

Unit 7 - WEEK 5

Course outline

How does an NPTEL online course work?

Week 0 Assignment 0

WEEK 1

WEEK 2

WEEK 3

WEEK 4

WEEK 5

- Lecture 35 : Frequency Response of CE and CS Amplifiers (Part A)
- Lecture 36 : Frequency Response of CE and CS Amplifiers (Part B)
- Lecture 37 : Frequency Response of CE and CS Amplifiers (Part C)
- Lecture 38 : Frequency Response of CE and CS Amplifiers (Contd.) (Part A)
- Lecture 39 : Frequency Response of CE And CS Amplifiers (Contd.) (Part B)
- Lecture 40 : Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT and MOSFET (Part A)
- Lecture 41 : Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT and MOSFET (Part B)
- Lecture 42 : Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT And MOSFET (Part C)
- Lecture 43 : Limitation of CE and CS Amplifiers in Cascading

● **Week 5 Lecture material**

○ **Quiz : Week 5 Assignment 5**

○ Tutorial : Practical Demonstration of CE Amplifier Circuit

○ Week 5 Feedback Form

WEEK 6

WEEK 7

WEEK 8

WEEK 9

WEEK 10

WEEK 11

WEEK 12

Supplementary material

Download Videos

Detail solution

Live Interactive Session

Text Transcripts

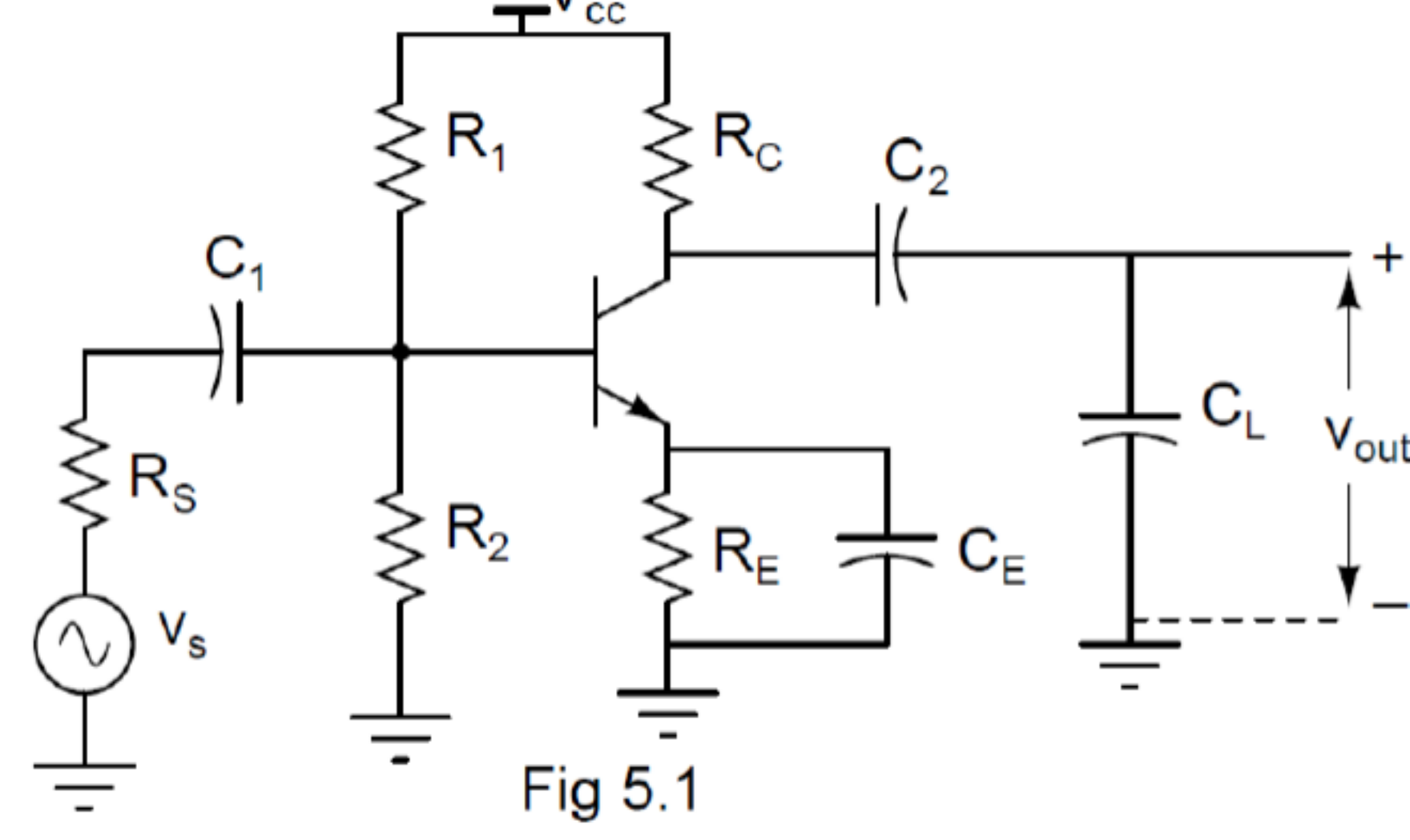
Week 5 Assignment 5

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-04, 23:59 IST.

