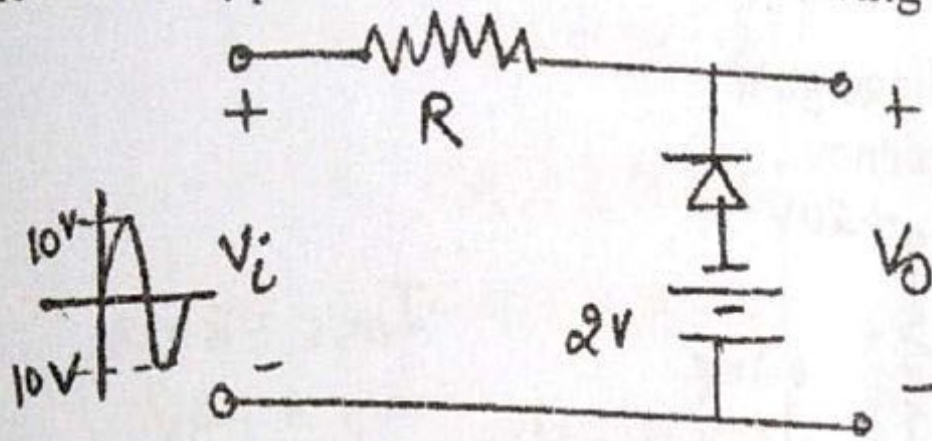


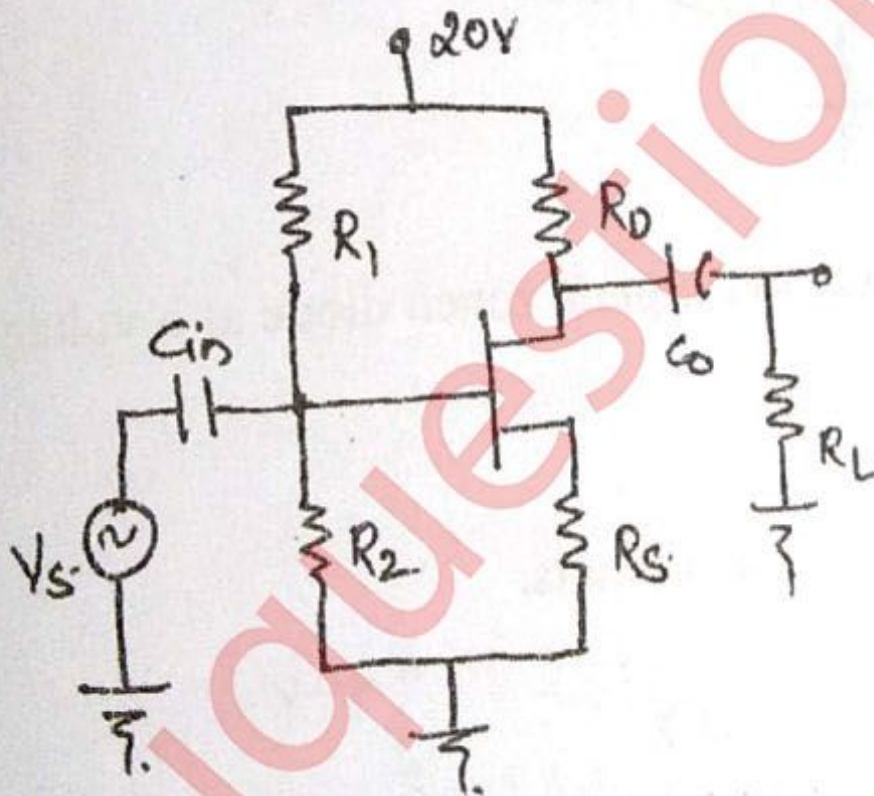
Please check whether you have got the right question paper.

- N.B:
1. Question no one is compulsory.
 2. Attempt any three questions from the remaining five.
 3. Assume suitable data if necessary.

