Name :	
Roll No. :	A star of Conceptor and Conference
Invigilator's Signature :	

CS/B.TECH(BME)/SEM-5/BME-505/2011-12

2011

COMMUNICATION CIRCUITS & SYSTEMS

Time Allotted : 3 Hours

Full Marks: 70

[Turn over

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP – A (Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) For critical modulation, the value of modulation index is

b)

d)

- a) <1
- c) >1

ii) Baseband transmission is the transmission of signal.

- Modulated b) Carrier
- Broadband d) Information.
- iii) The angle modulation is

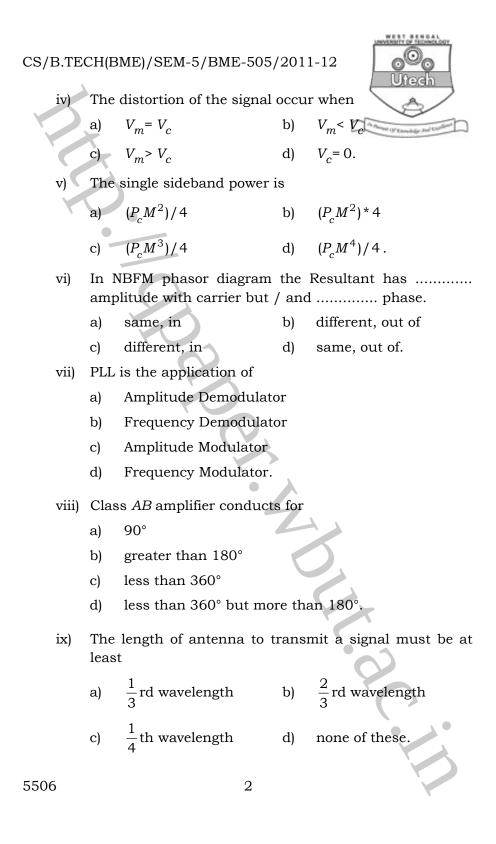
a)

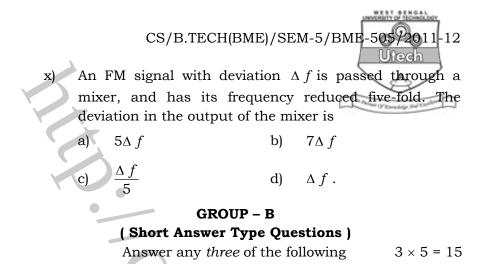
c)

a)

- only AM b) both PM & FM
- c) both AM & FM d) only FM.

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- 2. An AM transmitter uses high-level modulation of the final RF power amplifier, which has a DC supply voltage V_{cc} of 48 V with a total current I_T of 3.5 A. The efficiency is 70%.
 - a) What is the RF input power to the final stage ?
 - b) How much AF power is required for 100% modulation ?
 - c) What is the carrier output power?
 - d) What is the power in one sideband for 67% modulation ?
 - e) What is the maximum & minimum DC supply voltage swing with 100% modulation ?
- 3. What is Pseudo Noise Sequence ? What are the properties of it ? 2 + 3
- 4. Generate SSB signal phasing by Balanced Modulator with a neat sketch.
- 5. How a ferrite core and Hartley oscillator are used to measure pressure ?
- 6. How can you produce FM using PM modulator ? What are the frequencies used in medical telemetry ? 3 + 2
- 7. a) Distinguish between analog, digital, bio-signal telemetry.
 - b) Explain briefly how the physiological signals can be transmitted over telephonic line.
 3 + 2

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3 × 15 = 45

(Long Answer Type Questions) Answer any *three* of the following.

GROUP - C

- 8. With a neat sketch explain the operating principle of Class B power amplifier. What are the advantages and disadvantages of tuned circuit over untuned ? Draw the circuit of a double tuned power amplifier. 6 + 5 + 4
- 9. Draw a block diagram of general communication system. Why is modulation necessary ? Explain the operating principle of any amplitude demodulator. What are the advantages and disadvantages of FM over AM ? Find out the percentage of modulation index if an antenna current changes from 4.8 A un-modulated carrier to 5.1 A.

3 + 3 + 5 + 2 + 2

- 10. Explain the frequency division multiplexing and de-multiplexing with a neat sketch. What do you mean by lock range and capture range of phased lock loop ? Find out the Image Frequency and its Rejection Ratio at 1000 kHz and 25 MHz for a broadcasting Super-heterodyne Receiver with no RF amplifier with the input of loaded Q of the antenna coupling circuit is 100 and the intermediate frequency is 455 kHz. 8 + 3 + 4
- 11. Write down the definition of Sampling theorem and proof it mathematically. Explain the modulation and demodulation of any of its application. What is the significance of Code Division Multiplication ? 7 + 6 + 2
- 12. How will you convert analog signal to its digital from by Successive approximation ? Explain the Delta modulation with a neat sketch. What are the limitations of it and how will you overcome it ? 7 + 4 + 4
- 13. What are the different components of biotelemetry ? What are the typical applications of telemetry in biomedicine ? Describe a single channel biotelemetry system with a neat sketch. 6+4+5

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