझते हो? विदलन से प्राप्त उत्पादों को उदाहरण सहित लिखिये।

(ii) What are the elements of symmetry? Explain them with example.
सममिति के तत्व क्या होते है? उदाहरण सहित वर्णन कीजिये।

Q.7 (i) Write a note on Vant Hoff differential method.
वाण्ट हाफ की अवकलन विधि पर एक टिप्पणी लिखिये।

(ii) Discuss the Factors which affects the degree of ionization.
आयनीकरण की मात्रा को प्रभावित करने वाले कारकों का वर्णन कीजिये।

Section-'C'/खण्ड 'स'

Long answer type question/दीर्घ उत्तरीय प्रश्न **2×14=28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 (i) Explain the Hund's rule & Pauli's exclusion principle with example.
हुण्ड के नियम और पाउली अपवर्जन सिद्धांत को उदाहरण सहित समझाइये।

(ii) Explain briefly that Ayurveda came from which Veda.
आयुर्वेद किस बेद ग्रंथ से उत्पन्न हुआ है? संक्षेप में समझाइये।

Q.9 (i) What do you mean by Lattice energy? Explain by means of an example the relationship between lattice and salvation energy.
जालक ऊर्जा से क्या तात्पर्य है? विलायकन ऊर्जा और जालक के सम्बन्ध को उदाहरण से स्पष्ट कीजिये।

(ii) What is quantum number ? Explain all the four quantum numbers.
क्वांटम संख्या क्या होती है? चारो क्वांटम संख्याओ को समझाइए।

Q.10 (i) What are free radicals? Explain their stability and main properties.
मुक्त मूलक किसे कहते है? इसके स्थायित्व व प्रमुख गुणों का वर्णन कीजिये।

(ii) Explain geometrical isomerism with example and write how geometrical isomerism is caused?
ज्यामितीय समावयता को उदाहरण सहित समझाइये तथा ज्यामितीय समावयता के उत्पन्न होने के कारणों को भी स्पष्ट कीजिये।

Q.11 (i) Write notes on the following. निम्न पर टिप्पणी लिखिए

(a) Activation energy सक्रियण ऊर्जा

(b) Temperature coefficient ताप गुणाक

(ii) What is solubility product constant? Give some of its applications. What is the effect of pH on solubility.
विलेयता गुणनफल क्या है ? इसके अनुप्रयोगों का वर्णन कीजिए। विलेयता पर pH के प्रभाव को समझाइये।

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

B.Sc. -1 Year
Subject-Chemistry (Major-II/Minor/Elective)
Analytical Chemistry

Maximum Marks: -70 Minimum Marks: -25
Duration : Three hours

All Questions are compulsory
सभी प्रश्न अनिवार्य है।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct options:- सही विकल्प चुनिए

I. Which is primary memory
प्राथमिक मेमोरी है:
(i) ROM
(ii) Hard disk
(iii) CD
(iv) DVD

II. Who was the father of computer?
कम्प्यूटर के जनक कौन है ?

(i) Charles Babbage चार्ल्स बैबेज
(ii) Herman Hollerith हर्मन होलिरिथ
(iii) Blaze Pascal ब्लेज पास्कल
(iv) Baron Gottfried बेरान गॉटफाइड

III. What is the full form of DOS?
डॉस का पूरा नाम क्या है ?

(i) Disk operate service डिस्क ऑपरेट सर्विस
(ii) Disk operating system डिस्क ऑपरेटिंग सिस्टम
(iii) Disk operational server डिस्क ऑपरेशन सर्वर
(v) None of these इनमें से कोई नही।

Section-'B' / खण्ड 'ब

Short answer type question / लघु उत्तरीय प्रश्न **4×9=36**

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए

Q.2 Write short notes on संक्षिप्त टिप्पणी लिखिए

(i) Maxima and Minima उच्चिष्ठ तथा निम्निष्ठ

(ii) Partial differentiation आंशिक अवकलन

Q.3 Explain Accuracy and Precision.
यथार्थता एवं परिशुद्धता को समझाइये।

Q.4 Write difference between hardware and software?
हार्डवेयर एवं सॉफ्टवेयर में अंतर बताइए।

Q.5 Write short note on संक्षिप्त टिप्पणी लिखिये।

(i) Law of Mass action द्रव्य अनुपाती क्रिया का नियम

(ii) Chemical potential रासायनिक विभव

Q.6 Explain thin layer chromatography in detail.
पतली परत क्रोमेटोग्राफी को विस्तारपूर्वक समझाइये।

Q.7 Explain Woodward-Fieser rule for α, β Unsaturated carbonyl compounds.
α,β असंतृप्त कार्बोनिल यौगिक के लिए वुडवर्ड फाईजर नियम समझाइये ।

Section-'C'/खण्ड 'स'

Long answer type question/दीर्घ उत्तरीय प्रश्न **2×14=28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 Explain any five input and five output devices of a computer
कम्प्यूटर की किन्ही पांच इनपुट तथा पांच आउटपुट युक्तिओं को समझाइए।

Q.9 Explain with the help of Le- Chatelier's principle the relation between equilibrium of Ideal gas and condensed phase.
आदर्श गैस एवं संघनित प्रावस्था के मध्य साम्यों को ली-शातेलिए नियम समझाइये।

Q.10 What is chromatography? Explain ion- Exchange Chromatography in detail.
क्रोमेटोग्राफी क्या होती है? आयन विनिमय क्रोमेटोग्राफी को विस्तारपूर्वक समझाइये।

Q.11 Discuss the principle and applications of Infrared spectroscopy.
अवरक्त स्पेक्ट्रमिकी के सिद्धांत एवं अनुप्रयोगों का वर्णन कीजिये।

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

B.Sc. IInd Year
Subject-Chemistry (Major-1)
Reactions, Reagents and Mechanisms in Organic Chemistry

Maximum Marks: -70 Minimum Marks: -25
Duration : Three Hours

All Questions are compulsory
सभी प्रश्न अनिवार्य है।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct options:- सही विकल्प चुनिए ।

