



शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर

धरमपुरा-2, जगदलपुर, जिला-बस्तर, छत्तीसगढ़, भारत पिनकोड 494001

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क्रमांक/886/ / अका./पी-एच.डी./2023

जगदलपुर, दिनांक 13/10/2023

// अधिसूचना //

13 OCT 2023

निम्नलिखित तालिका के कॉलम-2 में उल्लेखित विषयों के अध्ययन मंडल द्वारा अनुशंसित एवं विद्यापरिषद की स्थायी समिति की बैठक दिनांक 20.09.2023 एवं कार्यपरिषद की 48वीं बैठक दिनांक 20.09.2023 के कार्यवृत्त अनुसार प्राप्त अनुमोदन के आधार पर शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर की पी-एच.डी. प्रवेश परीक्षा, 2023 हेतु संबंधित विषयों का सिलेबस लागू किया जाता है:-

क्रमांक	विषय	प्रश्न पत्र-1 कुल 50 बहुविकल्पीय प्रश्न, प्रति प्रश्न - 1 अंक, कुल - 50 अंक	प्रश्न पत्र-2 कुल 50 बहुविकल्पीय प्रश्न, प्रति प्रश्न - 1 अंक, कुल - 50 अंक
1	वानिकी एवं वन्यजीव	शोध प्रविधि	वानिकी एवं वन्यजीव
2	मानव विज्ञान एवं जनजातीय अध्ययन	शोध प्रविधि	मानव विज्ञान एवं जनजातीय अध्ययन
3	हिन्दी	शोध प्रविधि	हिन्दी
4	राजनीति विज्ञान	शोध प्रविधि	राजनीति विज्ञान
5	इतिहास	शोध प्रविधि	इतिहास
6	समाजशास्त्र	शोध प्रविधि	समाजशास्त्र
7	अंग्रेजी	शोध प्रविधि	अंग्रेजी
8	अर्थशास्त्र	शोध प्रविधि	अर्थशास्त्र
9	रसायनशास्त्र	शोध प्रविधि	रसायनशास्त्र
10	वाणिज्य	शोध प्रविधि	वाणिज्य

पी-एच.डी. प्रवेश परीक्षा, 2023 हेतु विश्वविद्यालय द्वारा जारी सूचना क्रमांक 510/108/पी-एच.डी.प्रकोष्ठ/पी.ई.टी./2023 दिनांक 14-08-2023 के अनुसार परीक्षा संपन्न होगी। जिन विषयों में पी-एच.डी. प्रवेश परीक्षा आयोजित की जायेगी, उनमें प्रश्न पत्र - 1 शोध प्रविधि एक समान रहेगा।

कुलसचिव

शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर,
जगदलपुर (छ.ग.)

जगदलपुर, दिनांक 13/10/2023

पृ. क्रमांक/887/ / अका./पी-एच.डी./2023
प्रतिलिपि:-

- माननीय कुलपति महोदय, शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर
- समस्त विभाग प्रमुख/विभागाध्यक्ष, शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर
- प्राचार्य, समस्त संबद्ध महाविद्यालय, शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर
- कुलानुशासक/अधिष्ठाता छात्र कल्याण, शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर
- वेबसाईट प्रभारी, शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर, जगदलपुर
- को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।
- संबंधित नस्ती।

13 OCT 2023

सहायक कुलसचिव (अकादमिक)

शहीद महेन्द्र कर्मा विश्वविद्यालय, बस्तर,

जगदलपुर (छ.ग.)

SAHEED MAHENDRA KARMA VISHWAVIDYALAYA
BASTAR, JAGDALPUR (C.G.)

SYLLABUS FOR Ph.D. ENTRANCE EXAM 2023-24
PAPER-I
(RESEARCH METHODOLOGY)

- 1. Basic concept of research problem**
 - Rationale of research
 - Identification of research problem
 - Research objective
 - Types of research- fundamental/ applied/ action/ quantitative/ qualitative

- 2. Review of literatures**
 - Primary source
 - Secondary source
 - Searching e-resources, using research engines
 - Searching data base
 - Writing literature review

- 3. Methods of research**
 - Concept and formulation of hypothesis
 - Survey method
 - Experimental method (variable, designs)
 - Historical methods
 - Content analysis

- 4. Sampling of data**
 - Concept of sampling
 - Probability sampling techniques
 - Non Probability sampling techniques
 - Sampling error

- 5. Collection of data**
 - Primary data generation
 - Secondary data collection
 - Methods of data generation/ collection- by experiments, questionnaire, interview Schedule, focus groups etc.

6. Analysis of data

- Statistical analysis techniques
- Qualitative analysis techniques
- Application of computer in research data analysis

7. Reports preparation

- Structure and component of research report
- Organization of data
- Indexing of journal and research output
- Citation, references, bibliography
- Copyright, plagiarism, originality of research work

8. Research ethics

- Ethics in research
- National and International regulations/ laws/ ethics related to research on Human, Animals and Environments

Each question in both papers carries 1 mark and will have a total of 50 marks for each paper. The duration for solving each paper is 1 hour. Students must appear for both Paper-I and Paper-II as specified for the entrance. After completion and submission of Paper-I, the question paper Paper-II will be provided to the students. It is mandatory for the Student to appear in both Paper-I and Paper-II as specified for the entrance.

