UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session 2004/2005

March 2005

PLG 712E – Research Issues in Science Education
[Isu-Isu Penyelidikan Dalam Pendidikan Sains]

Duration : 2 hours
(Masa: 2 jam)

Please check that this examination paper consists of **THREE** printed pages of printed material before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi **TIGA** muka surat yang bercetak sebelum anda memulakan peperiksaan ini].*

INSTRUCTIONS: Answer **THREE (3)** questions only.

*[ARAHAN: Jawab **TIGA (3)** soalan sahaja].*

Answer any **THREE (3)** questions.

1. Discuss the findings of the TIMSS 1999 and TIMSS 2003 studies with respect to:

    a)   the improvement in Malaysia's Form 2 pupils' performance in science according to the international benchmarks;

    (50 marks)

    b)   factors that may have contributed to the improved performance between the two studies.

    (50 marks)

2. a)   Discuss the instrument, *Integrated Process Skill Test (TIPS II)* used by Burns *et al.* (1985) in the assessment of science process skills. Your discussion should include the issues of validity and reliability of the instrument, usefulness for science teachers and necessary improvements of the instrument.

    (50 marks)

    (b)   Mattheis *et al.* (1992) carried out a comparative study on the logical thinking skills and integrated process skills of junior high school students in North Carolina and Japan. Discuss the implications of their findings for the teaching and learning of secondary school science in Malaysia.

    (50 marks)

3. Why should PBL (problem-based learning) be a preferred approach in the teaching of science in schools? Discuss your answer by referring to relevant examples.

    (100 marks)

4. Compare the three main approaches to educational inquiry, outlining their different epistemologies, methodologies and perspectives.

    In your opinion, which approach is the best approach to scientific inquiry? Give reasons to support your argument.

    (100 marks)

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