V-SEM / ETC / **2019 (S)**

COMMUNICATION ENGINEERING-II

Sub Code – **ETT-502**

Full Marks: 70

Time: 3 hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1.   [2+5+7=14]

   a) Define LOS propagation.

   b) Explain the transmission wave bands earthward after reflection by ionosphere region.

   c) Discuss the effects of environment like interference, diffraction, absorption and attenuation on EM wave.

2.   [2+5+7=14]

   a) What is a Dipole antenna?

   b) Define the term: Antenna Gain, Bandwidth and Beam-width.

   c) Explain the operation of parabolic reflector with advantages and application.

3.   [2+5+7=14]

   a) Draw an equivalent circuit of a transmission line indicating R, L, C, G.

   b) Explain the working of a Yogi-Uda antenna with a neat circuit diagram.

   c) Explain how transmission line behaves as reactive elements at high frequency

4.   [2+5+7=14]

   a) Define stub.

   b) What is reflection co-efficient? Explain how transmission takes place in transmission lines?

   c) What is impedance matching? Explain the working of a single-stub matching in transmission lines?

5.   [2+5+7=14]

   a) Define TE and TM mode?

   b) What is cut-off wavelength of a waveguide? Prove that the cut-off wavelength of a rectangular wave guide is 2a for TE_{10} mode where 'a' is a small wall separation.

   c) Discuss the principle operation of a Magnetron with a neat diagram?

6.   [2+5+7=14]

   a) What is Aspect Ratio?

   b) Explain Interlaced scanning?

   c) Draw the block diagram of Monochrome TV receiver and explain the function of each block.

7.   [2+5+7=14]

   a) How EM waves are propagated through wave guide?

   b) Discuss the working of a Travelling wave tube (TWT)?

   c) Discuss briefly the working principle of a two cavity Klystron amplifier?

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V-SEM / ETC / **2018**(W)   [DEC, REG]

COMMUNICATION ENGINEERING-II

Sub Code – **ETT-502**

Full Marks: 70

Time: 3 hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1.   [2+5+7=14]
   a) State the function of driven element.
   b) Draw a block diagram of SMPS of TV and explain its working principle.
   c) Derive the propagation, attenuation and phase shift constants of transmission line.

2.   [2+5+7=14]
   a) What is attenuation of radio wave?
   b) Discuss the single stub and double stub matching.
   c) Describe briefly about the constructional detail, working principle, advantages and disadvantages of horn antenna.

3.   [2+5+7=14]
   a) What is Transmission line? Where are coaxial lines used?
   b) Explain the operation of cassegrain antenna with its advantages and disadvantages.
   c) Describe how the environmental factors affect the electromagnetic wave propagation.

4.   [2+5+7=14]
   a) Write down the advantages of parabolic antenna.
   b) Explain the block diagram of TV transmitter with neat diagram.
   c) Write a detailed explanation on rectangular scanning and interlaced scanning.

5.   [2+5+7=14]
   a) Define beam width and polarization.
   b) Explain briefly the operation of directional coupler. Discuss the detail about the construction operation advantages and disadvantages of parabolic antenna

6.   [2+5+7=14]
   a) Write down the application of Magnetron.
   b) Discuss in brief the Yagi Uda antenna with neat diagram.
   c) Discuss the operation of isolator and circulator.

7.   [2+5+7=14]
   a) Define Standing wave Ratio.
   b) Explain the radiation mechanism of an antenna.
   c) Draw the block diagram of monochrome TV receiver and explain the function of each block

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V-SEM / ETC / **2018 (S)**

COMMUNICATION ENGINEERING-II
Sub Code – **ETT-502**
Full Marks: 70
Time: 3 hours
Answer any **FIVE** Questions
The figures in the right-hand margin indicate marks

1. [2+5+7=14]
   a) What is sky wave? Which frequency band is used for Sky wave propagation?
   b) What do you mean by Interlaced Scanning? How is it accomplished?
   c) Draw the block diagram of a Television Transmitter and explain the function of each block.

2. [2+5+7=14]
   a) What is duct propagation? Explain in brief.
   b) What is ionosphere? Show how the electron density in the ionosphere varies with height.
   c) Discuss the principle of operation of Two Cavity Klystron with a neat block diagram.

3. [2+5+7=14]
   a) Draw the RF equivalent circuit of a Transmission line.
   b) Discuss the principle of operation of LCD display.
   c) Explain the operation of Microwave dish antenna with Parabolic Reflector. Also discuss its advantages and applications.

