TENDER DOCUMENT

FOR

THE CONDUCT OF COMPUTER BASED NPTEL ONLINE CERTIFICATION (NOC) EXAMINATION

ORGANIZING INSTITUTE, NOC
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI (TAMIL NADU) - 600036
INDIA

Disclaimer

This Tender is not an offer by the Indian Institute of Technology Madras but an invitation to receive bids from vendors. No contractual obligation whatsoever shall arise from the tender process unless and until a formal contract is signed and executed by duly authorized office bearers of the NOC organizing team of Indian Institute of Technology Madras with the vendor.

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Proposals should reach the undersigned by **5 P.M on Wednesday, 1 October 2014:**

The NPTEL Coordinator

Web Studio,

IC & SR building, Third floor

IIT Madras, CHENNAI 600036

Tentative Date, Time and Venue of Pre-bid Meeting:
17 Sep 2014, 3 P.M. Conference Hall, Third floor, IC & SR building, IIT Madras

Tentative Date, Time and Venue of Opening of Technical bids:
7 Oct 2014, 3.00 P.M, Conference Hall, Third floor, IC & SR building, IIT Madras

Tentative Date, Time and Venue of Technical presentations by technically qualified vendors:
10 Oct 2014, 10.00 A.M, Conference Hall, Third floor, IC & SR building, IIT Madras

Tentative Date, Time and Venue of Opening of commercial bids:
13 Oct 2014, 3.00 P.M, Conference Hall, Third floor, IC & SR building, IIT Madras

About NPTEL Online Certification - NOC:

NPTEL is an acronym for National Programme on Technology Enhanced Learning which is an initiative by seven Indian Institutes of Technology (IIT Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and Indian Institute of Science (IISc) for creating course contents in engineering and science. NPTEL is a curriculum building exercise and is directed towards providing learning materials in Science and Engineering by adhering to the syllabi of All India Council for Technical Education and the slightly modified curricula of major affiliating Universities. The NPTEL faculty have modularized their courses into core concepts which every one of these institutions may teach and topics which are add-ons to the course. The courses are well structured and are elaborate with details wherever the faculty members have felt the need. Institutions are encouraged to build their own versions of NPTEL courses based on their curriculum design using the NPTEL materials and collective experience of all IITs and IISc in TEL. They are meant to fill the large gap that exists between the current expertise level of faculty in institutions of higher learning such as the IITs/IISc and those in private and other government aided engineering institutions in India.

The programme was begun in 2004 and after 10 years, NPTEL has 780 full fledged 40 hour lecture courses. The ultimate vision of this programme being the establishment of a Virtual Technological University, online certification courses were introduced wherein, enrolling and following the course is open to anyone around the world, while obtaining a certificate requires the conduct of a proctored certification exam, for which exam partners are being sought.

Brief scope of work of the Exam Partner:

The Exam Partner (EP) and course coordinators of the online course will be required to work together to conduct the Online Certification exam for that particular course. The Exam Partner (EP) shall provide the technology and the operational solutions for the conduct of the online examination while the faculty coordinator will provide the question paper.

1. General instructions

In this tender document, Vendor, Bidder, Bidding agency and Exam Partner (EP) mean one and the same. The bidding agency shall be a single point of contact with the NPTEL office and shall be solely responsible for the execution and delivery of the work.

a) The bidding agency should be registered in India and should be operating in India for the last **5** years offering similar services. They should have a minimum turn-over of **Rs. 20 crores** in the last **2** years.

b) The bidding agency should own the copyright of the source code being used for conducting the computer based online examinations. The agency should be able to make changes as and when required in any of the components of the software.

c) The agency should be certified for compliance with established Information Security Standards such as ISO 27001. Duly signed copy of ISO 27001 certificate should be submitted along with the technical bid.

d) It is desirable that the bidding agency should have authorized and globally accepted software certification, CMMi Level 5.

e) The agency should have an in-house quality assurance and product testing team with proven and robust quality management processes required for conducting the computer based online examination.

f) The agency must employ multiple backup systems including offline backups to securely maintain the software and its corresponding source code.

g) The agency should design a high-performance system and conduct performance exams to verify successful achievement of high concurrency, fast response time, and long-stress duration required of the system used to conduct the examination. Results of such performance exams should be made available to the client as and when required. Sometimes these exams may have to be conducted within a short notice and with strict deadlines.

h) The agency should design a highly secure system and conduct security tests to verify that there are no vulnerabilities that can make the system susceptible to attacks. Comprehensive testing of source code and the infrastructure must be carried out. Results of such security tests should be made available to the client, when requested.

i) There should be suitable emergency management plans towards any crisis situations/redundancy of servers, nodes additional center location, candidates' data. **The vendor has to clearly indicate these plans in the technical proposal.**

j) The agency should be able to support the entire solution (across India) on a 24 x 7 basis with a maximum response time of 3 hours.

k) At any time before the submission of bids, NPTEL Coordinators may amend the tender and

all amendments, time extension, clarifications, etc will be uploaded on the http://tenders.iitm.ac.in website only and will not be published in the newspapers and bidders will have to check the website regularly for any updates. The addendum will be binding on them. If the amendment is substantial, Bidder(s) shall be given reasonable time to make amendment or to submit revised bid and the deadline for submission of bids will be extended by the NPTEL Coordinators and this will be decided by the NPTEL coordinators. No extension in the bid due date/time shall be considered on account of delay in receipt of any document by mail.

l) All disputes arising out of this process shall be subject to the jurisdiction of Madras High court, **Chennai, TamilNadu**. The Chairman, Centre for Continuing Education (CCE), IIT Madras reserves the right to award the work or cancel the award without assigning any reason whatsoever. In case of differences, if any, the decision of the Chairman, CCE, IIT Madras, shall be final.

4. Submission of bids

The Tender Document can be downloaded from the website of IIT Madras (www.tenders.iitm.ac.in) in proper form along with all relevant documents.

