

JEE Advanced 2022 Paper 1 Detailed Analysis

28th August, 2022 (Sunday 9:00 am – 12:00 pm)

JEE (Advanced) 2022 was conducted in two parts (Paper 1 & Paper 2) by IIT Bombay. The exam is conducted in a computer-based (online) mode. Paper 1 was conducted from 9 AM to 12 PM and Paper 2 was conducted from 2:30 PM to 5:30 PM. Only candidates who appear in both Paper 1 and Paper 2 will be considered for ranking. Results will be declared on Sunday, September 11, 2022 at (jeeadv.ac.in). Category-wise All India Ranks (AIR) of successful candidates will be available on the online portal after the results are declared.

OVERALL MARKS DISTRIBUTION

The paper pattern was different in comparison to last Year. Paper 1 had a total of 54 questions, distributed evenly across three subjects i.e, Physics, Chemistry & Mathematics.

Each of the subjects were divided into 3 sections, which consisted of different types of questions. Below is the table for the question paper pattern which was similar to all the subjects :

| Question Type | No. of Questions | Marks for Each Question | Total Marks | Marking Scheme |
|---|------------------|-------------------------|-------------|---|
| Numerical Value | 8 | 3 | 24 | <ul style="list-style-type: none">• Correct numerical answer = +2 marks• In all other cases = 0 marks |
| MCQs more than one correct answer | 6 | 4 | 24 | <ul style="list-style-type: none">• If only (all) the correct option(s) is(are) chosen = +4 marks• If all the four options are correct but ONLY three options are chosen = +3• If three or more options are correct but ONLY two options are chosen, both of which are correct = +2 marks• If two or more options are correct but ONLY one option is chosen and it is a correct option = +1 marks• No option selected = 0 marks• In all other cases = -2 marks |
| Matching List Sets (Single Correct Answer) | 4 | 3 | 12 | <ul style="list-style-type: none">• Correct answer = +3marks• No option selected = 0 marks• In all other cases = -1 marks |

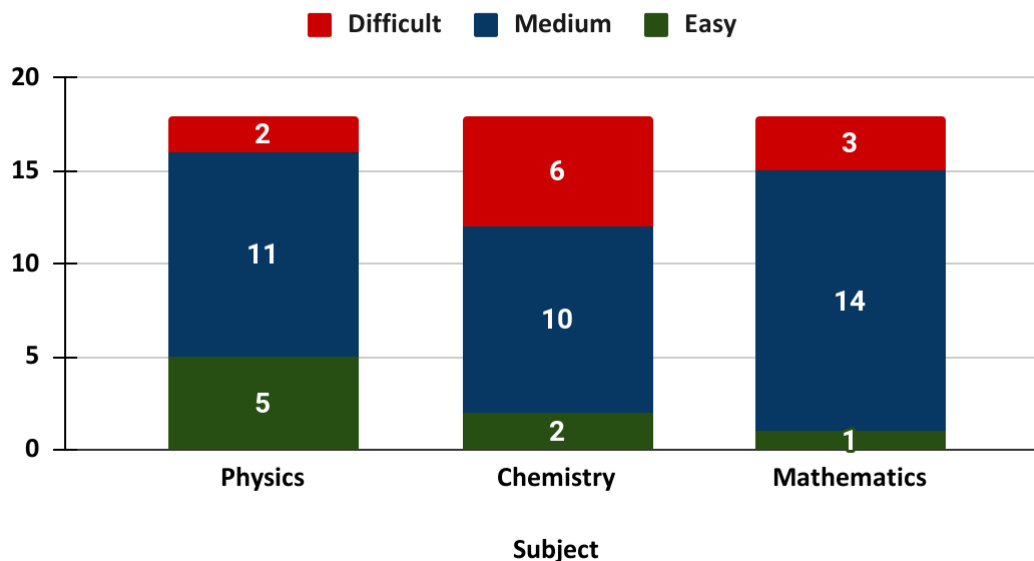
| Section | Type Of Question |
|---------|--|
| 1 | Numerical Value |
| 2 | MCQs more than one correct answer |
| 3 | Matching List Sets (Single Correct Answer) |

