

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2115

Roll No.

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**B.Tech.**

(SEM. V) THEORY EXAMINATION 2012-13

**ANALOG INTEGRATED ELECTRONICS**

Time : 3 Hours

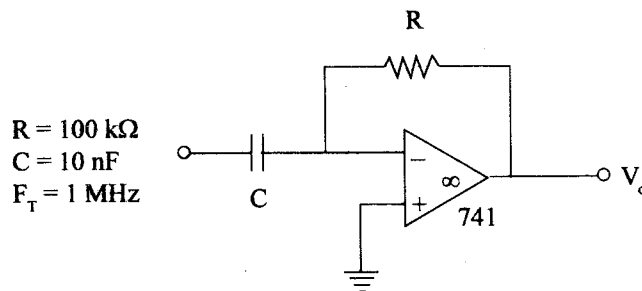
Total Marks : 100

**Note :** (1) Attempt *all* questions.

(2) All questions carry equal marks.

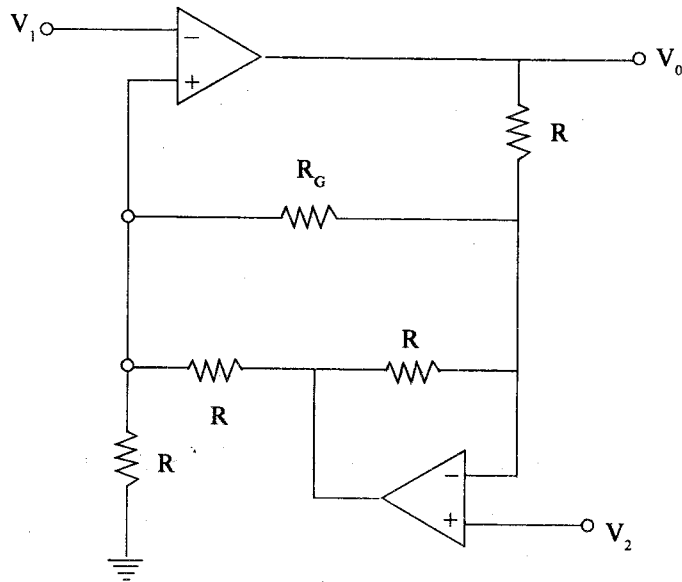
1. Attempt any **two** parts of the following : (10×2=20)

- Draw the frequency response of internally compensated OPAMP having pole within the feedback loop and explain it.
- What are different methods for pole compensation in uncompensated OPAMPs ? Discuss Miller Compensation.
- For the OPAMP circuit shown in Figure 1 :

**Figure 1**Calculate  $f_o$ ,  $f_x$ ,  $Q$  and  $\phi_m$ .

2. Attempt any **two** parts of the following : **(10×2=20)**

- (a) Draw the circuit diagram of Grounded load voltage to current converter and find the expression of output current.
- (b) Enumerate the requirement of an instrumentation Amplifier. Find the expression for output voltage in terms of input voltages as shown in Figure 2 :



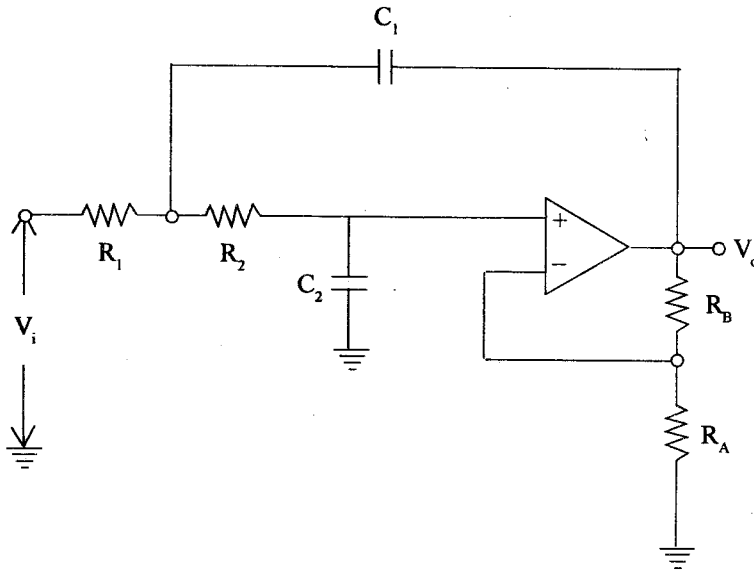
**Figure 2**

- (c) Draw the circuit diagram of a non-inverting integrator and find the expression for output voltage.

3. Attempt any **two** parts of the following : (10×2=20)

(a) For the filter shown in Figure 3 show that the critical

frequency is given by  $\frac{1}{\sqrt{R_1 C_1 R_2 C_2}}$ .



**Figure 3**

(b) Draw the circuit diagram of a All Pass Filter and show that phase is given by  $\phi = -2 \tan^{-1} 2\pi fRC$ .

(c) Draw the functional block diagram of voltage to frequency converter (VCO) and find the expression for free running frequency.

4. Attempt any **two** parts of the following : (10×2=20)

(a) Draw the circuit diagram of a Triangular waveform generator and find the mathematical expression for frequency Triangular waveform.

- (b) Draw the circuit diagram of a precision full wave rectifier and mathematically prove that the output is full wave rectified.
- (c) Compare Linear regulator and switching regulator. Draw the block diagram of switching regulator and explain its working.

5. Attempt any **two** parts of the following : **(10×2=20)**

- (a) Draw the circuit diagram of a two OPAMP log Amplifier and the expression for its output.
- (b) Define Lock-in-Range, capture range and pull in-time as related to a phase locked loop (PLL). Draw the block diagram of the PLL and explain its working.
- (c) Write short note on operational transconductance Amplifier.