## **END SEMESTER / RETEST EXAMINATION-2020**

(New Syllabus)

Semester - 4th

Subject Code: ET-401

## **COMMUNICATION ENGINEERING - I**

Full marks - (Part-A - 25 + Part-B-45) = 70

Time - Three hours

The figures in the margin indicate full marks for the questions.

All questions of PART - A are compulsory. Answer any five questions from PART - B.

## PART- A

| 1. Fill in the blanks with suitable words.                 | 10                            |
|--|-------------------------------|
| a) Modulation index in FM signal varies inversely as the   | frequency.                    |
| b) Balanced modulator can generate sidebands.              | , 4 to glob to english. I was |
| c) Frequency modulation has number of sideba               | ands.                         |
| d) In AM bandwidth is the audio signal frequency           | uency.                        |
| e) EM waves travel in the direction of                     |                               |
| f) A short dipole is also called doublet.                  |                               |
| g) A Marconi antenna is grounded antenna with a length equ | ual to                        |
| h) Parallel wire line is also known asline.                |                               |
| i) SWR is the ratio of maximumto minimum _                 |                               |
| j) Electrical signals are broadly classified into          | _types.                       |
| 2. Write TRUE or FALSE.                                    | 10                            |
| a) Radio waves are EM waves.                               | C OF LECKIC                   |
| b) Space waves are also known as tropospheric waves.       | TIVITE OF TECHNOOGS           |
|  | 172                           |

| c) Shortwave travels as s   | ky wave.                         |                                      |
|-----------------------------|----------------------------------|--------------------------------------|
| d) Wavefront is basically   | a locus of point acquiring simi  | lar frequency.                       |
| e) Velocity of EM waves     | depends on modulation method     | d.                                   |
| f) Filter method is used f  | or removing carrier.             |                                      |
| g) Waveguide cannot sup     | pport a TEM mode.                |                                      |
| h) The modes that have t    | he highest cutoff frequency is c | alled the dominant mode.             |
| i) PAM is analog system     |                                  |                                      |
| j) FM requires less bands   | width than AM.                   |                                      |
| 3. Specify the correct answ | ver.                             | 5                                    |
| a) Polarization of EM way   | re is due to -                   |                                      |
| i)Reflection ii)Tr          | ansverse nature of EM Waves      | iii) Longitudinal nature of EM waves |
| b) Demodulation is done at  | 3                                |                                      |
| i) Transmitter              | ii) Receiver                     | iii) Both (i) & (ii)                 |
| c) In phase modulation the  | modulation index is proportiona  | l to -                               |
| i)Carrier voltage           | ii)Modulating Frequency          | iii) Signal strength                 |
| d) In FM the frequency dev  | riation is proportional to-      |                                      |
| i)Modulating frequency      | ii)Amplitude of modulating       | signal iii) Both (i) & (ii)          |
| e) D layer of ionosphere oc | curs only during -               |                                      |

## PART-B

2

4. What is signal? What are the different types of signal? Discuss in detail.

ii) Night time

1+2+6 = 9

5. a) Derive an expression for FM wave.

i) Day time

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iii) Summer time

| b) What is Vestigial sideband system? Explain.  |   |            | 4              |
|---|---|------------|----------------|
| 6. a) Explain with the help of block diagram the genera   | tion of an SSB/SC signal  |            | 4              |
| b) Compare and contrast AM,FM and PM.   |   |            | 5              |
| 7. a) Name the different layers of ionosphere.  |   |            | 3              |
| b) Explain how this layers affect transmission of sig   | nal during daytime and duri   | ng night t | time. 4        |
| c) Give approximate frequency and distance range of   | f skywave propagation.  |            | 2              |
| 8. a) Explain the radiation mechanism of an antenna.  |   |            | 5              |
| b) Distinguish between resonant and non resonant ar   | ntenna.   |            | 4              |
| 9. a) What is waveguide? List some advantages of wave   | eguide over coaxial transmi   |            | es.<br>1+3 = 4 |
| b) Explain briefly the propagation of TE waves in re  | ctangular wave guide.   |            | 5              |
| 10. Write short notes on any three -  |   | 3          | 3x3 = 9        |
| <ul><li>a) Armstrong frequency modulator.</li><li>c) Quarter wave transmission lines.</li></ul> | <ul><li>b) Impedence matching</li><li>d) Directional coupler.</li></ul> |            |                |

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