

10. PHD PROGRAMME

- (i) A candidate seeking admission to the degree of Doctor of Philosophy must have obtained ME/MTech/MPhil/MCA/MSc/MA/MBA/CA or equivalent with minimum CGPA of 6.00 on a 10 point scale or 55% marks in aggregate where marks are awarded or NET (UGC/CSIR) qualified.
- (ii) Candidates with BE/BTech degree or equivalent with excellent academic record (minimum CGPA of 9.00 on 10 point scale or 80% marks in aggregate) may be considered for admission.

Relaxation in CGPA to 7.00 on a 10-point scale or in marks to 65% for the minimum eligibility conditions may be permitted for candidates with a BE / BTech degree or equivalent who have a minimum of 3 years of professional and/or research experience in the area in which the admission is sought. However, candidates admitted with BE/BTech or equivalent qualification will be admitted for PhD after successful completion of eight Masters level courses as suggested by the PhD Admission Committee of concerned Department/School, within a period of two years from the date of admission. A minimum CGPA of 6.00 on a 10-point scale should be earned in the courses prescribed by the concerned Department/School.

- (iii) Part-time studies leading to PhD degree are permitted for professionally employed personnel. Part-time studies leading to PhD shall also be permitted to persons working in Institutions with which a Memorandum of Understanding has been signed for research purposes. Such a candidate must be in employment at the time of admission and be engaged in professional work in the area to which admission is sought.
- (iv) **Admission of a PhD candidate in a department/ school other than his/her basic background:** Suitability of a candidate is the purview of admission committee, if a candidate qualifies the test and interview then he/she should be allowed to pursue PhD Program. However, the admission committee may recommend additional courses for the candidate to clear.
- (v) Candidates shall be admitted on the basis of merit of Entrance Test and Interview to be conducted by the University. **The candidates who secure minimum of 20% marks in the written exam shall only be called for Interview.** During interview, a candidate is required to indicate area of research.

Relaxation for appearing in the Entrance Test may be given by the University to those candidates who have qualified UGC/CSIR (JRF).

- (VI) Every admitted candidate shall have to do course work for a minimum of one semester. The course work shall include at least three courses, namely, a course on research methodology (may include quantitative methods and computer Applications) or a course proposed by the Admission Committee (for those who have studied a similar course on Research Methodology at PG level), a professional course (if not offered by any Department/ School, its syllabus to be proposed by the allocated supervisor and approved by DoAA) and a seminar (Relevant in the area of research). Minimum credits for the course work shall be 11 including a seminar of 4 credits. The process of registration in the course work, examination, evaluation and grading shall be same as followed for UG/PG programmes.

Only those candidates who successfully complete the course work within one year of admission and with a minimum CGPA of 6.00 on 10.00 point scale shall be registered in the PhD programme.

Every candidate will be required to submit research proposal, duly recommended by the Supervisor(s), after successful completion of the course work (December 31 shall be taken as date of completion of course work for odd semester and June 30 shall be taken as date of completion for even semester). The minimum time period to submit the research proposal shall be **one semester** from the date of admission **and maximum time allowed to submit the research proposal shall be one year from the date of admission.**

Research proposal will be submitted to the concerned Head of the Department/School. In case of non-submission of proposal within one year, DoRSP on the recommendations of the Supervisor and Head of the Department/School may grant an extension for a maximum period of six months.

If the candidate fails to submit the proposal even during the extended period her/his admission will be cancelled. In case the proposal is rejected by the URB, she may resubmit it within next six months starting the date of meeting of URB failing which her/his admission will be cancelled

Notes:

- (a) Part-time candidates are required to submit the "No Objection Certificate" from their parent organization/department/employer stating that the candidate is permitted to pursue studies on a part-time basis and that the candidate's official duties permit her/him to devote sufficient time for course work and research.
- (b) In case of FN candidates, Research VISA endorsed to TU is required.