4. [2+5+7=14]
   a) Define the term maximum usable frequency.
   b) Explain the phenomenon of selective fading in connection with tropospheric waves.
   c) A transmission line has a characteristics impedance of 500Ω. It has been terminated in a 200 Ω load. If the load is dissipating a continuous sinusoidal power of 100 watts, calculate:-
     (i) Reflection coefficient, ρ   **(ii)** VSWR on the line   **(iii)** Magnitude of reflected voltage.

5. [2+5+7=14]
   a) What are 'single-hop' and 'multi-hop' transmission?
   b) What makes ISDN signaling flexible? Why is it that a packet switched network is more suitable than a circuit switched network for ISDN signaling?
   c) Explain in brief the following terms with reference to colour television transmission and reception:
     (i) Luminance and Luminance signal
     (ii) Chrominance and chrominance signal
     (iii) Primary colour and secondary colour

6. [2+5+7=14]
   a) What is directivity? What factors affect the directional pattern of an antenna?
   b) What is a wave waveguide? Discuss about different modes of waveguides.
   c) Discuss the detail the principle of operation of Magnetron.

7. [2+5+7=14]
   a) Define the terms "skip distance" and "skip zone".
   b) What is scanning? Why is vertical scanning necessary in addition to horizontal scanning?
   c) Discuss the different types of losses in RF transmission lines. To what extent it is justifiable to assume RF transmission lines to be loss-less.

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V-SEM / ETC / **2017**(W)

COMMUNICATION ENGINEERING-II
Sub Code – **ETT-502**

Full Marks: 70

Time: 3 hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1.   [2+5+7=14]
  c) What is actual height and virtual height?
  d) Describe propagation of waves?
  e) Discuss the effects of environments relating to Reflection, Interference, Diffraction, Absorption and Attenuation?

2.   [2+5+7=14]
  a) Define Beam width and polarization?
  b) Explain Critical Frequency, Max. Useable Frequency, Skip Distance, Fading, Troposphere Scatter Propagation?
  c) Discuss about the parabolic dish antenna with its advantage, disadvantage & applications?

3.   [2+5+7=14]
  a) What do you mean by smart antenna?
  b) State and explain antenna gains, directive gain, directivity, effective aperture, antenna efficiency?
  c) Discuss about the Yagi-uda antenna with its advantage, disadvantage & applications?

4.   [2+5+7=14]
  a) What do you mean by Aspect Ratio & Flicker?
  b) Discuss the different type of losses in transmission line?
  c) With neat general equivalent circuit & RF equivalent circuit of transmission line, discuss about the Secondary constant of transmission line?

5.   [2+5+7=14]
  a) Define SONET & ISDN?
  b) Discuss the principle of directional coupler & circular?
  c) Discuss the principle of Magnetron with a neat diagram? State its application?

6.   [2+5+7=14]
  a) Define hue, luminance & saturation?
  b) Draw a black diagram of SMPS of TV and explain its working principle?
  c) Draw the block diagram of Monochrome TV Receiver with proper block diagram?

7.   [2+5+7=14]
  a) State the relation between standing wave ratio and reflection coefficient?
  b) Explain the operation of rectangular wave gives and its advantage?
  c) Write short notes on any two:-

(i) Incident, Reflected and Standing waves	**(iii)** Interlaced scanning & Composite video signal
(ii) LCD	**(iv)** Stub matching

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V-SEM / ETC / **2017(S)**   [20-5-17, BACK]

COMMUNICATION ENGINEERING-II

Sub Code – **ETT-502**

Full Marks: 70

Time: 3 hours

Answer any **FIVE** Questions

The figures in the right-hand margin indicate marks

1) (a) What is Resolution? Name the types of Resolution.   [2]

    (b) Discuss the operational of Directional Coupler.   [5]

    (c) Discuss about Yagi-uda Antenna with its advantages and neat diagram.   [7]

2) (a) Define Standing Wave Ratio.   [2]

    (b) Discuss the operation of Cavity Resonator.   [5]

    (c) Explain the principle of operation of two cavity klystron with neat diagram.   [7]

3) (a) What do you mean by Aspect Ratio?   Why it is essential in color T.V.   [2]

    (b) Briefly explain about radiation mechanism of an Antenna.   [5]

