

Information regarding the Common Screening Exam for admission to programs: EEX (X=N, Y, Z) and JVX (X=L, Y)

Integrated Electronics & Circuits (IEC) Thematic Group, and
the VLSI Device Tools & Technology (VDTT) Program

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1 Background

The IEC thematic group at the Department of Electrical Engineering, IIT Delhi is an intellectually diverse microcosm of its parent Department. It requires students with prior preparation in almost all science, technology, engineering, mathematics and even medicine-related (STEMM) areas. The VDTT program, which is an industrially focused program, offered in conjunction with Department of Computer Science and Engineering, and the Center for Applied Research in Electronics, has a similar need for a wide variety of student preparation. Given the following factors:

- unevenness in academic preparation of the applicant cohort, and the need to establish a common measure of intellectual capacity for candidates coming from a vast mix of backgrounds,
- topically diverse but stringent intellectual needs of the IEC group and the VDTT program for supporting the pedagogical postgraduate programs, as well as the research programs (EEY, EEZ and JVY)¹,

and consistent with trends elsewhere, it is necessary to screen applicants' abilities to reason logically, demonstrate basic quantitative skills, and reading comprehension of complex text (in English) of the sort commonly encountered in technical documents such as journal articles, patents, conferences, etc., before their scholastic abilities are closely examined in a potential face to face interaction. The interviews conducted by the IEC thematic group, and the VDTT program will thus be conducted in two steps:

1. A short (~ 45 min) common screening exam (CSE);
2. Face-to-face interaction with candidates who qualify the exam².

2 The Common Screening Exam (CSE)

Since our aim is to test the ability of applicants to think logically, carry out basic quantitative tasks (requiring no more than 10-12th grade mathematics knowledge), and to understand complex text, the exam will be completely devoid of any scholastic content. To be specific, nothing specific to any STEMM discipline will be tested. To discourage any guesswork, all questions will carry negative scoring.

2.1 Sample Questions

The questions provided below are roughly representative. In actual practice, the questions posed may be significantly more difficult than these:

1. Consider the text sequence: `_aa_ba_bb_ab_aab`. Which of the following choices complete the missing letters:
 - (a) aaabb
 - (b) babab
 - (c) bbaab
 - (d) baabb

¹A research or project intensive position is by its very nature quite different from pedagogical courses such as B. Tech, BE, etc. The ability of a candidate to think independently, logically, carefully and quantitatively, and to read and understand complex text are non-negotiable primary skills of interest to the selection process.

²This will be based on the number of positions available, and government mandates regarding reservations under various categories.

2. A is the son of B. B's sister C has a son D and a daughter E. F is the maternal uncle of D. How many nephews does F have?
- (a) None
 - (b) 1
 - (c) 2
 - (d) 3
3. In a group of able bodied cows and hens, the number of legs exceed twice the number of heads by 14. What is the number of cows?
- (a) 5
 - (b) 7
 - (c) 10
 - (d) 12
4. If $A = \int x^2 dx$, which of the following is the value for A?
- (a) $2x$
 - (b) x^3
 - (c) $\frac{x^3}{3}$
 - (d) None of these.

5. Consider the following passage: In the 16th century, which was an age of great maritime exploration and conquest, the name of Sir Francis Drake takes precedence over nearly all others. Sir Drake was the third known human to circumnavigate the globe in a single expedition between 1577 and 1580. He was also known to participate in the early English slaving voyages of his cousin, Sir John Hawkins, and John Lovell. Having started his naval career as a simple seaman, in the fateful year of 1588, he became part of the desperate fight of England against the Spanish Armada as a vice-admiral.

He also served sometimes as member of Parliament, starting in 1581. He was a hero to the English, but his privateering ways caused the Spanish to brand him a pirate, known to them as *El Draque* ("The Dragon" in medieval Spanish). He died of dysentery after his failed assault on Panama in January 1596.

Now answer the following questions, based on the above passage.

- (a) The English considered all slavers to be heroes in the middle ages. This explains their almost endless greed to colonize large parts of the world.
 - i. This statement is very likely to be false.
 - ii. This statement is very likely to be true.
 - iii. This statement cannot be inferred from the above passage.
 - iv. None of the above.
- (b) Vice admirals in the English Navy often served as simple seamen.
 - i. This can be inferred from the above passage.
 - ii. This cannot be inferred from the above passage.
 - iii. This statement is illogical, based on the above passage.
 - iv. More than one option is correct.
- (c) Which of the following statements is definitely false?
 - i. Sir Francis Drake was the first Englishman to circumnavigate the globe in a single expedition.
 - ii. John Lovel was not a cousin of Sir Francis Drake.
 - iii. Sir Francis Drake became a dragon late in life.
 - iv. Sir Francis Drake died outside England.

2.2 How should I prepare for the CSE?

No specific preparation is needed, since you completed at least 12 grades of education. Bring a thinking and well-rested mind. Best wishes.

Any other needed information regarding the conduct (exact venue, etc.) of the CSE will be provided on the day of the exam. Please plan to arrive at the location specified in email communications sent to you by the respective program coordinators.

3 Shortlisting of candidates

No academic or research program can hire more students than it can financially support through grants from various sources³. This limitation, coupled with compliance with Government of India reservation mandates, as well as the need to provide a certain minimum number of candidates for face to face interaction for each position⁴, will determine the number of shortlisted candidates after the exam is conducted. Thus, no cutoff scores for the exam can be released ahead of time, as they would be meaningless at this stage. Any cutoffs would depend strongly on the performance of the cohort taking the exam, as well as hiring needs of the IEC group / VDTT program, which vary from time to time.

Once the shortlist is posted a couple of hours after the exam, we will request the qualified candidates to either proceed directly to the face to face interaction, or make arrangements, as previously advised, to stay an additional day to attend the face to face interaction on the following day.

Applicants who do not make the shortlist will be requested to depart from the interview venue as soon as possible.

4 Content of the Face to Face interaction

Your performance in the CSE, once you are shortlisted for the face to face interaction, will not play any further role in determining your chances for selection.

The face to face interaction will happen with the interview committee. Please be punctual in arriving at the specified venue, and be patient in awaiting your turn. There is no fixed time for the length of the face to face interaction.

Depending on the position you are interested in, questions examining your scholastic, project, etc. preparation may be posed by committee members. Based on your responses, the committee may or may not seek to delve deeper to determine the actual strength of your preparation. Keep documents such as theses, project reports, any small prototypes, copies of manuscripts published in reputable journals, any certifications, or other supporting evidence of your relevant skills, etc., handy in case the committee is interested in examining them.

³Including any grants that a student may bring in through an extramural fellowship such as CSIR, UGC, DST INSPIRE, etc.

⁴All applicants will be provided a link to register their interest in the positions available sometime before their exam starts. It is assumed that as serious applicants to research/pedagogical positions, you will have familiarized yourself with the research interests of our faculty.