Common data for Q 5.1 to Q 5.6:

The Fig 5.1 is a self – biased CE amplifier. The values of various parameters / components are given as, $V_{cc} = 12V$, $\beta = 200$, $V_{BE(on)} \approx 0.6V$, $V_{CE(sat)} \approx 0.2V$, thermal equivalent voltage $V_T = 26 mV$ and early voltage is very high. $R_E = 2 k\Omega$, $R_C = 3 k\Omega$, $R_1 = 7.4 k\Omega$, $R_2 = 4.6 k\Omega$, $R_S = 50 \Omega$, $C_1 = C_2 = 10 \mu F$, $C_E = 100 \mu F$, $C_L = 100 pF$.



1) Find the lower cut off frequency of the amplifier circuit as shown in Fig 5.1. Assume, the parasitic capacitances are negligible (i.e., C_{π} and C_{μ} values are negligible). Select the closest option from the following:

a) 774 Hz b) 123 Hz c) 71.4 Hz d) 25.6 Hz e) 11.4 Hz

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: b)

2 points

2) Find the upper cut off frequency of the amplifier circuit as shown in Fig 5.1. Assume, the parasitic capacitances are negligible (i.e., C_{π} and C_{μ} values are negligible). Select the closest option from the following:

a) 123 Hz b) 774 Hz c) 3.3 MHz d) 530 kHz e) 3.3 kHz

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: d)

2 points

3) Find the gain (from base to collector) at 100 krad/sec for the circuit as shown in Fig 5.1. Assume, the parasitic capacitances are negligible (i.e., C_{π} and C_{μ} values are negligible). Select the closest option from the following:

a) - 115.3 b) 47.2 c) - 230.7 d) - 1.5 e) 1.5

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: c)

2 points

4) Find the effective input capacitance C_{in} looking into the base of the transistor for the amplifier circuit as shown in Fig 5.1. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitances are $C_{\pi} = 10 pF$, $C_{\mu} = 5 pF$. Select the closest option from the following:

a) 1168 pF b) 784 pF c) 2322 pF d) 1553 pF e) 22.5 pF

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: a)

2 points

5) Find the lower cut off frequency of the amplifier circuit as shown in Fig 5.1. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitances are $C_{\pi} = 10 pF$, $C_{\mu} = 5 pF$. Select the closest option from the following:

a) 774 Hz b) 11.4 Hz c) 33.3 Hz d) 71.4 Hz e) 123 Hz

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: e)

2 points

6) Find the upper cut off frequency of the amplifier circuit as shown in Fig 5.1. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitances are $C_{\pi} = 10 pF$, $C_{\mu} = 5 pF$. Select the closest option from the following:

a) 774 Hz b) 2.8 MHz c) 276.8 kHz d) 3.1 MHz e) 505 kHz

- a)
- b)
- c)
- d)
- e)