SUBJECT-WISE DIFFICULTY LEVEL ANALYSIS: NO OF QUESTIONS

This is the analysis on the basis of an official question paper which was sent to the respective candidate. Hence it has covered all the questions.

| Subject | Easy | | Medium | | Difficult | | Grand Total | |
|--------------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| | No of Questions | Total Marks | No of Questions | Total Marks | No of Questions | Total Marks | No of Questions | Total Marks |
| Physics | 5 | 17 | 11 | 36 | 2 | 7 | 18 | 60 |
| Chemistry | 2 | 11 | 10 | 29 | 6 | 20 | 18 | 60 |
| Mathematics | 1 | 3 | 14 | 46 | 3 | 11 | 18 | 60 |
| Grand Total | 8 | 31 | 35 | 111 | 11 | 38 | 54 | 180 |

Subject Wise Difficulty Level



Experts feel that Mathematics Paper 1 had the maximum moderately difficult questions as compared to Physics and Chemistry. Out of **180** marks, **31** marks constituted of easy level questions, **111** marks constituted of moderate level questions and **38** marks constituted of difficult level questions.

Physics

Physics was of easy to moderate level. Physics had 5 easy, 11 medium and 2 difficult questions. Following is the question distribution table as per Class, Chapter, Topic & Difficulty -

| Q. No | Class | Chapter Name | Topic Name | Difficulty Level | Section | Question type | Marks per Question |
|-------|-------|---|--|------------------|---------|-----------------------------------|--------------------|
| 1 | 11th | Gravitation | Gravitational Potential Energy | Medium | 1 | Numerical type question stems | 3 |
| 2 | 12th | Nuclei | Mass-Energy and Nuclear Binding Energy | Medium | 1 | Numerical type question stems | 3 |
| 3 | 12th | Electrostatic Potential and Capacitance | Grouping of Capacitors | Easy | 1 | Numerical type question stems | 3 |
| 4 | 12th | Ray Optics and Optical Instruments | Lens Formula | Medium | 1 | Numerical type question stems | 3 |
| 5 | 11th | System of Particles and Rotational Motion | General Motion of A Rigid Body | Medium | 1 | Numerical type question stems | 3 |
| 6 | 11th | System of Particles and Rotational Motion | General Motion of A Rigid Body | Medium | 1 | Numerical type question stems | 3 |
| 7 | 12th | Electromagnetic Induction | Inductance and Inductive Circuits | Difficult | 1 | Numerical type question stems | 3 |
| 8 | 11th | Motion In A Plane | Projectile Motion | Easy | 1 | Numerical type question stems | 3 |
| 9 | 12th | Electrostatic Potential and Capacitance | Capacitors With Dielectrics | Medium | 2 | MCQs more than one correct answer | 4 |
| 10 | 12th | Current Electricity | KirchhoffS Rules | Easy | 2 | MCQs more than one correct answer | 4 |
| 11 | 11th | Thermodynamics | Thermodynamic Processes | Difficult | 2 | MCQs more than one correct answer | 4 |
| 12 | 12th | Ray Optics and Optical Instruments | Reflection of Light | Medium | 2 | MCQs more than one correct answer | 4 |

| | | | | | | | |
|----|------|--|---|--------|---|-----------------------------------|---|
| 13 | 12th | Electric Charges and Fields, Electrostatic Potential and Capacitance | Electric Field, Potential Due To A Point Charge | Easy | 2 | MCQs more than one correct answer | 4 |
| 14 | 12th | Nuclei | Mass-Energy and Nuclear Binding Energy | Medium | 2 | MCQs more than one correct answer | 4 |
| 15 | 12th | Moving Charges and Magnetism | Torque On A Current Loop In A Uniform Magnetic Field | Medium | 3 | Multiple Choice Question | 3 |
| 16 | 11th | Motion In A Plane, Oscillations | Projectile Motion, Circular Motion, Some Systems Executing Simple Harmonic Motion | Medium | 3 | Multiple Choice Question | 3 |
| 17 | 11th | Thermodynamics | Heat, Internal Energy and Work | Medium | 3 | Multiple Choice Question | 3 |
| 18 | 12th | Ray Optics and Optical Instruments | Thin Lenses | Easy | 3 | Multiple Choice Question | 3 |