I. Which of the following group are ortho- para directing and activating
निम्न में से कौन आर्थो–पैरा निर्देशक समूह है

a) –OH b) $-NH_2$ c) –Cl d) All of the above

II. The catalyst Ziegler Natta is –
जिग्लर नाटा उत्प्रेरक है-

(a) $TiCl_4$ (b) $TiCl_3$ (c) $Al(C_2H_5)_3$ (d) $TiCl_4 + Al(C_2H_5)_3$

III. The transition to Fluorescence is –
प्रतिदीप्ति प्राप्त होने के लिये संक्रमण है-

(a) $S_1 \rightarrow S_0$ (b) $T_1 \rightarrow S_0$ (c) $S_2 \rightarrow S_1$ (d) $T_2 \rightarrow T_1$

Section-'B' / खण्ड 'ब

Short answer type question / लघु उत्तरीय प्रश्न

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए 4x9=36

Q.2 Write Diazonium Coupling with mechanism.
डायजोनियम युग्मन को क्रियाविधि सहित लिखिये।

Q.3 Explain Markonikou's rule with example.
मार्कोनीकोव का नियम उदाहरण सहित समझाइये।

Q.4 What is catalytic hydrogenation? Give examples of homogenous and heterogeneous catalysts.
हाइड्रोजनीकरण क्या है? समांगी एवं विषनांगी उत्प्रेरको का उदाहरण दीजिये ।

Q.5 Write short note on Birch reduction and Clemmensen reduction.
बर्च अपचयन एवं क्लेमेन्सन अपचयन पर टिप्पणी लिखिये।

Q.6 What is Electro cyclic reactions? Explain with examples.
चक्रीय अभिक्रियाएँ क्या हैं? उदाहरण सहित समझाइये।

Q.7 What Happens when क्या होता है जब –

a) RCH_2OH reacts with acidic $KMnO_4$. RCH_2OH अम्लीय $KMnO_4$ से क्रिया करता है।

(b) HOCl reacts with propene. HOCl प्रोपीन से क्रिया करता है।

(c) BF_3 reacts with $NaBH_4$ BF_3 $NaBH_4$ से क्रिया करता है।

Section-'C'/खण्ड स

Long answer type question/दीर्घ उत्तरीय प्रश्न **2 X 14 = 28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 What is SN^1 and SN^2 reactions? Explain their mechanism by giving example of alkyl halide.
SN^1 एवं SN^2 अभिक्रियाएँ क्या है? ऐल्किल हैलाइड का उदाहरण देते हुए क्रियाविधि समझाइये।

Q.9 Write the method of preparation, properties and uses of NBS?
NBS बनाने की विधि गुण व उपयोग लिखिये।

Q.10 Explain Norish I type and Norish II type reactions with examples in detail.
नॉरिश I प्रकार व नॉरिश II प्रकार की क्रियाओं को उदाहरण सहित विस्तार से समझाइये।

Q.11 Give the mechanism of following reactions.
निम्न अभिक्रियाओं की क्रियाविधि दीजिए

(a) Aldol reaction ऐल्डोल अभिक्रिया

(b) Cannizaro reaction कैनिजारो अभिक्रिया

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

B.Sc. -IInd Year
Subject-Chemistry (Major-II/Minor/Elective)
Transition Elements, Chemi - Energetics, Phase Equilibria

Maximum Marks: -70 Minimum Marks: -25
Duration : Three Hours

All Questions are compulsory
सभी प्रश्न अनिवार्य है।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct option:- सही विकल्प चुनिए ।

I. System with incongruent melting point is.
असर्वांगसम गलनांक वाला तंत्र है।
(a) Zn - Mg
(c) $NaCl.H_2O$
(b) Benzene-Toluene बेंजीन टालुईन
(d) Ag-Pb

II. Which of the following substance contains Antimony?
निम्न में किस पदार्थ में एन्टीमनी है ?
(a) Anjan अंजन (b) Talak तालक (c) Rasak रसक (d) Sasyak सास्यक

III. The SI unit of molar conductance is:
मोलर चालकता की इकाई है

a) ohm^{-1} b) $ohm^{-1}\ cm^{-1}$ c) mho d) $mho^{-1}cm^{-2}$

Section-'B' / खण्ड 'ब'

Short answer type question / लघु उत्तरीय प्रश्न

Attempt any four questions / किन्हीं चार प्रश्नों को हल कीजिए 4x9=36

Q.2 What is Lanthanide contraction? What is its effect on the properties of Lanthanides
लैन्थेनाइड संकुचन क्या है? इस संकुचन का लैन्थेनाइडस के गुणों पर क्या प्रभाव पड़ता है समझाइये।

Q.3 Explain valence band theory? Write its postulates and limitation.
संयोजकता बन्ध सिद्धांत समझाइये? इसकी अभिधारणायें तथा सीमायें लिखिये।

Q.4 What is Nernst heat theorem? Explain its application for the determination of e.m.f of a cell.
नन्सर्ट ऊष्मा प्रमेय क्या है? किसी सेल के e.m.f को ज्ञात करने के लिये इसके अनुप्रयोगों को समझाइये।

Q.5 Explain calomel electrode? Write its uses.

कैलोमल इलेक्ट्रोड को समझाइये तथा इसके उपयोग लिखिए।

Q.6 What is Roult's law?
राउल्ट का नियम क्या है ?

Q.7 Write the limitations of crystal field theory.
क्रिस्टलीय क्षेत्र सिद्धांत की सीमायें लिखिये।

Section-'C'/ खण्ड स

Long answer type question / दीर्घ उत्तरीय प्रश्न **2 X 14 = 28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 What is phase rule? Explain Ag-Pb system with diagram.
प्रावस्था साम्य क्या है ? Ag-Pb तंत्र को प्रावस्था आरेख की सहायता से समझाइये।

Q.9 Explain Werner's co-ordination theory? Write its postulates.
वर्नर का उप सहसंयोजकता सिद्धांत क्या है? इसकी अभिधारणायें लिखिये।

Q.10 Explain Kohlrausch law and its application?
कोलरॉश का नियम समझाइये तथा इसके अनुप्रयोग लिखिये।

Q.11 Write notes on the following.
निम्नलिखित पर टिप्पणी लिखिये।

(a) Clausius Clapeyron equation.
क्लासिअस क्लेपरोंन समीकरण

(b) Azeotropic Mixtures.
स्थिरक्वाथी मिश्रण

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

B.Sc. -III Year
Subject-Chemistry (Major - I)
Instrumental Techniques In Chemistry

Maximum Marks: -70 Minimum Marks: -25
Time allowed: 3 Hours

All Questions are compulsory
सभी प्रश्न अनिवार्य हैं ।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct options:- सही विकल्प चुनिए ।

I Which of the following is an example of systematic error
निम्नलिखित में से कौन व्यवस्थित त्रुटि का एक उदाहरण है?

