## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, April/May 2018

Course: Analog Electronics   **Semester:** IV
Program: B.TECH EE IOT
Time: 03 hrs.   **Max. Marks:** 100

Instructions: All questions are compulsory

SECTION A

S. No.		Marks	CO
Q1.	Analyze the Characteristics of NMOSFET and N type BJT and mention all the operating regions?	5	CO1
Q2.	Draw the transfer and output characteristics of N- channel JFET and elaborate on the input impedance of the JFET.	5	CO1
Q3.	Evaluate the output and input impedance of Voltage shunt and current shunt feedback amplifiers and also draw the block diagram?	5	CO3
Q4.	Determine the output voltage Vo(t) of the given circuit?	5	CO4
SECTION B			
Q 5	The fixed-bias configuration of Example 6.1 had an operating point defined by $VGSQ$ =2 V and IDQ = 5.625 mA, with $IDSS$ = 10 mA and $VGSOFF$ = -8 V. The network is redrawn as in given figure with an applied signal Vi. The value of yo is provided as 40uS. (a) Determine gm. (b) Find rd. (c) Determine Zi. (d) Calculate Zo. (e) Determine the voltage gain Av.	10	CO2

Q6.	Derive the small signal parameters of the given BJT configuration? 	10	CO2
Q7.	(a)Evaluate the final output of the multistage Opamp configuration? (b). Input signal is Triangular waveform (only positive amplitude) at non inverting terminal and calculate the final output response of the given Opamp? 	10	CO3
Q8.	Consider the given circuit below of MOSFET configuration and find the Value of	10	CO4
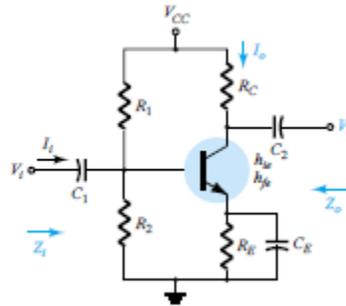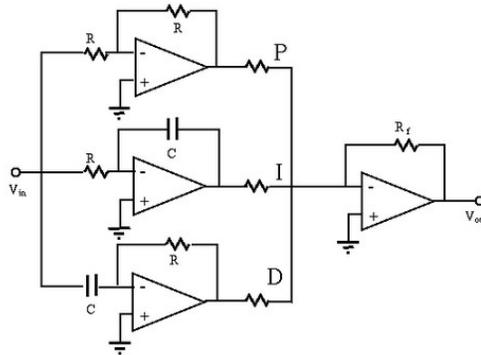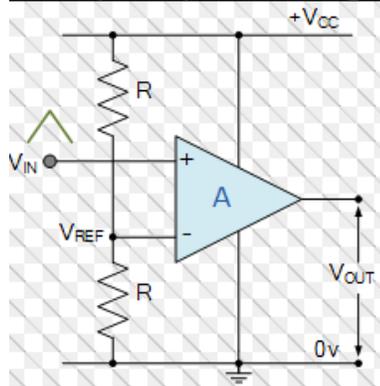
	resistance R2? IV) Shown below is a MOSFET amplifier and the characteristic curves for the MOSFET. Find R_2 so that Vo = 10 volts. 		
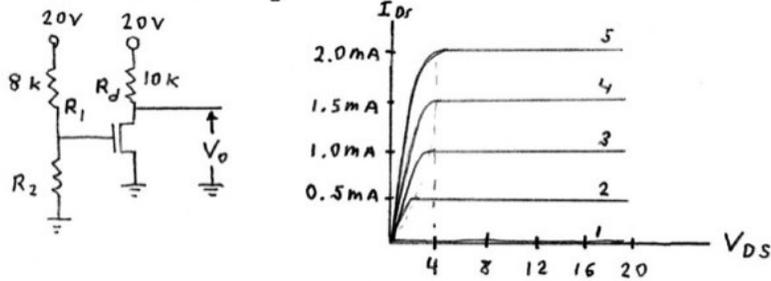
SECTION-C

Q9.	Design a band pass filter Using Operational Amplifiers for the Bandwidth 10 MHz and consider the following ? (a). Highest Frequency of the Bandwidth will be 50Mhz. (b). Draw the final frequency spectrum of the filter.	20	CO2,CO3
Q10.	(a).Design a self-bias network using a JFET transistor with ID_{SS} = 8 mA and Vgsoff = -6 V to have a Q-point at I_{DQ} = 4 mA using a supply of 14 V. (b). Design an circuit such that if the input is I(t)= 20u(t), the output will be O(t)= -80tu(t).	20	CO3,CO4

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