Case Study - 1 Analog & linear electronic circuits

1) Discuss the working

Series regulator fixed voltage Series Regulator?

-) It is a type of voltage regulator that maintains a constant o/p voltage regulator charge in i/p volt or load condition.

(i) Block diagram

It consit of a series pass transison voltage reference feedback network and contrd circuit

ii) Voltage referes.

It provide a stable refrence voltage against which the o/p voltage is compared the reference voltage is typically derived from a zener diode or bandgap refere circuit

iii) feedback network

it compare the o/p voltage agit the refee voltage operator error signal based on dif b/w 2 voltage

iv) Series pass transistor

it acts as a variable section b/w the o/p o/p terminate by adjust the refere resistance the voltage is regulated to the load true transistor exert power as heat when the voltage

Carrier frequency generation:

The PLL generates a stable and accurate carrier frequency typically in the audio frequency range which serves as the basis for the synthesized sound

ii) Frequency modulation

The o/p of VCO serves as a the carrier signal while the audio radio or the modulating signal to frequency of carrier signal is modulating the instantaneous amplitude of carrier signal resulting the change in pitch of instrument

iii) complex waveform modulation

By modulating the carrier frequency with various audio signal including single wave or more complex a wide range of sounds can be synthesized from traditional musical instrument to abstract electronic texture

Time in fm synthesis:

Time is play a crucial role in FM synthesis by controlling the time of duration various level within the synthesis process

is higher than o/p voltage

v) regulation :

The regulator also compensates for change in i/p voltage to maintain a constant o/p voltage thus ensure stable operation even when the i/p voltage fluctuate
overall the fixed voltage series regulator provides a fc reliable of stable o/p voltage series regulator power a fc reliable of stable o/p voltage making it suitable for various application where precise voltage regulator provides a reliable voltage power supplies for electronic device voltage refers voltage stabilities

* explain the working IC723 general purpose regulator the . and the operation o/p voltage.

→ The IC 723 is popular general purpose voltage regulator IC that can be configurated to provided both positive the regulated voltages.

working principle

1) Reference voltage

it uses a stable voltage reference circuit to created a provide reference voltage to the IS 715 for the regulator configuration.

(iii) feedback network

A feedback network is employed provide improv the regulation transid response it consist of resistor of capacitor to control the loop gain bandwidth of regulator

Exp for output voltage (Vout) :-

$$V_{out} = V_{ref} \times \left(1 + \frac{R_2}{R_1}\right) + I_{adj} \times R_2$$

Voltage gain (AV) :-

$$AV = \frac{\Delta V_{out}}{\Delta V_{ref}} = R_2/R_1$$

IC723 provides a flexi and reliable solution for voltage regulation in various electronic units with o/p voltage gain easily adjustable by selecting appropriate resistor values in feedback network

(8) Discuss any one application of phase loop timer

Phase locked loop (PLL) timer

One application that leverage the both phase locked loop (PLS) 2 times is frequency modulation in } Synthesizer
in electronic music production. Q5-)

Phase-locked loop (PLL) in FM Synthesis Q3-) :-

in FM Synthesis a PLL can be used to generate peack carrier frequency that are modulated by an also signal to create complex a dynamic sound

incomplete

Partially

22/30