

5E3102-Q

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B. Tech. (Sem. V) (Main/Back) Examination, December - 2011
Electronics & Communication Engg.

5EC2 Linear Integrated Circuits (Common with 5EC2, 5E12, 5A12 & 5BM2)

Time : 3 Hours]

[Maximum Marks : 80
[Min. Passing Marks : 24

Instructions to Candidates :

Attempt any five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

- 1 Draw the schematic diagram of non-inverting OP AMP with voltage series feedback; explain it and derive the expression for the
- (i) voltage gain
 - (ii) Input Resistance
 - (iii) Output Resistance.

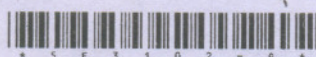
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OR

- 1 Explain the following applications of OPAMP :
- (i) Voltage follower
 - (ii) Adder
 - (iii) Comparator
 - (iv) Inverting Amplifier

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UNIT - II

- 2 (a) Design a triangular wave generator using a comparator circuit with integrator circuit to generate a triangular wave of frequency 5 KHz. Assume peak to peak output voltage is 5V and $(\pm V_{sat}) = (\pm 14 \text{ V})$.
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- (b) Design a R-C phase shift oscillator which gives the sinusoidal waveform of 600 Hz.
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OR

- 2 (a) Draw and explain with suitable diagram : Voltage to frequency converter.
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- (b) Explain the working of quadrature oscillator with suitable diagram.
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UNIT - III

- 3 (a) Draw and explain with suitable diagram First-order low pass Butterworth filter.
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- (b) Design a wide band pass filter with $f_L=500 \text{ Hz}$ and $f_H = 2\text{KHz}$, and a pass band gain = 5 for both sections of filter. Also determine the value of Q for the filter.
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OR

- 3 (a) Write short note on "switched capacitor filter".
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- (b) Design a narrow bandpass filter with a centre frequency $f_c = 1\text{KHz}$, $Q = 5$, $A_f = 8$. Change the centre frequency to 2KHz, keeping A_F and B_W constant.
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UNIT - IV

- 4 Explain the operation of PLL with the help of block diagram. Also explain linear model of second order PLL.

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OR

- 4 Briefly describe the role of PLL in the following applications :
- (i) AM detector
 - (ii) Tracking filter

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UNIT - V

- 5 (a) Explain the "Four quadrant Multiplier".
- (b) Design a 555 a stable multivibrator to generate an output pulse with a frequency $f_o = 5\text{KHz}$ and a duty cycle of 60%. Given $V_{CC} = 15\text{V}$ and $I_C \text{ min} = 1\text{mA}$.

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OR

- 5 (a) In the schmitt trigger, $R_1 = 100 \Omega$, $R_2 = 56 \text{K}\Omega$, $V_{in} = 2\text{V}$ peak to peak sine wave, and the power supply voltage = $\pm 15 \text{V}$. Determine the upper and lower threshold voltage, V_{ut} and V_{it} . The maximum output voltage swing is $\pm 14 \text{V}$.

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- (b) Write short note on Monostable multivibrator.

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