

4E1219

Roll No. \_\_\_\_\_

Total No of Pages: 3

4E1219  
B. Tech. IV - Sem. (Main) Exam., May - 2019  
PCC Electronics & Comm. Engg.  
4EC4-04 Analog Circuits  
EC. EI

Time: 3 Hours

Maximum Marks: 120

*Instructions to Candidates:*

*Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL

2. NIL

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**PART - A**

**(Answer should be given up to 25 words only)**

**[10×2=20]**

**All questions are compulsory**

- Q.1 Explain why is base made thin?  
Q.2 Why 'transistor' is called so?  
Q.3 Explain how BJT amplifier, bias stability is achieved?  
Q.4 Explain Gain Margin?  
Q.5 Explain common mode gain for an oscillator.  
Q.6 Explain low pass active filters.

- Q.7 Describe single slope of ADC.
- Q.8 Design a low pass filter at a cut off frequency of 1 kHz with a pass band gain of 2.
- Q.9 An operational amplifier has a slew rate of  $2\text{V}/\mu\text{s}$ . If the peak output is 12V, what is the power bandwidth?
- Q.10 Explain concept of stability?

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### PART - B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

- Q.1 Explain low frequency analysis of multistage amplifiers.
- Q.2 For a p-channel silicon FET with  $a = 2 \times 10^{-4}$  cm and channel resistivity  $\rho = 10\Omega\text{-cm}$
- Find the pinch off voltage
  - Repeat (i) for a p-channel germanium FET with  $\rho = 2\Omega\text{-cm}$
- Q.3 Calculate the operating frequency of a transistor Hartley oscillator if  $L_1 = 100 \mu\text{H}$ ,  $L_2 = 1\text{mH}$ , mutual inductance between the coils,  $M = 10\mu\text{H}$  and  $C = 10\text{pF}$ .
- Q.4 With a neat diagram, explain the action of Hartley and Colpitts oscillators.
- Q.5 Explain Schmitt trigger and its applications.
- Q.6 Explain Switched Capacitor Circuits?
- Q.7 Describe concept of stability and gain margin?

## PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

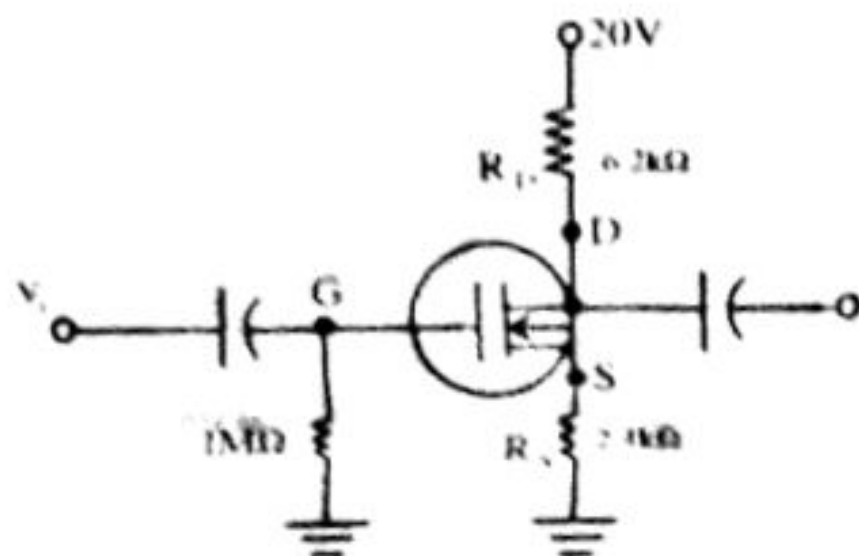
[4 × 15 = 60]

Attempt any four questions

Q.1 Design and explain Digital to Analog Converters.

Q.2 Explain active filters with low pass, high pass, band pass and band stop

Q.3 For the network of figure below given  $I_{DC} = 8 \text{ mA}$  and  $V_E = 8 \text{ volt}$



Q.4 Explain differential amplifier, its basic structure and principle of operation.

Q.5 Explain current mirror, its basic topology and its variants.