

(old)

QP Code : 4598

(OLD COURSE)

(3 Hours)

[ Total Marks :100]

- N.B. : (1) Questions No. 1 is compulsory.  
 (2) Attempt any four out of remaining six questions.  
 (3) Figures to the right indicate full marks.  
 (4) Assume suitable data wherever necessary.

1. Attempt any four

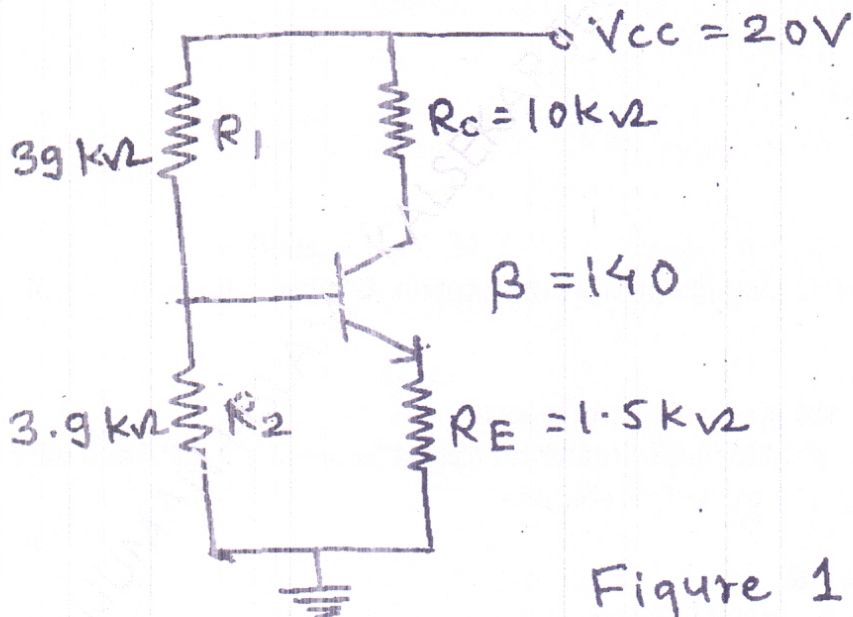
- (a) Design a circuit with OP-amp to produce the O/P  $V_o$  given by-  
 $V_o = (V_{s_1} + V_{s_3}) - (V_{s_2} + V_{s_4})$   
 (b) Explain two static and two dynamic parameters of OP-amp.  
 (c) Voltage divider bias method is best biasing method compared to fixed bias and collector to base bias. Justify/Contradict.  
 (d) Design practical differentiator for 5 KHZ.  
 (e) Justify how FET can be used as variable resistor, constant voltage source.

20

2. (a) Determine the following for the circuit shown in Figure 1.

- (i)  $I_{BQ}$ , (ii)  $I_{CQ}$ , (iii)  $V_{CEQ}$   
 (vi)  $V_{CQ}$ , (v)  $V_{EQ}$ , (vi)  $V_{BQ}$   
 Use approximate analysis.

10



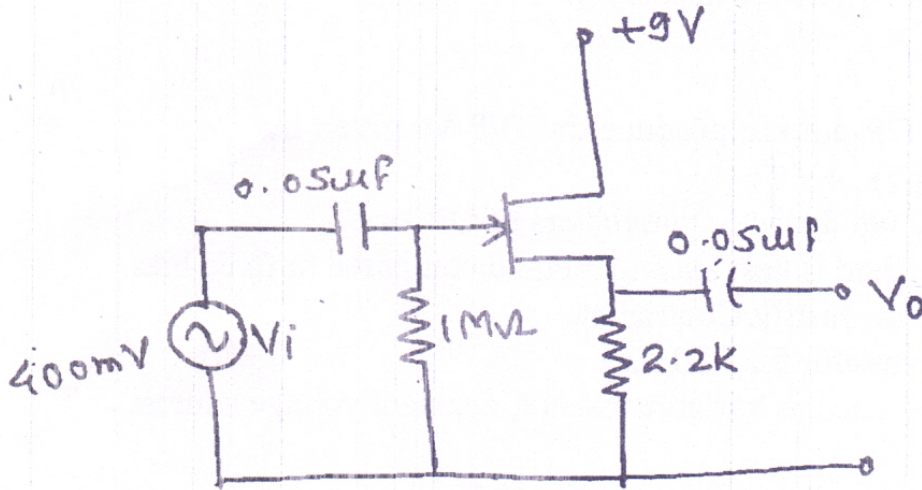
- (b) Explain parameters of h-model and derive them for two port network.

10

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3. (a) Explain the construction of n-type JFET and explain its transfer characteristics in detail. 10  
 (b) Calculate the Voltage gain, input and O/P impedance for the circuit shown in Figure 2. 10



$V_{GSQ} = -2.86V$   
 $I_{DSS} = 16mA$   
 $V_p = -4V$   
 $Y_{OS} = 2.5 \mu S$

Figure 2 .

4. (a) Draw and explain the working of R-2R ladder network and following terms 10  
 (i) Resolution (ii) Offset Voltage (iii) Full scale Voltage  
 (b) Design a low voltage regulator using IC 723 regulator 10  
 Given,  $V_o = 3V$ ,  $I_o = 100mA$ ,  
 dropout Voltage = 2V  
 $I_{sc} = 100mA$   
 $V_{sense} = 0.7V$
5. (a) Draw and explain functional diagram of PLL IC 565 in detail. 10  
 (b) Explain the working of practical integrator. Explain its advantages over simple integrator. 10
6. (a) Explain OP-amp as summer and Comparator. 10  
 (b) Using IC 555 design astable multivibrator for output frequency 5 KHZ and duty cycle of 70% . Draw the related waveforms. 10
7. Write short notes on (any four) 20  
 (a) Virtual ground concept of OP-amp  
 (b) Zero Crossing detector  
 (c) Instrumentation amplifier  
 (d) Monostable multivibrator using IC 555  
 (e) Schmitt trigger circuit.