

Total No. of Questions—8]

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[5152]-532

S.E. (Electronics/E&TC) (I Semester) EXAMINATION, 2017
ELECTRONIC DEVICES AND CIRCUITS
(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :-** (i) Answer Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4,
Q. No. 5 or Q. No. 6 and Q. No. 7 or Q. No. 8.
(ii) Neat diagram must be drawn wherever necessary.
(iii) Use of logarithmic tables, slide rule, Mollier chart,
electronic pocket calculator and steam tables is allowed.
(iv) Assume suitable data wherever required.

1. (A) Draw drain and transfer characteristics of N-channel JFET and state various JFET parameters. [6]
(B) For the circuit diagram shown in Fig. (1), the transistor : [6]

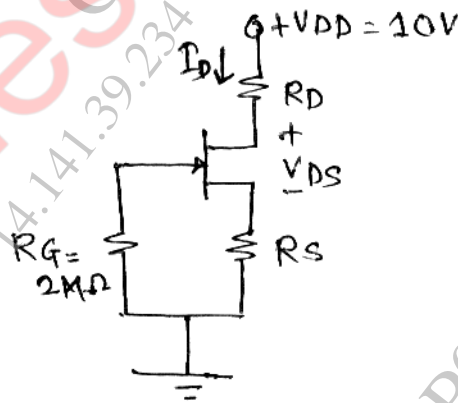


Fig. 1

Parameters are : $I_{DSS} = 5 \text{ mA}$, $V_{GS(off)} = -4 \text{ V}$.

Calculate the values of R_D & R_S for $I_D = 2 \text{ mA}$ and $V_{DS} = 6 \text{ V}$.

Or

2. (A) Draw and explain the frequency response of JFET CS Amplifier. [6]
(B) For the circuit shown in Fig. (2), Calculate A_v , R_i , R_o [6]

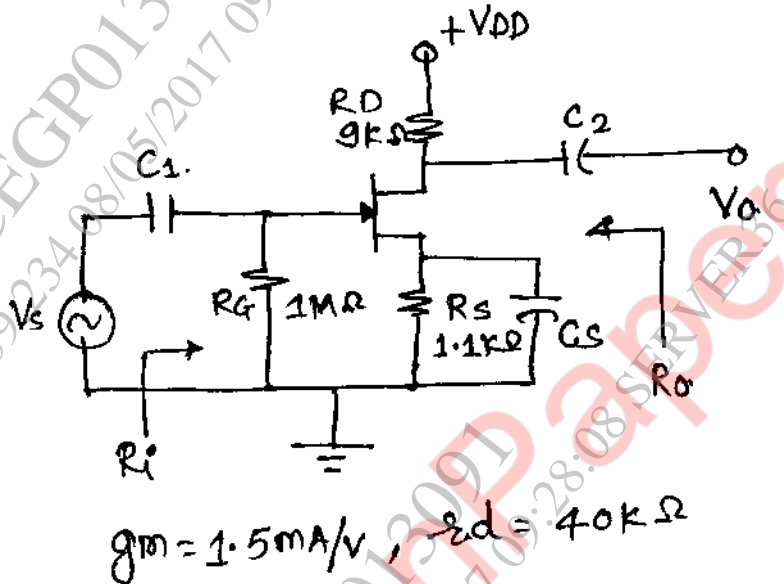


Fig. 2

3. (A) For NMOS E mode device $V_{TN} = 0.8\text{V}$, $K_n = 0.1 \text{ mA/V}^2$. The device is biased at $V_{GS} = 2.5 \text{ V}$. Calculate I_D when $V_{DS} = 2\text{V}$ & $V_{DS} = 10\text{V}$. for (a) $\lambda = 0$, (b) $\lambda = 0.02\text{V}^{-1}$. Calculate r_o for (a) & (b) [6]
(B) Draw and explain the CMOS Inverter with Active load. [6]

Or

4. (A) Write short note on MOSFET Scaling. [6]
(B) Explain the working of a MOSFET as diode. [6]
5. (A) State the advantages and disadvantages of -ve feedback amplifier. [4]
(B) Compare various feedback topologies on the basis of R_i & R_o . [4]

- (C) Draw the circuit diagram of Hartley oscillator and calculate f_0 for Hartley oscillator with $L_1 = L_2 = 100 \mu\text{H}$ and $C = 0.05 \mu\text{F}$. [5]

Or

6. (A) In single stage voltage amplifier $A_v = -20$, $R_i = 1\text{M}\Omega$, $R_o = 8\text{k}$, 20% O/P voltage is feedback in series with i/p. Determine A_{v_f} , R_{i_f} , R_{o_f} of $-v_c$ feedback amplifier. [6]
- (B) Write a short note on Colpitts oscillator using FET. [7]
7. (A) Draw and explain the block diagram of LM 317 and also state specification of LM 317. [8]
- (B) Define line and load regulation in case of voltage regulator. What are the ideal values of the same ? [5]

Or

8. (A) For the circuit diagram as shown in the Fig. (3) calculate range of O/P voltage. (Assume $I_{adj} = 50 \mu\text{A}$) [4]

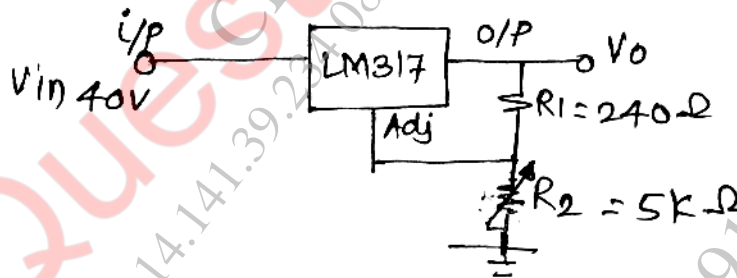


Fig. 3

- (B) Draw and explain the step down switching regulator. [5]
- (C) Write short note on current boosting regulator. [4]