10.1 GENERAL INFORMATION

TU offers PhD programme in almost all specializations of Engineering, Technology, Management and Sciences in the following Departments/Schools of the University (currently around 589 PhD candidates are working for their PhD degrees in the University).

DEPARTMENTS

Biotechnology Department

Agro-Biotechnology, Plant Biotechnology, Bioremediation, Microbial Ecology, Food Technology, Food process and Safety, Plant Microbe Interaction, Tissue culture, Sustainable Agriculture, Bioinformatics, Areas of Animal Biotechnology & drug discovery and Microbial Concrete.

Chemical Engineering Department

Modeling and Simulation, Catalysis, Environment Pollution, Polymers and Composites, Mass Transfer, Bio-Chemical Engineering, Heat Transfer, Nanofluids, Nanocomposites, Pulp and Paper, Energy Management, Membrane Separation.

Civil Engineering Department

Structural Engineering, Geo-technical, Engineering, Transportation Engineering, Construction Engineering and Management and Computer Aided Design, Water Resource Engineering.

Computer Science & Engineering Department

Parallel and Distributed Computing, Software Engineering, Network and Information Security, Soft Computing, Wireless and Sensor Networks, Theoretical Computer Science.

Electrical & Instrumentation Engineering Department

Optimal Power System Operation ; Electric Drives; Application of FACTS; Power Electronics ;Process Control & Instrumentation, Artificial Intelligence Applications , Biomedical Instrumentation, Embedded systems, Virtual Instrumentation, Control System.

Electronics & Communication Engineering Department

RF Devices, Antennas and Micro-wave integrated circuits, solid State & thin films, Digital Signal processing;VLSI, Wireless Communication, Optical Communication, Opto Electronics.

Mechanical Engineering Department

Heat Transfer; IC Engines; Energy Conservation and Management; Bearings & Lubrication; Computer Aided Analysis & Design; Industrial Engineering, Robotics and Vehicle dynamics; Modelling of multibody systems; Fluid Mechanics, Technology

Management, Materials and Metallurgy, Production Engineering, Manufacturing Engineering.

SCHOOLS

School of Physics & Materials Science

Solid State Physics; Materials Science; Nano Science; Liquid Crystal; Electroceramics Smart Materials; Magnetic Material, Condensed Matter Physics, Nuclear Physics.

School of Behavioral Science and Business Studies

Industrial Management, Business Economics, Intellectual Property Rights, E-Business, Finance, Organizational Behavior, Cognitive & Experimental Psychology

School of Mathematics & Computer Applications

Operations Research; Functional Analysis; Reliability; Fourier Analysis; Biomathematics; Differential Equations; Algebra; Pattern Recognition; Soft computing; Theory of fuzzy sets; Number Theory; Astrophysics; Grid Computing, Software Engineering

School of Chemistry & Biochemistry

Analytical Chemistry, Organic Chemistry, Organometallic Chemistry, Environmental Chemistry, Medicinal Chemistry/Inorganic Chemistry/ Nano Chemistry/ Nano – Materials/ Bio-physical Chemistry.

L M Thapar School of Management

International Business; Innovation Systems; Economics; Information Systems; Strategic Management; IPR; Supply chain management; Corporate Finance; Investment Management

School of Energy and Environment

Environmental Technology & Management, Environmental Engineering, and Bioremediation.

10.2 Number of Seats available for first semester of session 2014-15: Candidates are advised to browse www.thapar.edu for updated information about any further availability of seats for PhD.

