

B.E. / B.Tech. Electronics & Communication / Telecommunication Engineering
(Model Curriculum) Semester-IV
SE204 - Analog Circuits

P. Pages : 2

Time : Three Hours



GUG/W/24/13914

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Define clipper and clamper circuit. Explain the operation of positive clamper circuit with its input and output waveform. 8
- b) With the help of circuit diagram and its frequency response explain the operation of two stages RC coupled amplifier. 8

OR

2. a) Explain the significance of all components of small signal low frequency hybrid Pi model with its circuit diagram. 8
- b) Three amplifier stages are working in cascade with 0.05 V peak to peak input providing 150 V peak to peak output. If the voltage gain of the first stage is 20 and input to the third stage is 15 V peak to peak. Determine 8
 - i) The overall voltage gain.
 - ii) Voltage gain of second and third stage.
 - iii) Input voltage of second stage.

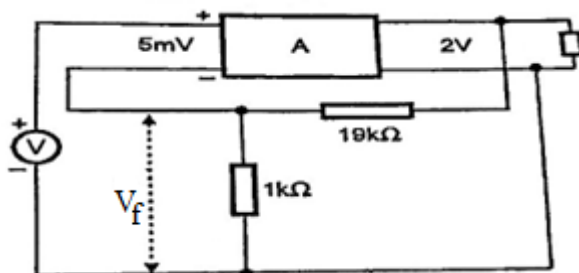
3. a) With neat diagram explain Push Pull Class B Power Amplifier and derive its maximum efficiency. 8
- b) Derive the input and output resistance of trans conductance negative feedback amplifier. 8

OR

4. a) What is negative feedback amplifier? Derive the gain formula for negative feedback amplifier. 8
- b) A feedback amplifier is shown in the following fig. 8

Calculate

 - 1) The value of feedback factor β
 - 2) Voltage gain of amplifier without feedback
 - 3) Voltage gain of amplifier with feedback
 - 4) The feedback voltage (V_f)



5. a) Draw and explain the circuit diagram and waveform of one shot multivibrator. 8
- b) Compare RC and LC oscillators on the basis of 4
- 1) Component used
 - 2) Feedback Element
 - 3) Frequency range
 - 4) Frequency formula
- c) State Barkhausen's criterion for oscillation. Compare AF oscillator and RF oscillator. 4

OR

6. a) A Hartley oscillator is designed with $L_1 = 2\text{mH}$, $L_2 = 20\mu\text{H}$ and a variable capacitance. Determine the range of capacitance values, if the frequency of oscillation is varied between 950kHz to 2050kHz. 8
- b) Draw and explain UJT relaxation oscillator circuit also derive its formula for frequency of oscillation. 8
7. a) Draw the circuit diagram of emitter coupled dual input balance output differential amplifier and obtain its a.c. analysis. 8
- b) Define 8
- 1) Input bias current
 - 2) Input offset current
 - 3) Input offset voltage
 - 4) Output offset voltage
 - 5) CMRR
 - 6) PSRR

OR

8. a) Draw and explain the block diagram of op amp. Also draw its symbol and pin diagram. 8
- b) What is CMRR? Explain current mirror method of improving CMRR. Also state the ideal characteristics of op-amp. 8
9. a) Draw and explain the operation of second order low pass active filter. Also draw its frequency response graph. 8
- b) What is active integrator circuit? With neat circuit diagram and waveform explain the working of an active integrator circuit. 8

OR

10. a) Explain the operation of op-amp inverting Schmitt trigger circuit with its waveform. 8
- b) With the help of neat diagram and waveform, explain the full wave precision rectifier circuit. 8
