Indian Institute of Technology Guwahati, Guwahati – 781039

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Department of Computer Science & Engineering

Call letter for Written Test and Interview for admission to the PhD programme at this Department commencing in January 2018.

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Dear Applicant,

With reference to your online application for admission to the **PhD** Programme in the Department of Computer Science and Engineering (CSE) of this institute commencing in January 2018, we are pleased to inform you that you have been shortlisted to appear for a **Written Test and Interview** according to the schedule given below:

Date & Time of Written Test	: Monday, 4th December, 2017 at 9.00 a.m.
Date & Time of Interview	: Monday, 4th December, 2017 at 2.00 p.m
Reporting Venue	: CSE Department Seminar Hall, Ground Floor, Department of Computer Science & Engineering, H-Block, Academic Complex, IIT Guwahati

The written test will be based on B.Tech. CSE curriculum (for Syllabus, see Annexure–B attached). Based on the performance in this test, **short-listed** candidates will be called for the interview. Such candidates are expected to make a **short-presentation** (See Annexure-C attached) **for about 10 minutes** and also be prepared to answer questions from subjects belonging to **any one group** given below**.** The candidate has to mark his/her choice of interview subject during the written test.

Group-1: Data Structures, Algorithms, Discrete Mathematics, Automata Theory
Group 2: Digital Logic, Computer Organization
Group 3: Operating Systems, Networks, DBMS

Please note that:

(1)   The **First List** of selected candidates shall be displayed in the Institute's website http://www.iitg.ernet.in/acad/AdvtNotificationPhDDec2017/WebAdvtPhDDec2017.htm within two weeks **after conclusion of the Written Test and Interview.**

If selected, you will be required to reserve your offered seat by depositing full admission fee (as per details as indicated at Annexure-A)*by scheduled time to be notified; failure to which your provisional admission offer shall be cancelled.

(2)   Subject to vacancy of seats, **if any further selection list is drawn**, candidates shall be intimated through e-mail. Candidates not having e-mail id shall be intimated through Fax, *provided such fax numbers are correctly stated in his/her admission* application form. Otherwise, the candidates shall have to keep on visiting the Institute's website http://www.iitg.ernet.in/acad/AdvtNotificationPhDDec2017/WebAdvtPhDDec2017.htm   to know about any updated admission result status.

Note: In case you decide to withdraw from the programme by intimating (sending also the copy of your Admission Fee deposit receipt, without which your request for withdrawal will not be valid) the Institute, through its Fax No. 0361 – 258 2090, e-mail : acadoff@iitg.ernet.in, **latest by 21-12-2017**, a sum of Rs.1,000/- only shall be deducted from your admission fee deposit, and the balance amount shall be refunded to the address, to be specified by you in the fax letter. **Otherwise, only refundable portion of your admission fee deposit shall be returned** to you. Refund of fees for withdrawal cases will be sent from IIT Guwahati by around 15-02-2018.

Also, please note the following:

(a)   (1)   Firstly, you will be required to bring your downloaded and signed copy of the Online Application Form (*If due to some reasons, you filled-up more than one   online application forms, you have to bring the latest and updated one only*),   **ALONG WITH**:

(i)   your coloured photograph of size 4.5 cm. x 3.5 cm., affixed on it;

(ii)   **Original Demand Draft** for Rs.150/- (Rs.75/- for SC/ST/PWD candidates), from any nationalized bank, in favour of INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, payable at Guwahati;

(iii)   attested copy of your Date of Birth Certificate (if DoB is not mentioned in your Class X/XII Pass Certificate/Mark Sheet);

(iv)   *if applicable*, attested copy of your Caste Certificate [*Please note that OBC (Non-creamy Layer) Certificate will have to be as per format prescribed in our Admission Notification for PhD programme, **and issued by the competent authority on or after 01-04-2016, failure to which you will be considered under `General' category***];

(v)   *if applicable*, attested copy of your `PwD' Certificate;