Departments	No. of Seats	Specialization
Biotechnology		
	02	Microbiology & Molecular Biology
	02	Microbiology & Bioremediation
	01	Plant Molecular Biology
	01	Industrial Biotechnology
	01	Food Biotechnology
Chemical Engineering		
	01	Heat transfer, Fluid flow, Nanofluids,

	Energy management
01	Synthesis and application of inorganic membranes for wastewater treatment
01	Development of novel adsorbents for pollution control
01(DRDO-JRF)	Polymer Rheology and Nanocomposites
01	Polymer Synthesis and Nanocomposites
01(BRNS-BARC-JRF)	Polymer
01	Advance oxidation processes
02(one DST-JRF)	Carbon dioxide capture by adsorption
01	Biosequestration of carbon dioxide
01	Catalysis
01	Modeling and Simulation
01	Waste water treatment
01	Heterogeneous reactions and Catalysis
02	Waste water treatment by Advanced photochemical Oxidation, by Electro-oxidation/ electro-chemical method, by polymeric adsorbent
01	Modelling & Simulation, Divided wall distillation column (DWC), Biodiesel production through reactive DWC, Innovative dimethyl ether synthesis in a reactive DWC, Extractive DWC
02	(i) Molecular Simulation Studies on Reversible Hydrogen Storage by Tailoring Nanostructure. (ii) Thermodynamic Properties of Fluids Confined at Nanoscale: A Molecular Simulation Study
02	(Separation Processes) Separation of azeotropic mixtures by using ionic liquids, salts/ organic compounds, Environmental Fluid mechanics
03	Separation/Reactive Extraction/Liquid-liquid Equilibrium/Heavy Metal Recovery
01	Development and Evaluation of Infrared Activated Nanoparticles for Cellular-Wide E-field mapping
01	Development and Evaluation of Non-linear Optical Nanomaterial for Bio-warfare Pathogen Detection
03	Waste water treatment by Electro-oxidation/ electro-chemical method, Development of polymeric adsorbent, Waste water treatment

		by Aerobic Sequential batch Reactor, Environmental Fluid Mechanics
	01	Computational Fluid Dynamics
	01	Perfume and Essential oil production and Characterization (Experimental)
	01	Environmental Fluid mechanics
Civil Engineering		
	2	Structural Materials
	2	Structural health monitoring & Rehabilitation.
	2	Hydraulic Engineering and GIS applications
Computer Science & Engineering		
	01	Software creation and management, Information systems, Security and privacy, Human-centered computing, Social and professional topics
	01	Algorithms, Computational complexity and cryptography, Design and analysis of algorithms, Information retrieval
	01	Network protocols, Network algorithms, Security and privacy, Cryptography
	01	Computer systems organization, Architectures, Cloud Computing, Software and its engineering
	01	Network algorithms, Network performance evaluation, Algorithms for application domains, Machine Learning
	01	Network architectures, Network protocols, Network components, Data management systems, Information retrieval
	01	Software engineering, Contextual software domains, Data Management Systems, Information retrieval, Machine Learning
	01	Information systems, Natural Language Processing, Machine Learning
	01	Networks, Design and analysis of algorithms, Semantics and reasoning
	03	Software engineering, Models of computation, Formal languages and automata theory, Semantics and reasoning
	01	Software functional properties, Software creation and management, Data management systems, Information retrieval

	03	Computer systems organization, Distributed computing methodologies
Electrical & Instrumentation Engineering		
	02	Protection of Machines
	02	Image Processing
Electronics & Communication Engineering		
	01	Fiber Optical Communication
	2	Wireless Communication, VLSI, Signal Processing
	2.5	Fractional Transforms and Signal Processing
	01	Wireless Communication
	01	Signal Processing/ VLSI
	01	VLSI Design
Mechanical Engineering		
	02	Advanced Manufacturing Process
	01	Design Area
	01	Advanced Manufacturing Process
	01	FEM
	01	Thermal/Fluid
	01	Robotics
	01	Dual Fuel Engine Technology (Broad Area-Thermal)
	01	Vehicle Dynamics/ Machine Dynamics/ Process Dynamics
	01	Microwave Material Processing
	03	Micro/Nano Finishing using MRP Fluids
	03	Design 01; Materials & Tribology 02
	01	Micro-machining/Advance Machining
Schools		
School of Physics & Materials Science		
	01	Condensed Matter Physics
	04	Nuclear Physics (Theoretical)
	06	Condensed Matter Physics (Experimental)
	02	Particle Physics
	02	Materials Science
	01	Thin Film Solar Cell
School of Behavioral Science & Business Studies		
	02	Industrial Management & Business Economics, E-business
	02	Finance & Accounts; Financial Markets
	02	Library & Information Science (LIS) and Knowledge Management (KM)
School of Mathematics & Computer Applications		
	01	Cloud Computing/ Software Engg.
	02	Operation Research / Numerical Analysis
	01	Differential Equations
	01	Natural Language Processing

