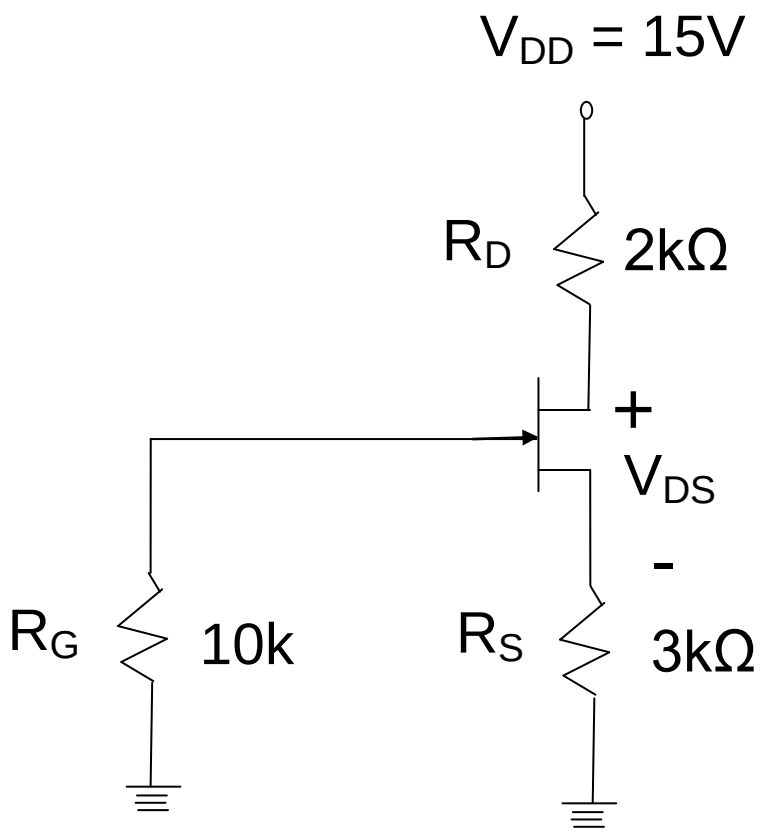
Unit – V

Field Effect Transistors and MOSFETS

5.1 In a JFET drain current is maximum when V_{GS} is
- (a) Zero
- (b) Positive
- (c) Negative
- (d) Equal to pinch-off voltage

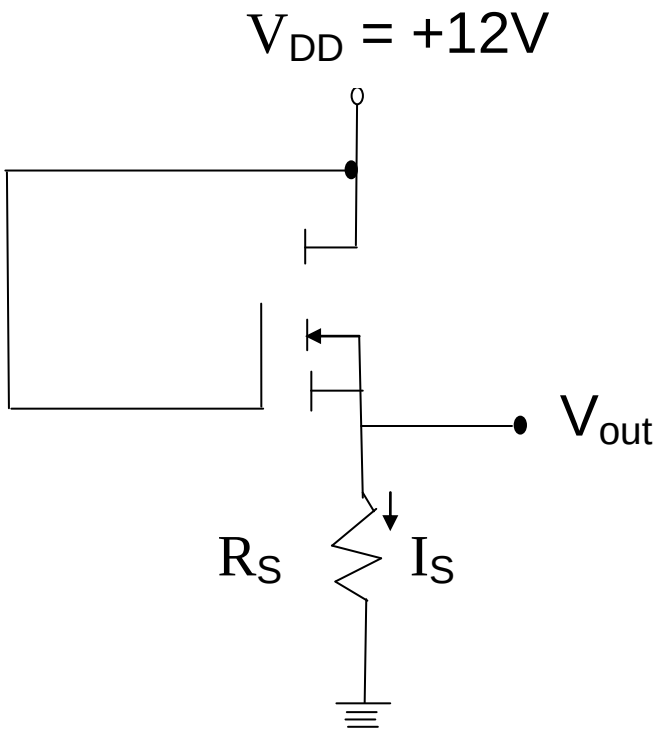
5.2 An n-channel JFET has pinch-off voltage Vp = -4 volts. Given V_{GS} = -1V, the minimum V_{DS} for the device to operate in the pinch-off region will be
- (a) + 1V
- (b) + 3V
- (c) + 4V
- (d) + 5V

