U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

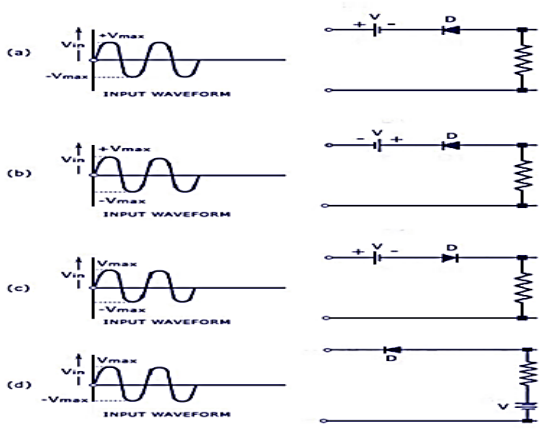
December 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: Electronics & Telecommunication Engineering **Duration: 3 hrs.**
Course Code: 22ET3PCALC **Max Marks: 100**
Course: Analog and Linear Circuits

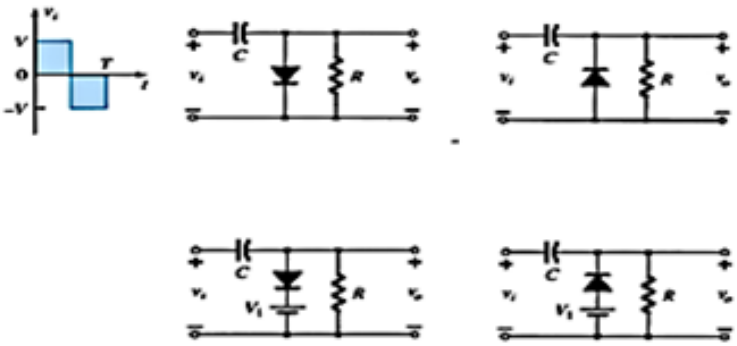
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) For the following circuits write the output waveforms. **08**



b) For the Following clamping Circuits write the output waveforms **08**



c) Draw the Frequency response of a BJT amplifier, mentioning the capacitive effect at low and high frequency. **04**

UNIT - II

2 a) Write the block diagram of the following indicating A, A_f and β. **10**
a. Voltage series feedback amplifier b. Voltage shunt feedback amplifier
c. Current series feedback amplifier d. Current shunt feedback amplifier.

b) Explain the working principle of a class A transformer coupled power amplifier circuit. Show that maximum power conversion efficiency is 50% for class A power amplifier. **10**

OR

3 a) Discuss briefly about various characteristics of an amplifier which are modified by negative feedback. Justify why negative feedback is preferred. **08**

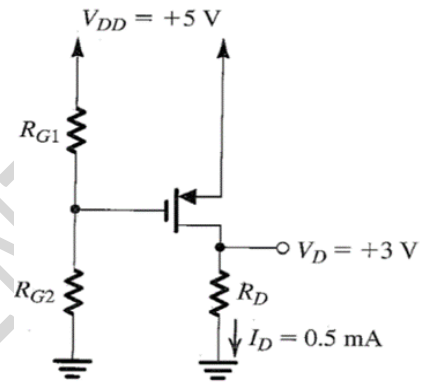
b) Explain the working principle of class B power amplifier circuit. Derive an equation for power conversion efficiency. **08**

c) For a class B amplifier providing a 20V peak signal to a 16Ω load (speaker) and a power supply of Vcc = 20V, determine the input power, output power, and circuit efficiency. **04**

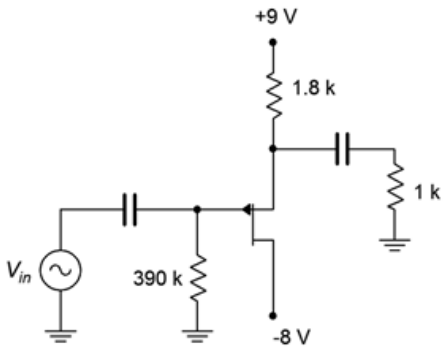
UNIT - III

4 a) With the circuit derive for the voltage gain, input impedance and output impedance for the common source (CS) MOS amplifier with Rs. **08**

b) Design the given circuit so that the MOSFET operates in saturation with I_D=0.5mA and V_D =+3V. Let the enhancement -type PMOS transistor have V_t =-1V and k'p (W/L)=1mA/V^2. What is the largest value that R_D can have while maintaining saturation region operation. **06**



c) For the circuit shown in Figure, determine the input impedance and output voltage. Assume V_{in}=100mV, I_{DSS}=36 mA, $V_{GS(off)}$=3V. **06**



UNIT - IV

5 a) With a circuit diagram and relevant equations for gain , explain the operation of Instrumentation Amplifier circuit. **10**

	b)	Explain the operation of full wave Precision Rectifier with the Transfer characteristics and output waveform, and mention its advantages.	**10**

UNIT - V

6	a)	Explain the working of R-2R DAC circuit and mention its advantages.	**10**
	b)	Explain the Functional Block diagram of 555 IC.	**10**

OR

7	a)	Explain the working principle of 3 bit Flash type ADC with its advantages and Disadvantages	**10**
	b)	Explain the working principle of astable Multivibrator using 555 IC and mention its applications.	**10**

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