SOFTWARE IMPLEMENTATION: NIC / IITK [VERSION: {1.2.1/1.2}]

What is given below is not exhaustive but is only illustrative. Testing and implementing teams have to give a written report along these lines.

(1) Mode of validation: None, Manual, Partly automated [partly manual, partly automated e.g., MS-EXCEL], Fully automated [i.e., a validation software was used]

Automated. We have used mysql, bash, sed and Makefile for validation purpose.

(2) Whether the test data was run through a "data pipeline" that tested the validity of the input [input sanity check was done or not]. If yes, where was this pipeline implemented?

Be specific and to the point; do not write generic statements like "everything is OK", "we have tested this", etc. Specify the input/output [expected and obtained] and the nature of analysis done clearly.

Data Snapshot: 12-July-2015 @1500 hours

Business rule tested	Outcome
Qualifying examination	*{whether JEE (Main) qualified alone are allotted NIT seats and JEE (Advanced) qualified alones are allotted IIT seats; comment on B.Eng. and B.Arch. of JEE (Main) also}* *Following check was performed:* 1. *All the eight Advanced ranks are 0 and candidate alloted IIT and the candidate not appear in the preparatory list.* 2. *All the eight engineering main ranks are 0, candidate allotted in the engineering branch in a NIT/GFTI/IIIT institute.* 3. *All the eight architecture main ranks are 0, candidate allotted in the architecture branch in appropriate institutes.* *All the above were written in SQL. Each of the above should result in empty set.* *This test is passed with all the queries resulting in empty sets.*
Seat category versus category tag	*{whether the allocated seat category is consistent with the category tag of the candidate? See BR 10}* *Example Query: Candidate allotted in OPNO category has Advanced CRL rank is 0 and the candidate is not alloted in Preparatory course.* *This query should return empty set from the Allotment table.*

	Twenty four such queries are written (eight queries for a rank list and there are three rank lists). *This test has passed with all the queries resulting in empty sets.*
Seat quotas in NITs	*{Whether candidates allocated seats in Home State quota are really Home state candidates and vice versa?* *Example Query #1: A candidate whose home state is Punjab allotted in the institute 201 under AllottedQuota "Other State".* *Example Query #2: Similarly, a candidate whose home state is NOT Punjab is alloted in the institute 201 under AllottedQuota "Home State".* *Above two query should result empty set.* *A total of 66 queries were written which cover all the states exhaustively.* *This test has passed with all the queries resulting in empty sets.*
Special cases of quotas in NITs	*{Business rule #11 – where candidates from certain union territories have quota in pre-identified NITs – how is this validated?]* *All the 64 queries include the special cases.* *This test has passed with all the queries resulting in empty sets.*
Preparatory course seat allocations?	*{Are candidates allocated seats for preparatory courses are really in preparatory rank lists AND not in regular rank lists}* *Example Query: Candidate allotted in Preparatory course having atleast one rank in one of the eight advanced rank lists and allotted a seat in an IIT.* *Example Query: Candidate allotted in Preparatory course is allotted in an institute other than IITs.* *This test has passed with all the queries resulting in empty sets.*
Business rules #18 and #19	*{Whether the sequence of seat categories described in this business rule is strictly adhered to or not}* *Example Query: Candidate who was allotted a preference **p**, obtain all this p-1, p-2, p-3, ..., 1 preferences. Check whether this candidate can get one of these preferences.* *This particular query makes use of the Business Rule 18 as follows:* *A candidate who belongs to OBC NCL PwD category check the following:* *BC,1,o_OPNO_AI,c_OPNO_AI,Adv_CRL_Rank* *This candidate's advanced CRL rank is less than Closing rank of the better preference.* *BC,1,o_OPPH_AI,c_OPPH_AI,Adv_CRL_PD_Rank* *This candidate's advanced PwD rank is less than Closing rank of the better preference.* *BC,1,o_BCNO_AI,c_BCNO_AI,Adv_OBC_NCL_Rank* *This candidate's advanced OBC NCL CRL rank is less than Closing*

	rank of the better preference.
	BC,1,o_BCPH_AI,c_BCPH_AI,Adv_OBC_NCL_PD_Rank *This candidate's advanced OBC NCL PwD rank is less than Closing rank of the better preference.* *A total of 216 queries were written that cover IITs/NITs/IIITs/GFTIs.* *This test has passed with all the queries resulting in empty sets.*
Same rank – multiple students case	*{Whether candidates with the same rank and same preference are allocated seats as per this business rule?}* *Example Query: Find candidates whose rank is equal to candidates who were allotted with Flag as "EQ". Find the candidates whose preferences match and allotted institute and branch do not match.* *This test has passed with all the queries resulting in empty sets.*
DS candidates	*{number of DS candidates, their category tag, their rank, seat allotment, etc.}* *Example Query: Candidate allotted with Flag "D" (DS) has an advanced CRL rank 0.* *This test has passed with all the queries resulting in empty sets.*
Foreign nationals	*Whether allocation for foreign national in the OPEN category or not* *Example Query: Candidate allotted with Flag "F" and nationality is 1 (Foreign) and allotted quota is NOT OPNO and has rank in any one of the rank lists: Adv_OBC_NCL_Rank, Adv_OBC_NCL_PD_Rank, Adv_SC_rank, Adv_SC_PD_Rank, Adv_ST_Rank, Adv_ST_PD_Rank.* *This test has passed with all the queries resulting in empty sets.*
De-reservation	*{nature of test undertaken to ensure that at the time the seats were de-reserved there were no more eligible candidates for this category}* *Example Query 1a: Get the list of Institutes and Branches where Allotted seats is more than that available in the Seat Matrix in BCNO.* *Query 1b: Get the preferences of all OBC NCL PwD candidates* *Query 1c: Check if the preference contains the Institute and Branch.* *This test has passed with all the queries resulting in empty sets.*
Preparatory course allocation	*Whether, in the 4th round, only preparatory seats are allocated for IITs* *None required in the first round.*
Freezing, floating, sliding options	*{cases with respect to these options e.g., number of candidates who opted sliding option and whether these candidates were indeed in the same institute in subsequent rounds; similarly for other two options}* *Example Query: List candidates who have chosen to freeze their allotment and got an institute and branch from the current of round allocation which is different from previous round of allocation.* *Note: only those candidates who did not suffer candidate attributes*