(a) Personal error व्यक्तिगत त्रुटि (b) Operational error परिचालन त्रुटि

(c) Instrumental error यांत्रिक त्रुटि (d) All of the above उपरोक्त सभी

II Signal splitting in Nuclear Magnetic Resonance arises from?
नाभिकीय चुंबकीय अनुनाद में सिग्नल विपाटन कहां से उत्पन्न होता है?

(a) Shielding effect परिरक्षण प्रभाव (b) Chemical shift रासायनिक विस्थापन

(c) Spin-spin coupling स्पिन-स्पिन युग्मन (d) Deshielding effect विपरिरक्षण प्रभाव

III The most widely used flame in atomic absorption is
परमाणु अवशोषण में सबसे व्यापक रूप से उपयोग की जाने वाली ज्वाला है

(a) Air acetylene वायु एसिटिलीन (b) Air propane वायु प्रोपेन

(c) Air coal gas वायु कोयला गैस (d) Oxyacetylene ऑक्सीएसिटिलीन

Section-'B' / खण्ड 'ब

Short answer type question / लघु उत्तरीय प्रश्न

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए 4x9=36

Q.2 Write a note on factors affecting the choice of analytical methods.

विश्लेषणात्मक विधियों के चयन को प्रभावित करने वाले कारकों पर टिप्पणी लिखिए।

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

Q.3 Explain Nuclear shielding and deshielding.
नाभिकीय परिरक्षण एवं विपरिरक्षण की व्याख्या कीजिए।

Q.4 Write in brief on characteristic properties of Raman lines.
रमन रेखाओं के अभिलाक्षणिक गुणों पर संक्षेप में लिखिए।

Q.5 Describe in brief the principle of mass spectroscopy?
द्रव्यमान स्पेक्ट्रोस्कोपी के सिद्धांत का संक्षेप में वर्णन कीजिए।

Q.6 Why the technique of atomic absorption spectroscopy is only limited to metals? Explain.
परमाणु अवशोषण स्पेक्ट्रोस्कोपी की तकनीक केवल धातुओं तक ही सीमित क्यों है? समझाइये।

Q.7 Write a note on different types of polarised light.
विभिन्न प्रकार के ध्रुवित प्रकाश पर टिप्पणी लिखिए।

Section-'C'/खण्ड स

Long answer type question/दीर्घ उत्तरीय प्रश्न **2 X 14 = 28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 Write notes on different types of ions produced in a mass spectrometer.
द्रव्यमान स्पेक्ट्रोमीटर में उत्पन्न विभिन्न प्रकार के आयनों पर टिप्पणी लिखिए।

Q.9 Write in detail on theory and instrumentation of Electron Spin Resonance spectroscopy.
इलेक्ट्रॉन चक्रण अनुनाद स्पेक्ट्रोस्कोपी के सिद्धांत एवं उपकरण पर विस्तार से लिखिए।

Q.10 What do you understand with high performance liquid chromatography (HPLC)? Describe different types of detectors used in HPLC.

उच्च प्रदर्शन द्रव वर्ण लेखन (एचपीएलसी) से आप क्या समझते हैं? एचपीएलसी में प्रयुक्त होने वाले विभिन्न प्रकार के संसूचकों का वर्णन कीजिए।

Q.11 What is gas chromatography? Write in detail on different types of detectors used in gas chromatography.

गैस वर्णलेखी क्या है? गैस वर्णलेखी में प्रयुक्त होने वाले विभिन्न प्रकार के संसूचकों का वर्णन कीजिए।

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

B.Sc. -III Year
Subject-Chemistry (Major - II)
Bio Physical, Bio-inorganic and Organometallic Chemistry

Maximum Marks: -70 Minimum Marks: -25
Time allowed: 3 Hours

All Questions are compulsory
सभी प्रश्न अनिवार्य हैं ।

Section-'A'/खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न 3×2=6

Q.1 Choose the correct options:- सही विकल्प चुनिए ।

1. Composition of hydrogen elements in the human body is as follows.
मानव शरीर में हाइड्रोजन तत्व का संघटन है-
(a) 25% (b) 63% (c) 9.5% (d) 0.31%

II. Unit of magnetic moment is
चुम्बकीय आधूर्ण की इकाई है
(a) Kcal (b) KJ (c) BM (d) KJ^{-1}

III. The Law of Curie is?
क्यूरी नियम है ?
(a) $\chi\alpha$ C (b) $\chi\alpha$ T (c) $\chi\alpha$ 1/C (d) $\chi\alpha$ 1/T

Section-'B' / खण्ड 'ब
Short answer type question / लघु उत्तरीय प्रश्न

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए 4x9=36

Q.2 Write short note on buffer solution.
बफर विलयन पर सक्षिप्त टिप्पणी लिखिए।

Q.3 Write a short note on Magnetic susceptibility.
चुम्बकीय सुग्राहिता पर संक्षिप्त टिप्पणी लिखिए ।

Q.4 What is Zigler - Natta catalyst? Explain its Mechanism.
जिग्लर नाटा उत्प्रेरक क्या है? इसकी क्रियाविधि समझाइये ।

Q.5 Explain the structure of chromium carbonyl.
क्रोमियम कार्बोनिल की संरचना समझाइये ।

Q.6 Write a note on toxicity of Arsenic.

आर्सेनिक विषाक्तता पर टिप्पणी लिखिए ।

Q.7 Define organic oxidation.
जैविक ऑक्सीकरण का वर्णन कीजिए ।

Section-'C'/खण्ड स

Long answer type question/दीर्घ उत्तरीय प्रश्न **2 X 14 = 28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 What do you understand with magnetic behaviour. Write in detail various types of magnetic behaviour.
चुम्बकीय व्यवहार से आप क्या समझते हैं? विभिन्न प्रकार के चुम्बकीय व्यवहार के बारे में विस्तार पूर्वक लिखिए।

Q.9 Write the classification of organo metallic compounds.
कार्ब धात्विक यौगिकों का वर्गीकरण कीजिये ।

Q.10 What is Zeise's salt? Explain its structure.
जीसे लवण क्या है? इसकी संरचना को समझाइये।

Q.11 Describe the biological contribution of sodium and potassium.
सोडियम तथा पौटेशियम के जैविकीय योगदान का वर्णन कीजिए ।

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P.

