NSEC - 2016

A Detailed Analysis by Resonance

INTRODUCTION

On 27nd November 2016, NSEC (National Standard Examination in Chemistry) – 2016 exam was conducted by the Indian Association of Physics Teachers (IAPT) at many centers all over the country. NSEC is the stepping stage for selection of aspiring and talented students in the Chemistry Olympiad Program. The student can move forward to other stages only after clearing this stage.

Eligibility: Only Indian citizens with date of birth between 1 July 1997 and 30 June 2002, both days inclusive and studying in Class XII or lower as of November 30, 2017, can apply and appear for NSEP 2016. The student has to himself re-assure his eligibility. At any stage if the student is found to be not eligible for the exam, he/she may be disqualified from the program.

Syllabus: The syllabus for National Standard Examination in Chemistry (NSEC) is almost similar as the curriculum of senior secondary level (Class XI and Class XII) of CBSE. However, only basic guideline for the course is mentioned. No detailed syllabus is given for NSEC.

Question Paper: The medium of test was English only and it comprised of 80 objective type questions, each with only one of the four options correct with 3 marks each and -1 negative marking for incorrect answer.

Qualifying for the Second Stage: The basic objective of conducting this test is not focusing on merit but to involve as many students from the country to participate in the exam and try to show and expose their talent. Hence the selection to the stage II examinations i.e. Indian National Olympiad Examinations (INOs) is based on the following scheme.

- **Cutoff:** To be eligible to get to the next level, i.e. the second stage, it is necessary that a student scores at-least a Minimum Admissible Score (MAS) which is 40% of the maximum score.
- **Proportional Representation Clause:** The maximum number of students that can get to Stage II (INO) in each subject is around 300. These many students are not selected only on the merit basis but also on proportionate basis. This proportion is decided on the base of the number of candidates who appeared for NSE in the previous year from that center in each State or Union Territory (UT). In case there is a tie at the last position, then all the students competing for the last position will be eligible to move to stage II. However it's necessary that the selected students fulfill the eligibility clause laid out above. The total number to be selected from centers in each State for each subject will be displayed on the IAPT and HBCSE website.

- **Minimum Representation Clause:** Notwithstanding the proportional representation clause the number of students selected for INO from each State and UT must be at least one, provided that the eligibility clause is satisfied.
- **Merit Clause:** As stated above, approximately 300 students are to be selected for second stage. If this does not happen according to MAS, then after selection as per merit, the shortfall from 300 students will be selected based purely on merit without further consideration to proportional representation and minimum representation clauses. In the event of a tie at the last position in the list all students with the same marks at this position will qualify to appear for the Stage II examination.

There will be no other criterion or provision for selection to the Indian National Olympiad Examinations (INOs). All students who qualify to appear for the INCO get a certificate of merit from IAPT.

OVERALL MARKS DISTRIBUTION

The paper pattern was same as last year. The paper had 80 questions each worth 3 marks (negative marking of 1 marks). All questions were objective type with single correct option.

SUBJECT	Class 11		Class 12		Total	
	No of Questions	Total Marks	No of Questions	Total Marks	No of Questions	Total Marks
Chemistry	21	63	59	177	80	240

OVERALL DIFFICULTY LEVEL ANALYSIS

In this analysis we have rated every question on a scale of 1 to 3. The ratings are done by expert faculty of Resonance. The individual ratings are then averaged to calculate overall difficulty level.

- 1: Easy
- 2: Moderate
- 3: Difficult

Difficulty Level	Number of Questions	Marks
Easy	11	33
Medium	41	123
Difficult	28	84
Grand Total	80	240
Aggregate Difficulty	2.25	

Difficulty Level Analysis: No of Questions

Resonance Experts feel that the paper was slightly difficult from last year. While 78 marks can be considered easy, 111 marks were of moderate level and 51 marks were of difficult level.

TOPIC WISE ANALYSIS

Unit & Topic Name	No of Questions	Total Marks	% Weightage
CHEMISTRY	**80**	**240**	**100.00%**
Alkane (Hydricarbon)	**1**	**3**	**1.25%**
Chemical reactions of alkanes	1	3	1.25%
Aromatic Compound	**4**	**12**	**5.00%**
Aniline	1	3	1.25%
Aromatic Compound	1	3	1.25%
Electrophilic aromatic substitution	2	6	2.50%
Atomic Structure	**6**	**18**	**7.50%**
Bohr Model	1	3	1.25%
De broglie wavelength & uncertainty principle	2	6	2.50%
Quantum numbers & Electronic configuration	1	3	1.25%
Quantum theory of light & Photoelectric Effect	1	3	1.25%
Spectrum	1	3	1.25%
Biomolecule & Polymer	**1**	**3**	**1.25%**
Carbohydrate	1	3	1.25%
Biomolecules	**1**	**3**	**1.25%**
Polymers	1	3	1.25%
Carbonyl	**2**	**6**	**2.50%**
Condensation reactions	1	3	1.25%
Electrophilic addition reaction of alkenes (X2, HOX, HX, H2O)	1	3	1.25%
Chemical Bonding	**4**	**12**	**5.00%**
Applilcation of MOT	1	3	1.25%
Bond angle, bond length comparison	1	3	1.25%
Hybridisation	2	6	2.50%
Chemical Kinetics	**4**	**12**	**5.00%**