Chemistry

Chemistry had moderate to difficult level of questions. Chemistry had 10 medium and 2 easy & 6 difficult questions. Following is the question distribution table as per Class, Chapter, Topic & Difficulty -

| Q. No | Class | Chapter Name | Topic Name | Difficulty Level | Section | Question type | Marks per Question |
|-------|-------|---|--|------------------|---------|-------------------------------|--------------------|
| 1 | 11th | Thermodynamics | Enthalpy & Heat of Combustion | Medium | 1 | Numerical type question stems | 3 |
| 2 | 12th | ElectroChemistry | EMF of cell using Gibbs energy, Latimer diagrams | Medium | 1 | Numerical type question stems | 3 |
| 3 | 11th | Equilibrium | Finding pH of mixture | Difficult | 1 | Numerical type question stems | 3 |
| 4 | 12th | D-block elements & Qualitative Analysis | Compounds of copper & group.2. of | Medium | 1 | Numerical type question | 3 |

| | | | | | | | |
|----|-------------|--------------------------------------|--|-----------|---|-----------------------------------|---|
| | | | Qualitative analysis | | | stems | |
| 5 | 12th | The P-Block Elements | Compounds of Phosphorus | Difficult | 1 | Numerical type question stems | 3 |
| 6 | 12th | Alcohols, Phenols and Ethers | Chemical reaction with Br ₂ /Red | Medium | 1 | Numerical type question stems | 3 |
| 7 | 12th | Alkyl halides, Aryl halide & Phenol | chemical property of phenol | Medium | 1 | Numerical type question stems | 3 |
| 8 | 11th & 12th | Aryl halide XII & Phenol (XII) | Preparation of phenol & properties of phenol | Difficult | 1 | Numerical type question stems | 3 |
| 9 | 11th | Chemical bonding | Molecular orbital Theory | Medium | 2 | MCQs more than one correct answer | 4 |
| 10 | 12th | Surface Chemistry | Chemisorption | Easy | 2 | MCQs more than one correct answer | 4 |
| 11 | 12th | Metallurgy Or Extraction of elements | Extraction of metal Al from Bauxite | Medium | 2 | MCQs more than one correct answer | 4 |
| 12 | 12th | The P-Block Elements | Properties of nitric acid | Medium | 2 | MCQs more than one correct answer | 4 |
| 13 | 12th | Amines | Gabriel phthalimide synthesis | Difficult | 2 | MCQs more than one correct answer | 4 |
| 14 | 12th | Amine + nitro compounds | Diazonium salts | Difficult | 2 | MCQs more than one correct answer | 4 |
| 15 | 11th | chemical kinetics | Rate of reaction and Half life | Difficult | 3 | Multiple Choice Question | 3 |
| 16 | 12th | S-block elements | Alkaline earth metals | Easy | 3 | Multiple Choice | 3 |

| | | | | | | | |
|----|------|---|---|--------|---|--------------------------|---|
| | | | | | | Question | |
| 17 | 12th | Co-ordination compounds | Crystal field theory & CFSE | Medium | 3 | Multiple Choice Question | 3 |
| 18 | 11th | General organic chemistry - XI & Some Basic Concepts of Chemistry | Qualitative analysis, (detecting N,S,X) | Medium | 3 | Multiple Choice Question | 3 |

Note : Q8 was a mixture of syllabus from both Class XIth & XIIth.

Mathematics

Mathematics had moderate to difficult levels of questions. Chemistry had 14 medium and 1 easy & 3 difficult questions. Following is the question distribution table as per Class, Chapter, Topic & Difficulty -

