Energy and Environment - Procedure for Access to the PhD (37th cycle) PON

Titles (max 20 points) will be evaluated according to the following evaluation grid:

Curriculum studiorum (max 15 points)
For students who have already graduated at the time of the assessment of their qualifications, the Final Mark of the Master in Science Degree (master, specialist or single cycle) is considered, while for students who will discuss their thesis after the assessment of their qualifications, the Grade Point Average (GPA) obtained in the courses supported in the master's degree will be taken into consideration.

Other titles (max 5 points)
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Oral exam (max 100 points)

The oral examination has the aim of evaluating the background of competences and skills of the candidate and his/her research attitude. With respect to the syllabus appended below, during the oral exam the basic knowledge of Thermodynamics, as well as a theme chosen by the candidate among the ten topics listed below, will be evaluated (max 40 points). Moreover, the basic knowledge of topics related to one of the funded projects, chosen by the candidate, will be also evaluated (max 40 points). Finally, the Commission will additionally evaluate the motivations, interests and aptitude for research, and the knowledge of the English language, through a 5-minute presentation of the candidate in English (max 20 points). The oral examination shall be deemed to have been passed if the candidate has obtained a score greater or equal than 60/100.

Syllabus
COMMON TOPIC - This topic is mandatory to all candidates:
Principles of Thermodynamics (thermodynamic systems, properties of a pure substance, heat and work, the first law of thermodynamics, the second law of thermodynamics, the entropy, thermodynamic potentials).
SPECIFIC TOPICS - Each candidate should select one topic among those in the following list:
1) heat transfer (conduction; forced, natural and mixed convection; radiation);
2) thermo-hygrometric, visual and acoustic comfort in built environment;
3) thermodynamic modelling of energy conversion systems (steam turbine power plants, internal combustion gas turbine engines, internal combustion reciprocating engines, combined cycle and CHP plants);
4) power generation from renewable energies: solar, wind and ocean, bio-energies;
5) applications of nuclear energy for a safe and sustainable future;
6) innovation in nuclear energy systems;
7) distributed micro-generation, micro-generative plants for buildings, energy smart grids and accumulation systems;
8) energy efficiency of buildings, near Zero Energy Building, BACS;
9) orbital design for energy and environment-targeted missions (satellite constellations, minimum energy transfers, space-based monitoring, space environment and perturbations);
10) remote sensing, image analysis, positioning and navigation applied to energetic and environmental monitoring systems (Earth observation, image processing, GNSS, navigation techniques)

Language: ITALIAN, ENGLISH
5-member Committee