(vi)   *if applicable*, the appropriate **Form in original** relating to candidate's Category [Sponsored (Full-Time)/Self-Financed/IITG's Project Staff/ Part-Time/External] - *as per*

format prescribed in our Admission Notification for PhD programme;

(vii) attested copies of Pass Certificates and Mark Sheets [*Mark Sheets should be complete for all semesters/years* of your educational qualifications (from Class X onwards)];

(viii) *as may be applicable*, copy of your qualifying degree Grade Point Average to Percentage conversion certificate(or proof thereof);

(ix) *as may be applicable*, attested copy of your valid GATE/CEED/NET(JRF)/INSPIRE Score Card (*This is a MUST, unless your qualifying degree is ME/MTech/MDes/MArch/MD/ MVSc/ MPharm OR Four-year Bachelor's degree in engineering/Technology or equivalent in a relevant area, with a Postgraduate Degree in Management Science(Finance) or MBA with Finance specialization or equivalent (for Construction Management area of Civil Engineering) OR Master's (M.A./M.Sc.) degree from an Indian Institute of Technology (IIT) with minimum CPI of 8.0 OR a Bachelor's (BTech/BDes) degree from a Centrally Funded Technical Institution(CFTI) with minimum CPI of 7.0];* and

(x) *as may be applicable*, attested copy of Certificates relating to your professional experience etc..

(2) *As may be applicable* , you are also required to bring all **ORIGINAL documents relating to** points (a)(1) (iii), (iv), (v), (vi), (vii), (viii), (ix) and (x), for verification on the day of your **Written Test and/or Interview.**

(b) If you have appeared in the qualifying degree examination and your results are awaited OR you are going to appear in all the subjects of your qualifying degree examination before **23-12-2017**, you may appear in the **Written Test and Interview**. Please note that, for such candidates, selections shall be provisional. And all provisionally selected candidates shall have to produce their original pass certificates and Mark Sheets of the qualifying degree examination latest by **31-01-2018**, for regularization – failure to which their admissions shall stand automatically cancelled.

For New PhD students for January-May 2018 Semester (First Semester)

Sl. No.	Items	Periodicity	Amounts (Rs.)
1.	Admission fee	One Time	150
2.	Thesis Fee	One Time	950
3.	Provisional Certificate Fee	One Time	100
4.	Medical Examination Fee	One Time	100
5.	Student Welfare Fund	One Time	200
6.	Identity Card Fee	One Time	50
7.	Tuition Fee *	Per Semester	2,500
8.	Examination Fee	Per Semester	350
9.	Registration / Enrolment Fee	Per Semester	200
10.	Gymkhana Fee	Per Semester	200
11.	Medical Fee	Per Semester	100
12.	Institute Caution Money	One Time (Refundable)	1,000
13.	Library Caution Money	One Time (Refundable)	1,000
14.	Hostel Admission Fee **	One Time	400
15.	Hostel Rent **	Per Semester	1,000
16.	Hostel Fund**	Per Semester	400
17.	Fan, Electricity and Water Charges **	Per Semester	2,000
18.	Hall Caution Money **	One Time(Refundable)	1,000
19.	Students' Brotherhood Fund (SBF)	Per Semester	50
20.	Alumni Fund	One Time	1,500
21.	Group Medical Insurance Scheme(GMIS) Premium for 2017-18	Per Year	1,800
Total (1 to 21) for General/OBC(NCL) category - (Without mess related fee / deposit)		**Hosteller**	**15,050**
		Non-hosteller	**10,250**
Total (1 to 21) for SC / ST / PwD category - (Without mess related fee / deposit)		**Hosteller**	**12,550**
		Non-hosteller	**7,750**

Mess related Collections for all hosteller students:

Sl. No.	Items	Periodicity	Amounts (Rs.)
22.	Mess Deposit	One Time (Refundable)	2,600
23.	Hall Mess Establishment Charges	One Time	1,000
24.	Mess Advance	First Semester	14,520
Total (22 to 24)			**18,120**

GRAND TOTAL (1 to 24) FOR GENERAL/OBC(NCL) CATEGORY - WITH MESS RELATED FEE / DEPOSIT		**Hosteller**	**33,170**
		Non-hosteller	**10,250**
GRAND TOTAL(1 to 24) FOR SC/ST/PwD CATEGORY- WITH MESS RELATED FEE / DEPOSIT		**Hosteller**	**30,670**
		Non-hosteller	**7,750**

* SC / ST/ PwD students are not required to pay Tuition Fees
** These are Hostel related Fees to be paid by Hostellers only.

