

## Centre for Rural Development and Technology

### Indian Institute of Technology Delhi

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Date: 16/05/2024

**The Ph.D. candidate's selection process for AY 2024-25 semester I is as follows:**

#### **Stage I: Written test - 03/06/2024**

##### Instructions

- A. Written tests will be conducted on an online platform.
- B. It is **mandatory** for all candidates to take the written test. However, the written test is only to evaluate the candidate's potential as a researcher, It is not to shortlist any candidate for Interview. By default, all candidates who take the written tests are eligible for interview/s irrespective of the marks obtained in written test.
- C. The candidates who have not taken the written test are not eligible for an interview.
- D. Please ensure smooth and steady internet connection on the day of written exam (**June 3<sup>rd</sup>**) and on the day of interview (**June 4<sup>th</sup>**).
- E. The duration of written test will be of one hour starting at **8 AM on June 3<sup>rd</sup>**. The written test will have two parts. Both parts, **Part 1 & Part 2**, are compulsory to all candidates. Part 2 will have four sections namely, (1) Energy & Environment (2) Lifesciences (3) Food & Agriculture (4) Social systems, local governance and innovation. The candidate has a choice to pick any one section for part 2 of the written exam. Based on the selection of the above section, the candidate will be interviewed June 4<sup>th</sup>.
- F. Part 1 of the written test will have common syllabus for all candidates.
- G. The syllabus for the written exam is available in Appendix A

\*More details on the written test will be shared soon.

#### **Stage II: Interview - 04/06/2024**

- A. PhD interviews will be conducted on the online platform.

\*More details on PhD interviews will be shared soon.

**Minimum Shortlisting Criteria for Ph.D. Programme (I Semester, 2024-2025) at CRDT.**

**1. National Candidates**

**A. Criteria for regular candidates**

The CGPA criteria with qualifying requirements in a national-level examination for regular candidates in different categories are reformed and finalised as summarised in Table 1.

**Table 1. CGPA criteria with qualifying requirements in a national level examination for regular candidates in different categories**

<b>Qualifying degree</b>	<b>Minimum performance in the qualifying degree for General/OBC-NCL/EWS Category</b>	<b>Minimum performance in the qualifying degree for SC/ST/PH Category</b>	<b>Qualifying requirements in national level exam</b>
B. Tech./B.E. or Equivalent	80% marks or 8.0 CGPA on 10.0 point scale	75% marks or 7.5 CGPA on 10.0 point scale	GATE (Score $\geq$ 450 for Gen/OBC-NCL/EWS, and $\geq$ 400 for SC/ST/PH)/CSIR/UGC/ICAR/ICMR/DST Inspire, etc.
M.Sc./MBA/ or Equivalent	70% marks or 7.0 CGPA on 10.0 point scale	65% marks or 6.5 CGPA on 10.0 point scale	GATE (Score $\geq$ 400 for Gen/OBC-NCL/EWS, and $\geq$ 350 for SC/ST/PH)/CSIR/UGC/ICAR/ICMR/DST Inspire, etc.
M.A.	60% marks or 6.0 CGPA on 10.0 point scale	55% marks or 5.5 CGPA on 10.0 point scale	CSIR/UGC/ICAR/DST Inspire, etc.
M. Tech./ M.E. or Equivalent	60% marks or 6.0 CGPA on 10.0 point scale	55% marks or 5.5 CGPA on 10.0 point scale	NIL

1. The CRC decided to consider only those candidates whose qualifications and research area are corresponding with the expertise available at the Centre.
2. The requirement of qualification in the GATE/National Level Examination is waived for the following categories of applicants:

- a. Students registered currently in Centrally Funded Technical Institutes (CFTIs) pursuing B. Tech./B.E. /Integrated M. Tech./ Integrated M.Sc. programmes, who have completed six semesters or more, and have secured a CGPA of 8.00 or above (on a 10 point scale). Such students must obtain a CGPA of 8.00 or above at the time of graduation, and before they formally register for the PhD programme (80% aggregate marks if marks are the primary mode of evaluation);
- b. Graduates of CFTIs (in the programmes marked under (i)) with a final graduation CGPA of more than 8.00 (80% aggregate marks, if marks are the primary mode of evaluation);
- c. MA or M. Sc. graduates from IITs with a CGPA of 8.00 or above.

### **B. Criteria for Part-time candidates**

The CGPA criteria for part-time candidates in different categories will be the same as the regular candidates defined in Table 1. However, the requirement of qualifying in a national level exam is waived.