5.3 In the self bias circuit for n-JFET shown in figure, V_{GS} is



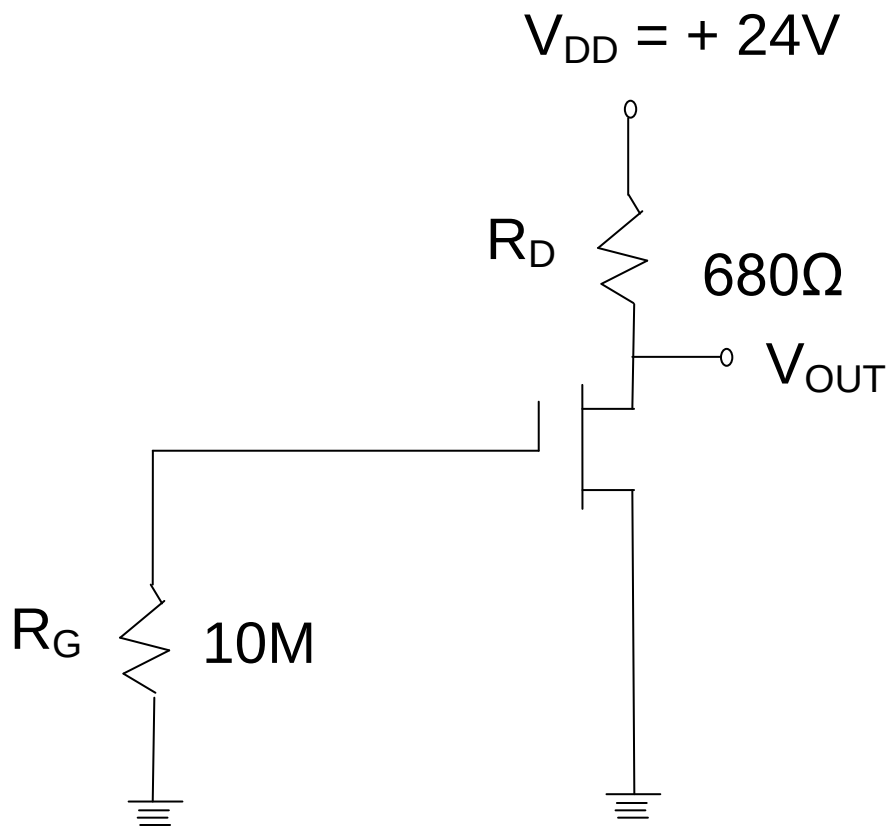
(a) + 5V
(b) – 5V
(c) +6V
(d) -6V

5.4 Pick up the correct value of R_S that will give V_{out} = 5V. The parameters of MOSFET in the circuit shown are : V_T = 2V and device constant k = 500μA/v^2



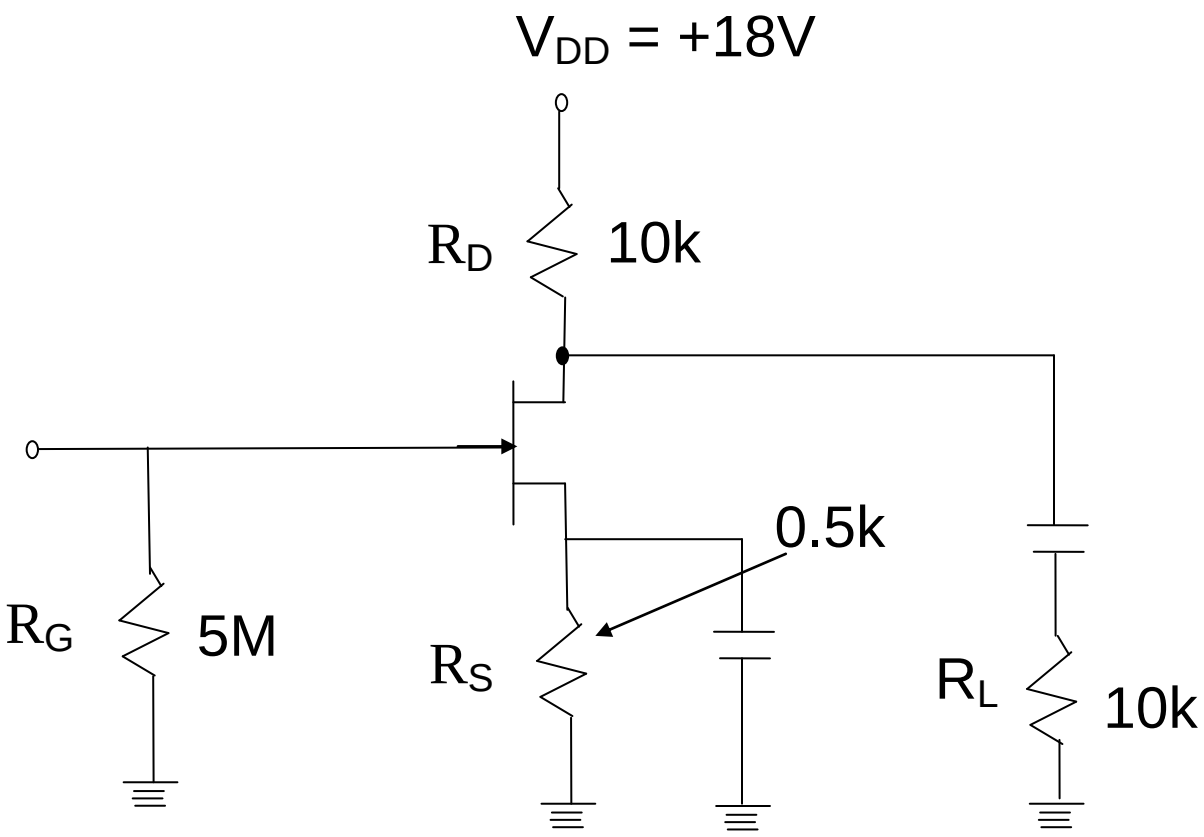
(a) 400 Ω
(b) 600 Ω
(c) 800 Ω
(d) 1200 Ω

5.5 The DMOSFET in the circuit shown has $V_{GS(OFF)}$ = - 6V and I_{DSS} = 10mA. V_{OUT} is,



(a) 21.6 V
(b) 17.2 V
(c) 19.6 V
(d) 15.2 V

5.6 For the common-source amplifier circuit shown, how much is the voltage gain? The transconductance of the transistor is 4000μS. Capacitors may be taken as short as signal frequency.



(a) 40
(b) 20
(c) 10
(d) 6.6

5.7 The power consumption is least in CMOS circuits as compared to NMOS and PMOS circuits. This is because, in CMOS
(a) Both the transistors remain in off-state most of the time.
(b) Small voltages are required.
(c) High value resistors are used
(d) Both the transistors go to on-state simultaneously only for a very short time during change of states.

5.8 Which of the following statements is not true for common source (CS) amplifier.

(a) It is most widely used as compared to common-drain or common-gate amplifiers

(b) It has high voltage gain

(c) There is no phase inversion

(d) It has high input impedance.

Answers:

5.1 (a) 5.2 (b) 5.3 (d) 5.4 (a) 5.5 (b) 5.6 (b)

5.7 (d) 5.8 (c)