- Q.1
- a Discuss graphical method of calculating h parameters. 05
 - b Draw the i/p and o/p characteristics of D-MOSFET. 05
 - c Compare CE and CS amplifier. 05
 - d Sketch the o/p waveform for the following ckt. 05

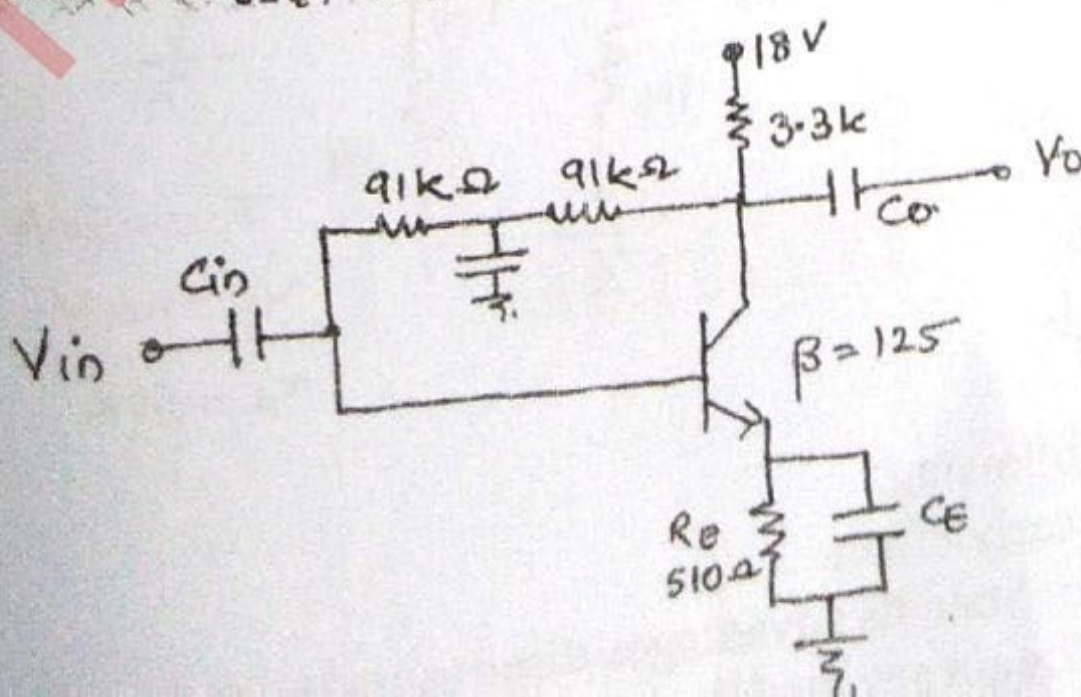


- Q.2 a Calculate A_v , R_{in} , R_o and f_L for the following ckt. 10



- Given:
- $R_1 = 910 \text{ k}\Omega$
 - $R_D = 2.2 \text{ k}\Omega$
 - $R_2 = 220 \text{ k}\Omega$
 - $R_S = 1.2 \text{ k}\Omega$
 - $G_n = 47 \mu\text{f}$
 - $C_o = 10 \mu\text{f}$
 - $C_S = 1 \mu\text{f}$
 - $R_L = 10 \text{ k}\Omega$

