

**Ph.D. PROGRAMME IN MATHEMATICS  
EDUCATION**

**Term-End Examination**

**December, 2015**

**RMT-011 : EVOLUTION OF MATHEMATICAL  
REASONING AND PHILOSOPHY**

*Time : 2 hours*

*Maximum Marks : 50*

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**Note :** Attempt *all* questions.

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1. Explain the concepts of 'representation' and 'form and function' in the context of mathematical reasoning. Use examples from algebra to support your explanation. 10
2. Explain each of the following statements, with an example as part of each explanation : 15
  - (a) Mathematical tasks have considerable cognitive complexity.
  - (b) The 'certainty' in mathematics differs from the 'certainty' in the discipline of education.
  - (c) The mathematical knowledge of the ancient Chinese was limited to a few areas.

3. Explain one feature of mathematics that makes it useful to other disciplines. Your response should include two examples, related to *distinct areas* of mathematics.

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4. Briefly describe the schools of mathematical philosophy listed below :

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(a) Formalism

(b) Intuitionism

(c) Logicism

Also name a well-known practitioner of each school of philosophy.

5. Explain the processes of abstraction and generalisation, bringing out the differences in them, if any. Give an example to support your explanations.

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