**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: COMMUNICATION THEORY AND SYSTEMS Time: 3 hours**

**Subject Code: 09EC222 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. Bandlimiting is done by passing the signal through a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ filter.

2. Define Bandwidth.

3. What is the transmission bandwidth of AM signal?

4. What is the theoretical bandwidth of FM signal?

5. What is low level modulation?

6. What is the direct method of generating FM signal?

7. What is the midband frequeny of IF section in AM radio?

8. Define Noise figure.

9. Give an example for internal noise.

10. So/No for FM signal is equal to So/No for AM when the modulation index is equal to \_\_\_\_\_\_\_.

**PART – B (5 x 3 = 15 MARKS)**

11. What is the need for modulation?

12. Calculate the percentage power saving in an AM modulated wave to a depth of 100 percent, when the carrier and one of the sidebands are suppressed.

13. Briefly explain the frequency spectrum of FM wave.

14. Explain preemphasis and deemphasis in FM.

15. Calculate the overall noise figure of a three stage cascaded amplifier each stage having a power gain of 10 dbs and a noise figure of 6dbs.

**PART – C (5 x 15 = 75 MARKS)**

16. Draw the block diagram of the communication system and explain.

(OR)

17. Plot the spectrum of the following signals:

a. cos(2000πt) b. m(t). cos (8000 πt) where the spectrum of m(t) is shown below.

M(f)

1.0

-f(khz)

f(khz)

-2

+2

18. a. Draw the phasor representation of an amplitude modulated wave. (5)

b. Explain the phase shift method of generating SSB/SC signals? (10)

(OR)

19. Derive an expression for FM wave.

[P.T.O]

20. Discuss in detail about Envelope detector.

(OR)

21. Explain the working of the Foster-seeley discriminator in detail.

22. Explain with neat diagram, the operation of super heterodyne receiver.

(OR)

23. Discuss the following:

a. Space diversity reception (8)

b. Frequency diversity reception (7)

24. Prove that the post detection signal to noise power ratio is 3dbs greater than the pre detection signal to noise ratio in AM systems.

(OR)

25. Derive an expression for the output signal to noise power ratio for FM systems.