Model Question Paper

B.Sc. -III Year
Subject-Chemistry (Minor/Elective)
Pharmaceutical and Medicinal Chemistry

Maximum Marks: -70 Minimum Marks: -25
Time allowed: 3 Hours

All Questions are compulsory
सभी प्रश्न अनिवार्य है।

Section-'A'/ खण्ड अ

Objective type questions/ वस्तुनिष्ठ प्रश्न **3×2=6**

Q.1 Choose the correct options:- सही विकल्प चुनिए ।

I . First edition of Indian Pharmacopeia was published in which year?
भारतीय भेषज संहिता का प्रथम संस्करण किस वर्ष में प्रकाशित हुआ था ?
(a) 1955 (b) 1948 (c) 1978 (d) 1965

II. Which of the following is not a classification of medicinal.
निम्नलिखित में से कौन औषधियों का वर्गीकरण नहीं है
(a) Depending on size आकार के आधार पर
(b) Based on chemical structure रासायनिक संरचना के
(c) Depending on the action of the Drug दवा की क्रिया के आधार पर
(d) Based on target लक्ष्य के आधार पर

III. Antibioties are used to treat infections.
एंटीबायोटिक का उपयोग संक्रमण के इलाज के लिए किया जाता है।
(a) Virus विषाणु
(b) Bactria बैक्टिरिया
(c) All Microorganisms सभी सूक्ष्मजीव
(d) None of these इनमे से कोई नही

Section-'B' / खण्ड 'ब
Short answer type question / लघु उत्तरीय प्रश्न

Attempt any four questions / किन्ही चार प्रश्नों को हल कीजिए 4x9=36

Q.2 Write introduction to the pharmacy.
फार्मेसी का परिचय लिखे।

Q.3 What are the responsibilities of IPQA professionals?
फार्माकोग्नोसी पर संक्षिप्त टिप्पणी लिखिए।

Q.4 Explain SAR.
SAR को समझाइये ।

Q.5 Explain ß-lactum antibiotics.
ß-लैक्टम एन्टीबायोटिक को समझाइये।

Q.6 Write marine and mineral sources of drugs.
औषधि के समुद्री एवं खनिज स्त्रोत लिखे ।

Q.7 Define Antibacterial.
जीवाणुरोधी को परिभाषित करे।

Section-'C'/ खण्ड स

Long answer type question / दीर्घ उत्तरीय प्रश्न **2 X 14 = 28**

Attempt any two questions / किन्ही दो प्रश्नों को हल कीजिए

Q. 8 Write classification and sources of Drugs.
औषधि का वर्गीकरण एवं स्त्रोत लिखिए।

Q.9 Define relationstip between free - Wilson anlaysis and Hansch anlaysis.
मुक्त विल्सन विशलेषण और हँस विशलेषण के बीच संबंध को परिभाषित करे।

Q.10 Write in detail about the Important forces involved in drug-receptor complex.
औषधि–ग्राही संकुल में सम्मिलित प्रमुख बलों के बारे में विस्तार पूर्वक लिखिए।

Q.11 Define Antimalarial? Write a note on malaria SAR & ibuprofen.
मलेरिया रोधी को परिभाषित करें एवं मलेरिया एसएआर और इबुप्रोफेन को समझाइये ।

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Sadhu Vaswani (Autonomous) College
Bairagarh, Bhopal-462030, M.P.

Model Question Papers

M.Sc. Chemistry

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – I
Inorganic Chemistry - I

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain the Bent Rule.

OR

Explain the structure of NH_3 on the basis of VSEPR.

Q.2 Explain the stability of complex ion.

OR

Write a short note on the stability of Chelate Complexes.

Q.3 Explain Hydrolysis reactions.

OR

Write a short note on acid hydrolysis.

Q.4 Write a short note on the limitations of CFT.

OR

Write a short note on the factors effecting CFSE.

Q.5. Explain the classification of Hard and Soft acids and bases.

OR

Write a short note on the factors affecting hardness of an acid.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – I
Inorganic Chemistry - I

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Explain VSEPR Theory with suitable example.

OR

Write a detailed note on energetic of hybridization.

Q.7 What is Chelate effect, how it is associated with the stability of complex. Explain with suitable example.

OR

How the size of metal ion and charge present on it is associated with the stability of the complex.

Q.8 Write detailed note on inert and labile complex with example.

OR

Explain the mechanism of one electron transfer reaction.

Q.9 Write a detailed note on MOT for complexes.

OR

How the weaknesses of CFT is improved in MOT explain with example.

Q.10 Write an essay on the applications of HSAB concept.

OR

What are the factors which effects on the hardness of an acid, explain.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – II
Organic Chemistry - I

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain Huckel's rule.
or
Discuss in brief inclusion compounds.

Q.2 What are elements of symmetry? Explain in brief.
or
Write a note on Chirality.

Q.3 How does conformation effect reactivity. Write in brief.
or
Explain Taft equation.

Q.4 Explain various types of reaction with example.
or
Write Hammond's Postulate

Q.5. Explain 'SET' mechanism.
or
Write a brief note on regio selectivity.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Write explanatory notes on (any two) -

(a) Resonance
(b) Anti & homoaromaticity
(c) Crown ether complexes

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – II
Organic Chemistry - I

Q.7 Describe in detail various methods of resolution.

or

Discuss optical activity of 'biphenyls'.

Q.8 What is conformational analysis? Give its importance in organic chemistry. How it been applied in the case of cyclo alkanes?

or

(a) What is Hammett equation?
(b) What do you know about linear free energy relationship?

Q.9 Describe methods of determining mechanism (any two)

or

(i) Explain the thermodynamic and kinetic requirements of a reaction.
(ii) Differentiate between transition states and intermediates.

Q.10 Give an account of classical and non-classical carbocations.

or

(i) How has NMR spectroscopy been used for detecting carbocations?
(ii) Write a note on phase transfer catalysis

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – III
Physical Chemistry - I

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Write a note on activated complex theory?

