

**G12402 ANALOG ELECTRONICS****MODEL QUESTION PAPER****Time : 3 Hours****Max.Marks: 100****Instructions:**

1. **Group A** and **Group B** questions should be answered in the Main Answer book.
2. Answer any **TEN** questions in **Group A**. Each question carries two marks.
3. Answer **ALL** questions either **(a)** subdivision or **(b)** subdivision in **Group B**. Each question carries 14 marks.

**Group – A****Marks: 10 x 3 = 30**

1. Draw the ideal schematic and block diagram of OP-AMP.
2. List the ideal characteristics of OP-AMP
3. List the non-ideal DC characteristics of OP-AMP
4. Draw the circuit diagram of half wave rectifier using OP-AMP and mention the need of precision diode.
5. Draw the Sample and Hold circuit using OP-AMP and list the type and material of capacitor used.
6. Design an Adder/subtractor circuit using OP-AMP.
7. Draw the zero crossing detector circuit and mention its importance.
8. Determine the threshold voltages  $V_{UT}$  and  $V_{LT}$  of a Schmitt trigger whose  $R_2=100\text{ Ohm}$ ,  $R_1 = 50\text{KOhm}$ ,  $V_{ref} = 0\text{V}$ ,  $V_i = 1\text{ V}_{pp}$  sine wave and saturation voltage =  $(+/- 14)\text{V}$ ,
9. With the use of OP-AMP, design a triangular wave form generator.
10. Draw the series OP-AMP regulator circuit and mention its uses
11. Draw the 723 general purpose regulators
12. Draw and mention the uses of variable resistive network.
13. Draw the functional block diagram of 555 IC
14. In the monostable multivibrator  $R=100\text{ Kohm}$  and the time delay  $T=100\text{mS}$ . Calculate the value of C.
15. List the applications of mono stable mode.

**PSG POLYTECHNIC COLLEGE, COIMBATORE - 641 004****DIPLOMA EVEN SEMESTER EXAMINATIONS – APR 2014****Group– B****Marks: 5 x 14 = 70**

16. a) i) Explain the operation of inverting amplifier using OP-AMP (5)  
ii) In the inverting amplifier calculate (i)  $i_1$  (ii)  $v_o$  (iii)  $i_L$  and (iv) total current  $i_o$  in to the input pin when the value  $R_1=10\text{kohm}$ ,  $R_f= 100\text{Kohm}$ ,  $V_i= 1\text{V}$  and a load of 25 Kohm is connected at the output. (9)
- (OR)**
- b) i) Brief about Difference mode and Common mode. (5)  
ii) Brief about Input offset voltage, Slew rate, and Thermal drift. (9)
17. a) i) Explain how the portion of input signal is blocked at the output signal using OP-AMP and full wave rectifier using OP-AMP. (5)  
ii) With neat circuit diagram explain the OP-AMP can be used as Full-wave rectifier. (9)
- (OR)**
- b) Explain the operation of Integrator and differentiator using OP-AMP.
- 18.a) Draw and explain the circuit generates sine wave using OP-AMP. (5)  
**(OR)**  
b) Explain the operation of mono stable multi vibrator using OP-AMP.
- 19.a) In-short explain the 4-bit digital to analog convertor with its complete schematic. (5)  
**(OR)**  
b) Explain the working of successive approximation technique of analog to digital convertor.
20. a) Explain the operation of linear ramp detector using timer IC. (5)  
**(OR)**  
b) With neat sketch, explain the working of Voltage Controlled Oscillator and Pulse Width Modulation circuit

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