Reg. No.



III SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER 2017

SUBJECT: ANALOG ELECTRONIC CIRCUITS [ELE 2105]

REVISED CREDIT SYSTEM

Time:	3 Hours Date: 28 November 2017	Max. Mar	ks: 50
Instructions to Candidates:			
	✤ Answer ALL the questions.		
	 Missing data may be suitably assumed. 		
1A.	Sketch the output voltage waveform and voltage transfer curve for the circuit Fig Q1A. Given that the input varies linearly from 0 to 100V. Assume the diodes t	t shown in to be ideal.	(03)
1B.	For the circuits shown in Fig Q1B(i) and FigQ1B(ii), analyze and develop truth tab of inputs and output and comment on the logic function. Assume V_{DD} = V_{SS} =5V.	le in terms	(03)
1C.	For Fig Q1C (i) determine Io and Vo, and for Fig Q1C (ii) Find V_0 and I_D . Cut in Si=0.7V, and that of Ge=0.3V.	voltage of	(04)
2A.	The 8V zener diode is used in the regulator circuit where Vin varies from 9 R_L =500 Ω . Determine minimum and maximum power in the zener diode. Assussurce resistance is 50 ohm.	V-20V and ume series	(03)
2B.	For the MOSFET Amplifier circuit shown in Fig Q2B(i) and Fig Q2B(ii), determ operating voltages V _{GS} , V _G , V _D and V _S . Assume $\mu_n c_{ox} \frac{w}{L} = 1mA/V^2$, V _{th} = 0.7 V.	ine the DC	(05)
2C	Define MOS trans conductance and state the significance of it.		(02)
3A.	Determine the required aspect ratio of the MOSFET and resistance R in the circu such that $V_0=1V$ and $I_{ref}=500$ uA. Assume M1 & M2 are identical, $\mu_n c_{ox}=250$ $V_{th}=0.7V$.	it Fig Q3A., μA/V² and	(03)
3B.	Develop the small signal model and determine coordinates of Q point and output if Vin=0.8mV applied at the input of the amplifier shown in the Fig Q3B. $\lambda = \mu_n c_{ox} \frac{w}{L} = 0.2mA/V^2$. Assume Voltage gain to be large initially.	voltage Vo 0. Vth=1V.	(07)
4A.	Develop the small signal model and determine the overall gain of cascaded conshown in Fig Q4A. The gain of the source follower is -4.029dB and the overall gain the gain reduction due to signal source resistance is 16.16dB. Find the trans conc the amplifiers M_1 and M_2 and output resistance of the cascaded configuration. A $\lambda 2= 0$, Vth1=Vth2=1.2V.	nfiguration n excluding luctance of ssume λ1=	(07)
4B.	Determine the bandwidth of the amplifier shown in Fig Q4B, and draw the response with all capacitor effects in different regions of the response.	frequency	(03)
5A.	Classify the Power Amplifiers based on Operating Point and comment on the Effi	iciency.	(02)
5B.	Derive the efficiency of class B Power Amplifier and draw the block diagram.		(02)
5C.	A Power amplifier of class A type with transformer coupling delivers a maximum a 10 Ω load resistance with V _{DD} =20V. The Q point is adjusted for symmetrica Determine i) Turns ratio of transformer ii) Q point iii) Maximum Efficiency	m of 5W to al clipping.	(03)

5D. The bias current I, of a certain MOS differential pair is 5mA. It employs transistors with aspect ratio of 150, $\mu_n c_{ox} = 0.6 \text{mA}/v^2$, $R_D=1k$ and $R_{SS}=50k$. Determine the differential gain, common mode gain and common mode rejection ratio if the output is taken single ended and the circuit is perfectly matched.

(03)

