

PART-II(Electronics)
(Used green color answer book for this part)
GROUP A
(Multiple Choice Type Questions)

1. Answer any five questions.

5×1 = 5

- (i) FET is less noisy than BJT because of
 - (A) high input resistance
 - (B) low output resistance
 - (C) voltage controlled current
 - (D) unipolar current
- (ii) MOSFET is a
 - (A) current controlled device
 - (B) voltage controlled device
 - (C) temperature controlled device
 - (D) none of these
- (iii) Current shunt feedback is used in
 - (A) voltage amplifier
 - (B) current amplifier
 - (C) transconductance amplifier
 - (D) transresistance amplifier
- (iv) An OP-AMP has
 - (A) negligible input resistance
 - (B) infinitely large voltage gain
 - (C) very large output impedance
 - (D) all of these
- (v) The simplest form of Boolean expression $A \oplus \bar{A}B$ is
 - (A) A
 - (B) B
 - (C) AB
 - (D) A+B

- (vi) What range of decimal values can be represented by an eight bit positive unsigned binary number
 - (A) 0 to 63
 - (B) 0 to 127
 - (C) 0 to 255
 - (D) 0 to 511

GROUP B
(Short Answer Type Questions)

Answer any two questions.

2×5 = 10

- 2. (a) What is the relation among JFET parameters? 2.5+2.5
(b) What are the advantages of FET over BJT?
- 3. Deriving proper expression explain the effect of positive feedback on gain, input impedance, output impedance, stability and bandwidth. 5
- 4. Draw the block diagram of an OP-AMP and write down the characteristics of an ideal OP-AMP. 5
- 5. (a) Perform the following number conversion: 2.5+2.5
(i) $(11011.1010)_2 = (?)_{10}$
(ii) $(756.603)_8 = (?)_{16}$
(b) Realize the Boolean expression using minimum number of NOR gates
 $Y = AB' + A'B$



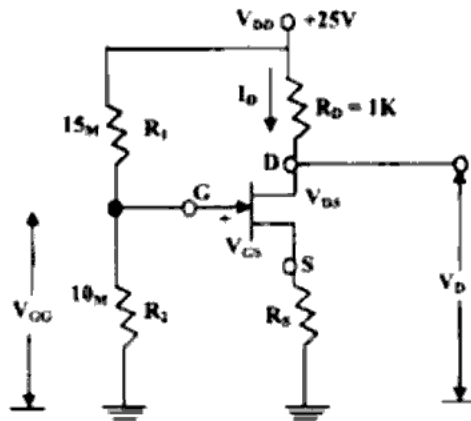
GROUP C
(Long Answer Type Questions)

Answer any two questions.

2 × 10 = 20

6. (a) An N-channel JFET amplifier with a voltage divider biasing circuit as shown in the figure has the following parameters: $V_p = -4V$, $I_{DSS} = 4mA$. Calculate the value of drain current at the operating point. Verify whether the FET will operate in the pinch-off region.

7+3

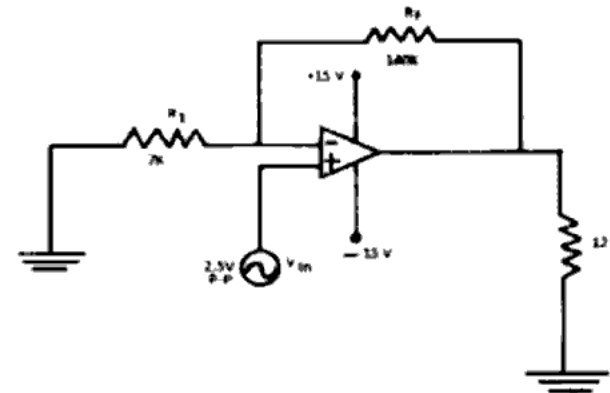


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- (b) Explain the basic operation of depletion type n channel MOSFET with a suitable diagram.

7. (a) Obtain the closed loop gain, CMRR in dB and maximum operating frequency for the non-inverting amplifier shown in the figure whose common-mode gain is 0.003 and slew rate is 0.2 V/μs.

5+2+3



- (b) What do you mean by negative feedback?
 (c) Why is it used in designing an amplifier?

8. (a) Why NAND gate is called a 'universal' gate? Explain with examples.
 (b) A current series feedback amplifier has the following circuit parameters: $R_L = 1K\Omega$, $R_E = 100\Omega$, $R_2 = 20k\Omega$, $R_1 = 30k\Omega$ and $h_{fe} = 100$. Calculate A , β , R_{if} , A_f and loop gain in dB.

5+5

9. Write short notes on any two of the following:

2×5

- (a) Slew rate
 (b) Barkhausen criterion
 (c) Pinch-off condition of JFET
 (d) Op-amp as an integrator.