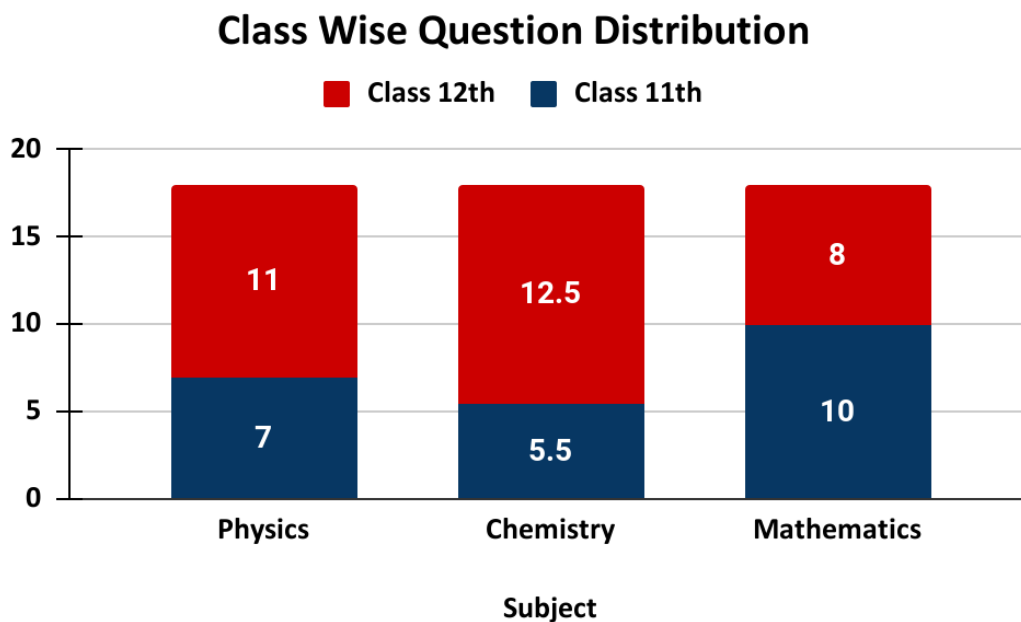
| Q. No | Class | Chapter Name | Topic Name | Difficulty Level | Section | Question type | Marks per Question |
|-------|-------|---------------------------------|--|------------------|---------|-------------------------------|--------------------|
| 1 | 12th | Inverse Trigonometric Functions | Properties of Inverse Trigonometric Functions | Medium | 1 | Numerical type question stems | 3 |
| 2 | 12th | Limit | Limit of composite function | Medium | 1 | Numerical type question stems | 3 |
| 3 | 11th | Probability | Computation of Probability of Events Using Permutations and Combinations | Medium | 1 | Numerical type question stems | 3 |
| 4 | 11th | Complex Number | Properties of Modulus | Difficult | 1 | Numerical type question stems | 3 |
| 5 | 11th | Complex Number | Solution of Equation | Medium | 1 | Numerical type question stems | 3 |
| 6 | 11th | Sequences and Series | Arithmetic Progression (A.P.) | Medium | 1 | Numerical type question stems | 3 |
| 7 | 11th | Permutation and combination | Formation of Digits | Medium | 1 | Numerical type question | 3 |

| | | | | | | | |
|----|------|----------------------------|--|-----------|---|-----------------------------------|---|
| | | | | | | stems | |
| 8 | 11th | Solution of triangle | Circumcircle | Medium | 1 | Numerical type question stems | 3 |
| 9 | 12th | Integrals | Some Properties of Definite Integrals | Difficult | 2 | MCQs more than one correct answer | 4 |
| 10 | 11th | Sequences and Series | Arithmetic Progression (A.P.) | Medium | 2 | MCQs more than one correct answer | 4 |
| 11 | 12th | Three Dimensional Geometry | Intersection of two Plane | Medium | 2 | MCQs more than one correct answer | 4 |
| 12 | 12th | Vector Algebra | Image of a point w.r to plane | Medium | 2 | MCQs more than one correct answer | 4 |
| 13 | 11th | Conic Sections | Parabola | Medium | 2 | MCQs more than one correct answer | 4 |
| 14 | 12th | Matrices & Determinants | Determinants | Difficult | 2 | MCQs more than one correct answer | 4 |
| 15 | 11th | Trigonometry | Trigonometric Equation | Easy | 3 | Multiple Choice Question | 3 |
| 16 | 12th | Probability | Computation of Probability of Events Using Permutations and Combinations | Medium | 3 | Multiple Choice Question | 3 |
| 17 | 12th | Determinants | Cramer's rule | Medium | 3 | Multiple Choice Question | 3 |
| 18 | 11th | Conic Sections | Ellipse | Medium | 3 | Multiple Choice Question | 3 |