The Vendor (bidder) shall submit their bid in **two parts**: (1) Technical Proposal, and (2) Commercial proposal, in separate sealed envelopes.

a) The tender is a "2-Bid' document. The technical proposal should contain all the relevant information along with all the relevant enclosures including the compliance sheet. The commercial proposal should contain only the price bid. If any bidder encloses the financial bid within technical bid, the same shall be rejected summarily.

b) The EMD should be Rs 50,000/- (INR Fifty thousand only).
The EMD should be included in the Financial bid which will not be opened for Technical evaluation. Enclosing the EMD in the Technical bid will automatically disqualify the tenderer. EMD should be in the form of DD in favour of "The Registrar, Indian Institute of Technology, Madras" and payable at Chennai. The tender without EMD would be considered as UNRESPONSIVE and REJECTED. Photo/Fax copies of the Demand Draft/Banker's pay orders will not be accepted. No interest will be paid for the EMD and the EMD (Bid security) will be refunded to the Successful bidder on receipt of Performance Security.

The Successful bidder should submit Performance security of an amount of 5% of the value of the contract. The Performance Security may be furnished in the form of an Account Payee DD, FD receipt from the Commercial bank, Bank Guarantee from commercial bank will be an acceptable.

The Performance Security should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

b) All relevant information as specified in the Technical and Commercial Proposals including the contingency plans, and Annexures-1 to 8 should be furnished by the bidders. The bidder is advised to attach any information that is necessary with regard to the capabilities to establish that the bidder is capable in all respects to successfully complete the envisaged work. The bidders are cautioned that not giving complete information called for or deliberately suppressing the information may result in the bidder being summarily disqualified.

c) The Tenders should be typewritten. The name and signature of bidder's authorized person should be recorded on each page of the application. All pages of the tender document shall be numbered and submitted as a package along with forwarding letter on agency's letter head.

d) The offer must remain open for a minimum period of **90 days** from the date of opening of the tender, within which the bidders cannot withdraw their offer.

e) Reference, information and certificates from the respective clients certifying technical, delivery and execution capability of the bidder should be signed and the contact numbers of all such clients should be mentioned. The NPTEL coordinators may also independently seek information regarding the performance from the clients.

f) Even though the bidder may satisfy the qualifying criteria, the bidder is liable to disqualification due to record of poor performance or not able to understand the scope of work etc.

g) The sealed envelopes should be marked (a) "Bid for NPTEL Online examination" from "Vendor Name", "Technical", (b) "Bid for NPTEL Online examination" from "Vendor Name", "Commercial". The larger enclosing envelope should be marked "Offer for NPTEL Online examination" from "vendor name". The contents of Technical and Commercial proposals should be as follows:

4.1. Technical Proposal (including operational proposal)

The technical proposal should consist of bids for any of or both the options given below:

1. Programming testing capability
2. Non-programming testing capability

Hence separate bids (both technical and commercial) need to be submitted for each of the testing capabilities that the vendor is applying for. The bids will be evaluated separately for each of the above two categories.

4.1.1 Programming testing capability

Please refer Annexure 9 for complete details on the requirements and design of the testing platform.

4.1.2 Non-programming testing capability

This includes creation and support for the following forms of testing:

1. multiple choice questions

2. fill in the blanks

3. drag and drop / match the following

4. order the sequence of actions

5. identification of hot spots

6. essay type questions

(the vendor must be willing to consider other formats as requested by the faculty coordinator of the online course from time to time)

The testing options that the vendor can support from the above list need to be clearly specified.

The data requested below should be provided for any/both the options that the vendor is bidding for.

4.1.3. Technical proposal (for each bid submitted) should contain

1. A technical proposal that details the capabilities of the
   - Exam Registration software (which is in accordance with the requirements detailed in section 6.1),
   - Question Paper Authoring Software,
   - Examination Software (Client and Server)
   - software that handles post examination operations (including subjective/manual evaluation, if necessary, and verification of the uploaded data)

   Please provide the feature list as an enumerated list or a table.

2. An operational proposal that gives the following details:

    a. The number of nodes per city that the vendor has qualified as per their process for the list of cities indicated in Annexure 7.

    b. Please also indicate the number of nodes per city on which you have conducted an exam.

    c. Note that for the qualified nodes you MUST have in place an agreement with the institute/college providing the infrastructure.

    d. The projected capability in terms of the number of audited seats in each city that the vendor will be able to identify by the end of October 2014.

    e. The availability of adequate number of technical personnel for conducting the examination in the required number of exam centers. The EP has to submit a complete list of such personnel one week before each exam.

    f. The process followed by the vendor for qualifying an exam center

    g. The procedures followed for the pre-exam, exam and post-exam operations including the capability of the vendor to set up a secure Master Control facility (as indicated in 14) where the post-exam data will be uploaded.

3. A statement that gives the following details of the exams conducted by the vendor in the past 12 months:

    (a) Total number of candidates appeared for the examination,

    (b) Total number of candidates across all the cities in a single session,

    (c) Number of sessions on a day of examination and

    (d) Number of days of examination.

4. A statement that outlines the three largest exams, if any, committed to by the vendor over the period of Oct 2014 - Oct 2015. This should indicate the expected number of candidates for each exam as well as the expected number of candidates in a single session. The vendor may withhold the details of clients for these future exams if that information is confidential.

4.2. Commercial proposal

The commercial proposal should also contain one/two bids corresponding to the number of technical bids being submitted. For each commercial bid, the details below should be submitted.

The commercial proposal should give the details of the charges per registered candidate AND the minimum number of candidates at this rate. If the vendor has slabs at which the rates change, the vendor should indicate the slabs up to 50,000 candidates.

The charges per registered candidate should include the cost towards
(a) charges paid to their technical personnel by the EP during vetting of exam centers,
(b) charges paid by the EP to the college for hiring the infrastructure at the college,
(c) providing partitions at the Exam Centers,
(d) development of the software for registration form for collecting student details/ fee collection/ hall ticket generation
(e) development of question paper authoring software as per NPTEL Online Examination specifications,
(f) development of Exam Software for Online Examination,
(g) deployment of the Company Personnel, i.e. the Test Administrators and Company Representatives at the Exam Centers and the technical personnel at the Master Control Rooms,
(h) administration of Exam ,
(i) payment to college or other personnel involved in the conduct of the examination,
(j) payment to exam invigilators, and
(k) other incidental expenses.

