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PRESIDENCY UNIVERSITY BENGALURU

 **SET-A**

SCHOOL OF ENGINEERING

**MAKE UP EXAMINATION – JULY 2024**

**Course Code:** EEE2009

**Course Name:** Analog Electronics Circuits

**Program:** B. Tech.

**Date :** 18-JULY- 2024

**Time :** 1:30 PM - 4:30 PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

**Part - A**

**Answer any 5 questions 5 x 4M= 20M**

* 1. Amplifiers and oscillators are two important circuits in analog design. Define what is an oscillator and give the 2 criteria for oscillations to sustain in any oscillator design.

(CO3) [Knowledge]

* 1. Diodes can be used in building clipping and clamping circuits. Define clippers and clampers.

(CO1) [Knowledge]

* 1. H parameters are also called as hybrid parameters. Give the equations for the h- parameters H11 and H22.

(CO2) [Knowledge]

* 1. BJT and MOSFET both need proper biasing to put the device to conduction. Give the symbol of a BJT and FET mention the types and list the different types of biasing.

(CO4) [Knowledge]

* 1. Oscillators consists of tank circuit in feedback path. List the different types of oscillators. Give the circuit for RC feedback network and mention the phase shift in each RC network.

(CO3) [Knowledge]

* 1. FET can be biased to conduction using fixed or voltage divider bias network. Give the FET equivalent circuit for fixed biasing and give the equation for gm.

(CO4) [Knowledge]

* 1. Oscillators are classified as sinusoidal and non-sinusoidal. Name the criteria to obtain sustained oscillations.. List the conditions in the criteria.

(CO3) [Knowledge]

**Part - B**

**Answer any 4 questions 4 x 10M = 40M**

* 1. *Push*-*pull Amplifier* is a type of power amplifier. It contains a pair of active devices such as a complementary pair of transistors. With a neat diagram, working advantages and disadvantages explain class B pushpull amplifiers.

(CO3) [Comprehension]

* 1. Hartley and colpitts are sinusoidal oscillators.
		1. Give the circuit diagram of hartely oscillator. (5M)
		2. If L1=750µH,L2=750µH, M=150µH , Lrfc=0.5mH, C=150pF,C2=10µF, hfe=50. Calculate the frequency of oscillations. (5M)

(CO3) [Comprehension]

* 1. FETs are voltage controlled devices unlike BJT. Explain with neat diagram and cases the operation of an FET.

(CO4) [Comprehension]

* 1. Baising for a transistor is done using a DC supply. List the types of biasing used for an FET and explain any one type with a neat diagram.

(CO4) [Comprehension]

* 1. Silicon and germanium are two widely used material to make a diode.
		1. Give difference between a normal and a zener diode. (5M)
		2. A silicon diode working at 75 degree celcuis. Determine the forward voltage required to be applied. The reverse saturation current is 10µa, forward current is 100ma and η=2. (5M)
	2. Rectifiers can be of three types Half wave , Full wave and Full wave bridge.
		1. Give atleast 4 differences between the types mentioned above.
		2. with a neat diagram and waveform explain any one series clipper circuit.

(CO1) [Comprehension]

(CO2) [Comprehension]

**Part - C**

**Answer any 2 questions 2 x 20M = 40M**

* 1. A Resistance Capacitance (RC) Coupled Amplifier is basically a multi-stage amplifier circuit extensively used in electronic circuits.Explain RC coupled amplifier with a neat circuit diagram, graph and also mention the advantages and disadvantages.

(CO3) [Application]

* 1. The behaviour of any electronic component can be observed by the standard input output characteristics.
		1. List the advantages and disadvantages of FET. (10M)
		2. Explain with a neat diagram output characteristics of FET. (10M)

(CO4) [Application]

* 1. Clipping circuits (also known as limiters, amplitude selectors, or slicers), are used to remove the part of a signal.
		1. Clampers are used to clamp the dc level of the signal. With a neat diagram and waveform explain negative clamper circuit. (10M)
		2. Manoj is designing a circuit to perform a double ended clipping of a 20Vp-p sinusoidal input waveform, for a positive bias of 2.5V and negative bias of 2.5V . Give a neat circuit diagram, waveform and explanation. (10M)

(CO2) [Application]