

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 4 marks  
frequency of 455 kHz, 600 kHz and 1055 kHz respectively. Determine image  
frequency and image frequency rejection ratio for a Q of 100.
- 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

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- 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