    (c) State and explain Antenna Gain, Directive Gain, Directivity and Efficiency of Antenna.   [7]

4) (a) Define Antenna Array.   [2]

    (b) Discuss the different types of losses in Transmission Line.   [5]

    (c) Derive the equation for Primary and Secondary Constants of a Transmission Line.   [7]

5) (a) What do you mean by Smart Antenna?   [2]

    (b) With neat general equivalent circuit diagram of a transmission line discuss about the Primary constants of transmission line.   [5]

    (c) Describe working of Monochrome TV receiver with proper diagram.   [7]

6) (a) What is actual height and virtual height?   [2]

    (b) Explain the rectangular scanning and interlaced scanning.   [5]

    (c) Discuss the effects of environments relating to reflection, diffraction, absorption and Attenuation of electromagnetic waves.   [7]

7) (a) What is a Stub? What do you mean by single stub matching?   [2]

    (b) Discuss about the rhombic antenna with its advantages and neat diagram.   [5]

    (c) Write the short notes on any TWO of the following with necessary diagrams: [7]

       (i) Rectangular Waveguide   **(iii)** LCD

       (ii) SONET   **(iv)** ISDN

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V-SEM / ETC / **2016** (W) [DEC – REG]

COMMUNICATION ENGINEERING-II
Sub Code – **ETT-502**
Full Marks: 70
Time: 3 hours
Answer any **FIVE** Questions
The figures in the right-hand margin indicate marks

1.
    a) What is stub? What do you mean by single stub matching?   [2
    b) Discuss the different types of losses in transmission line.   [5
    c) Discuss about Yagi Uda Antenna with its advantages and neat diagram.   [7

2.
    a) Define standing wave ratio.   [2
    b) Discuss about the rhombic Antenna with its advantages and neat diagram. [5
    c) Explain the principle of operation or working of two cavity klystron with neat diagram.   [7

3.
    a) What do you mean by Aspect Ratio? Why is it essential in color T.V.?   [2
    b) Briefly explain about radiation mechanism of an antenna.   [5
    c) State and explain antenna gain, directive gain, directivity and efficiency of antenna.   [7

4.
    a) What is actual height and virtual height?   [2
    b) Discuss the operational of directional coupler.   [5
    c) A transmission line is terminated in load impedance of 73-j42.5 ohms. The different parameters are R=2 ohms/m, G=0.5 mho/m, f=1 GHz, L=8 nH/m, C=0.23 pf. Find Characteristics Impedance, Propagation Constant and Reflection Coefficient.   [7

5.
    a) What do you mean by smart antenna?   [2
    b) Discuss the operation of cavity resonator.   [5
    c) Describe monochrome T.V. Receiver with proper block diagram.   [7

6.
    a) Define end fire antenna array.   [2
    b) Explain the rectangular scanning and interlaced scanning.   [5
    c) Discuss the effects of environments relating to reflection, diffraction, absorption and attenuation of Electromagnetic waves.   [7

7.
    a) What is resolution? Name the types of resolution.   [2
    b) With neat general equivalent circuit diagram of a transmission line, discuss about the primary Constant of transmission line.   [5
    c) Write the short notes on any two of the following with necessary diagrams: [7
      (i) Rectangular Waveguide   **(iii)** LCD
      (ii) SONET   **(iv)** ISDN

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V – SEM/ETC/2016 (S) (BACK)

FULL MARKS : 70   [ANSWER ANY **FIVE** QUESTIONS]   **TIME : 3 HOURS**

1. (a) Define absorption and attenuation of EM Wave. [2

     (b) Explain critical Frequency, Maximum Useable frequency, Skip distance and Fading. [5

     (c) Discuss the effect of environments such as interference, diffraction, absorption and attenuation on EM Wave. [7

2. (a) Describe propagation of wave. [2

     (b) State and explain the terms: Antenna gains, Directivity and Effective aperture. [5

     (c) Explain the operation of Horn antenna with advantage and application. [7

3. (a) Define Bandwidth and Beam width of an Antenna. [2

     (b) Explain Losses in Transmission. [5

     (c) Derive equation for primary and secondary constants of transmission line. [7

4. (a) Define SWR and VSWR. [2

     (b) Drew a block diagram of SMPS of TV with a neat diagram and explain its working principle. [5

     (c) Drew the block diagram of Monochrome TV receiver and explain the function of each block. [7