OR

Explain primary and secondary salt effect.

Q.2 What is Gibb's adsorption isotherm equation. Explain it ?

OR

Explain critical micellor concentration.

Q.3 Write the type of polymer with example?

OR

Define & Explain number mass average molecular and mass of macro molecules

.Q.4 Discuss the thermodynamic criteria for non equilibrium states.

OR

What are phenomenological equations? Explain.

Q.5. Derive Debye-Huckel-Onsager equation.

OR

Write a note on overpotential.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester I Chemistry
Paper – III
Physical Chemistry - I

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Write notes on any two of the following:

(a) Hydrogen Bromine photochemical reaction.

(b) Arrhenius equation.

(c) Kinetics of enzyme reactions.

(d) Collision theory of reaction rates,

Q.7 Derive BET equation?

OR

What do you mean by CMC? Give factors affecting CMC. Explain thermodynamics of CMC.

Q.8 Explain the kinetics of polymerisation?

OR

Describe viscometry and light scattering methods for molecular mass determination of polymers.

Q.9 Write notes on of the following (any two):-

(a) Electrokinetic phenomena.

(b) Diffusion.

(c) Onsager's reciprocity relation.

Q.10 Explain any two of the following :-

(a) Charge transfer reactions and tunnelling

(b) Semiconductor interface theory of double layer

(c) Half wave potential

(d) Polarography principle

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem I Chemistry
Paper – IV
Group Theory and Spectroscopy

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain the symmetry elements.

OR

Define the matrix representation of rotation and reflection operations.

Q.2 Describe the applications of microwave spectroscopy.

OR

Give qualitative description of Non-rigid rotator.

Q.3 Write a short note on vibrations of polyatomic molecules.

OR

Explain the force constant.

Q.4 Explain briefly classical theory of Raman effect.

OR

Write a note on Coherent anti-Stokes Raman Spectroscopy(CARS).

Q.5 What is ESCA?

OR

Explain Franck-Condon Principles.

Section-B

Long answer type question **5x11 = 55**

Q.6 Write notes on the following.

(a) Symmetry operation.

(b) The great Orthogonality theorem

OR

Discuss Schonfilies notation.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem I Chemistry
Paper – IV
Group Theory and Spectroscopy

Q.7 What is Stark effect in rotational & Spectra?

OR

Discuss the electron spin interaction in microwave spectroscopy?

Q.8 Derive an expression for simple harmonic oscillator.?

OR

Write notes on the following-
(a) PQR Branches
(b) Overtones

Q.9 Define Resonance Raman Spectroscopy and Discuss the applications of Raman Spectra.

OR

Explain the Pure Rotational Raman Spectra in Raman Spectroscopy.

Q.10 Write notes on the following:

(a) Emission Spectra

(b) Koopman's Theorem

OR

Write notes on the following-

(a) Charge Transfer Complex

(b) Electronic Spectroscopy.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem I Chemistry
Paper – V(b)
Biology for Chemists

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Differentiate between prokaryotic and eukaryotic cells.
or
Differentiate between plant cell and animal cell.

Q.2 Define polysaccharides. Explain the structure of cellulose.
or
Write a note on N-Acetylmuramic acid.

Q.3 Define biological membrane. Explain fluid mosaic model of membrane structure.
or
Explain in brief the role of liproproteins in atherosclerosis.

Q.4 What is Tryptophan Releasing Hormone (TRH)? Write short note on chemistry of TRH.
or
Describe biosynthesis of Amino acids.

Q.5 Write a note on genetic code.
or
Explain the double helical structure of DNA.

Section-C

Long answer type question **5x11 = 55**

Q.6 Describe the origin of life. Also write unique properties of carbon chemical evolution.
or
Explain structure and functions of biomacromolecules

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem I Chemistry
Paper – V(b)
Biology for Chemists

Q.7 Explain in brief, glycosides and glycolipids.
or
Explain structural and biological function of muco- polysaccharides.

Q.8 Define fatty acids. Explain lipid metabolism of fatty acids.
or
Explain liposomes and their possible biological functions.

Q.9 Discuss in detail sequencing of amino acid.
or
What are proteins? Describe Secondary structure of protein.

Q.10 What are Nucleic acids? Explain purine and pyrimidine bases of Nucleic acids.
or
Describe chemical and enzymatic hydrolysis of Nucleic acids.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – I
Inorganic Chemistry - II

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Discuss the selection rules for d-d transition.
OR
Write a short note on charge transfer spectra.

Q.2 Discuss High-Spin and low spin crossover.
OR
Explain quenching of orbital contribution in brief?

Q.3 Write a short note on tertiary phosphate as ligand.
OR
Explain metal- nitrosyls with suitable examples.

Q.4 Explain structure of closo and Nido boranes.
OR
Explain metallo-carboranes with example.

Q.5. Discuss Faraday and Kerr effects?
OR
Explain Cotton effect in brief.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Explain selection rules for electronic transition.

OR

Explain Orgel energy level diagram for d^3, d' and d' states what are the limitations of Orgel- energy level diagrams. d^1?

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – I
Inorganic Chemistry - II

Q.7 Discuss anomalous magnetic moment in detail.

OR

Explain magnetic exchange coupling and spin cross-over?

Q.8 Describe dioxygen and dinitrogen complexes with examples.

OR

Describe metal carbonyl structure and bonding.

Q.9 Draw and explain the structure of B_3H_{11} and $B_{10}H_4$.

OR

What are High Nuclearity carbonyl clusters?

Q.10 Describe ORD and CD Explain its application in determination of absolute Configuration of complexes.

OR

Explain how cotton effect can decide conformational changes in molecules. Explain linearly and circularly polarised lights.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – II
Organic Chemistry – II

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 What is ipso effect?
or
Give one example of SN_1 mechanism.

Q.2 Why are free radicals very reactive?
or
Describe effect of solvents on reactivity in brief.

Q.3 Give a brief description of regioselectivity.
or
Give an example of hydrogenation. taking place in open chain compounds.

Q.4 In several situations the E_2 elimination gives a complex mixture of region and stereoisomers of alkenes-explain with a suitable example.
or
Write a brief note on hydrolysis of esters.

