

University of Mumbai

Examinations Summer 2022

Program: Electronics Engineering

Curriculum Scheme: Rev 2019

Examination: SE Semester IV

Course Code: ELC402 and Course Name: Electronic Devices and Circuits-II

Time: 2 hour 30 minutes Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	(Gain X Bandwidth) of amplifier =
Option A:	Constant
Option B:	High
Option C:	Low
Option D:	Zero
2.	Lower cutoff frequency corresponds to ____ of all the time constants and higher cutoff frequency corresponds to ____ of all the time constants.
Option A:	Smallest, Largest
Option B:	Largest, Largest
Option C:	Smallest, smallest
Option D:	Largest, smallest
3.	In negative feedback closed loop gain (A_{vf}) is ____ open loop gain (A_v)
Option A:	Smaller than
Option B:	Larger than
Option C:	Equal to
4.	In Current series Input impedance ____ and output Impedance ____
Option A:	Increase, Increase
Option B:	Decrease, increase
Option C:	Increase, decrease
Option D:	Decrease, decrease
5.	$A_v = 40$ and $\beta = 0.02$ then what will be the over all gain A_{vf} ?
Option A:	-400
Option B:	0.1
Option C:	200
Option D:	400
6.	Phase shift oscillators used for low frequency range
Option A:	True
Option B:	False
7.	Colpitt's oscillator uses tapped ____ and Hartley oscillator uses tapped ____
Option A:	Capacitance, inductance
Option B:	Capacitance, Capacitance
Option C:	Inductance, inductance
Option D:	inductance, Capacitance
8.	A Differential Amplifier should have drain resistor's value (R_{D1} & R_{D2}) as....
Option A:	10k Ω ,5k Ω
Option B:	5k Ω ,5k Ω

Option C:	5kΩ ,10kΩ
Option D:	5Ω , 5kΩ
9.	In Class-AB Power Amplifier, Q-Point is located at.....
Option A:	Cut-off Point
Option B:	Saturation Point
Option C:	Middle of the DC Load Line
Option D:	Above Cut-off Point
10.	Cross over distortion present in
Option A:	Class A
Option B:	Class B
Option C:	Class C
Option D:	Class AB

Q2 (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	<p>For the CS MOSFET amplifier shown in figure below, calculate the values of f_H and f_L. Assume the following values for the MOSFET. $C_{gd}=2\text{pF}$, $C_{gs}=5\text{pF}$, $R_{si}=100\Omega$, $g_m=10\text{mS}$, $C_1=0.5\mu\text{F}$, $C_2=1\mu\text{F}$, $C_s=10\mu\text{F}$, $R_1=R_2=250\text{k}\Omega$, $R_D=5\text{k}\Omega$, $R_S=250\text{k}\Omega$ and $R_L=5\text{k}\Omega$</p>
B	Explain in brief MOSFET differential amplifier with active load and small signal analysis of MOSFET active load circuit?
C	Explain the advantages of negative feedback and suggest and explain scheme for improving input and output impedance of amplifier
Q3 (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	Compare class B and class AB power amplifier with neat diagram, working, features and expression for its efficiency?
B	Derive the equation for overall voltage gain, input resistance and output resistance of cascade amplifier.
C	What are general conditions needed for an oscillator circuit to operate? Explain any one oscillator with detailed diagram
Q4 (20 Marks)	
A	Solve any Two 5 marks each
i.	Compare all negative feedback topologies
ii.	Short note on darlington pair
iii.	Design a suitable heat sink using transistor 2N3055 for following specification: Actual power dissipation in transistor= 40 watts, Maximum thermal resistance from case to heat sink $\Theta_{CS} = 0.5^\circ\text{C/W}$, $\Theta_{JC} = 1.5^\circ\text{C/W}$,

	TA(max) = 40° C, Tj(max) = 200° C and draw electrical equivalent circuit for heat sink flow
B	Solve any One 10 marks each
i.	Explain voltage series negative feedback with appropriate circuit.
ii.	How power amplifier is different from voltage amplifier? Explain any power amplifier with suitable graphs and circuit diagram