Experimental Method to calculate order and rate law of reaction	1	3	1.25%
Integrated rate law : Zero and First Order Reaction	1	3	1.25%
Reversible first order reactions and Sequential first order reactions	1	3	1.25%
Temperature dependence of rate	1	3	1.25%
Chemistry in Everyday life	**1**	**3**	**1.25%**
Amino Acids	1	3	1.25%
Chlorine Family	**1**	**3**	**1.25%**
Group 17th (Helogen)	1	3	1.25%
Coordination Compounds	**5**	**15**	**6.25%**
applications of crystal field theory (Color of complex, Magnetic moment of complex, Stability of complex)	1	3	1.25%
Bonding in coordination compounds (Initial bonding theories and EAN rule, Valence bond theory)	1	3	1.25%
General introduction of complex salts and definitions to be used	1	3	1.25%
IInd Group	1	3	1.25%
Isomerism in Coordination compounds : (Structural Isomerism, Stereoisomerism, Geometrical Isomerism, Optical Isomerism)	1	3	1.25%
d & f-Block Elements	**2**	**6**	**2.50%**
Lanthanoids and actinoids	2	6	2.50%
d-Block Elements	**2**	**6**	**2.50%**
Electronic configuration, atomic size and ionic size, density, melting and boiling points.	1	3	1.25%

Important d-block metal compounds.	1	3	1.25%
Electrochemistry	**6**	**18**	**7.50%**
Application of electrochemical series	1	3	1.25%
Basic terminology and construction of electrochemical cell and its representation, salt bridge	1	3	1.25%
Concept of DG and nernst equation	1	3	1.25%
Electrical Conductance (Basic Definitions and Calculation of Conductance of Different Mixtures)	1	3	1.25%
Electrolysis (Faraday laws)	1	3	1.25%
Kohlrausch Law and Its Applications	1	3	1.25%
Free Radical Reaction	**1**	**3**	**1.25%**
Free radical addition /Allylic substitution reaction of alkenes	1	3	1.25%
GOC-I	**1**	**3**	**1.25%**
Applications of electronic effect	1	3	1.25%
Halogens	**1**	**3**	**1.25%**
Group 17th (Helogen)	1	3	1.25%
Hydrogen	**1**	**3**	**1.25%**
Water	1	3	1.25%
Ionic Equilibrium	**2**	**6**	**2.50%**
Ostwald dilution concept, Degree of dissociation of single weak acid or base	1	3	1.25%
Solubility product and simple solubility calculation, Common ion effect.	1	3	1.25%
Mol Concept	**1**	**3**	**1.25%**
Daltons law of partial pressure	1	3	1.25%
Mol Concept-II	**1**	**3**	**1.25%**

Equivalent Concept for Acid Base Titration and Precipitation Reactions	1	3	1.25%
Mole Concept-II	**1**	**3**	**1.25%**
Equivalent Concept for Acid Base Titration and Precipitation Reactions	1	3	1.25%
Nitrogen family	**4**	**12**	**5.00%**
Group 15th (Nitrogen)	1	3	1.25%
Group 16th (Oxygen)	2	6	2.50%
Nucleophilic Substitution Reaction (1) SN1 (2) SN2	1	3	1.25%
Organic Nomenclature	**1**	**3**	**1.25%**
IUPAC-Nomenclature of Aromatic compounds (Ester, Anhydride, Amimde etc.)	1	3	1.25%
ORM-I	**1**	**3**	**1.25%**
Electrophile, Nucleophile, Nucleophilicity, Leaving group ability & Solvent.	1	3	1.25%
ORM-II	**1**	**3**	**1.25%**
Free radical addition /Allylic substitution reaction of alkenes	1	3	1.25%
ORM-III	**1**	**3**	**1.25%**
Miscllaneous	1	3	1.25%
Oxidation Reduction	**1**	**3**	**1.25%**
Stereochemistry involved in reactions of alkane/alkene/alkyne	1	3	1.25%
p-Block Compounds	**2**	**6**	**2.50%**
Group 15th (Nitrogen)	1	3	1.25%
Group 16th (Oxygen)	1	3	1.25%
Phenol	**1**	**3**	**1.25%**
MIXED	1	3	1.25%
POC	**2**	**6**	**2.50%**
Polymers	1	3	1.25%
Test for Functional groups	1	3	1.25%
POC-II	**3**	**9**	**3.75%**
Aromaticity/Antiaromaticity	1	3	1.25%

POC-II	1	3	1.25%
Solubility in water	1	3	1.25%
Salt Analysis	**1**	**3**	**1.25%**
Application of electrochemical series	1	3	1.25%
Salt Analysis (anion)	**1**	**3**	**1.25%**
Group 15th (Nitrogen)	1	3	1.25%
Salt Analysis (Cation)	**2**	**6**	**2.50%**
IInd Group	1	3	1.25%
IVth Group	1	3	1.25%
Solid State	**1**	**3**	**1.25%**
Radius ratio rule and Type of ionic structures	1	3	1.25%
Solution & Colligative Properties	**1**	**3**	**1.25%**
Elevation of Boiling Point & Depression of Freezing Point	1	3	1.25%
Stereochemistry	**1**	**3**	**1.25%**
Hydrolysis	1	3	1.25%
Stereoisomerism	**1**	**3**	**1.25%**
Definition and Properties of Enantiomers, Diastereomers, Mesocompounds	1	3	1.25%
Steroisomerisum	**1**	**3**	**1.25%**
Reduction	1	3	1.25%
Surface chemistry	**1**	**3**	**1.25%**
Adsorption	1	3	1.25%
Thermodynamics	**4**	**12**	**5.00%**
Enthalpy of formation & combustion	1	3	1.25%
Free energy	2	6	2.50%
Thermodyanamics of equilibrium	1	3	1.25%
Grand Total	**80**	**240**	**100.00%**

EXPECTED CUTOFF

To be eligible to get to the next level, i.e. the second stage, it is necessary that a student scores at-least a Minimum Admissible Score (MAS) which is 40% of the maximum score. However, all students scoring 80% of the average of top 10 students will be considered qualified (Merit Clause).