A clear break-up as indicated in (a) to (k) should be provided. The applicable taxes should be indicated in the proposal. For the sake of uniformity across all the exam centers, the EP is advised to maintain uniform rates for infrastructure for all the exam centers and adhere to the same without any deviation.

In the event of any unforeseen circumstances, examinations may have to be held in buffer sessions decided by mutual consultation between NPTEL and the EP.

It may be noted that if any examination has to be conducted on the buffer date due to any technical or non-technical problems from vendor's side, the vendor has to bear the cost of the conduct of the examination as quoted in the commercial proposal.

4.3. Demonstration and Presentation

The vendor will be required to give a demonstration of the following for each submitted

technical bid:
1. Software for registration, payment, centre selection and hall ticket
2. Question paper authoring software
3. Client and server software for online examination

The vendors may be required to make a presentation on their capabilities to conduct the online examination as per the conditions specified above. The date and venue for demonstration and presentation will be announced by the NPTEL Committee.

4.4. Deviations

Any deviations from the scope of work as outlined above should be mentioned clearly with suitable justification by the vendor in a separate sheet under the heading '**Deviations**'. **This sheet should be included in the technical proposal**. If no deviations are mentioned, then it will be assumed that the vendor has accepted the scope of work in its entirety as mentioned in the tender document and is bound to deliver the same.

4.5. Mode of Payment and penalty clauses

The payment to the EP shall be made in Indian rupees and shall be paid only after the successful completion of the entire work without any delays or errors. **No advance payment shall be made.** The successful bidder has to **sign an agreement** on non-judicial stamp paper which shall contain **penalty clauses** related to **liquidated damages** on account of **delays**, **errors**, **cost and time overruns** etc. If the bidder fails to execute the contract, the NPTEL committee shall have the liberty to get the work done through any other agency with full cost recoverable from the bidder in addition to damages and penalty.

5. Evaluation of the Proposals

Selection of the vendor shall be based on Quality and Cost Based Selection (QCBS). The proposals will be evaluated by taking the following factors into consideration:

5.1. Technical evaluation

Technical evaluation will be based on the criteria given below (Total 100 points):

1. Prior experience of the vendor in conducting online examinations
2. Capability of the vendor to develop the required software
3. Capability of the vendor to support different question formats
4. Availability of adequately trained personnel in the Company to conduct the examination in the required number of centers and cities
5. Capability of the vendor to identify the required number of audited nodes in the cities listed. It is desirable that the vendor should have conducted examination for at least 50,000 candidates in a single session in the past one year. The vendor must submit **city-wise list of nodes** vetted and available as on 1 September 2014.
6. Standing of the agency and its financial position
7. Security and software quality certification

Technical evaluation of the offers shall be carried out by a sub-committee constituted specially, for this purpose by NPTEL Office, IIT Madras. The Technical Evaluation Committee may call the bidders for presentation or clarifications to assess the understanding of the bidder regarding the scope and magnitude of the work. However, whether to call the bidder for discussion or not is at the sole discretion of the NPTEL Office, IIT Madras.

5.2. Commercial Evaluation

The commercial bids of only those bidders who have been found to be technically eligible (with scores higher than 70 points from Technical evaluation) by the constituted sub-committee shall be opened. The commercial bids shall be opened in the presence of the eligible bidders' or their representatives. The NPTEL Office, IIT Madras shall intimate the time and venue of opening of the commercial bids at a suitable date. The commercial scores of the bidders would be normalized on a scale of 100, with the lowest quote getting a score of 100 and the rest being awarded on a pro-rata basis.

5.3. Final Evaluation

Final selection of the vendor shall be based on Quality and Cost Based Selection (QCBS) with 70 % weightage for technical evaluation and 30 % weightage for commercial evaluation.

6 Detailed scope of work

6.1 Registrations for certification examination

6.1.1. The vendor will have to create a registration form for the students. The registration form should begin with the student logging in with their Gmail Id, which should be authenticated using Google Auth. After authentication, the student's personal details such as Full Name, Date of birth, their contact mobile number, postal address to be used for communication purposes, the institute they study in / work with along with a provision to upload their photograph and signature.

6.1.2. This form should be live and ready to use when payment for certification exam is enabled.

6.1.3. The payment options should be handled by the vendor and reconciliation of all data, including any issues with respect to payment, should be done by the vendor and communicated to the NPTEL office. Upon successful payment, assign NPTEL registration number, as per mutually agreed format.

6.1.4. The registration data received should be shared with the NPTEL office on a regular basis. All errors and duplications must be corrected by the vendor and only the fully verified details must be given to NPTEL.

6.1.5. The exam dates and exam centres should be available as a menu option with number of slots available in each session visible to the student. The student should be able to view the seat availability in the city of choice for the dates desired, before he pays the registration fee for the exam. On his payment of the registration fees, the seat chosen should be booked for him.

6.1.6. As soon as the student completes the registration process, he should be issued his e-hall ticket, which needs to be brought on the day of the exam.

6.1.7. The vendors should have a helpdesk to handle and resolve all queries with respect to 6.1.1 to 6.1.6 from the students

6.2 Administering the Examination

The procedures followed for admitting the candidate into the exam hall, the processes to be followed during the duration of the exam and after the exam is completed, need to be described clearly.

6.3 Post Processing

The evaluation of the exam, if online, needs to be done within 7 days and the results should be shared with the NPTEL office.

If the evaluation requires manual intervention, the EP should coordinate with the course coordinator to have the exam evaluated and obtain the scores. The EP should hand over the manual sections to the exam coordinator in a suitable format within 7 days of the completion of the exam.

The attendance sheet and scores of all candidates should be shared with the NPTEL office within 7 days of the course coordinator completing the evaluation of the manual sections.

6.4 Helpdesk/ phone/ email

EP should maintain a 24x7 manned helpdesk which will be able to respond to user queries in the form of phone calls as well as emails with a turnaround time of 1 day. The service is required from the day registrations for the certification exam are opened to the day the certificates are dispatched and the course is announced as officially closed.

All announcements, reminders, and other information to the candidates must be sent by email and sms on a regular basis.

