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Regulations Governing Minimum Standards and Procedures for Course work and Ph. D. Registration

Regulations 2009 of UGC Minimum standards and procedures for award of Ph. D. Degree effective from 01.06.2009 need to be incorporated in the Regulations for the award of Ph. D Degree approved by His Excellency on 15.01.2009 and conveyed to the Chief Secretary, Govt. of Jharkhand vide letter No. 342 (अनु0) रा0 स0 dated 17.02.2009 and communicated to Registrars of Universities of Jharkhand by Director (H.E.), Ranchi Vide letter No. 5- वि 1-55/2008 310 dated 20.03.2009.

Section 13 of the said Regulation of the UGC makes the "Course work" mandatory for each Candidate seeking Ph. D. Degree of the University.

Admission

1. A Candidate shall be eligible for admission to "Course work" only when he/she passes the 'Entrance Test' for Ph.D. programme of the university.
2. For admission to Course work classes a Candidate will be required to deposit a sum of Rs. 5000/- (Five thousand only) through Bank challan in A/c of the University.

   Candidates of other universities shall have to deposit a sum of Rs. 5500/- (Five thousand five hundred only) through the same process and they will also have to submit original Migration certificate at the time of admission.

Course work

3. The duration of course work will be of one Semester beginning from July to Dec/January to June.
4. This course work shall be treated as pre Ph. D. preparation.
5. The period of 'Course work' will include admission, attending of classes in the concerned university departments, Examination and publication of result.
6. The Course work will be divided into the following four parts-each having 50 marks and thus the entire course work will be of 200 marks.

Part I : Research Methodologies and Review of published papers.

Part il: Computer Application

Part lil: Subject Content (Core/Elective)

Part IV: Attending class room seminars and Presentation of papers of interest in DRC.

Note: Part I, II & IV will be compulsory for all Candidates enrolled on the course work.

7. Syllabus for Part III will be prepared by HODs of university Depts. with the help of their faculty members as per the enclosed format prepared for Part I & Part II.

Examination

8. A Candidate shall be sent up for the Examination for Pre. Ph.D. (Course work) only when he/she attends 75% of lectures delivered in the concerned university Departments.
9. Examination shall be held in the last month of Semester I,e. June or Dec.
10. Duration of examination shall be of 03 hours and Full marks and pass marks will be 150 and 75 respectively.
11. Fifteen MCQ- each of 02 marks and four short questions each of 05 marks from each part will be asked. The length of a short answer will not exceed 200 words.
12. Questions will be asked only from part I, part II and part III respectively.
13. A Candidate securing 100 marks inclusive of all the four parts will be declared pass in course work.
14. Computation of result will be done by the concerned university Departments and the result of successful candidates will be sent to the C. E. for publication and issuing certificates to them.

Registration

15. After passing the entrance test the candidate shall apply for Ph. D. registration after observing all formalities for the same and University Registration for those who come from other universities (outside S. K. M. University, Dumka). This will be followed by admission to the Ph. D. course work programme.
16. Those who have already been awarded Ph. D. Degree may also join the course-work programme as per the norms mentioned in clause 5.
17. Any addition or omission in the Regulation may be made only after the order of the Vice-Chancellor.

SYLLABUS

Part – I

Research Methodology and Reviewing of Published Paper

Full Marks. 50 Pass Marks: 25

(15 MCQ of 02 marks each and 4 short question of 5 marks each will be asked)

Unit-I :- Beginning of Research survey of Methodology used.

Unit-II :- Identification and formation of research problem (Hypothesis)

Elements in methodology – Research Design.

Unit-III :- A brief ideas about different Research Agencies and their funding process.

Unit-IV :- Writing Research proposal, report and research paper.

Unit-V :- Review of Published papers in Journals in work of interest.

Unit-VI :- Research Ethics: Types of Ethics, Ethical approval for Research, Conflicts of interest.

SYLLABUS

Part – II

Computer Application

Full Marks. 50 Pass Marks: 25

(15 MCQ of 02 marks each and 4 short question of 5 marks each will be asked)

Idea of Computer Basics:

Unit-I : Basic concept

Unit-II : office Application

Unit-III : MS office 2000/XP including MS Word

Unit-IV : MS Excel

Unit-V : MS Power Point and Internet.

Ph.D Course -work Syllabus

Part III-Physics (Core/Elective)

Full Marks: 50 **Pass Marks: 25**

(15 MCQ of 02 marks each and 04 short questions of 05 marks each will be asked)

Answer any one of the following three groups.

Group-A

Condensed Matter Physics

Unit-I: Atomic theory of Solids, Properties of solids, Crystalline and Amorphous Solids, Nano materials, preparation of nano materials, Density of states of quantum well, quantum wire and quantum dot. Crystal Periodicity, Representation of lattice, Crystal Symmetry, Lattice Types, Nomenclature of Crystals, Crystal structure, Amorphous Structure, Liquid Crystal Structure.

Unit-II: Crystal Diffraction and Reciprocal Lattice: X-Ray Diffraction, Laue Theory, Bragg's Treatment, X-Ray Scattering by Amorphous Solids.

Unit-III: Experimental Methods of X-Ray Diffraction and its types, Neutron Diffraction, Electron Diffraction, RAMAN and SEM.

Unit: IV: Crystal of Controlled Perfection- Energy States Associated with Imperfections.

Unit-V: Some properties of Simple Alloys- Solid Solution, Binary System with Solid Solutions, Binary System with Solid-Solid Phase Transitions, Super Lattice, Energy States in Alloys.

Group-B

Mathematical, Quantum and Computational Physics

Unit-I: Review of differential equation (2^{nd} and Higher Order), Linear and Non-linear differential equation. Solutions of 2^{nd} order differential equations. Special functions (Lagurre, Jacobi and Hermite etc.)

Unit-II: Applications of Special functions in quantum theories, Solutions of Schrodinger's equation for different potential problems (one and three dimensional Harmonic oscillator, Particle in a 3D box and Scarf potential).

Unit-III: Supersymmetry in Quantum Mechanics (SUSY QM) and its important applications. Parity (P) and Time reversal (T) symmetry, Role of P, T and combined PT symmetry in Real and complex systems.

Unit-IV: Non-central potentials & its solutions. Relativistic Mechanics : K.G and Dirac equation.

Unit-V: Computational methods to solve the quantum mechanical problems (using Mathematica / Matlab).

Group-C

Electronics

Unit-I: Solar Cell :- Invention, Development, Operation, Efficiency, Advantage.

Unit-II: Different types of Diodes and its uses, Efficiency, Advantage. Environment issue.

Unit-III: Doping and its effect, Amorphous Silicon Cell, Solar Radiation and Photo Current.

Unit-IV: Lithium metal battery, Micro sensors, Semiconductor Equipments, Electronic Devices.

Unit-V: Carbon Nanotube, Bio-sensors, Artificial photo synthesis, photo voltaic, Solar fuel, Solar thermal energy, Thermo photo voltaic.