



P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Third Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; Dec. - 2019
Analog Electronics Circuits

Time: 3 hrs

Max. Marks: 100

Note: i) **PART - A** is compulsory. **Two** marks for each question.

ii) **PART - B:** Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks
I : PART - A		10
I a.	How does a clipping circuit differ from a clamping circuit?	2
b.	What is Barkhausen criteria?	2
c.	What are the advantages of Negative feedback in amplifiers?	2
d.	Define total Harmonic Distortion and state the expression for the same.	2
e.	State the important features of JFET.	2
II : PART - B		90
UNIT - I		18
1 a.	With neat circuit diagram and waveforms, explain the operation of positive clamper.	9
b.	Determine the dc bias voltage V_{CE} and current I_C for the voltage divider bias configuration with $R_1 = 39 \Omega$, $R_2 = 3.9 \text{ k}\Omega$, $R_C = 10 \text{ k}\Omega$, $R_E = 1.5 \text{ k}\Omega$ and $V_{CC} = 22 \text{ V}$. Assume Silicon transistor with $\beta = 100$ and also draw the circuit.	9
c.	Explain with a neat circuit diagram, the low frequency response of RC coupled amplifier.	9
UNIT - II		18
2 a.	Derive the expressions for current gain, voltage gain, input impedance and output impedance for an emitter follower circuit with h-parameter model for the transistor.	9
b.	With a neat circuit diagram explain the operation of transistor RC phase shift oscillator. Write the expression for the frequency of oscillation.	9
c.	Explain the basic operation of LC tank circuit in tuned oscillation. Also calculate the frequency of oscillation of a Harley oscillator with $L_1 = 0.5 \text{ mH}$, $L_2 = 1 \text{ mH}$ and $C = 0.2 \mu\text{F}$.	9
UNIT - III		18
3 a.	With a neat block diagram, explain various feedback amplifier topologies.	9
b.	Using a block diagram approach obtain the transfer gain of the feedback amplifier.	9
c.	Derive expressions for input and output resistances of a voltage shunt feedback amplifier.	9

UNIT - IV

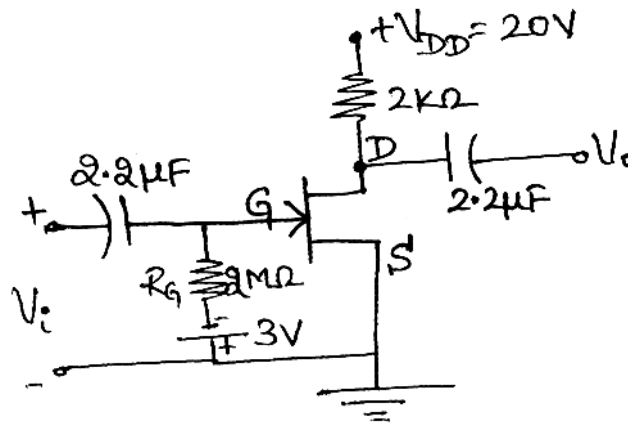
18

- 4 a. Draw the circuit diagram and explain the operation of transformer coupled Class B push pull power amplifier. 9
- b. Explain the operation of series fed directly coupled class A power factor. Also mention its advantages and disadvantages. 9
- c. For a class B Amplifier using a supply of $V_{CC} = 30\text{ V}$ and driving a load of $16\ \Omega$, determine the maximum input power, output power, efficiency and transistor dissipation. 9

UNIT - V

18

- 5 a. With necessary diagrams explain the construction, working and characteristics of n-channel JFET. 9
- b. Explain the construction, operation and characteristics of n-channel enhancement MOSFET. 9
- c. For a JFET amplifier shown below calculate;
 - (i) Z_i (ii) Z_o (iii) A_v . Given $I_{DSS} = 5\text{ mA}$, $V_P = -6\text{ V}$, $Y_{OS} = 40\ \mu\text{s}$



9