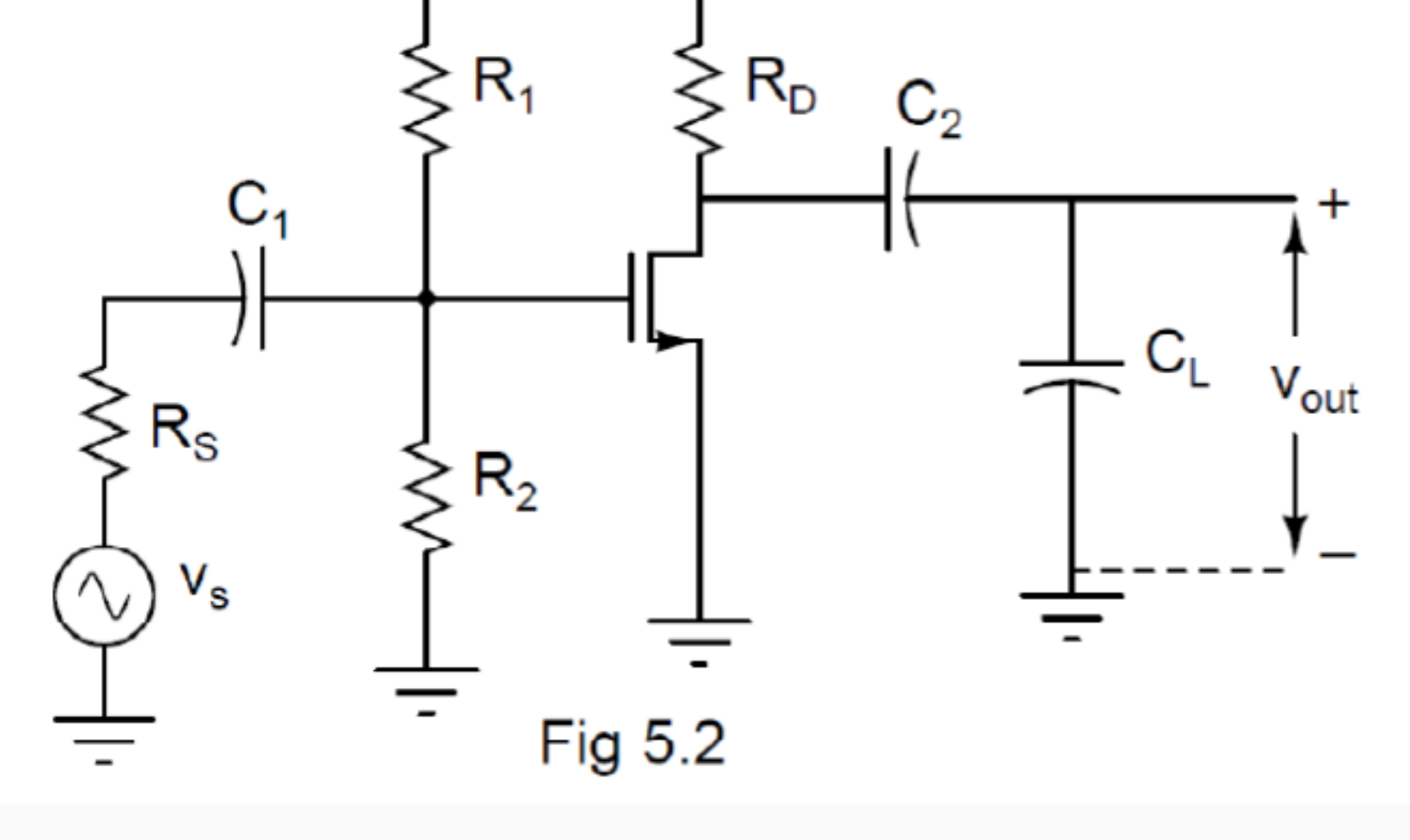
No, the answer is incorrect. Score: 0

Accepted Answers: e)

2 points

Common data for Q 5.7 to Q 5.10

The Fig 5.2 is a self – biased CS amplifier. The values of device parameters for NMOS are given as, $K \frac{W}{L} = 2 mA/V^2$, $V_{thn} = 1 V$, $\lambda \approx 0 V^{-1}$, and power supply $V_{dd} = 10 V$. The values of other components are given as, $R_1 = 80 k\Omega$, $R_2 = 20 k\Omega$, $R_D = 5 k\Omega$, $R_S = 650 \Omega$, $C_1 = C_2 = 10 \mu F$, $C_L = 100 pF$.



7) Find the upper cut off frequency (in rad/sec) of the amplifier circuit as shown in Fig 5.2. Assume, the parasitic capacitances are negligible (i.e., C_{gs} and C_{gd} values are negligible). Select the closest option from the following:

a) 24.63 M b) 2 M c) 1 M d) 13.92 M e) 40 M

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: b)

2 points

8) Find the effective input capacitance C_{in} looking into the gate of the transistor for the amplifier circuit as shown in Fig 5.2. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitors are $C_{gs} = 10 pF$, $C_{gd} = 5 pF$. Select the closest option from the following:

a) 65 pF b) 115 pF c) 10 μF d) 10 pF e) 27.5 pF

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: a)

2 points

9) Find the lower cut off frequency (in rad/sec) of the amplifier circuit as shown in Fig 5.2. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitors are $C_{gs} = 10 pF$, $C_{gd} = 5 pF$. Select the closest option from the following:

a) 48.13 b) 125.66 c) 6 d) 41.98 e) 131.76

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: c)

2 points

10) Find the upper cut off frequency (in rad/sec) of the amplifier circuit as shown in Fig 5.2. Consider, the effect of parasitic capacitances on the amplifier. The parasitic capacitors are $C_{gs} = 10 pF$, $C_{gd} = 5 pF$. Select the closest option from the following:

a) 40 M b) 2 M c) 24.63 M d) 13.92 M e) 1.9 M

- a)
- b)
- c)
- d)
- e)

No, the answer is incorrect. Score: 0

Accepted Answers: e)

2 points