EASTERN UNIVERSITY, SRI LANKA

THIRD EXAMINATION IN SCIENCE - 2009/2010

FIRST SEMESTER (PROPER/REPEAT)

(June/July 2011)

PH 301 ELECTRONICS II

Time: 01 hour.

Answer ALL Questions

---

1. Describe the major properties of an ideal operational amplifier.

A) Explain the functions of the following amplifiers using suitable sketches.

a) Inverting amplifier

b) Non Inverting amplifier

c) Differential amplifier

d) Differentiator

e) Adder

B) A voltage of 1 V and another of 0.5 V are added together in an inverting summing amplifier. Determine the output voltage if an ideal OP-Amp is used with,

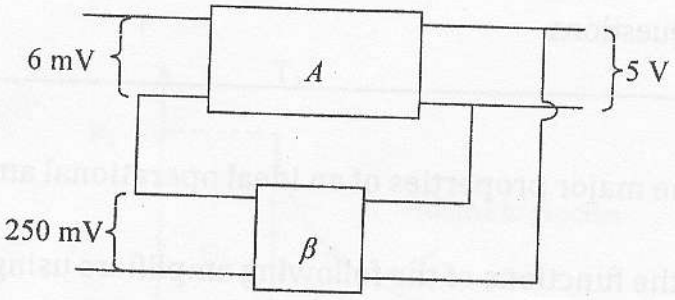
a) input resistors of 1 MΩ each and a feedback resistor of 1 MΩ,

b) input resistance of 0.5 MΩ and 0.8 MΩ for 1 V and 0.5 V signals respectively, and a feedback resistor of 1.5 MΩ.

2. Explain what is meant by positive and negative feedback as applied to electronic circuits. Discuss the advantages of negative feedback.

Derive an expression for closed-loop gain A in terms of feedback fraction β and open-loop gain A_o.

A) For the following series-parallel feedback amplifier circuit, calculate;



a) open-loop gain of the amplifier;

b) gain of the feedback network;

c) closed-loop gain of the amplifier; and

d) Sacrifice factor (S).

B) If an overall gain of an amplifier is reduced from 500 to 100 when negative feedback is introduced, find the following

a) Feedback ratio β.

b) Percentage of drop in gain of the feedback amplifier when the gain of the amplifier without feedback fallen by 20 %.