6.5 Tentative dates for exams for the 2 online courses being offered in September-November 2014 – Programming in C and Basic Electrical Circuits.

Session	Time	Day and date
1	10.00 AM to 1.00 PM	Saturday, 29 November, 2014
2	10.00 AM to 1.00 PM	Sunday, 30 November, 2014
3	10.00 AM to 1.00 PM	Saturday, 13 December, 2014
4	10.00 AM to 1.00 PM	Sunday, 14 December, 2014

In the event of any unforeseen circumstances, examinations may have to be held in the buffer sessions on one or more of the unused weekends between 29 November 2014 and 21 December, 2014.

6.5.1 Dates for exams of subsequent courses:

For each of the subsequent courses exams will be run on 4 different days, a session a day, preferably consecutive or alternate weekends, which will be indicated when the respective courses commence.

7. Detailed description of the features and scope of work for conduct of exam:

The following sections list the features in the Online Examination that the EP is expected to provide through their technology and operations, and the capabilities of the EP needed for delivery of the Online Examination:

7.1 Exam question paper creation

1. The EP would provide the Question Paper Authoring software and train the course coordinator on Question Paper Authoring and Question Pack Generation.
2. The EP should be **willing to modify** the Question Paper Authoring Software as per the requirements of the NPTEL committee. These requirements will be communicated to the EP as and when required, but well before the beginning of the actual authoring process.
3. Question Paper authoring will be carried out by the faculty coordinators and the necessary infrastructure required for Question Paper Authoring will be provided by

NPTEL office. However, the EP has to provide the infrastructure requirement and set up a model exam facility that will be tested with dummy question papers.

4. The authoring software must support the features as requested by the faculty coordinator of the course.

5. The Question Paper Authoring software must allow for creating multiple versions of a question paper by jumbling the questions and the choices for a question.

6. Authoring software must allow for encryption and password protection. The EP should provide the certificate of confidentiality with regard to contents of all the question papers.

7.2 Exam Centers, Personnel, Infrastructure, Administration, Exam Delivery and Post-examination Operations

1. Examination Cities- The tentative list of cities in which the NPTEL Online Examination may be conducted is given in Annexure-7. The final list of cities will be identified by the NPTEL Coordinators at a suitable date. The minimum number of centres (evenly distributed all over India) expected is 100.

2.Exam Centers – The EP would arrange to identify Exam Centers that have been certified and audited by the EP. A College may have one or more Exam Centers. The Internal Training Facilities (ITF) of the EP may be used as exam centers. The minimum requirements for the candidate system and center server are given below:

Minimum requirements for the candidate system

Screen resolution	1024 X 768
Operating System	Windows XP Professional Service Pack 3 Microsoft Windows Server 2003 Enterprise Edition Service Pack 2, Windows Vista Enterprise Edition
Browser	Internet Explorer 6.0 or above as supported by above Operating systems
Browser Settings	Internet Explorer (IE) Java Script enabled Pop-up blocker disabled Paste operations via script enabled Proxy disabled USB disabled

Minimum requirements for the Examination Center Server

Processor	CPU Speed: 1.5 GHz or more
RAM	2048 MB or more
Screen Resolution	1024 X 768
Operating System	Windows XP Professional Service Pack 3 Microsoft Windows Server 2003 Enterprise Edition Service Pack 2, Windows Vista Enterprise Edition
Browser	Internet Explorer (IE) 6.0 or above as supported by above Operating systems
Browser Settings	IE Java Script enabled Pop-up blocker disabled Paste operations via script enabled Proxy disabled USB disabled
Other software	Net 2.0 Framework Microsoft Office Excel 2003 or above

3. Personnel

Personnel of Exam Partner: The EP would provide adequately trained Test Administrators (TAs) in every Exam Center. The TAs should be the staff of the EP, temporary staff of EP are not acceptable. There will be one TA for every 100 candidates and part thereof at a Exam Center. There will be a minimum of two TAs in a Exam Center with 200 or more candidates in a session. The TAs will administer the conduct of Exam and provide the technical support for maintaining the servers used in the conduct of examination at a Exam Center. The EP will also ensure availability of at least one adequately trained Network Maintenance Engineer at each Center. The EP would identify a senior staff member of the Company as the Center Head (CH) at each College or ITF. The CH will be responsible for supervising the Technical Personnel of the EP at all the Exam Centers in the College or ITF. The CH will be the contact person of the EP for the College Personnel and the course coordinator to interact regarding the conduct of Online Examination at the College or ITF.

i. **College or ITF Personnel:** A senior faculty member from the College or a senior staff member of the ITF will be identified as the Presiding Officer (PO), if the number of candidates exceeds 100 in a single session. The PO for a Exam Center will be responsible for the availability of facilities to assist the EP in conduct of the Online exam. Invigilators (Proctors) of the exam will be from the faculty members of the College or from the permanent staff members of the ITF. There will be one invigilator for every 20 candidates and part thereof at a Exam Center. At a Exam Center with less than 20 registered candidates, there will be a minimum of 2 Invigilators. The EP should train the Invigilators for invigilating the Online Examination. There will be two Technical Staff from the College or the ITF at each Exam Center to assist the TAs from the EP. The PO will be responsible for identifying the Invigilators and Technical Staff for all the Exam Centers at the College or the ITF. **The honorarium for PO, Invigilators and Technical Staff of the College or the ITF will be paid by the EP. The PO will also be responsible for ensuring the availability of infrastructure for the conduct of examination at all the Exam Centers in the College or the ITF**.

The PO at the Exam Centers in a College or an ITF will interact with the CH for resolving any issues regarding the Technical Personnel of the EP and any technical problems that may arise during the dry run and during the conduct of examination at any of the Exam Centers in the College or ITF.

