STUDENT EXAM NO. : _____

GANPAT UNIVERSITY
B.TECH SEM.IV BIOMEDICAL & INSTRUMENTATION ENGINEERING
CBCS REGULAR EXAMINATION MAY/JUNE – 2014
2BM401 - ANALOG INTEGRATED ELECTRONICS

TIME : 3 HOURS **TOTAL MARKS: 70**

INSTRUCTION:

1. Write each section in separate answer books.
2. All questions are compulsory.
3. Draw figures and assume data wherever necessary.
4. Conventional terms / notations are used.
5. Figure to the right indicate marks.

Section – I

Q.1 **[12]**

a) Define IC. Differentiate between Analog and Digital IC's. Classify IC's based on scale of integration.

b) Enlist and Describe different configurations of transistor based differential amplifier. What do you mean by single ended mode, double ended mode and common mode operation

c) Explain OP-AMP electrical properties: 1) input offset voltage ratio 2) output voltage swing

OR

Q.1 **[12]**

a) Define OP-AMP. Draw and explain typical OP-AMP Block diagram. Explain schematic symbol and pin diagram µA 741.

b) Derive following equation for closed loop Non-inverting amplifier given below. Describe voltage follower circuit with related equations.

1] $A_F = 1 + \frac{R_F}{R_1}$ 2] $A_F = \frac{A}{1+AB}$

Q.2 **[11]**

a) How OP-AMPs can be used as AC inverting and non-inverting amplifier. In inverting amplifier circuit if Rin = 50Ω , Ci = 0.1µF, R_1 = 100 Ω, R_F = 1K Ω , R_L = 10K Ω. Vs = ±15V. Determine amplifier Bandwidth. Assume K = 0.909, UGB = 1 MHz

b) Explain how differential configuration of OP-AMP can be used as subs-tractor and summing amplifier with output voltage equations

OR

Q.2 **[11]**

a) Describe instrumentation amplifier circuit operation using R_G resistor and obtain its output voltage gain equation. Enumerate its industrial applications

b) Derive output voltage equation of Integrator and explain its frequency response. Draw the output waveform if input is sine and square wave.

Q.3 **Write shot note on (Any three)** [12]

a) Sample and hold circuit
b) logarithmic Amplifier
c) Peak Detector
d) Zero crossing Detector

Section – II

Q.4 [12]

a). Explain Voltage Control Oscillator with neat diagram.
b) Draw and explain Astable Multivibrator in detail.

OR

Q.4

a). Explain Schmitt trigger with necessary diagrams.
b). Design RC phase shift oscillator for 2kHz frequency.

Q.5 [11]

a). Draw and explain Notch filter. Also design notch filter for 60 Hz frequency.
b). Draw and explain high level modulator AM transmitter in detail.

OR

Q.5 [11]

a). Write a short note on voltage regulator.
b). Design narrow band pass filter so that the center frequency f_c = 1.5 kHz, figure of merit Q= 3, Gain = 11. Change the center frequency f'_c = 2 kHz keeping the gain and bandwidth constant.

Q.6 [12]

a). Define: Filter. Give classification of filter. What are the advantages of active filter over passive filter? Write application of filter.
b). Explain operating principle of PLL with necessary diagram.
c). Define: communication system. Explain basic block diagram of it. What is modulation? What is the need of modulation?

----------END OF PAPER----------