	01	Multimedia Security
	01	Optimization
	01	Number Theory
	02	Fourier Analysis, Fixed Pt. Theory
	01	Numerical Analysis
	02	Cryptography, Cellular Automata
	02	Adhoc Network Sensor, Cloud Computing
School of Chemistry & Biochemistry		
	01	Heterogeneous Catalysis
	02	Nanomaterial Photocatalysis
	02	Heterogeneous Catalyst - Biodiesel/ Transesterification
	01	Organic Chemistry
	02	Biophysical and Bioinorganic Chemistry
	02	Organic and Medicinal Chemistry
	02	Synthetic Organic Chemistry and Medicinal Chemistry
	02	Organic and Supramolecular Chemistry
LMT School of Management	Nil	
School of Energy and Environment		
	2	Environmental Technology & Management
	2	Bioremediation
	2	Env. Engineering

The policy of UGC guidelines regarding reservation of seats for SC/ST and PH candidates shall be followed.

- 10.3** The application form along with attested copies of certificates must be submitted to the 'Incharge Admission Cell" on or before the specified dates for the odd semester and even semester. Incomplete application forms and those received after the prescribed date will not be entertained under any circumstances. No correspondence/enquiry from such candidates shall be entertained.

No separate intimation will be sent regarding conduct of exam, Interview and start of session. Application form must accompany:

- (i) Attested copies of the certificates of the examinations passed.
- (ii) One passport size photograph pasted on the application form in the space provided for the purpose.

10.4 DURATION

The student shall submit his/her thesis to the Registrar within five years but not earlier than 2.5 years in case of regular and 3.5 years in case of part time student from the date of his/her admission.

10.5 TEACHING ASSOCIATESHIP

i Eligibility

The associateship may be granted to candidates out of those admitted to the PhD (Regular) programme. Only those candidates will be considered who have obtained minimum CGPA of 6.75 (10.00 point scale) or first division in their qualifying examination. Teaching associateship is also available to full time Ph.D students admitted to engineering department having B.E/ B.Tech qualification under TEQIP

ii Number and Values of the Associateship

Teaching Associateship are allocated to each Department/School depending upon their requirement. The numbers of Teaching Associateship vary from time to time.

Emoluments for the Teaching Associateship will be ₹13,000/- (including contingency) per month or as approved from time to time by the University.

Suitable accommodation may be provided, if available in the University on rental basis.

iii Duration

The associateship will be tenable for one semester at the first instance from the date of selection, to be renewed after every semester as per requirement of the Deptt./School.

iv General Conditions

A scholar who has been selected for the award will be given 8-12 hours of teaching load per week.

A scholar who has been selected for associateship shall not be eligible for any other fellowship from the University or from any other source.

A scholar who has been selected for associateship shall be liable to pay tuition fee and other dues as prescribed by the University from time to time.

IMPORTANT DATES AND INFORMATION:

The online application form is available on www.thapar.edu. Fill the complete details and then take the **print out** of the form. Paste a recent passport size photograph on it. Please keep one copy of the printout of completely filled form as it will be required at the time of document checking during counselling. You can pay the the required amount online or attach DD (in favour of Thapar University and payable at Patiala) and send it to "Incharge Admission Cell' Thapar University, Patiala (Punjab)-147004.