4. Infrastructure

- The EP would arrange for the servers necessary, and any necessary backup to conduct the examination at each Exam Center.
- The College or the ITF would arrange for the client systems necessary to conduct the examination at each Exam Center. One client system will be available for every candidate registered at each Exam Center. There will be a reserve pool of client systems. The number of systems in the reserve pool will be at least 10% of total number of registered candidates in a session at a Exam Center. However, there will be a minimum of 10 client systems in the reserve pool at a Exam Center with less than 100 candidates in a session. The client system should have at least 1GB of main memory. LCD monitors are preferred over CRT monitors.
- There must be adequate spacing (**of at least 2 ft.**) between two adjacent seats. In addition the EP must arrange for providing **partitions** of appropriate size between the adjacent seats.
- The College or the ITF would also ensure the availability of a functional local area

network and a power backup generator. All systems and network equipment at each Exam center should be provided with functional UPS. Uninterrupted power should be made available for the period of each session and for 30 minutes prior to and after each session on the day of examination.

5. Exam Delivery

The proposal submitted by the vendor should indicate the manner of Exam delivery and the limits to which the server has been tested in terms of number of client systems connected simultaneously without loss of performance in the examination environment.

6. Distribution of Question Packs to the Exam Centers

The Online Examination Software developed and used by the EP must ensure confidentiality and protection of the QP content both at the Master Control Room as well as during transfer over a network. The loading of a QP into the Online Examination Software on the servers at an Exam Center must be password protected.

7. Invigilation

Announcement of instructions to the candidates, admit card check, candidate identity verification, attendance recording and collection of undertaking given by candidates will be carried out by Invigilators. Attendance sheets, Instruction sheets and other relevant documents would be provided by EP. Invigilators should also ensure proper conduct of examination and ensure that candidates use no unfair means.

8. Zero Loss of Data

The EP will ensure that there is no loss of response related data for any candidate or any other data related to the examination either from the client systems or the servers.

9. Generation of Event based Log (Audit Trail)

The EP will ensure that the event (click and keyboard) based log (audit trail) for every candidate will be generated and saved on the servers. The audit trail for every candidate would be provided at the end of session in the format agreed upon. The EP would not keep/have any audit trail data with them post handover.

10. Saving of Response

The EP will ensure that the click-based and keyboard based activity of every candidate will be saved on servers. This means that the answer responses for each question at that click time will be only saved/updated. The question clicks by candidates without a response are also

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recorded in the database. The final response data in a format specified by NPTEL should be uploaded to the server in the Master Control Room within 30 minutes of the completion of each session of examination. The EP will not keep/have any response data with them post handover.

11. Security

The computers administering the examinations should not be able to connect or access any other machine or network other than the one on which the examination is being conducted. The computers shall be sanitized (during pre-examination preparations).

12. Monitoring

The server shall have the capability to start the examination for all candidates, monitor the status of each candidate (whether logged in, examination started, idle/active, disconnected, submitted, etc.), award additional time for candidates (only with approval of NPTEL)and close the examination. The server MUST maintain an audit trail of every operation on the server. All server-side audit trails are also the property of NPTEL and shall be handed over at the end of the examination.

13. Master Control Facility

There will be one or more Master Control Facilities fully operated by the EP in a Data Center, which should be accessible for monitoring by NPTEL. The activities at each Exam Center will be monitored in the Master Control Facility. At the Master Control Facility, the EP should provide at least 2 technical personnel who are well versed with the Online Examination Software. These personnel will interact with the TAs in each of the Exam Centers. A secure and highly reliable server should be set up in each Master Control Facility. At the end of examination in a session, the candidate response data and audit trail data from each of the Exam Centers will be uploaded to the servers at the Master Control Facility.

14. Post-Examination Operations

Individual candidate-wise, item-wise responses and audit trail will be captured and loaded into a physical storage medium such as CDs or pen drives. The CDs or pen drives will be handed over to NPTEL. The data will also be uploaded to a server at the Master Control Facility. After the confirmation of proper transfer of data to the server at the Master Control Facility, the TAs will delete the responses and audit trails in the hard disks of any local server (if applicable). The EP will maintain the data in a secure manner till instructed by NPTEL to delete the same.

15. Process Manual - The detailed Standard Process Manual (SPM) will be prepared by the EP and submitted to NPTEL for approval two weeks prior to the exam.

Mock Exams

    a) The EP must make arrangements so that static mock exams can be conducted by the interested candidates, if necessary using question papers provided by the NPTEL team. The static mock exams should be available to all the applicants at least two weeks before the actual examination so that the candidates can have practice sessions.

    b) URL for the mock exam should be sent to every registered candidate by email and sms as soon as the mock exam is available.

16. Conduct of Examination and Security of Examination Centers

    ii. **White labeling of the service:** The entire operations of the NPTEL online examination will be under the Brand name of NPTEL, and its designated logo. At no point of time and location will the identity of EP be displayed in public domain.

    iii. The EP and the College or the ITF shall ensure that the Exam Centers are kept in examination-friendly environments with no disturbances from external sources. The EP will also ensure the secrecy of the examination material and will support NPTEL in maintaining the secrecy of the examination material. Any decision by the NPTEL in this regard shall be final. The EP will also ensure that the examination is held in a candidate-friendly environment and enough security arrangements have been made to ensure the safety of examination material and the persons involved in the conduct of examination.

    iv.

17. Features to be Provided in Online Examination Exam Software

The Online Examination Exam Software should include the following features:

1. Keyboard should be disabled, depending on the options used in the question paper
2. Login using a virtual keypad
3. Display of details of candidate (including a photograph) upon login for verification by the candidate and invigilators.
4. Display of instructions to candidates upon login and before start of examination. The candidate must be able to retrieve instructions at any time during the examination as well. **The software must obtain concurrence of the candidate having read the instructions before start of examination.**
5. Start and closure of the examination at scheduled time (candidates must not be able to start their examination even if they login before the scheduled time).
6. Display of remaining time available

7. Display of candidate details on the screen (including a photograph if available) during the examination.
8. Viewing the complete question paper or a section in the case of sectional papers.
9. Display of a selected question with choices of answers for multiple choice type questions.
10. Display of a selected question and a virtual numeric keypad for numerical answer type questions.
11. Marking/unmarking a question (answered or unanswered) for review.
12. Display of status of questions using different colors and symbols for all questions of the paper.
13. Switching between sections in the question paper (if applicable)
14. Disabling of exit from exam software for the period of examination, i.e., the candidate cannot exit at any point of time during the entire duration of the exam.

