Roll No. _____

END SEMESTER EXAMINATION
SEMESTER –III

COURSE CODE :EEE-406/EE408
COURSE TITLE :ELECTRONIC DEVICES AND CIRCUITS
SESSION :JUL-DEC' 2021

DURATION : 3 (THREE)HRS
MAXIMUM MARKS :75
PASS MARKS : 35 %

NOTE: 1.Attempt any 5 (five) full questions
3. Mark for each question is shown against it.
4. Assume suitable logical data wherever necessary.

1.	**(a)**	Explain with suitable diagram how four diodes are used in a rectifier circuit to convert AC signal into DC output. Also show the input and output waveforms in each half cycle.	**(6)**
	(b)	What do you mean by Ripples in rectified output? Calculate the ripple factors for both HWR & FWR.	(1+4=5)
	(c)	Obtain the expression for Average DC output voltage for a full wave rectifier.	**(4)**
2.	**(a)**	Describe in detail why Capacitors and Inductors are used in Filter circuits.	(6)
	(b)	Explain the working of a Pi filter circuit with suitable diagram and waveforms.	**(5)**
	(c)	Why series inductor filter cannot be used with Half wave rectifier circuit?	**(2)**
	(d)	What do you mean by Zener Breakdown? Explain.	**(2)**
3.	**(a)**	Why is the width of the base region in a transistor kept very small compared to other regions?	**(2)**
	(b)	Why CE configuration is the most popular in Amplifier circuits?	(2)
	(c)	Why is the emitter region highly doped?	**(2)**
	(d)	Why is an ordinary transistor called Bipolar ?	(2)
	(e)	Explain with suitable diagram the working of a RC coupled Multistage Amplifier and draw its frequency response.	(7)
4.	**(a)**	Compare Insulators ,conductors and Semiconductors on the basis of Energy Band Diagram	**(6)**
	(b)	Explain how barrier potential is developed at the PN junction.	**(2)**
	(c)	Define doping. How is an N type Semiconductor formed using doping? Explain .	**(1+4=5)**
	(d)	Why are FET called unipolar transistors?	**(2)**
5.	**(a)**	What do you mean by feedback in amplifier? What are the types of feedback?	(1+3)
	(b)	Draw the different types of negative feedback connections and give the expression of output resistances.	(6)
	(c)	Define coupling. What are the different methods of coupling in multistage amplifiers?	(1+4)
6.	**(a)**	Obtain the relationship between α&β&γ.	(5)
	(b)	What is current amplification factor under CB configuration? What are its classifications? Discuss.	(2+3=5)
	(c)	What do you mean by Thermal runaway? What is the function of heat sinks? Discuss.	**(5)**

7.	**(a)**	Discuss the biasing techniques of MOSFET.	(6)
	(b)	Diffentiate between BJT and FET.	(4)
	(c)	Write short noteson : Light emitting diode and Varactor Diode	2.5x2=5
8.	**(a)**	A crystal diode having internal resistance $r_f = 20\Omega$ is used for half-wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800\ \Omega$, find : (i) Im, Idc, Irms (ii) a.c. power input and d.c. power output (iii) d.c. output voltage (iv) efficiency of rectification.	(6)
	(b)	In a common base connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current.	(3)
	(c)	A three-stage amplifier has a first stage voltage gain of 100, second stage voltage gain of 200 and third stage voltage gain of 400. Find the total voltage gain in db .	(4)
	(d)	In a common base connection, the emitter current is 1mA. If the emitter circuit is open, the collector current is 50 μA. Find the total collector current. Given that $\alpha = 0.92$.	**(2)**