Q.5. Explain classification of pericyclic reactions.
or
What is FMO approach

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Write in detail about your acquaintance with aromatic electrophilic substitution.
or

Write explanatory notes on (any two) -

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – II
Organic Chemistry – II

(a) Arenium iron mechanism

(b) Gatterman Koch reaction

(c) Smiles rearrangements

Q.7 Describe different types of free radical reactions, in brief.
or
Explain auto oxidation with mechanism.

Q.8 Give an explanatory description of additions involving free radicals.
or
Write a note on hydroboration.

Q.9 Explain mechanism of Aldol Claisen condensation.
or

Write a descriptive note on E2 reactions.

Q.10 What do you know about conrotatory & disrotatory motions.
or
Discuss in detail antarafacial and suprafacial additions.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – III
Physical Chemistry – II

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Write notes on Eigen values and Eigen function.

OR

Define operator. Describe different types of operators used for angular momentum.

Q.2 Apply Schrödinger wave equation to hydrogen atom.

OR

Explain Huckel theory of conjugated system.

Q.3 Give the postulates of ensemble averaging.

OR

Describe the Thermodynamic derivation of phase rule.

.Q.4 Explain molecular orbital theory for butadiene and cyclobutadiene

OR

Explain the statistical concept of Thermodynamic probability.

Q.5. Define Fugacity. Describe one method of its determination.

OR

Write a note on Pauli exclusion principle.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Define Partition function. Describe Rotational and Translational partition function.

OR

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester II Chemistry
Paper – III
Physical Chemistry – II

Write notes on:-

(i) Equipartion of Energy

(ii) Application of Portion function to evaluate work function

Q.7 What is partial molar properties? Give its methods of determination.

OR

Define activity and activity co-efficient of a solution. Describe the vapour pressure method of determining activity coefficient.

Q.8 Describe the Perturbation method for approximate solution for poly electron system.

OR

Write a short note on:-

(i) Fermi-Dirac statistics

(ii) Bose-Einstein statistics

Q.9 Discuss the application of variation method for the calculation of energy of hydrogen atom.

OR

Derive Schrodinger wave equation with respect to time.

Q.10 Explain Debye-Huckel theory for electrolytic solutions.

OR

Explain any two of the following

(i) Application of phase rule to three component system.

(ii) Canonical and micro canonical ensembles.

(iii) Harmonic oscillator and rigid rotator.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem II Chemistry
Paper – IV
Spectroscopy II and Diffraction Methods

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain shielding and deshielding effects in NMR Spectroscopy with suitable examples.

Or

Describe instrumentation in NMR spectroscopy.

Q.2 Describe the principle of nuclear quadrupole resonance (NQR) spectroscopy.

Or

What are quadrupole nuclei? Give examples.

Q.3 What is zero field slitting in Electron Spin Resonance (ESR) spectroscopy?

Or

Describe the basic principle of ESR spectroscopy.

Q.4 What are Miller indices? Explain in brief.

Or

Describe the Bragg's condition for X-ray diffraction.

Q.5 Explain the technique of electron diffraction

Or

Describe the Wierl equation.

Section-B

Long answer type question **5x11 = 55**

Q.6 Explain chemical shift. How is it helpful in the elucidation of the structure of organic compounds?

Or

Explain spin-spin interactions in NMR spectroscopy giving suitable examples.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Sem II Chemistry
Paper – IV
Spectroscopy II and Diffraction Methods

Q.7 Explain the splitting in NQR spectroscopy with suitable examples.

Or

Discuss the applications of NQR spectroscopy.

Q.8 Explain hyperfine splitting in ESR spectroscopy.

Or

Describe the measurement technique and applications of ESR spectroscopy.

Q.9 Describe the procedure for X-ray structural analysis.

Or

Explain Debye Scherrer method of X-ray structural analysis of crystals.

Q.10 What is low energy electron diffraction (LEED).How it is used to determination the structure of surfaces.

Or

How will you elucidate the structure of magnetically ordered unit cells by neutron diffraction.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – I (Compulsory Paper)
Application of Spectroscopy-I

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 What is electronic spectrum of complex ions?
OR
What is electronic shielding?

Q.2 Give the theoretical principles of normal modes in ABC molecule.
OR
Explain vibrational modes in a molecular complex ligands nitrosyl.

Q.3 Write short notes on the following (any one)
(a) chemical shift.
(b) Spin-Spin interaction.

Q.4 Explain mechanism of measurement of chemical shift value.
OR
Explain effect of deuteration of NMR.

Q.5. What do you mean by inequivalent MB atoms.
OR
Write detection of oxidation state.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Describe the electronic spectral studies of Cobalt-(II) and Nickel (II).

OR

Discuss the electronic spectral studies for d^1d system in octahedral and tetrahedral complexes.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – I (Compulsory Paper)
Application of Spectroscopy-I

Q.7 Write a detailed note on Raman Spectroscopy and its applications.

OR

Write a detailed note on Raman Spectroscopy and its applications.

Q.8 Discuss the applications of NMR spectroscopy in details.

OR

What physical changes would you expect in the shape of the NMR. Signal if the deuterium lock is not applied during data acquisition?

Q.9 Write detailed notes on any two of the following:

(a) Chemical Exchange

(b) Hindered Rotation

(c) Nuclear Overhauser Effect (NOE)

Q.10 Explain in detail principle and instrumentation of Mossbauer spectroscopy.

OR

Discuss applications of Mossbauer Technique to study of bonding and structure of Fe^{+2} and Fe^{+3} compounds and detection of oxidation state and in equivalent MB atoms.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – II (Compulsory Paper)
Photochemistry

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Discuss the transfer of Excitation energy.
Or
What is Einstein law of equivalence.

Q.2 Discuss the effect of light on the rate of photochemical reactions.
Or
Write a note on various types of photochemical reactions.

Q.3 Describe geometrical Isomerization of Ethylene.
Or
Explain cis trans isomerisation in Benzophenone.

Q.4 Differentiate between Norrish type I and II reaction.
Or
Explain intermolecular reaction of carbonyl compounds, formation of oxetane.

Q.5 Describe photochemical formation of smog.
Or
Explain the photochemical mechanism of vision.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 What is meant by Actinometry? Write the application of Actinometers for me assuring the intensity of light.
Or
Explain Quantum yield? What information does it provide regarding reaction mechanism and kinetics of reaction.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – II (Compulsory Paper)
Photochemistry

Q.7 Define photodissociation and gas phase photolysis.