Annexure -1: Financial Information

Details furnished below are to be supported duly by figures in Balance Sheet, Profit & Loss Account for the last 5 years as certified by the Chartered Accountant and submitted by the bidder to the Income Tax Department

Details	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
1) Gross annual turnover for works of similar nature					
2) Profit/Loss					
3) Financial position					
a) Cash					
b) Current assets					
c) Current liabilities					
d) Working capital					
e) Current Assets to Liabilities Ratio					

Documents to be attached along with the above statement:

a) Up-to-date Income Tax Clearance Certificate

b) Certificate of Financial soundness from the bankers of the Bidders

c) Financial Arrangements for carrying out the proposed work

d) Any other relevant documents

(Signature of Bidder)

Annexure-2: Details regarding works of similar nature executed in the past 2 years

Sl. no	Name of the work	Client's organization	Cost of work (in Crores)	Starting date	Ending date	Details of officer to whom reference can be made	Remarks

(Signature of bidder)

Annexure-3: Projects of similar nature currently under execution

Sl. no	Name of the work	Client's organization	Cost of work (in Crores)	Starting date	Expected date of completion	Details of officer to whom reference can be made	Remarks

(Signature of bidder)

Annexure-4: Performance Report for works referred in Annexures-2 and 3

(Please furnish the following details for each individual project from the Client)

1. Name and location of project:

2. Agreement No.:

3. Estimated Cost

4. Tendered Cost:

5. Date of Start:

6. Date of Completion

        a) Stipulated date:

     b) Actual date:

7. Performance report by client:

a) Quality of Work: (Excellent/Very Good/Good/Fair/Poor)

b) Approach to problem solving: (Excellent/Very Good/Good/Fair/Poor)

c) Resourcefulness: (Excellent/Very Good/Good/Fair/Poor)

Date: (Signature of the client with seal)

Annexure-5: Structure of the Organization

1. Name and address of bidder :

2. Telephone No./Fax No./Email address :

3. Legal status (Attach copies of original document defining the legal status).

a) An Individual/ Consortium:
b) A Proprietary/ Partnership agency:
c) A Trust:
d) A Limited Company or Corporation:

4. Particulars of Registration with various
Government bodies & Statutory Tax Authorities
(attach attested photocopy)
       a. Registration Number:
       b. Organization/Place of registration:
       c. Date of validity:

5. Names and titles of Directors & Officers with
designation to be concerned with this work
with designation of individuals authorized to
act for the organization.

6. Were you or your company ever required to
suspend the work for a period of more
than six months continuously after you
commenced the works? If so, give the
name of the project and reasons for not
completing the work.

7. Have you or your constituent partner(s) ever
left the work awarded to you incomplete? If
so, give name of the project and reasons for
not completing the work.

8. Have you or your constituent partner(s) been
debarred/black listed for tendering in any
organization at any time? If so, give details.

9. Area of specialization and Interest

10 Any other information considered necessary
but not included above.

Annexure-6: Details of Technical and Administrative Personnel to be employed for this work

Sl. no	Designation	Total No. of employees in this category	Number available for this project	Name	Qualification	Professional experience	Capacity in which the employee was involved in this work

(Signature of the bidder)

Tentative List of Cities for the certification exam

IISc Bengaluru Zone

S.No.	City
1	Anantapur
2	Belgaum
3	Bengaluru
4	Davengere
5	Hubli
6	Hyderabad
7	Kannur (Kerala)
8	Kollam
9	Kottayam
10	Kozhikode
11	Kurnool
12	Mangalore
13	Mysore
14	Palakkad
15	Secunderabad
16	Surathkal
17	Thrissur

IIT Bombay Zone

S.No.	City
1	Ahmedabad
2	Ahmednagar
3	Amravati
4	Aurangabad
5	Gulbarga
6	Jalgaon
7	Kolhapur
8	Mumbai
9	Nagpur
10	Nanded
11	Nashik
12	Navi Mumbai
13	Pune
14	Rajkot
15	Sangli
16	Solapur
17	Surat
18	Thane
19	Vadodara

IIT Delhi Zone

S.No.	City
1	Ajmer
2	Bikaner
3	Delhi
4	Faridabad
5	Gurgaon
6	Indore
7	Jaipur
8	Jodhpur
9	Kota
10	Udaipur
11	Ujjain

IIT Kanpur Zone

S.No.	City
1	Agra
2	Aligarh
3	Allahabad
4	Bareilly
5	Bhopal
6	Gwalior
7	Jabalpur
8	Kanpur
9	Lucknow
10	Varanasi

IIT Guwahati Zone

S.No.	City
1	Agartala
2	Asansol
3	Dhanbad
4	Durgapur
5	Guwahati
6	Imphal
7	Jorhat
8	Kalyani
9	Patna
10	Silchar
11	Siliguri
12	Tezpur

IIT Kharagpur Zone

S.No.	City
1	Bhubaneswar
2	Bilaspur
3	Cuttack
4	Jamshedpur
5	Kakinada
6	Kharagpur
7	Kolkata

S.No.	City
8	Raipur
9	Ranchi
10	Rourkela

S.No.	City
11	Sambalpur
12	Vijayawada
13	Visakhapatnam

IIT Madras Zone

S.No.	City
1	Bapatla
2	Chennai
3	Chidambaram
4	Coimbatore
5	Ernakulam
6	Guntur
7	Kadapa
8	Madurai
9	Nellore
10	Puducherry (Pondicherry)
11	Salem
12	Thanjavur
13	Thiruvananthapuram
14	Tiruchirapalli
15	Tirunelveli
16	Tirupati
17	Vellore
18	Warangal

IIT Roorkee Zone

S.No.	City
1	Amritsar
2	Bathinda
3	Chandigarh
4	Dehradun
5	Ghaziabad
6	Haldwani
7	Hamirpur (HP)
8	Hisar
9	Jalandhar
10	Jammu
11	Kurukshetra
12	Meerut
13	Muzffarnagar
14	Noida
15	Patiala
16	Rohtak
17	Roorkee
18	Shimla

ANNEXURE 8 – COMPLIANCE SHEET (TO BE ADDED)

