



# Contest Components

The contest consists of the theoretical components (70% weightage) and experimental components (30% weightage).

## 1. Theoretical (70%)

1. Components: Five (5) problems, at least 3 parts within each problem. Each problem must be of one (1) hour duration.
2. Total time is 5 hours.
3. The complexity of each problem should increase gradually.
4. At least one problem should cover topics from 1, 2, 3, and 4 of the syllabus.
5. An aspect of topic 6 and 7 should be incorporated within some of the problem(s).
6. No single problem solely on topic 5.
7. Allocation of marks, marking scheme, and answer sheets should be provided.

## 2. Experimental (30%)

1. General guidelines
  - i. The experimental part consists of two sections:
    - ii. experimental section
    - iii. data analysis section
  - b. The theoretical part of the syllabus provides the basis for all problems in the experimental part.
  - c. Considerations: availability of radioactive sources and detectors and relevant electronics for experimental exam.
  - d. alternatively: create a scenario – students design an experiment for measurement of physical quantities.
  - e. Provide data – students analyze the data using graph papers/computers.
  - f. Possibility of simulation experiment.
  - g. The maximum time allocated to complete the experimental session is 3.5 hours.
  - h. Allocation of marks, marking scheme, and answer sheets should be provided.



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2. The experimental section focuses on contestant's competency in:
  - a. Identification of the parameters that are to be measured and measurement of those parameters using provided equipment.
  - b. Usage of basic nuclear instruments with enough instructions provided to the contestants. Experimental observations may be from real sources or imitated sources in the laboratory. Computer simulations or codes may be used in the problems, but sufficient instructions must be provided to the contestants.
  
3. The data analysis section focuses on the calculation and analysis of the experimental data provided in the problems. Additional requirements are as follows:
  - a. Proper identification of error sources, calculation of errors, and estimation of their influence on the final results.
  - b. Proper use of graph papers with different scales, e.g., linear and logarithmic papers. Transformation of the data to get a linear plot and finding the "Best Fit" line approximately.
  - c. Basic statistical analysis of observational data.
  - d. Knowledge of the most common experimental techniques for measuring physical quantities in nuclear science and technology.
  - e. Request: Instrument, simulation program, or codes for the experimental aspects