Or

How the rate constant of photo chemical reaction is determined.

Q.8 Explain rearrangement of 1, 4 and 1, 5 dienes in detail.

Or

Explain various types of photochemical Aromatic substitution and addition reaction.

Q.9 Explain the mechanism of Inter molecular cyclo-additions of carbonyl compounds.

Or

Discuss the photochemistry of cyclohexadienones.

Q.10 Give the mechanisms of photo fries rearrangement in detail.

Or

Explain Barton reaction in detail.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – III (Compulsory Paper)
Environmental Chemistry

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain Biogeochemical cycle of Nitrogen.

OR

Describe the major natural sources of NO, (nitrogen oxides) pollution. Explain the harmful effects of Nitrogen oxides (NO) on plants and materials.

Q.2 Explain greenhouse effect in short.

OR

What is acid-rain? Explain the mechanism for the formation of acid-rain.

Q.3 Write in brief on petrification.

OR

Write a short note on sewage treatment.

Q.4 What do you understand by Bioaccumulation?

OR

Write a short note on Poly nuclear Aromatic Hydrocarbons as pollutants.

Q.5. Write brief note on Bioremediation or phytoremediation.

OR

Write note (short note) on London smog.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Explain the photochemical smog and its formation mechanism. How it adversely affect the human health?

OR

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – III (Compulsory Paper)
Environmental Chemistry

What is temperature inversion? Explain the causes and effects of inversion.

Q.7 How does air get polluted by oxides of carbon and sulphur? Discuss different ways for their control?

OR

Discuss the various mechanism involved in the formation and depletion of ozone in the atmosphere. What are the consequences of depletion of ozone in Stratosphere? What steps are needed to protect the stratospheric ozone layer?

Q.8 Describe procedures of determination of DO and BOD?

OR

Write a detail note on "chemical pollutions of water" and describe the method for the determination of Chemical Oxygen demand (COD).

Q.9 What is chemical speciation of metals? Explain their biochemical and damaging effect.

OR

Write in detail about classification uses and damaging effects of Organochlorine pesticides.

Q.10 What is soil profile? What are micro and macro nutrients in soil and how soil pollution take place by fertilizers?

OR

Write short notes on any two of the following:

a) Agro-chemicals.

b) The Seveso disaster

c) Three mile island disaster.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – IV (Optional Paper -1)
Polymers

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 What do you understand by repeat unit explain with examples.

OR

What is the degree of polymerization? What is its significance and how is it measured?

Q.2 Explain polydisperistiy with suitable diagrams.

OR

If two polymer samples of molecular weight 10.000 and 100,000 are mixed together in equal parts by weight, determine the number average molecular weight.

Q.3 What is glass transition temperature? How is it measured?

OR

What speical care is to be observed for chemical analysis of polymers? Explain.

Q.4 What are Carboranes? How the substituted carboranes can be prepared ?

OR

Give an account of classification of inorganic polymers.

Q.5. What are Carboranes? How the substituted carboranes can be prepared ?

OR

Give an account of classification of inorganic polymers.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Describe the classification of polymers.

OR

Discuss the mechanism of free radical polymerization.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – IV (Optional Paper -1)
Polymers

Q.7 Discuss anomalous magnetic moment in detail.

OR

Explain magnetic exchange coupling and spin cross-over?

Q.8 Describe the Osmometry method for determination of molecular weight of a polymer.

OR

Discuss the practical significance of molecular weight of polymers and how is it represented?

Q.9 What are silicones? How are they classified? Describe their preparation, properties and uses.

OR

Describe the classification of inorganic polymers with special characteristic and example of each class.

Q.10 What are coordination polymers? Discuss their classification and modes of preparation.

OR

Discuss the structure, significant properties and important applications of metal chelate polymers.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – V (Optional Paper -2)
Industrial Chemistry-Heavy Chemicals & Petroleum

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain reverse osmosis process for water purification with necessary diagram.
Or
How pollution of water is caused by fertilizers.?

Q.2 Write industrial uses of nitrogen.
Or
Describe one method for production of acetylene.

Q.3 How carbonization of coal is done?
Or
Discuss composition of coal.

Q.4 Write a short note on reforming.
Or
What is knocking? How anti-knocking characteristics of a fuel can be improved?

Q.5 What are edible oils?
Or
How will you distinguish between oils and fats?

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Describe different methods of water purification in detail.
Or
What is water pollution? How it is caused? Discuss different types of water pollutants.

Q.7 Explain in detail the production and uses of hydrogen.
Or
Describe the manufacture of sulphuric acid in detail.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester III Chemistry
Paper – V (Optional Paper -2)
Industrial Chemistry-Heavy Chemicals & Petroleum

Q.8 Describe the manufacture and uses of producer gas and water gas.

Or

Discuss the importance of coal-tar based chemicals.

Q.9 Write short notes on the following:
i) Synthetic petrol
ii) Petrochemicals

Or

Discuss origin and composition of petroleum.

Q.10 What do you understand by hydrogenation of oils? How it is carried out?

Or

Discuss in detail manufacturing of Vanaspati and margarine.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – I (Compulsory Paper)
Application of Spectroscopy-II

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Explain Beer lambert law.
Or
Explain the effect of solvent on electronic transitions.

Q.2 What are overtone and combination bands?
Or
Explain Fermi Resonance IR spectroscopy.

Q.3 Discuss the factors affecting nuclear relaxation.
Or
Explain NMR phenomenon in ^{195}Pt metal nuclide.

Q.4 Explain general principle of Carbon-13 NMR Spectroscopy.
Or
Discuss coupling constants in Carbon-13 NMR Spectroscopy.

Q.5 Explain Mc Lafferty rearrangement in Mass Spectrometry.
Or
Give introduction and principle of Mass Spectrometry.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Explain the various electronic transitions.
Or
Explain Fieser Woodward rule for carbonyl compounds.

Q.7 Explain the effect of hydrogen bonding and solvent effect on vibrational frequencies.
Or
Explain the vibrational frequencies of carbonyl compounds giving any three examples.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – I (Compulsory Paper)
Application of Spectroscopy-II

Q.8 Explain the contact and Pseudo contact shifts in NMR spectroscopy.