- b Determine I_{CEQ} , V_{CEQ} & stability for the given network 10



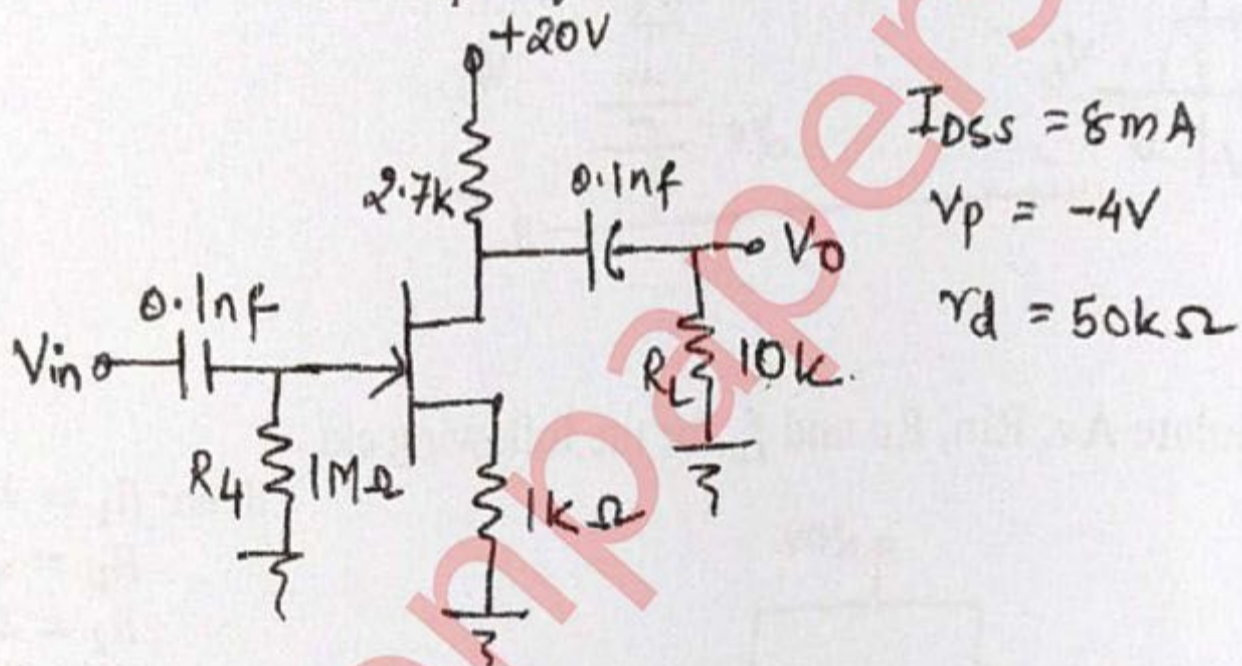
Q.3 Design a single stage RC coupled CE amplifier to meet the following specifications.

- i) $|A_v| \geq 220$
- ii) $S \leq 10, V_o = 4V, f_L = \leq 20Hz$
- iii) Calculate A_v, R_o and R_{in} for the above design

Q.4 a Draw and explain cascode amplifier. Drive expression for gain, input impedance & output impedance. State an application for the same.

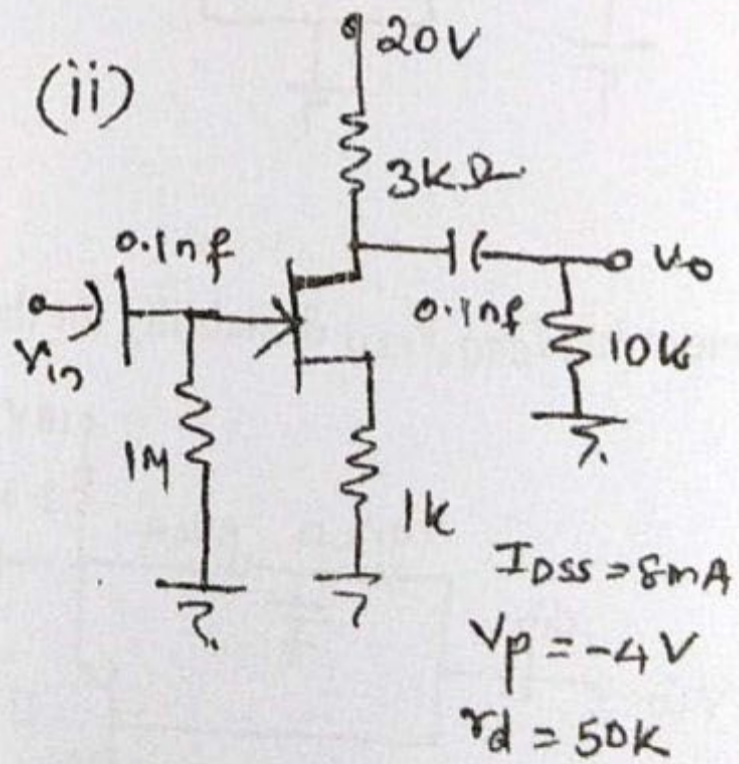
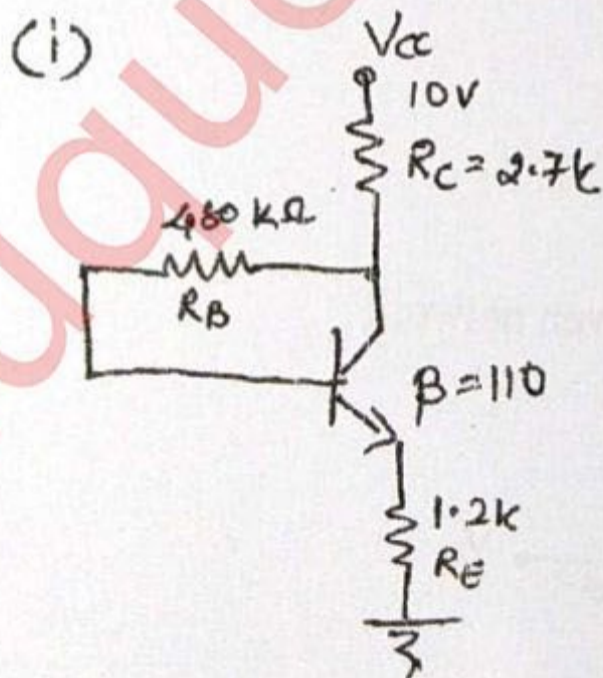
b For the JFET amplifier shown find the following