CLASS WISE QUESTION DISTRIBUTION

As per our expert faculties, the questions from Class 12th syllabus dominated Class 11th syllabus in Physics and Chemistry. In Mathematics, the Class 11th syllabus dominated the Class 12th syllabus. Below is the Class wise question distribution table -

| Subject | 11th | | 12th | | Total Percentage | |
|--------------------|------------------|-------------|-----------------|--------------|------------------|------------|
| | No. of Questions | Total Marks | No of Questions | Total Marks | Class 11 | Class 12 |
| Physics | 7 | 22 | 11 | 38 | 39% | 61% |
| Chemistry | 5.5 | 17.5 | 12.5 | 42.5 | 31% | 69% |
| Mathematics | 10 | 32 | 8 | 28 | 56% | 44% |
| Grand Total | 22.5 | 71.5 | 31.5 | 108.5 | 42% | 58% |



Note : Q8 in Chemistry was a mixture of syllabus from both Class XIth & XIIth.

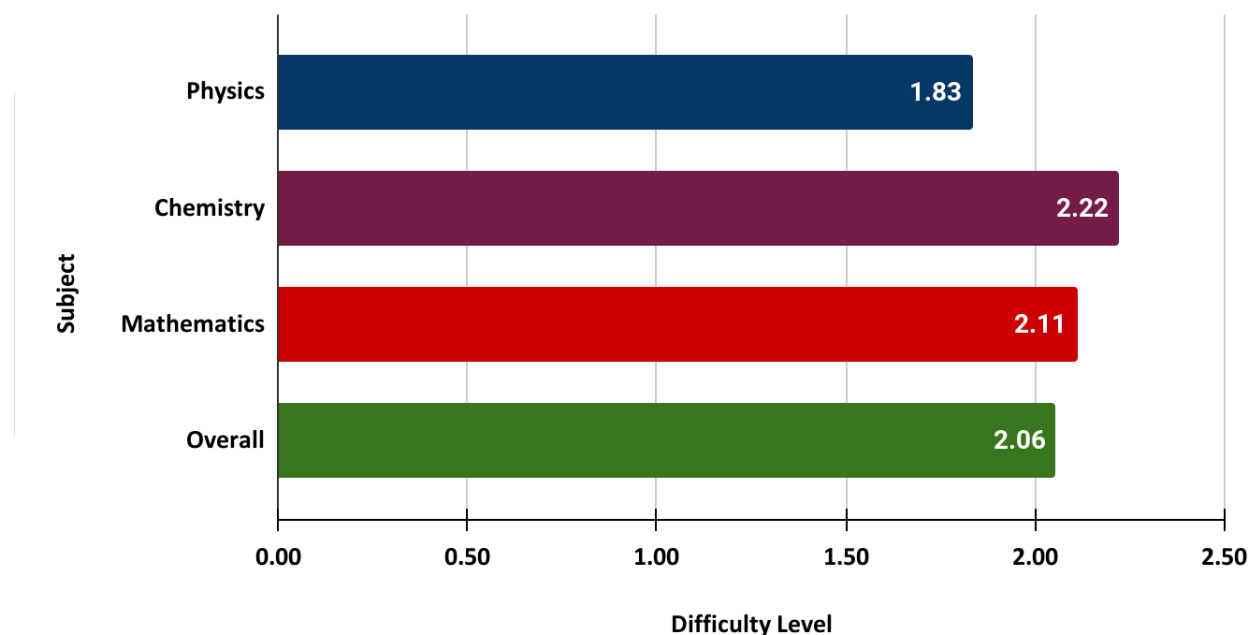
OVERALL DIFFICULTY LEVEL ANALYSIS

In this analysis, we have rated every question on a scale of 1 to 3. The individual ratings are then averaged to calculate the overall difficulty level.

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

| Subject | Difficulty Level |
|-------------|------------------|
| Physics | 1.83 |
| Chemistry | 2.22 |
| Mathematics | 2.11 |
| Overall | 2.06 |

Overall Difficulty Level - JEE Mains 2022



The overall difficulty of JEE Advanced (Paper 1) 2022 was of moderate difficulty and was comparatively a bit easier than Paper 2.

The difficulty level of the exam was a bit easier compared to previous years as per our expert faculties.

- Physics was at the same level as the previous year
- Chemistry was more difficult than the previous year.
- Mathematics was a bit easier than the previous year.