	or who suffered candidate attributes but with no penalty are to be considered for this check. *This test has passed with all the queries resulting in empty sets.*
Change of Class XII marks	*{nature of case studies, their outcome}* *No check performed for this test case.*
Change of category	*{nature of case studies, their outcome, etc}* *Change of category is taken care through open close rank computation and explicitly including them in business rule 18/19.*
Change of state code of eligibility	*{nature of case studies, their outcome, etc.}* *Change of category is taken care through open close rank computation and explicitly including these in appropriate tests.*
Ineligible candidates	*Candidates who become ineligible in 2nd and subsequent rounds – what kind of tests were done to verify this.* *None required in the first round.*
Seat allocated vs Seat matrix	Check total allocated seats against seat matrix in given institute, program, quota and category. *This test has passed with all the queries resulting in empty sets.*

INPUT SANITY CHECK {if performed}

1. Class XII marks – for JEE (Main) – 45% for B.Eng., 50% for B.Arch. – the nature of output that is issued if the input fails this test – then, what happens to the program? Does it stop OR ignore this candidate and proceed OR …

Board marks are not available in the data that was presented to the validation teams.

2. Does each and every candidate has a category tag? What happens if this data field is missing?

Yes every candidate has a category in the data shared with the validation team. This is ensured by writing an SQL query.

3. Whether each and every candidate has at least one of JEE (Main) B.Eng., JEE (Main) B.Arch., or JEE (Adv) rank? If not, what happens to the program?

The check is not explicitly performed. However, if a rank is missing and allotment has been made business rule 18/19 implemented as described above will certainly result in non empty set of allotted candidates.

4. Whether the candidate's category tag and the rank lists in which the candidate is present are consistent with each other? Here, category tag includes PwD status also?

This input check is not explicitly performed. However, the category and tag validation will be able to identify if there are any errors.

5. Does a candidate who has DS certificate is indeed present in the common merit list?

This input check is not explicitly performed. However, the DS validation will identify if there is any discrepency.

6. Is the presence of a candidate is >1 ranklist consistent? For example, are there any OBC/SC/ST candidates who are in the common rank list but not in the OBC/SC/ST merit list? Similarly, for the PwD rank lists also.

Three SQL queries are written based on the (Adv/AI_Eng/AI_Arc)_Rem_Symb and examined appropriate rank lists for any possible errors.

7. Is each and every foreign national present in the common rank list?

This check is performed in the validation SQL: Foreign nationals.

8. Does the entry for each and every candidate complete vis-à-vis the mandatory fields: e.g., class XII marks, at least one JEE (Main) / JEE (Adv) rank, state code of eligibility, gender, for those who are PwD = yes, nature of physical handicap, AAT status, ...

This check is not performed.

9. Whether the seat matrix is meaningful; for example, OPEN, OBC-NCL, SC and ST seats should be >0.

This check is performed and the output of the same is enclosed as a separate file and is shared along with this report.

NOTE: The above observations holds for both IITK and NIC Implementations.

OUTPUT TRAIL / LOG

1. What are contents of the output trail/log e.g., number of seats de-reserved, number of supernumerary seats allocated and the reason for the same, opening-closing ranks, seat category for each candidate, etc.

MODE OF IMPLEMENTATION ON THE D-DAY

1. What exactly are the steps which lead to seat allocation? When will the input sanity be done? For example, one can argue that the seat matrix has been visually inspected and is ok. But how do we ensure that the input seat matrix is NOT corrupted at the time of execution of the program?

2. Format for filled-in choices? Is this format amenable to be used by the IITK implementation? If not, who will do the format conversion, and who will ensure that the data did not get corrupted at the time of conversion?

3. Mode of transmission of data from NIC to IITK implementation – will it be through a HDD [physically in the same location] or through internet [if physically at distinct locations]

4. Who will validate the allotment and give the final go ahead? And, what are the inputs and the mode of validation – random checking of a few candidates' allotment or a thorough automated validation of the entire allotment?

5. Estimated time for seat allocation [NIC and IITK implementations], time for data transfer, etc., and time required for validation.

6.

VERSION CHANGE [for NIC and IITK]

1. Whether changes in versions of implementations are documented? e.g., when was the change made, why was it made, how was it ascertained that the requisite change is indeed incorporated AND that is has affected any other part of the code

AS IS ANALYSIS OF LARGE DATA SETS [SYNTHETIC DATA SETS]

1. AIR versus number of choices filled in

2. Closing ranks of the programs versus the AIRs of candidates who opted for the program

{and so on; see the document circulated in Jan/Feb 2015}