

SE choice Based (R-19 'c' scheme) - Summer 2025

EXTC

Duration: 3 hours

[Max Marks:80]

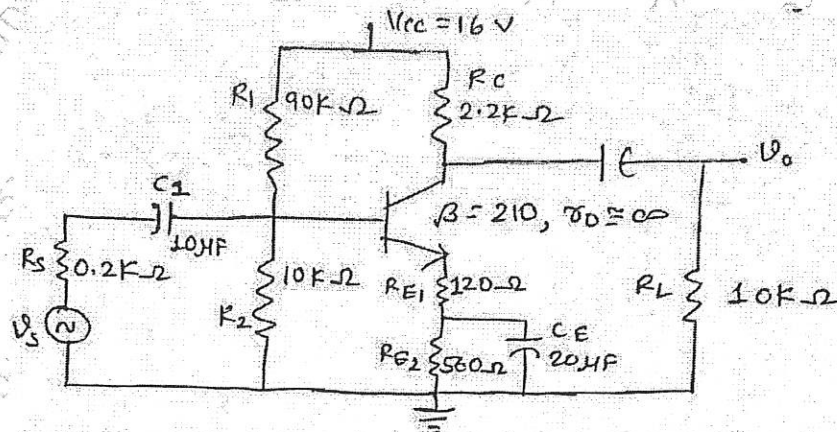
4-6-25

- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR

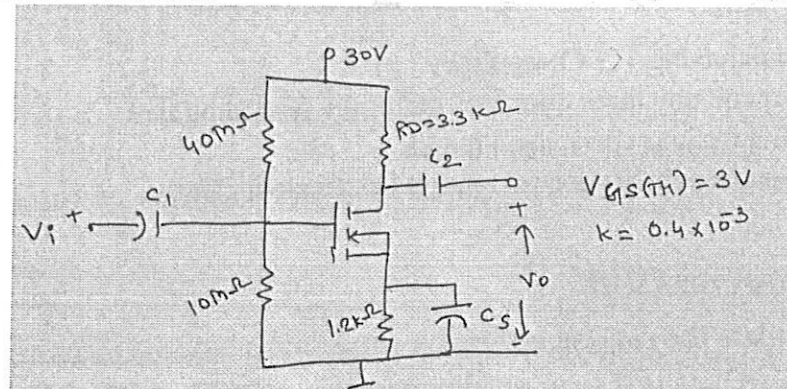
[20]

- a Calculate the reverse saturation current of a diode if the current at 0.2V forward bias is 0.1mA at a temperature of 25°C and the ideality factor is 1.5. [5]
 b Draw Drain and Transfer characteristics of E-MOSFET. [5]
 c What is Differential gain and Common mode gain related to differential amplifier And define CMRR. [5]
 d Compare Small signal amplifiers and large signal amplifiers. [5]
 e Explain the concept of DC load line and AC load line w.r.t the CE amplifier output characteristics.
- 2 a Explain High frequency analysis of CS E- MOSFET amplifier with necessary equations and circuit diagrams. [10]
 b Determine the input impedance, output impedance and voltage gain for the given circuit. [10]

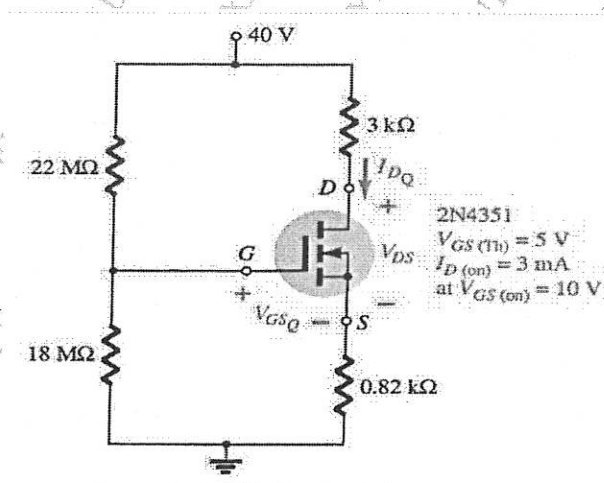


- 3 a State different types of Coupling in multistage amplifiers with suitable diagrams and explain any one coupling method with its advantages and disadvantages. [10]

- b Determine output voltage of below given network if input voltage $v_i = 0.8\text{mv}$ and $r_d = 40\text{ Kohm}$ [10]



- 4 a State and explain Miller effect. Derive Miller input impedance and Miller output impedance in case of capacitive reactance. [10]
- b What is cross over distortion in class B Power amplifier and how it is overcome by diode biasing of class AB Power amplifier. [10]
- 5 a Find the value of I_{DQ} , V_{GSQ} and V_{DSQ} for given circuit. [10]



- b Draw and explain high frequency model for BJT in CE configuration. [10]
- 6 a The cascading of amplifiers increases the gain but it reduces bandwidth. Justify with suitable equations and diagram/Plot. [10]
- b Draw and explain DC transfer characteristics of MOSFET differential amplifier. Derive expression describing DC transfer characteristics of MOSFET differential amplifier. [10]