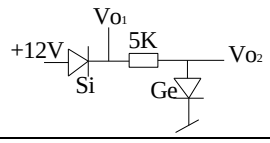
Roll No											

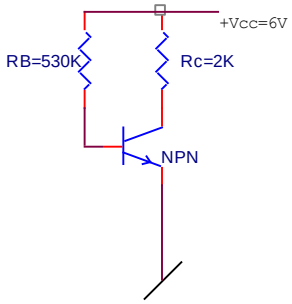
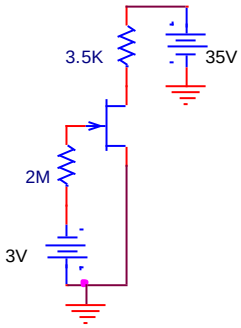
PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
Make Up Examinations – December 2025

Semester : MK	**Date :** 26-12-2025
Course Code : ECE1006	**Time :** 1.00pm to 04.00pm
Course Name : Basic Electronics Engineering	**Max Marks :** 100
Program : B. Tech	**Weightage** : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A			
	ANSWER ANY 4 QUESTIONS		**4Q X 5M=20M**
1	A **filter circuit** is one which removes the ac component present in the rectified output and allows the dc component to reach the load. Explain the shunt capacitor filter of rectifier.	(CO 1)	[Knowledge]
2	The electronic band structure is an energy scheme to describe the conductivity of conductors, insulators, and semiconductors. It consist of two energy bands and the band gap. Define conductor, insulator and semiconductor and also draw the energy band diagram.	(CO 1)	[Knowledge]
3	A bipolar junction transistor is a three-terminal semiconductor device which is capable to amplify the input signal. Derive the relation between **α and β** of a transistor. A transistor has β=95. If the collector current is 40mA, find the value of emitter current.	(CO2)	[Knowledge]
4	Diodes connected in parallel share the same voltage but carry individual currents. It offers improved current handling and lower voltage drop. Determine V_{o1} and V_{o2} for the circuit shown in Figure. 	(CO2)	[Knowledge]
5	The function of a power amplifier is to raise the power level of input signal. Compare the efficiency for Class-A, Class-B, Class-AB and Class-C power amplifier.	(CO3)	[Knowledge]
6	The Junction Field Effect Transistor is a unipolar device in which current flow between its two electrodes is controlled by the action of an electric field at a reverse biased pn-junction. Prove that $\mu = g_m * r_{ds}$ in JFET	(CO4)	[Comprehension]

PART B			
	ANSWER ANY 5 QUESTIONS		**5Q X 10M=50M**
7	A Rectifier is a circuit that converts AC voltage to DC voltage. Explain the working of full wave Rectifier with input and output waveform.	(CO2)	[Comprehension]
8	A transistor is a semiconductor device which transfers a weak signal from low resistance circuit to high resistance circuit. Explain the Input and output characteristics of a common Base configuration indicating saturation, cut-off and active region.	(CO1)	[Comprehension]
9	Distortion is the inexact reproduction of an input signal at the output of an amplifier. Due to their two-stage design, push-pull amplifiers suffer from crossover distortion of the output waveform around its zero crossover point. Explain Crossover distortion in Class B Amplifier. How it can be avoided.	(CO3)	[Comprehension]
10	The proper flow of zero signal collector current and the maintenance of proper collector emitter voltage during the passage of signal is known as **Transistor Biasing**. Find the value of I_B, I_C, V_{CE} for β=100. Given R_B = 630KΩ, R_C=2KΩ, Vcc=6V 	(CO2)	[Comprehension]
11	A p-n junction diode is a basic semiconductor device that controls the flow of electric current in a circuit. Explain the V-I characteristics of PN Junction Diode in Forward and Reverse bias Condition. What is the effect of temperature on the V-I characteristics of diode?	(CO1)	[Comprehension]
12	A MOSFET is a field-effect transistor with an insulated gate where the voltage determines the conductivity of the device. Explain the working of N Channel Enhancement type MOSFET. Also draw the drain and transfer characteristics.	(CO4)	[Comprehension]
13	Biasing is known as setting of initial operating conditions of an active device in an amplifier. Determine V_{GSQ}, I_{DQ}, V_{DS}, V_S, V_G, V_D for a JFET. Given I_{DSS}=10mA, V_P= - 4V, R_D=3.5KΩ, R_G=2MΩ, V_{DD}=35V, V_{GG}= -3V. 	(CO4)	[Application]

PART C			
	ANSWER ANY 2 QUESTIONS		**2Q X 15M=30M**
14	A MOSFET is a field-effect transistor with an insulated gate where the voltage determines the conductivity of the device. Deduce the expression for overall voltage gain, input and output impedance in common Gate amplifier in MOSFET.	(CO4)	[Application]
15	BJT amplifier is basically a bipolar junction transistor operated in the active region. It increases the strength of the input signal and produces an amplified output. Explain the frequency response of CE amplifier in LF, HF and mid- band with cut off frequency. Derive the expression of external capacitors on frequency response.	(CO3, CO4)	[Application]
16	A MOSFET is a field-effect transistor with an insulated gate where the voltage determines the conductivity of the device. Deduce the expression for overall voltage gain, input and output impedance in common source amplifier in MOSFET. Why Common drain amplifier is called as unity gain amplifier?	(CO4)	[Comprehension]