- i) Q-point
- ii) Mid frequency voltage gain
- iii) Lower cut-off frequency.



Q.5 a Sketch zener diode characteristics and explain zener diode as a voltage regulator.

b Determine the Q point for the following circuits.



Q.6 Write short notes on the following

- 1 Explain thermal drift and early effect.
- 2 Draw Darlington amplifier. State its advantages disadvantages and application.
- 3 Draw frequency and high frequency model of JFET.
- 4 Comparison of CB, CC, and CE amplifier.

DBEC DATA SHEET

Transistor type	P _{dmax} @ 25°C Watts	I _{cm} @ 25°C Amps	V _{CE} volts d.c.	V _{CE} (Sus) volts d.c.	V _{CE} (Sus) volts d.c.	V _{CE} (Sus) volts d.c.	V _{CE} (Sus) volts d.c.	V _{CE} (Sus) volts d.c.	V _{CE} (Sus) volts d.c.	T _J max °C	D.C. current		Small Signal h _{FE}	V _{CE} max.	θ _{JA} °C/W	Derate above 25°C W/°C
											min	typ				
2N 3055	115-5	15-0	100	70	90	7	200	20	50	70	15	50	120	1-8	1-5	0-7
ECN 055	50-0	5-0	60	55	60	5	200	25	50	100	25	75	125	1-5	3-5	0-4
ECN 149	30-0	4-0	50	—	—	8	150	30	50	110	33	60	115	1-2	4-0	0-3
ECN 100	5-0	0-7	70	65	—	6	200	50	90	280	50	90	280	0-9	35	0-05
BC147A	0-25	0-1	50	50	—	6	125	115	180	220	125	220	260	0-9	—	—
2N 525(PNP)	0-225	0-5	85	—	—	—	100	35	—	65	—	45	—	—	—	—
BC147B	0-25	0-1	50	50	—	6	125	200	290	450	240	330	500	0-9	—	—

BFW 11—JFET MUTUAL CHARACTERISTICS

Transistor type	h _{ie}	h _{oe}	h _{re}	θ _{JA}
BC 147A	2-7 K Ω	18 μ U	1-5 × 10 ⁻⁴	0-4°C/mw
2N 525 (PNP)	1-4 K Ω	25 μ U	3-2 × 10 ⁻⁴	—
BC 147B	4-5 K Ω	30 μ U	2 × 10 ⁻⁴	0-4°C/mw
ECN 100	50 Ω	—	—	—
ECN 149	15 Ω	—	—	—
ECN 055	12 Ω	—	—	—
2N 3055	6 Ω	—	—	—

	-V _{GS} volts	I _{DS} max. mA	I _{DS} typ. mA	I _{DS} min. mA
	0-0	0-2	0-4	0-6
	10	9-0	8-3	7-6
	7-0	6-0	5-4	4-6
	4-0	3-0	2-2	1-6

N-Channel JFET	V _{GS} max. Volts	V _{DS} max. Volts	V _{GS} max. Volts	P _d max. @25°C	T _J max.	I _{DS}	g _{ms} (typical)	r _d	Derate above 25°C	θ _{JA}
2N3822	50	50	50	300 mW	175°C	2 mA	3000 μ U	50 KΩ	2 mW/°C	0-59°C/mW
BFW 11 (typical)	30	30	30	300 mW	200°C	7 mA	5600 μ U	50 KΩ	—	0-59°C/mW