Application fee:

Amount to be deposited with print out of application forms taken from website.	Rs 1500
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IMPORTANT DATES

	PhD
Last date for receipt of completed application forms.	June 04, 2014 (for odd semester) December 1, 2014, (for even semester)
Date of Entrance test to be conducted by TU	June 24 – 29, 2014 (for odd semester-online test) December 19-21, 2014 (for even semester-online test)
Display of result of Entrance Test	July 7, 2014 (for odd semester) January 1, 2015, (for even semester)

Admission schedule:

PhD Admission schedule

Date of interview for PhD:

July 11, 2014(for odd semester)
January 9, 2015(for even semester)

Admission notification and deposit of fee for PhD program:

July 21-25, 2014(for odd semester)
January 5-9, 2015(for even semester)

Venue for Interview: in respective departments/schools (9.30AM onwards)

FOR ANY OTHER DETAILS INCLUDING ELIGIBILITY CRITERIA, FEE ETC

CONTACT (08288008120, 08288008121) Email: admissions@thapar.edu Website: www.thapar.edu

IMPORTANT NOTE: Candidates are advised to regularly browse www.thapar.edu for information/instructions regarding admissions. No separate letters shall be sent.

All applications must be sent to "Incharge Admission Cell' Thapar University, Patiala (Punjab)-147004.

Documents required at the time of counselling:

Candidates must bring with them following original certificates and **a set of attested copies of all the certificates** at the dates specified hereunder for various programmes.

- **Copy of the Application form**
- 10+2 /diploma/graduation/post graduation DMC
- Matriculation/Higher Secondary Certificate showing Date of Birth
- Result Card of Entrance Exam
- Admit Card of Entrance Exam
- Character Certificate
- Medical Fitness Certificate
- Reserved Category Certificate on the prescribed proforma and signed from the competent authority (if applicable)
- Affidavit required in case of discontinuity of studies
- Undertaking by candidates not having result of qualifying exam as per prescribed format.
- Migration Certificate
- Income Certificate
- Experience certificate & No objection certificate from employer. (For PhD candidates)
- **Check list proforma**

Commencement of session: July 21, 2014

HOW TO APPLY

- 1 Candidates seeking admission in TU shall fill up the online form available on our website www.thapar.edu. Kindly fill the complete details and then take two print outs of the form and paste a recent passport size colored photograph.

Application fee paid Online: Please send one of the printouts of form to the Incharge Admission Cell. The hardcopy of application form alongwith required documents should reach the University within 7 days after the last date of submission of online applications.

Application fee paid through DD: Please send one of the printouts by attaching the required amount of DD (in favour of Thapar University and payable at Patiala).

Retain second copy of the printout of the form to be produced at the time of document checking of original documents during counseling.

Important Note: A candidate cannot claim admission merely by filling the application form and paying the application fee. If he/she fulfils the eligibility criteria as per the prospectus, only then he/she shall be considered for admission during counseling. So, candidates are advised to read eligibility and other conditions before filling the form.

- 2 The original certificates and set of attested copies of the certificates are required to be produced at the time of document checking.
- 3 Every candidate must indicate in his/her application the category of seat for which he/she wants to apply. **A copy of the certificate of the reserved category (if applicable) shall be attached.**
- 4 Application completed in all respects should reach the INCHARGE ADMISSION CELL, THAPAR UNIVERSITY, PATIALA -147004, on or before the last prescribed date of the respective programmes.
- 5 Incomplete application in any manner and received after the due date/time will be rejected. The University does not take any responsibility for postal delay or loss in transit of the application form, demand draft, withdrawal form or any other communication in this regard.
- 6 The specimens of the format of the required certificates are available on our website for the guidance of candidates. Each certificate must be submitted on the prescribed format and must be issued by the competent authority as mentioned, under proper seal/stamp of their office on a date prior to or on the last date for submission of application form.
- 7 **PENALTY FOR WRONG INFORMATION/SUPPRESSION OF INFORMATION.**

If at any stage it is found that a candidate has concealed, suppressed or distorted any information/fact, in the application form, his/her admission to the University, if granted, shall stand cancelled. He/she will have no claim, whatsoever, against the University.

