2203N270 Candidate's Seat No :_____

M.Sc. Sem.-1 Examination
402
Electronics

Time : 2-00 Hours]   March 2022   [Max. Marks : 50

Instructions:
1. Attempt any THREE questions out of first EIGHT questions.
2. Question NINE is compulsory to attempt.

Q-1 (A) Discuss main properties of two wire line and co-axial line.   7
  (B) Explain with necessary equations how a section of a short circuited and open   7
       circuited transmission line can be used as capacitive circuit element in high
       frequency (R.F.) circuits.

Q-2 (A) What are "wave guides"? Discuss important properties of waveguides.   7
  (B) What is Smith chart? Write properties of Smith chart.   7

Q-3 (A) Derive an equation for the phase difference caused due to path difference   7
       between direct and ground reflected waves in tropospheric propagation.
  (B) Obtain the fundamental equation for free space transmission.   7

Q-4 (A) Write a detailed note on: Ionospheric layers   7
  (B) Discuss the effects of Earth's magnetic field on sky wave propagation.   7

Q-5 (A) Obtain the equation of radiation resistance for HERTZIAN dipole antenna.   7
  (B) Explain in the brief the antenna array.   7

Q-6 (A) Obtain the equation of radiation resistance for Small loop dipole antenna.   7
  (B) Explain in the brief the parabolic dish antenna.   7

Q-7 (A) What is QAM? Explain the work of 8-QAM transmitter line divided by I and Q   7
       channels and bandwidth consideration of 8-QAM.
  (B) Explain in the brief the clock recovery.   7

Q-8 (A) Explain the work of 16-QAM transmitter, and bandwidth consideration of 16-   7
       QAM, Express minimum bandwidth equation.
  (B) Discuss in brief "THE EYE DIAGRAM"? (Draw necessary figure.)   7

Q-9   Select correct answer from the given options. Each question carries ONE mark.

   1 A co-axial cable supports _____ of EM wave.   1
        (a) TEM mode
        (b) quasi TEM mode
        (c) TE mode
        (d) TM mode

   2 A transmission line terminated by a load equal to its characteristic impedance,   1
      behaves like a
        (a) a quarter wave line

    (b) an infinite line
    (c) a short circuited line
    (d) an open circuited line

3   D layer extends approximately from   1
    (a) 50 to 90 km
    (b) 20 to 50 km
    (c) 90 to 110 km
    (d) Upto 50 km

4   MUF is given by   1
    (a) $f_c \cos \theta$
    (b) $f_c \sec \theta$
    (c) $f_c \sin s\, \theta$
    (d) f_c

5   Determine the overall length of a quarter wave monopole antenna operating in   1
the air at frequency 1MHz.
    (a) 75m
    (b) 150m
    (c) 300m
    (d) 50m

6   The E-pattern is the polar plot of $f(\theta)$ with limit of $\theta = 0°$ to $180°$. similarly for   1
z-axies, plot symmetry with $\theta = 0°$ and H-plane pattern the angle $\theta = \pi/2$ gives a
function of ...
    (a) $f(\theta) = 3/4$
    (b) $f(\theta) = 1/2$
    (c) $f(\theta) = 0$
    (d) $f(\theta) = 1$

7   What is the identity of the term is related to a rate of change and refers to the   1
rate of change of a signal on the transmission medium after encoding and
modulation have occurred?
    (a) Bit rate
    (b) Baud
    (c) Bandwidth
    (d) Demodulation

8   The phase relationship between signaling elements for BPSK (i.e 180 out of   1
phase) is the optimum signaling format, here when two binary signal levels are
allowed and at that time one signal is the exact negative of the other. That
optimum signaling format is called by another name. The name is?
    (a) Podal signaling
    (b) Antipodal signaling
    (c) Error signaling
    (d) Reference signaling