



SE-8283

B. E. - III (Sem. - V) (ECC) Examination

May / June - 2011

Integrated Circuits & Applications

Time : Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दृष्टावेव निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 3 (SEM. - 5) (ECC)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="INTEGRATED CIRCUITS & APPLICATIONS"/>	<input type="text"/>
Subject Code No. : <input type="text" value="8"/> <input type="text" value="2"/> <input type="text" value="8"/> <input type="text" value="3"/>	<input type="text" value="Student's Signature"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	

- (2) Attempt all questions.
(3) Figure to right indicate full marks.
(4) Programmable calculators are not allowed.

1 (a) Attempt the following : 5

- (i) When an op-amp has no feedback path or loop the voltage gain is maximum. (True/false)
(ii) Op-Amps designed with minimum imperfections and intended for applications such as measurement and control are referred as _____ op.amps.
(iii) An ideal op-amp has zero input offset voltage (true/false)
(iv) The unity gain frequency of an op-amp is _____
(v) The output of the comparator can be _____ or _____.

(b) Match the right pair : 4

- | | |
|---------------------------|--------------------------------|
| (E) Slew rate | (e) $\Delta v_{io} / \Delta T$ |
| (F) Input bias current | (f) $ I_{B1} - I_{B2} $ |
| (G) Input offset current | (g) $d v_o / d + 1 \max$ |
| (H) Thermal voltage drift | (h) $(I_{B1} + I_{B2}) / 2$ |

- (c) With a neat circuit diagram, derive the expression of closed loop gain of non inverting amplifier. 4
- (d) Design op.amp circuit which gives an output $V_o = \sin (+) - \cos (+)$ 4
- (e) List the open-loop configuration of op.amp. Explain why it is not used for linear application. 3

2 Attempt any two : 16

- (a) What do you mean by precision rectifiers ? State their advantages. Sketch the circuit of a non-saturating half wave precision rectifier and draw its input and output wave forms.
- (b) Draw and explain basic integrator circuit. What are the problems with the circuit ? Modify circuit to obtain practical integrator.
- (c) Show that circuit shown in figure 1 works as double integrator.

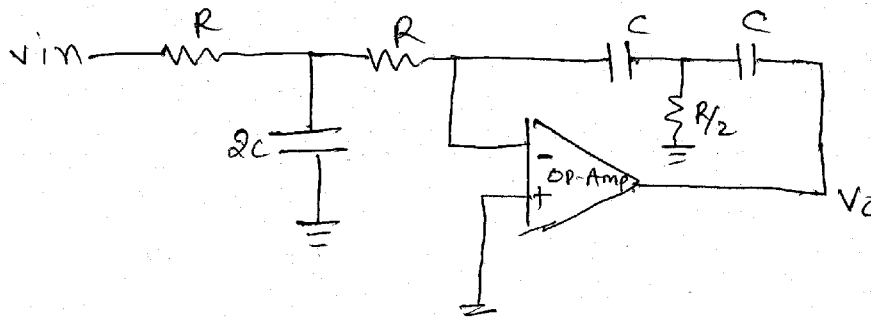


Fig.1

3 Attempt any two : 14

- (a) Explain positive and negative clamper circuit with neat diagram.
- (b) Explain sample and hold circuit with neat circuit diagram.
- (c) What are the advantages of Schmitt trigger circuit over ZCD ? Find out V_{it} and V_{ut} for the figure 2

if the $\pm V_{Sat} = \pm 15$ V plot VTC.

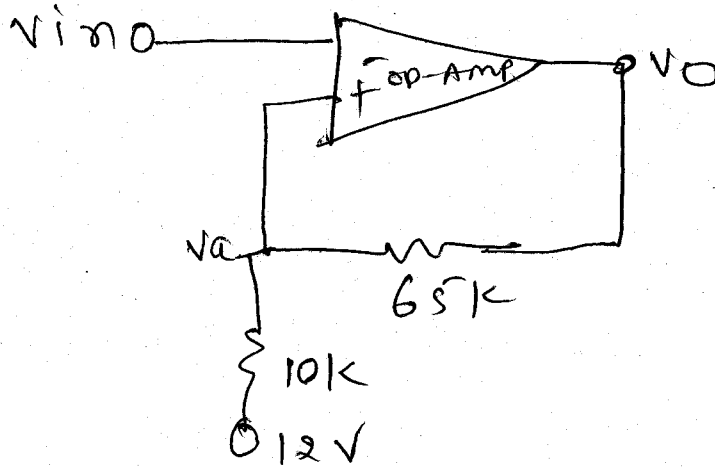


Fig.2

- 4 (a) (i) Design a second order low pass filter at a high cut off frequency of 1 kHz. 5
- (ii) Design an adjustable voltage regulator to satisfy the following specifications : 5
- Output voltage $V_o = 5$ to 12 V
- Output current $I_o = 1.0$ A
- Voltage regulator is LM 317.
- (b) (i) Design the wien bridge oscillator so that $f_o = 965$ Hz. 5
- (ii) Explain Barkhausen criterion for oscillations. 5
- 5 (a) Draw and explain astable multivibrator using IC 555. 8
- (b) Design the bandpass filter so that $f_c = 1$ kHz, $Q = 3$ and $A_F = 10$. 7

OR

- 5 (a) What is the design procedure for frequency to voltage conversion ? Explain in brief. 8
- (b) Write short note on first order 10 W pass Butter worth filter. 7
- 6 Write short note on any three : 15
- (i) Sample and hold circuit
- (ii) Window detector
- (iii) Instrumentation amplifier
- (iv) PLL