

Prelim Paper

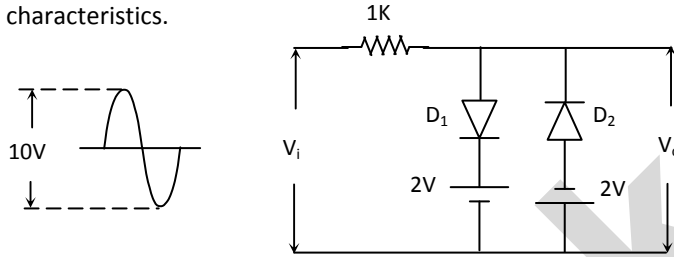
Time: 3 Hrs.]

Electronic Circuits and Design - I

[Marks : 80

- N.B.:** (1) Question No. 1 is **compulsory**.
 (2) Solve any **Three** from remaining **Five** questions.
 (3) Assume suitable **data** wherever **necessary**.

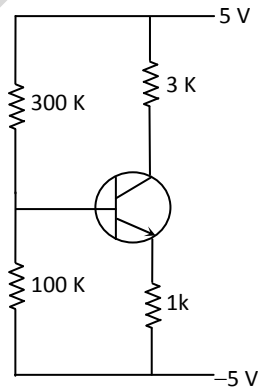
1. (a) For the circuit shown in figure draw output waveform for given input signal draw transfer characteristics. [5]



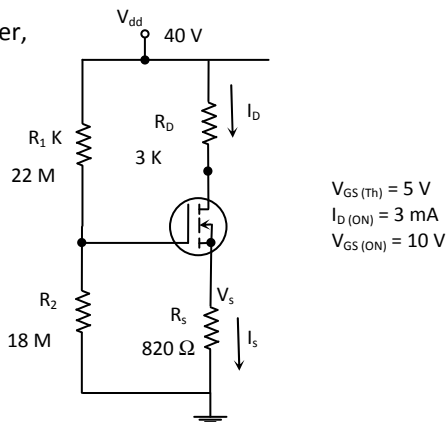
- (b) Explain why CC configuration is referred as Voltage follower. [5]
 (c) Draw transfer and drain characteristics oh E–MOSFET. [5]
 (d) Explain construction of Schottky diode and draw its characteristics. [5]
 (e) What is the Voltage Regulator explain simple zener shunt voltage Regulator. [5]

2. (a) Draw Energy band diagram of pin junction diode under : [10]
 (i) Zero Bias, (ii) Forward bias and (iii) Reverse Bias

- (b) For the given circuit determine DC Q point and represent it on DC load line
 Given $\beta = 100$ and $V_{BE} = 0.7 V$, also state in which region the circuit is working. [10]



3. (a) For the given MOSFET amplifier, Determine I_{Dq} , V_{GSq} and V_{DS} . [10]



- (b) Explain working principle, characteristics and applications of Tunnel diode. [10]
4. (a) Derive expression for ripple factor for L–section filter. [10]
(b) Derive expression for Input resistance, Voltage gain, current gain and output resistance for CE amplifier with R_E unbypassed. [10]
5. (a) Design Single Stage CE amplifier for the given specifications [10]
 $A_v \geq 100$, $S = 10$, $V_o = 3\text{ V}$, $f_L = 20\text{ Hz}$ and $R_i > 3\text{ K}\Omega$, also calculate A_v , R_i and R_o for the designed circuit..
(b) What is Clamping circuit, explain with neat Input and output waveforms for negative Clamping circuit. [10]
6. (a) For the voltage divider biased E MOSFET circuit derive equation of Input Resistance, Voltage gain and output resistance for CS amplifier. [10]
(b) Derive equation of Input resistance, Current gain and Voltage gain for CC amplifier. [10]

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