**Table 2. Experience required for admission to part-time Ph.D. Programmes**

<b>Qualifications</b>	<b>Work experience (Post Qualification)</b>
M.E./M. Tech./M.S.(R)/M.D. or Equivalent	Nil
B.E./B.Tech./M.Sc./M.A./M.B.A./MBBS or equivalent from CFTIs/Central Universities	1 Year
B.E./B.Tech./M.Sc./M.A./M.B.A./MBBS or equivalent, and working in IIT Delhi* (Project or Regular) *Through proper channel	1 Years
B.E./B.Tech./M.Sc./M.A./MBA/MBBS or equivalent from institutions other than CFTIs/Central Universities	2 Years

Part-time candidates are required to submit a “No Objection Certificate” (NOC) on a proper letterhead from the appropriate authority in the organization clearly stating the following:

1. The candidate is permitted to pursue studies on a part-time basis;

2. He/she will be fully relieved from duty and permitted to reside at the Institute for the period of required residency that is essential for completing the course work (this is not a requirement for candidates who are working in NCR or organizations located within a distance of 50 km from the Institute);
3. That his/her official duties permit him/her to attend required classes as per the Time Table of IIT Delhi;
4. That his/her official duties permit him/her to devote sufficient time for research;
5. Facilities for research in the candidate's field of research are available at the candidate's place of work, in case the proposed Ph.D. research plan requires him/her to use these facilities when the candidate is physically present at this place of work.

The template of this NOC is available on the IIT Delhi PG admissions website. Kindly note that lack of confirmation and clarity on one or more of the above points in the NOC may make prevent the applicant's application from being processed, even if he/she qualifies in the interview/screening.

### **C. Criteria for sponsored candidates**

The CGPA criteria for the sponsored candidates in different categories will be the same as the regular candidates defined in Table 1. However, the requirement of qualifying in a national is waived.

Sponsored (full-time) candidates seeking admission to a Ph.D. programme on the basis of study leave, must submit a "Sponsorship Certificate" on a proper letterhead from the appropriate authority in the organization clearly stating the following:

1. for the period of his/her studies in the programme, the candidate would be treated as on duty with the usual salary and allowances; and
2. that he/she will be fully relieved and granted study leave for a minimum period of 3 years (2 years for M. Tech. and equivalent degree holders).

### **2. International Candidates**

CRC decided to adopt the institute minimum criteria for shortlisting of foreign applicants to the PhD programme at CRDT.

# **Appendix A**

## **Syllabus for written exam**

### **Part 1:**

Holistic Rural Development, Gandhi and Gram Swaraj, Guidelines of SAGY;

Farmers welfare, PM KISAN, PMFBY, e-NAM and SAMPADA Scheme for Food Processing;

Role of Communities, People's Movements & Grassroot Organisations in Rural Development; Participatory Approaches to Rural Development;

Rural Crafts and Artisans, Grassroot Innovations & One District One Product Scheme; Rural Livelihoods & NRLM, MGNREGA, Mission Antyodaya,

DDUGJY; Rural Sanitation and Govt Schemes such as Swach Bharat Abhiyan & Amrit Sarovar Mission

### **Part 2**

#### **Section 1: Energy & Environment**

Units and Dimensions; Laws of thermodynamics; Heat and refrigeration cycles; Properties of pure substance; Fuel Combustion; Gas laws; Ideal gas mixtures; Basics of Heat transfer- Conduction, Convection, Radiation; Mass and energy balance; Stoichiometry; Types and behavior of fluid; Fluid statics; Continuity equation and Bernoulli's Principle; Principles of aerobic and anaerobic digestion; Water and waste water quality- pH, Alkalinity, Hardness, BOD,COD; Ambient air quality.

#### **Section 2: Lifesciences**

Classification of living organisms; Physical and chemical properties of water; Lignocellulosic biomass; Photosynthesis; Respiration; Biomass valorization; Soil health; Laboratory techniques in life science research; Bioremediation-concept and applications; Bioreactors and photobioreactor designs; Phytoremediation and phycoremediation; Emerging contaminants

#### **Section 3: Food & Agriculture**

Mass and energy balance, fluid flow, continuity equation, Bernoulli's Principle, heat (conduction, convection & radiation) and mass transfer (Fick's law) ; Principal food compositions - water, carbohydrates, lipids, proteins, pigments, nutrients their properties and analysis, natural food additives, colourants, antioxidants;

Unit operations in food processing- sorting, grading, sieving, drying & dehydration, concentration, evaporation, spray & freeze drying, size reduction, centrifugation, fermentation, food packaging, CA & MA storage; Food safety and quality - food hazards, microbial food safety (D-value, z-value, Q10 value), food safety management systems, hurdle

technology; Cereal processing (milling of rice, wheat, and maize, parboiling of paddy), oil processing (expelling, solvent extraction, refining & hydrogenation), fruits & vegetable processing (extraction, clarification, concentration and packaging), plantation crops processing (tea, coffee, cocoa, spice), milk & milk product processing (pasteurization & sterilization of milk, cheese, ghee, ice-cream)

#### **Section 4: Social systems, local governance and innovation.**

Indian Villages and conflicting views on village life; Rural development and state policies; Green Revolution; Agriculture and non-farm livelihoods; Sustainable rural livelihoods in present context; Rural power, local governance, and Panchayati Raj Institutions; Rural Healthcare, Education, and Energy; Agrarian crisis in India; Issues related to the governance and management of land, water, and forest; Rural empowerment and contemporary issues and challenges; Weaker sections in Rural India; Rural transformation through S&T; Unnat Bharat Abhiyan; Carbon Neutral Gram Panchayat. Rural Innovations, Rural Entrepreneurship, Gandhi and Rural Technology,