Annexure – B

Syllabus for the Written Test – Ph.D in CSE @ IIT Guwahati

Mathematical Logic: Propositional Logic; First Order Logic.

Probability: Conditional Probability; Mean, Median, Mode and Standard Deviation; Random Variables; Distributions; uniform, normal, exponential, Poisson, Binomial.

Set Theory & Algebra: Sets; Relations; Functions; Groups; Partial Orders; Lattice; Boolean Algebra.

Combinatorics: Permutations; Combinations; Counting; Summation; generating functions; recurrence relations; asymptotics.

Graph Theory: Connectivity; spanning trees; Cut vertices & edges; covering; matching; independent sets; Colouring; Planarity; Isomorphism.

Programming and Data Structures: Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.

Algorithms: Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Dynamic programming, Divide-and-conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds.

Formal Languages & Automata Theory: Regular languages and finite automata, Context free languages and Push-down automata.

Digital Logic: Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

Computer Organization and Architecture: Machine instructions and addressing modes, ALU and data-path, Memory interface, I/O interface, Interrupt and DMA controllers, Instruction pipelining, Cache and main memory, Secondary storage.

Operating System: Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems and file management, Disk management and disk scheduling.

Computer Networks: ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), basic concepts of hubs, switches, gateways, and routers.

Databases: ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL).

Annexure – C

Guidelines for Presentation

1. Duration of the Presentation: 10 Minutes.
2. You are expected to make an oral presentation using the white-board.
3. The topic should be one from the list of research areas listed in the advertisement. (List of areas[†] given below)
4. Selection of the topic should be done keeping the following points in mind :-
   A) It should not be about a broad-overview of any particular topic/research area. For example, you should not be talking about OS or Computer Architecture or Machine Learning or any other area/topic in generic sense.
   B) It should be on a particular problem, talking about its formulation and methodologies to solve it. You are expected to understand the problem so that the same may be discussed and debated in terms of complexity and reason of choosing a particular method. For example, you can talk about your M. Tech/B. Tech project or any of your publications.
   C) Your Presentation should include: Motivation, Problem Statement/Definition, Solution/Methods, Analysis, open (if any) issues and conclusion.

[†] Research Areas of the Department

Algorithms; Computational Geometry; Systems Biology (Bio-computing); Bio-inspired Robotics and related algorithms;

Intelligent Mobile Agent Based Cyber-physical Systems; Human-Computer Interactions;

Speech Processing; Multimedia: Image and Video Processing; Machine Learning; Information Retrieval; Data Mining; Web Mining;

Computer Architecture; Formal Verification; Embedded Systems; CAD for VLSI; Real-time Systems and Scheduling;

Computer Security; Networks; Operating Systems; Distributed Systems.

Annexure – D (Miscellaneous Information)

(A) Note that only the shortlisted candidates will be provided accommodation in the hostels. No accompanying persons can be accommodated in the hostels. Details regarding accommodation will be posted at the Department website by November 25th, 2017 : http://www.iitg.ernet.in/cse.

(B) On arrival at Guwahati you may make use of the Institute bus service. This bus service (designated "Green-Valley, ON IIT DUTY") operates from G.N.B road, Panbazar, near Assam Publication Board, opposite Hotel President, Guwahati (which is about a kilometre away from the Guwahati Railway Station) to the IIT Guwahati campus. Details are available in the following weblink.

http://www.iitg.ernet.in/aa/pages/campusmap/index.php?hq

(C) Kindly visit our department website for updates. http://www.iitg.ernet.in/cse/

(D) For any queries, refer to Frequently Asked Questions (FAQ) link given in the admission webpage of CSE department.