5. (a) State Aspect Ratio and Flicker in TV. [2

     (b) Briefly discuss the operation of Isolator and Circulator. [5

     (c) Discuss the principle of operation of two Cavity Klystron with a neat diagram. [7

6. (a) Define TE and TM mode. [2

     (b) Discuss the principle of Magnetron with a neat diagram. [5

     (c) Discuss Rectangular and circular Waveguide. [7

7. (a) Define Broadband Communication system. [2

     (b) Discuss the principle of Travelling Waveguides with a neat diagram. [5

     (c) Explain SONET with its advantages and application. [7

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V – SEM/ETC/2015 (W) (NEW)

FULL MARKS : 70   [ANSWER ANY **FIVE** QUESTIONS]   **TIME : 3 HOURS**

1. (a) Define Aspect Ratio. [2

     (b)Explain the operation of SMPS of TV with the help of diagram. [5

     (c) Draw the block diagram of Monochrome TV Transmitter and explain the function of each block. [7

2. (a) Define Polarization of an antenna. [2

     (b) Write a short note on the Cassegrain Feed antenna. [5

     (c) Discuss about the parabolic antenna with its advantages and neat diagram. [7

3. (a) What is resolution? [2

     (b) Discuss the effects of environments relating to interference attenuation and absorption of Electromagnetic waves. [5

     (c) Derive the equation for primary and secondary constants of transmission line. [7

4. (a) Define Standing Wave Ratio. [2

     (b) Explain the fundamentals of Electromagnetic waves. [5

     (c) Discuss in brief the working of two cavity klystron with a neat diagram. [7

5. (a) Name two antennas which are Omni-directional in nature. [2

(b) Explain the operation of Directional Coupler. [5

(c) With a neat sketch discuss the operation of horn antenna. [7

6. (a) What is Isolator? For what purpose it is used? [2

(b) Explain briefly the losses in a transmission line. [5

(c) Describe the operation of Yagi-uda antenna and write its advantages and disadvantages. [7

7. (a) State two disadvantages of Rhombic antenna [2

(b) Explain the operation of circulator with a neat diagram. [5

(c) Write short notes on any TWO: - [7

    (i) Interlaced Scanning

    (ii) Isolator

    (iii) Impedance matching in transmission line.

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FULL MARKS : 80　　　　　**[THEORY - 2]**　　　　　**TIME : 3 HOURS**

[ANSWER ANY **FIVE** QUESTIONS]

1) **(a)** Define Beam width and Polarization. [2]

    (d) Explain how environmental factors affect the propagation of electromagnetic waves. [6]

    (e) Discuss the working of a two cavity klystron with a neat sketch. [8]

2) **(a)** What is impedance matching? [2]

    (b) Discuss different losses in a transmission line. [6]

    (c) Derive the equations for secondary constants of a transmission line. [8]

3) **(a)** Write down the advantages of Rhombic Antenna. [2]

    (b) Explain the radiation mechanism of an antenna. [6]

    (c) Discuss in detail about the constructional details, operation, advantages and disadvantages of Cassegrain feed antenna with proper sketch [8]

4) **(a)** Define reflection co-efficient. [2]

    (b) Explain the fundamentals of electromagnetic waves. [6]

    (c) Describe the operation of magnetron with a neat diagram. State its applications. [8]

5) **(a)** What are standing waves? [2]

    (b) Discuss the principle of directional coupler and circulator. [6]

    (c) Describe about the parabolic reflector with its advantages and disadvantages with neat diagram.[8]

6) **(a)** Define Antenna resistance. [2]

    (b) With a neat general equivalent circuit diagram of a transmission line discuss about the primary Constants of transmission line. [6]

    (c) Describe the construction, working operation and application of Gunn diode. What is Gunn Effect?

7) **(a)** What is a transmission line? Where are the parallel wire lines and unbalanced lines used? [2]

    (b) Explain the transmission and reception process of a Horn Antenna. [6]

    (c) Write short notes on any TWO: [8]

        (i) Cavity resonator

        (ii) Varactor diode

        (iii) Incident, Reflected and Standing waves

        (iv) Travelling Wave Tube

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FULL MARKS : 80   **[THEORY - 2]**   **TIME : 3 HOURS**

[ANSWER ANY **FIVE** QUESTIONS]

1) (a) Define the polarization. [2]
   (f) Explain the working of Magnetron with a neat circuit diagram. [6]
   (g) Discuss briefly about the two effects of environment of EM waves? [8]