- 8 The provisions of Prospectus 2014-15 may be changed by the competent authority without any notice.
- 9 In case of any dispute, the decision of the Director, TU, Patiala shall be final and binding on the candidates.
- 10 **Candidates applying in more than one department/school are required to fill separate application form for each department/school.**

INSTRUCTIONS FOR ONLINE ENTRANCE TEST

- 1 Entrance test shall be conducted ONLINE.
- 2 Candidates will be able to generate 'Admit Card' from April 16-June 17, 2014 provided their DD alongwith print out of application form reaches Thapar University in time. The login id and password created by candidate at the time of filling the application form shall be used to register for generation of Admit card.

Note: The Admit card shall be issued provisionally to the candidate subject to his/her satisfying the eligibility condition.

- 3 After registering, the candidate shall take out two print outs of 'Admit Card', paste latest photograph on each and then come to the entrance test centre. Alongwith admit cards, the candidate will also carry any one of the identity proof (Original) with him/her like Passport/Voter I Card/ PAN Card/ Driving License. One copy of the admit card shall be retained by the entrance test centre. The candidate shall keep the other copy (duly acknowledged by the examiner at test centre) to be shown at the time of document checking.
- 4 **The entrance test shall contain objective type questions. Other details are as under:**

SNo	Name of the programme	Duration of Entrance Test	Number of questions in the entrance test
1	PhD (for each department/school)	1.5 hours	75

- 5 While registering for ONLINE entrance test on our website, the candidate shall choose entrance test centre of his/her choice from the available list and any one slot available in the test period given above i.e. **(June 24 – 29, 2014)**. Once slot is chosen, it cannot be changed thereafter.
- 6 Filling of valid mobile number is mandatory.

General Instructions:

- 1 In case of a tie among candidates securing equal marks in the merit list, the same will be broken in accordance with the following criteria:

(a) Candidate senior in age shall rank higher in order of merit.

(b) In the case of a tie in age also, a candidate getting higher percentage of marks in the qualifying examination shall be ranked higher in order of merit.

(c) In the case of a tie in percentage of marks in the qualifying examination also, a candidate securing higher percentage of marks in matriculation/secondary or equivalent examination shall rank higher in order of merit.

2 Withdrawal of Seat / Refund of fee:

Candidate wishes to withdraw the seat, must submit the application to IN-CHARGE, ADMISSION CELL, Thapar University. The fee will be refunded after adjusting all the outstanding dues, if any. The candidates are advised to mention their Account Number and IFSC code of the bank for the prompt refund.

	Date of Receipt of Application		Amount to be refunded
(i)	One day before the final counseling or before the start of the session	:	After deducting Rs. 1000/- of the total fee deposited.
(ii)	From the date of final counselling and up to September 30, 2014	:	50% Tuition Fee + 50% Development Fee + University Security and Alumni Fee + 50% of all Hostel dues (if applicable)
(iii)	After September 30, 2014	:	University Security + Alumni Fee

- 3 No separate letters for counseling/document checking/deposit of fee shall be issued for any programme.

- 4 **Admitted candidates will have to submit the migration certificate from the earlier University/Board within a month of their admission.**

- 5 Electronic gadgets such as Mobile Phones, Pagers, etc. are not permitted in the Examination Centre.

- 6 The statements made in this Prospectus and all other information, contained herein are believed to be correct at the time of publication. However, the University reserves the right to make at any time, without notice, changes in and/or additions to the regulations of University and conditions governing the conduct of students, requirements for degree, fee and any other information, or statements contained in this Prospectus either on its own or under any rules or regulations imposed by UGC/MHRD. No responsibility will be accepted by the University for hardship or expense encountered by its students or any other

person for such changes, additions, omissions or errors, no matter how they are caused.

