UNIT-4

1. What is a differential amplifier?

An amplifier that has two inputs and produces on output signal that is a function of the difference between the two given output.

2. What are the applications of difference amplifier?

- Medical electronic field
- Input stage in the measuring instruments
- Analog computation
- Linear integrated circuit

3. What are the advantages of differential amplifier?

- It uses no frequency dependent coupling or bypassing capacitors.
- It can compare any tow signals and detect the difference.
- It gives higher gain than two cascaded stages of ordinary direct coupling.

4. What is operational amplifier?

An op amp to perform mathematical operation like summation, multiplication, differentiation and integration etc. in analog computers. It is very high directly couplenegative fee back amplifier, which can amplify signals having frequency ranging from 0Hz to1 MHz.

5. What are the specifications for an ideal operational amplifier?

Open loop gain = ∞, Input impedance = ∞

Output impedance = 0, Band width = ∞, CMRR = ∞

6. How do you bias the class A operation?

In class A mode, the output current flows through out the entire period of input cycle and the Q point is chosen at the midpoint of AC load line and biased.

7. Which amplifier gives minimum distortion?

Class S amplifier gives minimum distortion.

8. List the applications of class C power amplifier.

The applications of class C power amplifier are, a. Used in radio and TV transmitters.
b. Used to amplify the high frequency signals. c. Tuned amplifiers

9. **.Define Class B mode of operation and its advantages and disadvantages.**

Class B mode of operation
The Biasing signal and input signal flow through the circuit for half cycle i.e., 180o.
Advantages
a. Efficiency is increased from 25% to 78.5%
b. Due to push pull configuration all even harmonics are reduced. So harmonic distortions are reduced.
c. Due to centre-tapped transformer at input and output, the core
saturation loss is reduced. Disadvantages
a. Transistor is biased above the cut off region
b. Due to the centre-tapped transformer at both input and output, the circuit becomes complex

10. What is common mode voltage swing?

The common mode voltage swing is defined as the maximum peak input voltage which may be applied to either input terminal without causing abnormal operation or damage.

11. Define slew rate.

It measure of an operational amplifier's switching speed defined as the maximum time rate of change of the output voltage when subjected to a square wave input signal when the closed loop gain is unity. Unit is V/msec.

12.What is difference between voltage amplifier and power amplifier?

Small signal amplifiers are also known as "Voltage amplifiers". This is because these amplifiers are used primarily for voltage amplification but they are not capable of supplying a large power to the loads such as loud speakers. The large signal amplifier (poweramplifier) will increase the current sourcing and sinking capability. So at its output we get a high voltage, high current signal that means a high power signal. Thus the power amplifier is basically a current amplifier.

13. What are the types of bias method?

1. Fixed bias circuit (single base resistor biasing)
2. Collector to base bias circuit
3. Voltage divider bias (self-bias) circuit.

14. Define pinch off voltage.

The drain source voltage(V_{DS}) at which the drain current (I_D)reaches to its constant saturation level is called as "pinch off voltage, V_P"

$V_P = (q\ N_D\ a^2)/2\epsilon$

15. Why thermal runaway not present in FET?

Thermal runaway does not exist in JFET, because drain resistance rd increases with the temperature, which reduces I_D. Thus with the reduction of I_D the temperature of the device is reduced.

16. What is meant by monostable, bistable, astable multivibrator?

Bistable multivibrator-It has two stable states. The multivibrator can exist indefinitely ineither of the two stable states .It requires an external triggering pulse to change from one state to another.

Monostable Multivibrator: It has one stable state and one quasi state. The multivibratorremains in a stable state and when external triggering is applied, then multivibrator goes to quasi state .After some time interval, the circuit automatically returns to normal state

Astable Multivibrator-The astable multivibrator has both the states as the quasi stablestates. None of the state is stable. Due to this, the multivibrator automatically makes the successive transition from one quasi stable state to other, without any triggering pulse

17. Mention few applications of UJT.

1. Phase control 2.Saw – tooth generators 3.Non-sinusoidal oscillators 4.Triggering device for SCR and DIAC.

18. List the various square wave generator circuits.

a. Astable multivibrator.

b. Monostable multivibrator.

c. Bistable multivibrator.

d. Schmitt trigger

19. List the various saw tooth generator circuit.

a. Exponential charging

b. Miller circuit.

c. Bootstrap circuit.

d. Phantastron circuit.

e. Inductor circuit

20. How the frequency of oscillation varied in an astable multivibrator?

1/T = 1/ 1.38RC, so by varying the value of R or C, the frequency of oscillation canbe varied.