Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[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]

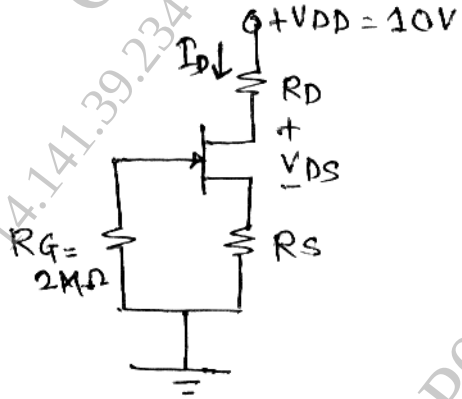

Fig. 1

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

Calculate the values of R_D & R_S for I_D = 2 mA and V_{DS} = 6 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]

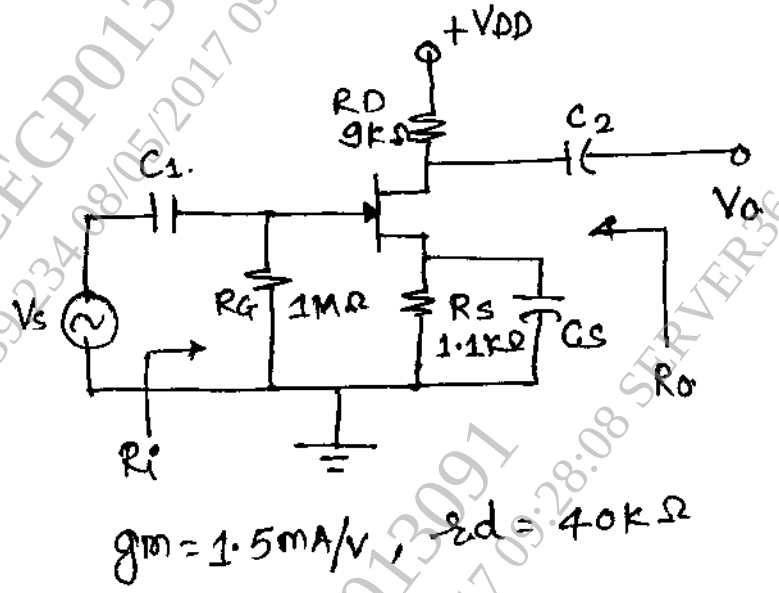

Fig. 2

3. (A) For NMOS E mode device V_{TN} = 0.8V, K_n = 0.1 mA/V². The device is biased at V_{GS} = 2.5 V.
Calculate I_D when V_{DS} = 2V & V_{DS} = 10V.
for (*a*) λ = 0, (*b*) λ = 0.02V^{-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 $L_1 = L_2 = 100$ µH and C = 0.05 µF. [5]

Or

6. (A) In single stage voltage amplifier $A_V = -20$, $R_i = 1M\Omega$, $R_o = 8k$, 20% O/P voltage is feedback in series with i/p. Determine A_{vf}, R_{if}, R_{of} of –ve 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 Iadj = 50 µA) [4]

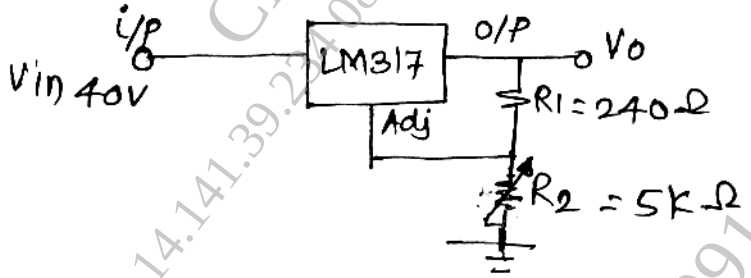

Fig. 3

(B) Draw and explain the step down switching regulator. [5]

(C) Write short note on current boosting regulator. [4]