Roll No. ..... Total Pages : 4

SE/MDQ/0-20 **5204**

ELECTRONICS-I

Paper - PHY-304(B)

Time allowed : 3 Hours *Maximum Marks : 60*

Note : Attempt any five questions in all. Selecting one question from each Unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) Why, in practical OPAMP integrator, we connect a suitable resistance in parallel with feedback capacitor ? 3

   (b) List the factors which influence the operation of a sample and hold circuit. 3

   (c) How frequency modulation is superior than amplitude modulation ? 3

   (d) Explain the following instructions : 3

   (i) RAR (ii) JNZ

   (iii) ANI

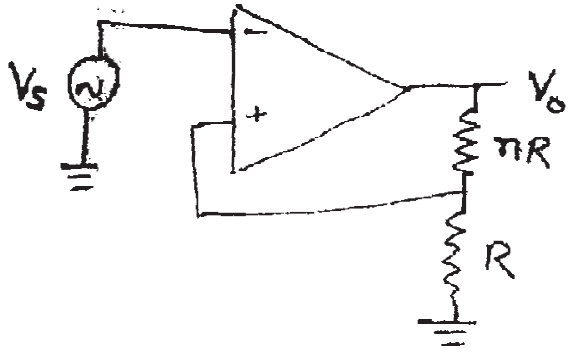
UNIT - I

2. (a) Explain the operation on an ac-voltage follower circuit for what type of applications it is used. 6

   (b) Determine the effect of negative feedback on the input and output impendence of an inverting OPAMP. 6

3. (a) Discuss the operation of anti-log amplifier. Further explain that how log and antilog amplifiers can be used for analog multiplication ? 6

   (b) For the base differentia-input amplifier shown, assume $R_i = \infty$. $R_o - 0$ and finite differential gain $A_v = V_o / V_1 - V_2$. Obtain an expression for gain Avf and further show that $A_{vf} = n + 1$ for $A_v \to \infty$. 6



UNIT - II

4. (a) What are active-filters ? Explain the operation of a second order low pass Butterworth filter. 6

   (b) What is digital communication ? Further explain pulse width modulation. 6

5. Explain frequency-modulaion. Further develop the frequency spectrum for a FM wave. Also describe a diode FM generator. 12

UNIT - III

6. (a) Set up an analog computer in block-diagram form, using OPAMPs, to solve the following differential equation 6

$$2\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 2y - x(t) = 0$$

   Assume that a generator is a variable which will provide the signal $x(t)$.

   (b) Describe the operation of a diode matrix encoder to transform a deciman number into a binary code. 6

7. (a) Show how a multiplexer may be used as : 6

   (i) a parallel to serial converter and

   (ii) a sequential data selector

(b) Sketch the circuit for BJT RAM storage cell and explain its operation.

UNIT - IV

8. Discuss the arithmatic and logical instructions of the 8085 microprocessor. 12

9. Describe the architecture of 8085 microprocessor using its block diagram. 12