Scheme:

Paper-I Research Methodology

Number of questions – 50 MCQs covering whole syllabus

Maximum Marks – 50

Duration – 1 hr

Paper-II

Number of questions – 50 MCQs covering whole syllabus

Maximum Marks – 50

Duration – 1 hr

SYLLABUS FOR Ph.D. ENTRANCE EXAM
PAPER – II
(CHEMICAL SCIENCE)

Inorganic Chemistry

1. Chemical periodicity
2. Structure and bonding in homo- and heteronuclear molecules, including shapes of molecules (VSEPR Theory).
3. Concepts of acids and bases, Hard-Soft acid base concept, Non-aqueous solvents.
4. Main group elements and their compounds: Allotropy, synthesis, structure and bonding, industrial importance of the compounds.
5. Transition elements and coordination compounds: structure, bonding theories, spectral and magnetic properties, reaction mechanisms.
6. Inner transition elements: spectral and magnetic properties, redox chemistry, analytical applications.
7. Organometallic compounds: synthesis, bonding and structure, and reactivity. Organometallics in homogeneous catalysis.
8. Cages and metal clusters.
9. Analytical chemistry- separation, spectroscopic, electro- and thermoanalytical methods.
10. Bioinorganic chemistry: photosystems, porphyrins, metalloenzymes, oxygen transport, electron- transfer reactions; nitrogen fixation, metal complexes in medicine.
11. Characterisation of inorganic compounds by IR, Raman, NMR, EPR, Mössbauer, UV-vis, NQR, MS, electron spectroscopy and microscopic techniques.
12. Nuclear chemistry: nuclear reactions, fission and fusion, radio-analytical techniques and activation analysis.

Physical Chemistry:

1. Basic principles of quantum mechanics: Postulates; operator algebra; exactly- solvable systems: particle-in-a-box, harmonic oscillator and the hydrogen atom, including shapes of atomic orbitals; orbital and spin angular momenta; tunneling.
2. Approximate methods of quantum mechanics: Variational principle; perturbation theory up to second order in energy; applications.
3. Atomic structure and spectroscopy; term symbols; many-electron systems and antisymmetry principle.
4. Chemical bonding in diatomics; elementary concepts of MO and VB theories; Huckel theory for conjugated π -electron systems.
5. Chemical applications of group theory; symmetry elements; point groups; character tables; selection rules.
6. Molecular spectroscopy: Rotational and vibrational spectra of diatomic molecules; electronic spectra; IR and Raman activities – selection rules; basic principles of magnetic resonance.
7. Chemical thermodynamics: Laws, state and path functions and their applications; thermodynamic description of various types of processes; Maxwell's relations; spontaneity and equilibria; temperature and pressure dependence of thermodynamic quantities; Le Chatelier principle; elementary description of phase transitions; phase equilibria and phase rule; thermodynamics of ideal and non-ideal gases, and solutions.
8. Statistical thermodynamics: Boltzmann distribution; kinetic theory of gases; partition functions and their relation to thermodynamic quantities – calculations for model systems.

9. Electrochemistry: Nernst equation, redox systems, electrochemical cells; Debye-Huckel theory; electrolytic conductance – Kohlrausch's law and its applications; ionic equilibria; conductometric and potentiometric titrations.
10. Chemical kinetics: Empirical rate laws and temperature dependence; complex reactions; steady state approximation; determination of reaction mechanisms; collision and transition state theories of rate constants; unimolecular reactions; enzyme kinetics; salt effects; homogeneous catalysis; photochemical reactions.
11. Colloids and surfaces: Stability and properties of colloids; isotherms and surface area; heterogeneous catalysis.
12. Solid state: Crystal structures; Bragg's law and applications; band structure of solids.
13. Polymer chemistry: Molar masses; kinetics of polymerization.
14. Data analysis: Mean and standard deviation; absolute and relative errors; linear regression; covariance and correlation coefficient.

Organic Chemistry

1. IUPAC nomenclature of organic molecules including regio- and stereoisomers.
2. Principles of stereochemistry: Configurational and conformational isomerism in acyclic and cyclic compounds; stereogenicity, stereoselectivity, enantioselectivity, diastereoselectivity and asymmetric induction.
3. Aromaticity: Benzenoid and non-benzenoid compounds – generation and reactions.
4. Organic reactive intermediates: Generation, stability and reactivity of carbocations, carbanions, free radicals, carbenes, benzyne and nitrenes.
5. Organic reaction mechanisms involving addition, elimination and substitution reactions with electrophilic, nucleophilic or radical species. Determination of reaction pathways.
6. Common named reactions and rearrangements – applications in organic synthesis.
7. Organic transformations and reagents: Functional group interconversion including oxidations and reductions; common catalysts and reagents (organic, inorganic, organometallic and enzymatic). Chemo, regio and stereoselective transformations.
8. Concepts in organic synthesis: Retrosynthesis, disconnection, synthons, linear and convergent synthesis, umpolung of reactivity and protecting groups.
9. Asymmetric synthesis: Chiral auxiliaries, methods of asymmetric induction – substrate, reagent and catalyst controlled reactions; determination of enantiomeric and diastereomeric excess; enantio-discrimination. Resolution – optical and kinetic.
10. Pericyclic reactions – electrocycloaddition, cycloaddition, sigmatropic rearrangements and other related concerted reactions. Principles and applications of photochemical reactions in organic chemistry.
11. Synthesis and reactivity of common heterocyclic compounds containing one or two heteroatoms (O, N, S).
12. Chemistry of natural products: Carbohydrates, proteins and peptides, fatty acids, nucleic acids, terpenes, steroids and alkaloids. Biogenesis of terpenoids and alkaloids.
13. Structure determination of organic compounds by IR, UV-Vis, ^1H & ^{13}C NMR and Mass spectroscopic techniques.

Interdisciplinary topics

1. Chemistry in nanoscience and technology.
2. Catalysis and green chemistry.
3. Medicinal chemistry.
4. Supramolecular chemistry.
5. Environmental chemistry

Indira