- 7 All disputes will be subject to jurisdiction of the Courts at Patiala only. The person in whose name the University can sue or be sued shall be the Registrar, Thapar University, Patiala.
- 8 The students of all the regular programmes are not allowed to join any job till they complete all the requirements for the award of degree. Only part-time students are allowed to join job.
- 9 In case,
a selected candidate submits false information about fee, eligibility, rank of entrance test
or
a candidate who is not offered any seat but deposits the full fee

then seat allotted to him/her shall stand cancelled.
- 10 Candidates must be medically fit and must bring along with them a medical fitness certificate signed by a Gazetted Medical Officer at the time of admission on the prescribed proforma as per Annexure-IV.

11 MODES OF PAYMENT OF APPLICATION FEE AND OTHER DUES:

11.1 **APPLICATION FEE : In the form of DD or through Online payment.**

11.2 **TOTAL FEE:**

- i) **Receipts in any Axis Bank/Kotak Mahindra Bank account-to-account transfer):** It is available in all the branches of **Axis Bank/Kotak Mahindra Bank**. A sample payment pay-in-slip is enclosed at Annexure-IX. The system generates **Journal Number** which is to be used for linking the payment. The students are instructed to get the 6-10 digit **journal number** from the branch where they have made the payment and feed the same in the web site where the details are captured along with date of payment. The deposit of amount in the below mentioned account of the University will not give any right to the depositor for jurisdiction of the station where it has been deposited in any manner what so ever it may be.

For depositing money through AXIS/KOTAK MAHINDRA BANK, a candidate can deposit money in favour of the following account:

AXIS Bank	KOTAK MAHINDRA BANK LTD
910010028666757	02630020000237

- ii) In the form of Demand Draft (DD), the DD of requisite amount should be made in favour of Thapar University, Patiala and payable at Patiala. The DD must reach the University on or before the prescribed date otherwise the candidature shall be cancelled.

- iii) Candidates depositing total fee through AXIS/KOTAK MAHINDRA BANK must enter complete details in 'Fee Confirmation Slip' (FCS) available at www.thapar.edu on or before the respective last prescribed date. In case, a candidate fails to enter the details, his/her candidature will not be processed further.

GENERAL INFORMATION REGARDING PhD ENTRANCE TEST

Duration of test: 90 minutes (75 Questions)

1/4th mark will be deducted for each wrong answer.

Syllabus for the Ph.D entrance examination

1. English & General Studies

Interpersonal skills including communication skills,onyms/synonyms, sentence completion, active/passive voice, prepositions, direct/indirect speech, idioms & phrases. General issues on environmental ecology, biodiversity and climate change (not requiring subject specialization). Economic and social development – multilateral trade agreement, sustainable development, poverty, inclusion, demographics, social sector initiatives, etc. Indian polity and governance – constitution, political system, public policy, rights issues, etc. Indian and world geography – physical, social, economic geography of India and the world. History of India and Indian national movement. Nobel prize winners, inventions & discoveries, awards & recognitions

2. Quantitative Reasoning

Ratios and proportion, percentages, profit & loss, averages, partnership; time-speed- distance, work and time; number system, factors, multiples; pipes and cisterns, simple interest & compound interest, installment payments; clocks, calendar; in-equations, quadratic and linear equations, functions, logarithm geometry, mensuration and solid geometry, geometry (lines, angles, triangles, spheres, rectangles, cube, cone etc), co- ordinate geometry.

Set theory, measures of central tendency and dispersion, probability and theory random variables (single variable case only), probability distribution (binomial, poisson and normal), correlation & regression; permutation & combinations; maxima & minima progression; complex numbers; data Interpretation based on text, graphs (column graphs, bar graphs, line charts, Pie charts, graphs representing area) and tables.

3. Analytical Reasoning & Mental Ability

Critical reasoning, visual reasoning, assumption-premise-conclusion, assertion and reasons; statements and assumptions, identifying valid inferences, identifying strong arguments and weak arguments, statements and conclusions; cause and effect, identifying probably true, probably false, definitely true, definitely false kind of statement; linear arrangements, matrix arrangements, puzzles, family tree problem, symbol based problems; coding and decoding, sequencing, identifying next number in series, etc; tables. Basic numeracy (numbers and their relations, orders of magnitude, etc.)