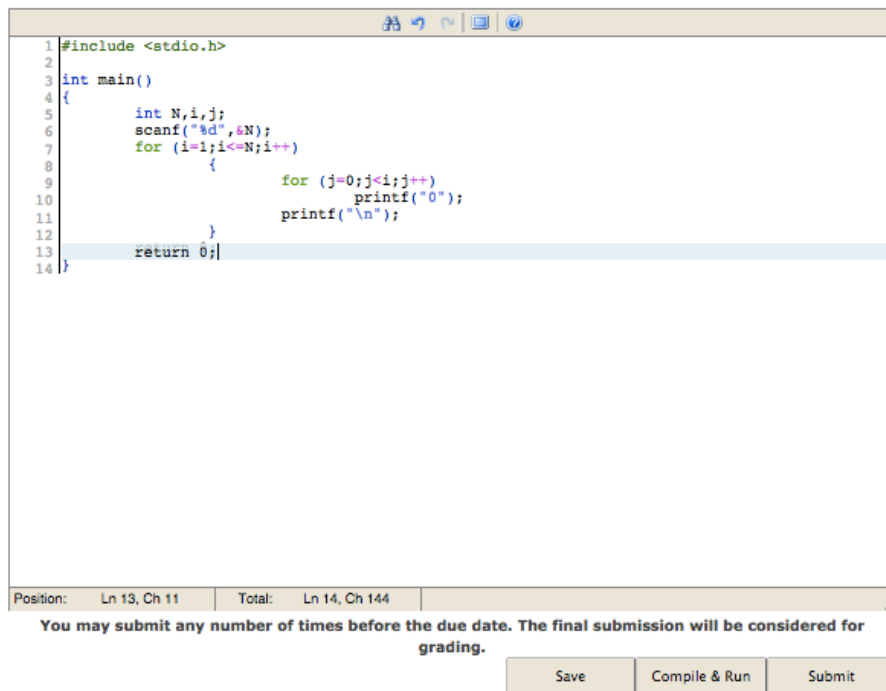| S.No	Criterion (to be filled in by the vendor)	Satisfy – Yes/No	If deviation - specify
1	Turnover in the last 2 years – more than INR 20 crores?		
2	Own the copyright of source code?		
3	ISO 27001 certified?		
4	CMMi Level 5 certified?		
5	Technical proposal contains		
	a. details of registration software, question paper authoring software, exam software and post processing software		
	b. the operational proposal		
	c. details of exam conducted the last 12 months		
	d. largest 3 committed exams		
6	Commercial proposal contains the breakup of costs?		
7	Annexures 1-6 have been filled and submitted?		

Specification of Online Programming Questions

For programming courses, the questions in the certification exam will be programming questions. Typically, four programming problems will be given with public and private test cases. The methodology of these questions is similar to that of online automatic judging of programming competitions using spoj (http://www.spoj.com/) or mooshak (https://mooshak.dcc.fc.up.pt/). We explain the required features of the programming questions and show here screenshots from our online portal (https://onlinecourses.nptel.ac.in) to clearly convey the required features.

Question page

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```
1  #include <stdio.h>
2
3  int main()
4  {
5          int N,i,j;
6          scanf("%d",&N);
7          for (i=1;i<=N;i++)
8              {
9                      for (j=0;j<i;j++)
10                         printf("0");
11                 printf("\n");
12             }
13         return 0;
14 }
```

Position: Ln 13, Ch 11   Total: Ln 14, Ch 144

You may submit any number of times before the due date. The final submission will be considered for grading.

| Save | Compile & Run | Submit |

Sample Test Cases

	Input	Output
Test Case 1	2	0 00
Test Case 2	6	0 00 000 0000 00000 000000

1. The question text comes on top.
2. Next is the editor window, where the candidate enters the code.
3. Below the editor, there are buttons for save, compile&run, submit.
4. At the bottom, public test cases with input and correct output are shown.
5. When the candidate presses "Save", the code in the editor needs to be saved with a filename that indicates the candidate registration number, problem id and timestamp.

Compile & Run

Successful compile and run

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```
1  #include <stdio.h>
2
3  int main()
4  {
5          int N,i,j;
6          scanf("%d",&N);
7          for (i=1;i<=N;i++)
8                  {
9                          for (j=0;j<i;j++)
10                                 printf("0");
11                         printf("\n");
12                 }
13         return 0;
14 }
```

| Position: | Ln 1, Ch 1 | | Total: | Ln 14, Ch 144 | |

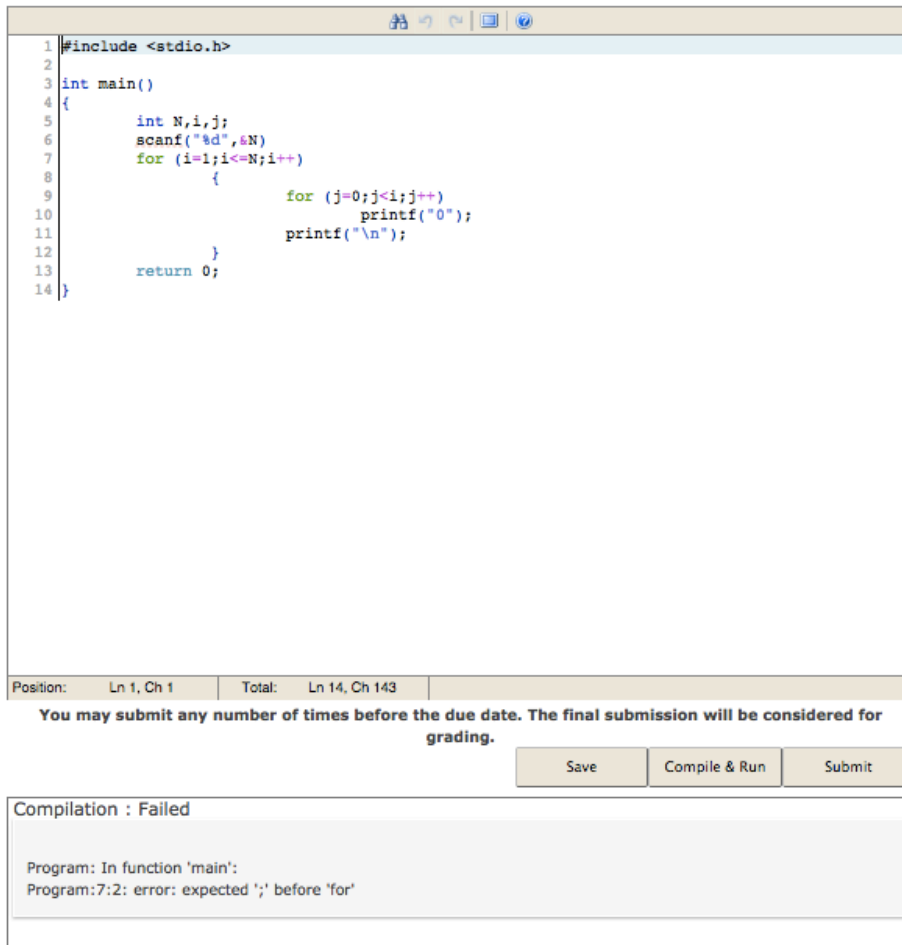You may submit any number of times before the due date. The final submission will be considered for grading.