2) (a) Define Rayleigh criterion. [2]
   (b) Discuss briefly about the characteristic impedance. [6]
   (c) Explain the operation of rectangular waveguide with its advantages. [8]

3) (a) What is waveguide? [2]
   (b) Discuss isolator with neat diagram. [6]
   (c) Explain the two cavity klystron and its application with proper Applegate diagram. [8]

4) (a) Define end-fire antenna array. [2]
   (b) Explain the power measurement by bolometer method. [6]
   (c) Explain the frequency, wavelength and attenuation measurement of microwaves. [8]

5) (a) Define standing wave ratio. [2]
   (b) Explain the space wave propagation. [6]
   (c) Explain Gunn effects. Also explain the working, construction of gun diode. [8]

6) (a) What is stub? What do you mean by single stub matching? [2]
   (b) Discuss the primary constant of X-mission line. [6]
   (c) Explain the different types of antenna. [8]

7) (a) What is IMPATT diode and where it is used? [2]
   (b) What is the fundamental of LASER and its application? [6]
   (c) Write down about the Varactor diode and PIN diode. [8]

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FULL MARKS : 80   **[THEORY - 2]**   **TIME : 3 HOURS**

1) (a) What are the different losses in transmission line? [2]
   (b) Discuss the effects of environments relating to diffraction, absorption & attenuation of EM waves.
   (c) Derive the equation for primary and secondary constants of a transmission line. [8]

2) (a) Define polarization and why it is needed. [2]
   (b) State and explain antenna gain, directive gain, directivity and efficiency of antenna. [6]
   (c) Explain the operation of parabolic reflector disc antenna and state their application. [8]

3) (a) Define Standing Wave Ratio. [2]
   (b) Describe the propagation of waves. [6]
   (c) State impedance matching in transmission line. Explain briefly double stub match lines. [8]

4) (a) What is directional coupler? [2]
   (b) Explain the operation of cavity resonator. [6]
   (c) Describe the propagation of wave through rectangular and circular waveguide in TE & TM modes.

5) (a) What do you mean by magnetron? [2]
   (b) Discuss the principle of isolator and circulator. [6]
   (c) Explain the principle of operation of two cavity klystron with neat diagram. [8]

6) **(a)** Write any two application of travelling waveguide.   [2]

   (b) Explain how the frequency and wavelength can be measured in microwave.   [6]

   (c) Describe the measurement of power by Bolometer method.   [8]

7) **(a)** Write the application of Tunnel diode.   [2]

   (b) Describe the principle of operation of MASER and LASER.   [6]

   **(c)** Explain the working principle, construction and application of IMPACT diode.   [8]

V – SEM/ETC/2011 (W) (NEW)

FULL MARKS : 80   **[THEORY - 2]**   **TIME : 3 HOURS**

1) Answer ALL Questions: **[ANSWER ANY FIVE INCLUDING QNS NO 1 & 2]**   [2 x 10]

   a) Define the gain of an antenna.

   b) Name two antennas which are used for microwave communication.

   c) What is polarization?

   d) What is waveguide and name the various types of waveguide.

   e) Define standing wave ratio (SWR).

   f) What is a stub?

   g) Whether magnetron is an oscillator OR an amplifier and suggest your answer.

   h) What is LASER and where it is used?

   i) What is an Isolator and where it is used?

   j) What are the factors affects the directional pattern of an antenna?

2) Answer any **FIVE** Question: [6 x 5]

   a) Explain the different types of losses in transmission line.

   b) Explain different modes of propagation of electromagnetic waves.

   c) What is the function of a directional coupler?

   d) Discuss the principle of operation of two cavity klystron amplifier with a neat circuit diagram.

   e) Explain the operation of dish antenna with parabolic reflector.

   f) Explain the measurement of microwave power by bolometer.

   g) Explain the basic principle of   (i) LASER   (ii) IMPACT diode

3) Derive the equation for primary and secondary constant of transmission line.   [10]

4) Explain the principle of operation of magnetron with neat diagram. Discuss its applications.   [10]

5) Explain the operation of rectangular waveguide and write its advantages and disadvantages.   [10]

6) Explain the effects of environment on propagation of waves, particularly reflections, refraction,
   interference and diffraction.   [10]

7) Write short notes on any TWO: [5 x 2]

   (i)   TWT

   (ii)   Varactor diode

   (iii) Gunn effect

   (iv)   MASER

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