

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: EC208**

**Course Name: ANALOG COMMUNICATION ENGINEERING (EC)**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any 2 questions.*

- 1 a) Write two reasons why modulation is necessary in electronic communication. 5marks  
Determine minimum length of antenna required to transmit 1kHz signal.
- b) Define Noise Figure. Calculate the input signal to noise ratio for an amplifier 5marks  
with an output signal to ratio of 16 dB and a noise figure of 5.4 dB
- c) A sinusoidal carrier signal of 5V peak amplitude & 100kHz frequency is 5marks  
amplitude modulated by a 5kHz signal of peak amplitude 3V. What is the  
modulation index & bandwidth.
- 2 a) Write short notes on shot noise, partition noise and white noise. 7marks
- b) Derive Friis's formula 4 marks
- c) Determine noise figure for an equivalent noise temperature of 1000K 4 marks
- 3 a) Define amplitude modulation. Derive the expression for amplitude modulated 7marks  
signal. Draw the output waveform and spectrum of amplitude modulated  
waveform.
- b) Explain the operation of amplitude modulator circuit using collector 8marks  
modulation method.

**PART B**

*Answer any 2 questions.*

- 4 a) Define image frequency. 3 marks
- b) For an AM super heterodyne receiver with IF, RF and local oscillator  
frequency of 455 kHz, 600 kHz and 1055 kHz respectively. Determine image  
frequency and image frequency rejection ratio for a Q of 100. 4 marks
- c) With neat diagrams describe the working of balanced ring modulator. 8marks
- 5 a) With circuit diagram explain the balanced modulator using FETs. 7marks
- b) With a block diagram explain ISB transmitter. State the advantages of SSB & 8marks  
ISB systems.
- 6 a) Draw the block schematic of a superheterodyne receiver & explain the working. 7marks

- b) Derive the expression for a frequency modulated signal. State the advantages of FM over AM. 8marks

**PART C**

*Answer any 2 questions.*

- 7 a) Explain the Foster Seeley Discriminator method for FM demodulation with the help of neat circuit diagram. 10marks
- b) Explain working of FM transmitter using Armstrong method with a neat block diagram. 10marks
- 8 a) With neat diagram explain transistor modulator circuit for FM. 10marks
- b) Show the equivalence between PM and FM. Explain how FM is obtained from PM. 10marks
- 9 a) Explain the working of varactor diode modulator in FM. 10marks
- b) What is the purpose of dial tone? Briefly discuss about the call initiation procedures. 5 marks
- c) Explain working of a cordless telephone with the help of a block diagram. 5 marks