| Save | Compile & Run | Submit |

Compilation : Passed
Tests : 2 / 2 Passed

| Test Case 1 | **Passed** |
| Test Case 2 | **Passed** |

1. When "Compile & Run" button is pressed, the code is compiled and run with the inputs from the public test cases.
2. The result of compilation is shown first.
3. The output from the code is compared with the expected output.
4. If the output from the code is correct, "Passed" is printed for the corresponding test case.
5. The number of test cases passed is also shown on the top.
6. The code that is compiled needs to be saved with the same filename convention as mentioned earlier.

Compilation error

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```c
1  #include <stdio.h>
2
3  int main()
4  {
5          int N,i,j;
6          scanf("%d",&N)
7          for (i=1;i<=N;i++)
8              {
9                      for (j=0;j<i;j++)
10                         printf("0");
11                     printf("\n");
12             }
13         return 0;
14 }
```

Position:	Ln 1, Ch 1	Total:	Ln 14, Ch 143	

You may submit any number of times before the due date. The final submission will be considered for grading.

Save	Compile & Run	Submit

Compilation : Failed

Program: In function 'main':
Program:7:2: error: expected ';' before 'for'

1. If compilation failed, the error message should be printed as above.

Runtime error

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```c
#include <stdio.h>

int main()
{
        int N,i,j;
        scanf("%d",&N);
        for (i=1;i<=N;i++)
                {
                        for (j=0;j<i;j++)
                                printf("%d",1/j);
                        printf("\n");
                }
        return 0;
}
```

Position: Ln 1, Ch 1   Total: Ln 14, Ch 149

You may submit any number of times before the due date. The final submission will be considered for grading.

| Save | Compile & Run | Submit |

Compilation : Passed
Tests : 0 / 2 Passed

Test Case 1   **Runtime Error**

Input	Expected Output	Actual Output
2	0\n 00\n	

1. If a test case caused a runtime error, that should be indicated as above.

Incorrect output

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```
1  #include <stdio.h>
2
3  int main()
4  {
5        int N,i,j;
6        scanf("%d",&N);
7        for (i=0;i<N;i++)
8              {
9                    for (j=0;j<i;j++)
10                        printf("0");
11                   printf("\n");
12              }
13       return 0;
14 }
```

Position:	Ln 1, Ch 1	Total:	Ln 14, Ch 143	

You may submit any number of times before the due date. The final submission will be considered for grading.

Save	Compile & Run	Submit

Compilation : Passed
Tests : 0 / 2 Passed

Test Case 1   **Wrong Answer**

Input	Expected Output	Actual Output
2	0\n 00\n	\n 0\n

1. If compile & run was successful, but the answer is wrong for some test case, this should be indicated as above.
2. The expected output and the actual output must be shown on the screen as above.

Submission page
Correct submission

You are given a positive integer N. You have to print N rows as follows. The first row consists of one 0, the second row 2 zeroes, and so on, until the Nth row, which consists of N zeroes.

```
1  #include <stdio.h>
2
3  int main()
4  {
5          int N,i,j;
6          scanf("%d",&N);
7          for (i=1;i<=N;i++)
8              {
9                      for (j=0;j<i;j++)
10                         printf("0");
11                     printf("\n");
12             }
13         return 0;
14 }
```

Position: Ln 1, Ch 1   Total: Ln 14, Ch 144

You may submit any number of times before the due date. The final submission will be considered for grading.

[Save]   [Compile & Run]   [Submit]

You scored 100.0/100

1. When the candidate presses "Submit", the code is compiled and run with private test cases as input.
2. The private test cases are not to be shown to the candidate. These are used only for the final evaluation.
3. The score displayed should show the percentage of private test cases passed.
4. If all test cases passed, the score is 100/100. If 3 out of 4 private test cases passed, the score is 75/100 and so on.
5. All submitted code must be saved with the filename convention mentioned earlier.

Important points to be considered

1. All compilation and/or runtime scenarios must be gracefully handled and should not result in any errors from the server.
2. Memory problems and infinite loops must be handled gracefully.
3. The compiler to be used will be an open source (mostly GNU) compiler for the language. The NPTEL office or course instructor will give the exact version.
4. An open source syntax-highlighting editor is to be used in the browser.
5. The compilation server needed for programming questions needs to be suitably configured to ensure a quick response time to candidates during the exam.
6. The connections needed form the candidate machines to the servers or between servers must be robust and suitably configured.

Integrated Development Environment (IDE) on candidate machines

1. As a failsafe option, an IDE for edit/compile/run is to be installed on all candidate machines. The NPTEL office or course instructor will provide all necessary installation files for the IDE.

2. The installation and testing of the IDE on each candidate machine is the full responsibility of the exam partner.
3. The candidate is to save one final submission file on a local folder with the following file naming convention: A.c, B.c, C.c, D.cpp for Problems A, B, C, D etc.
4. This local folder will be named with the registration number of the candidate.
5. At the end of the exam, all local folders should be handed over on a pen drive to the NPTEL office.