

D 20619

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Name.....

Reg. No.....

**THIRD SEMESTER B. TECH. (ENGINEERING) DEGREE  
EXAMINATION, OCTOBER 2011**

EE 09 305 – ANALOG ELECTRONICS

(2009 Admissions)

Time : Three Hours

Maximum : 70 marks

**Part A**

1. Define Rectifier efficiency.
2. What are the advantages of Bipolar Junction Transistors?
3. State Millers theorem.
4. Define slew rate of an operational amplifier.
5. What is the order of a filter? State its significance.

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. How the Zener diode is used as a voltage regulator? Explain.
7. How will you determine the drain characteristics of JFET?
8. What is a negative feedback? State its advantages.
9. State the characteristics of an ideal operational amplifier.
10. State and explain Bark Hausen's criteria.
11. How the zero crossing detector is deduced from OP-amp comparator? State its application.

(4 × 5 = 20 marks)

**Part C**

12. (a) (i) Derive an expression for ripple factor of Half wave and Full wave diode rectifiers.  
(ii) Describe the positive and biased clippers.

(6 + 4 = 10 marks)

*Or*

- (b) (i) State the advantages and disadvantages of various transistor biasing methods.  
(ii) Draw the emitter follower circuit and explain its operation.

(6 + 4 = 10 marks)

**Turn over**

13. (a) (i) Explain the low frequency response of a common emitter BJT amplifier.  
(ii) Write a note on Gain Bandwidth product of a BJT amplifier.  
(6 + 4 = 10 marks)

*Or*

- (b) When a negative voltage feedback is applied to an amplifier of gain 100, the overall gain falls to 50.  
(i) Calculate the fraction of the output voltage feedback.  
(ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.  
(10 marks)

14. (a) (i) With schematic, explain the operation of a OP-amp integrator and differentiator. Also derive the expressions for their output.  
(ii) Explain the principle of operation of a Wein Bridge oscillator.  
(6 + 4 = 10 marks)

*Or*

- (b) (i) Discuss in detail about the OP-amp compensation.  
(ii) Explain the operation of a Inverting and Non-inverting summer.  
(6 + 4 = 10 marks)
15. (a) (i) Explain the design of a Butterworth Low pass filter.  
(ii) Briefly explain the operation of a VCO.  
(5 + 5 = 10 marks)

*Or*

- (b) Derive the expression for the output of a first order Phase Locked Loop and explain its operation. Also explain its application as a FM demodulator.  
(10 marks)

[4 × 10 = 40 marks]