

THE OPEN UNIVERSITY OF SRI LANKA
M.A. IN TEACHER EDUCATION - PART II
FINAL EXAMINATION 2006
ESP 2266 – MATHEMATICS AT PRIMARY LEVEL



DURATION: THREE (03) HOURS

DATE: 03rd March 2006

TIME: 10.00 a.m. – 1.00 p.m.

Answer only three Questions. Each answer should be given in a Separate Book.

01. (i) Discuss two major surveys or research studies pertaining to Primary Mathematics conducted in Sri Lanka paying emphasis to their relevance to curriculum reforms.
- (ii) Give an overview of a survey or a research study pertaining to Primary mathematics conducted in a selected country.
- (iii) Why are surveys and research studies essential for developing relevant Primary Mathematics curricula for teaching training programmes?
02. (i) Describe briefly the main features of the competency based curriculum introduced by the new primary education reforms.
- (ii) Compare the developments you discussed above with the recent developments in Primary Mathematics in a selected country.
- (iii) Explain, citing examples how mathematics could be adopted in developing competencies in primary student through integration of subjects.
03. (i) Discuss the significance of the teaching units used for Primary Mathematics in the National Colleges of Education (NCOEs).
- (ii) Compare the teaching units used for Primary Mathematics in NCOEs with those used in Teacher Colleges.
- (iii) Discuss the new changes introduced into the present pre-service Teacher Education curriculum in Primary Mathematics in Sri Lanka.
- (iv) How does the Teacher Education curriculum help student teachers to acquire an awareness of the Primary mathematics curriculum used in schools.

04. (i) How does the structure of the present Primary Mathematics curriculum and the supporting curriculum material help the teachers to develop mathematical concepts in pupils?
- (ii) Discuss how children in the primary school learn mathematics.
- (iii) Review the factors that facilitate and support learning of mathematics in Primary School Children.
- (iv) Name strategies adopted by primary children to learn mathematics concepts.
05. i. Define an irrational number.
- ii. Show that $\sqrt{2}$ is an irrational number.
- iii. If a, b, c are in Geometric progression (GP) show that the following are also in GP.
- i. $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ ii. a^2, b^2, c^2 iii. a^3, b^3, c^3
- (iv) Sum the following series to n terms.
- $7+77+777+\dots$ to n terms
- (v) Prove by the method of induction that for any $n \in \mathbb{N}$ $a^{2n} - b^{2n}$ is divisible by $a+b$.
- (vi) If x is real, show that the expression $\frac{x^2 - 3x + 4}{x^2 + 3x + 4}$ lies between 7 and $1/7$
- (vii) Solve $9^x = 3^y$
 $8^{xy} = 4^{y+1}$

06. (i) From 6 gentlemen and 5 ladies a committee of 4 members is to be formed. In how many ways can this be done so as to include at least 2 ladies?
- (ii) An urn contains b white balls and c black balls. Another urn contains d white balls and e black balls. One ball is transferred from the first urn into the second and then one ball is drawn from the latter. What is the probability that it will be a white ball?
- (iii) If α and β are any two angles prove that,
- $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$
 - $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$
 - $\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$
 - Find the values of
 - $\cos 75^\circ$
 - $\sin 15^\circ$
 - $\sin 105^\circ$
 - $\tan 15^\circ$

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