Or

Describe the applications of NMR spectroscopy in biochemical systems.

Q.9 Explain chemical shift in Carbon-13 NMR Spectroscopy giving examples.

Or

What is two-dimensional NMR spectroscopy? Discuss any two techniques.

Q.10 Describe methods of ion production in Mass Spectrometry.

Or

Discuss the factors affecting fragmentation in Mass Spectrometry.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – II (Compulsory Paper)
Solid State Chemistry

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Discuss Lyotropic and Thermotropic liquid crystals.
OR
Write a note on Liquid Crystal Display.

Q.2 Write a brief note on Band theory.
OR
Write a note on p-n junction.

Q.3 What are superconductors?
OR
Differentiate between extrinsic and intrinsic semiconductors.

Q.4 What is nucleation? Explain its types.
OR
Explain process of zone-refining for metal purification.

Q.5. Derive an expression for number of Frenkel defects in a crystal.
OR
What are F-centers? Write in brief.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 What are the characteristics of solid-state reaction? Explain Wagner's theory.
OR
What is sintering? Explain mass transport through diffusion.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – II (Compulsory Paper)
Solid State Chemistry

Q.7 What do you understand by diffusion in solids? Explain Fick's Law of diffusion.

OR

What are line and plane defects? Explain with examples.

Q.8 Discuss conductive polymers giving suitable examples.

OR

Write a detailed note on organic superconductors.

Q.9 What do you understand by super exchange interaction? Explain giving example.

OR

How can materials be classified into conductors, semiconductors and insulators? Explain the basis on which this classification is made.

Q.10 Enumerate different types of liquid crystals. Explain with diagram their structure and properties.

OR

Describe how liquid crystals are being used in medical, electronic and other fields.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – III (Compulsory Paper)
Biochemistry

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Discuss the role of photosystem I and Photosystem II in cliavage of water.
OR
Write the significance of trace elements in biological processes?

Q.2 Write short note on nitrogenase?
OR
Explain with example iron-Sulphur proteins in brief?

Q.3 Write short notes on
(a) Mechanism for chemotrypsin
(b) enzyme catalysed carbonylation and decarboxylation
OR
Write a note on Michael's Menten and Lineweaver Burk plots?

Q.4 Write a note on immobilization of enzymes?
OR
Discuss in brief Cyclodextrins.

Q.5. Write the functions of proteins?
OR
Write a note on ATP.

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Discuss the mechanism of Na^+/K^+ Pump?
OR
Explain structure and function of haemoglobin in detail?

Q.7 Write a detailed note on Cytochromes.
OR

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Model Question Paper

M.Sc. Semester IV Chemistry
Paper – III (Compulsory Paper)
Biochemistry

Describe metal carbonyl structure and bonding.

Q.8 What are enzymes? Explain Fischer's lock and key model for enzyme mechanism?

OR

Explain isomerisation reactions catalysed by enzymes with examples?

Q.9 Write in detail various applications of enzymes.

OR

What are coenzymes? Write structure and biological function of coenzyme A.

Q.10 Explain the structure and functions of DNA.

OR

Describe various forces involved in biopolymer interactions.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – IV (Optional Paper -1)
Analytical Chemistry

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 Write a short note on techniques of weighing.
OR
Write a short note on sample preparation and decompositions.

Q.2 Give the method of Analysis of any one
(a) Moisture in vegetable oils
(b) Total ash of spices.

Q.3. Write a brief note on biological oxygen demand or chemical oxygen demand.

Q.4. Write short note on any one
(a) analysis of Total nitrogen in Soils.
(b) heating values and grading of coal.

Q.5. Write a note on collection and preservation of Blood samples.
OR
Write in brief classification of drugs

Section -B

Long Answer Type Questions **5x11=55**

Q.6. Write an essay on safety measures in Analytical Laboratory.
OR
Describe the following.
(a) Mean and median
(b) Standard deviation and relative standard deviation

Q.7 Write detailed note on any one
(a) Analysis of crude fibres
(b) Chlorinated pesticides analysis in food products.

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IV Chemistry
Paper – IV (Optional Paper -1)
Analytical Chemistry

Q.8 Write a detailed note on Heavy metal pollution and its impacts on public Health.

OR

Discuss various water pollutants and their effects.

Q.9 Describe the analysis of silica and lime present in soil.

Or

Describe the following.

(a) Aniline Point
(b) Knocking
(c) Reforming

10. Write in detail on any one of the following

(a) Analysis of Blood Glucose.
(b) Analysis of Trace elements in the body.

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Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IVChemistry
Paper – V (Optional Paper -2)
Industrial Chemistry- Pesticides &Glass industries

Duration: 3 Hours
Maximum Marks : 85 Minimum Marks : 31

Note: Attempt all questions.

Section -A

Short Answer Type Questions **5x6=30**

Q.1 What are synthetic detergents?
Or
Write a short note on Soaps.

Q.2 Explain Nitrogen Fixation
Or
What is Glass? Describe the types and composition of the glass.

Q.3 What is Cement? Describe various types of the Cement.
Or
What do you understand with Ceramics? What is the role of clays and feldspar in ceramics?

Q.4 Explain the important categories of insecticides.
Or
Write a note on herbicides.

Q.5 Describe the Chemistry of Tabun and write the Chemical formula of the Tabun.
Or

Write notes on the following:
(i) Common pesticides
(ii) Baygon

Section -B

Long Answer Type Questions **5x11=55**

Q.6 Describe in detail alkyl aryl sulfonates.
Or
Write notes on the following:
(i) Ethanolamines
(ii) Nonionic detergents

Sadhu Vaswani (Autonomous) College, Bairagarh, Bhopal-462030, M.P
Model Question Paper

M.Sc. Semester IVChemistry
Paper – V (Optional Paper -2)
Industrial Chemistry- Pesticides &Glass industries

7. Write a note on Lead Glass and Neutron Absorbing class.
   Or
   What are various types of cement and their manufacturing process ?

8. What is Ferrous Industry? Describe the manufacturing process of steel with example.
   Or
   Describe the types and their manufacturing process of cement.

9. Write notes on the following (with examples):
   (i) Insecticides
   (ii) Rodenticies

10. Discuss the Chemistry of sarin in detail.
    Or
    Write a detailed note on DDYP Paraquat.

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