Enrolment No……

Bachelor of Engineering
Fifth Semester Main Examination, Dec-2020
Electromagnetic Theory [EC501]
Branch-EC

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions. All question carry equal marks.
Student should not write anything on question paper.

Q.1 (a) State Faraday's law of induction? Why is it necessary to modify Ampere's law for time varying field?.
(b) Define Poynting vector and give its physical interpretation.

Q.2 (a) State Maxwell's equation in Differential form and explain their physical significance.
(b) Determine the polarization of the wave if the electric field in a region is given by:

$$\bar{E} = (3\bar{a}_x + j4\bar{a}_y)\, e^{-0.02z} e^{-0.05z}\ V/m$$

Q.3 (a) What is meant by a critical angle of reflection? Also explain the difference between phase velocity and group velocity?
(b) Show that the intrinsic impedance has the dimensions of resistance.

Q.4 (a) Give the physical Significance of curl, divergence and gradient of a vector.
(b) Explain Ampere's circuital law and show that magnetic field is irrotational. Find the magnetic field inside a solenoid.

Q.5 (a) Define Magnetic Flux Density. A 'q' charge is moving with a velocity 'v' in free space. Write an expression for the magnetic field produced at any point by this range.
(b) Define Reflection. Explain the condition of Total Internal Reflection.

Q.6 (a) A lossy dielectric has an intrinsic impedance 200 <30° ohms at a particular frequency. If at that frequency the plane wave propagating through the dielectric has the magnetic field component.

$$\bar{H} = 10\, e^{-ax}\cos(\omega t - \tfrac{x}{2})\bar{a}_y \text{ A/m}$$ Find E.

(b) Point charges 1mC and -2mC are located at (3, 2,-1) and (-1,-1,4) respectively. Calculate the electric force on a 10nC charge located at (0,3,1)

Q.7 (a) Explain Helmholtz wave equation.
(b) Write down the difference between circular and elliptic polarization.

Q.8 Define the following:-

(i) The propagation constant
(ii) The attenuation constant
(iii) The phase constant

Enrollment No……

Bachelor of Engineering
Fifth Semester Examination, Dec-2020
Voice & Data Communication [EC502]
Branch-EC

Time: 3:00 Hrs **Max Marks 70**

Note : (i) Attempt any five questions out of eight.
(ii) All questions carry equal marks.
iii) Answer should be precise and to the point only.
iv) Assume suitable data if necessary and state them clearly.

Q.1 (a) What is cross talk? What is meant by near-end cross talk and far-end cross talk?
(b) Explain and draw the block diagram of an electronic telephone?

Q.2 (a) What is common channel signaling system number 7 (SS7)? Also give its network function?
(b) Define the following term :–
(i) Service provider (ii) Instruments (iii) Local Loops
(iv) Trunk circuit (v) Exchanges

Q.3 (a) Explain with the help of diagram multichannel TDM system
(b) Explain with the help of diagram seven layers of OSI?

Q.4 (a) Discuss Telephone Exchange hierarchy? With the help of an example describe a telephone numbering plan?
(b) What is digital exchange? Also explain local office telephone exchange?

Q.5 (a) Define multiplexing. What are the different types of multiplexing?
(b) Explain Frame synchronization? Compare between bit interleaving and word interleaving.

Q.6 (a) Explain line encoding in detail with the help of example.
(b) Write short note on :-
(i) VRC (ii) LRC

Q.7 (a) What is caller ID and when it is used? Also explain the function of telephone set?
(b) Differentiate between FDM and WDM. Also write advantage and disadvantage of WDM.

Q.8 (a) What is Topology? Explain it along with its type.
(b) What are the steps involved in creating a Hamming code?

Enrollment No……

Bachelor of Engineering
Fifth Semester Main Examination, Dec-2020
Digital Communication [EC503]
Branch-EC

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions. All questions carry equal marks.

Q.1 (a) Explain sampling theorem. What do you understand by flat top and natural sampling.
(b) Define autocorrelation and power spectral density. What is relation between these.

Q.2 (a) What is vocoder? Explain working of channel vocoder.
(b) Define coding. Explain the properties of channel coding.

Q.3 (a) Define Probability. Explain the properties of Probability function.
(b) Write down the difference between Analog and Digital System.

Q.4 (a) Explain the properties of power spectral density of digital data.
(b) Define ASK. Write down the uses of ASK with example.

Q.5 (a) Define QPSK. Draw and explain the phasor diagram of QPSK.
(b) Explain the concept of intersymbol interference with diagram.

Q.6 (a) Derive the expression for Probability of error for BPSK.
(b) Define Equalizer. Explain any one different types of equalizer.

Q.7 (a) Explain the properties of Matched Filter.
(b) Draw and explain the block diagram of Adaptive Delta Modulation.

Q.8 (a) Define Filter. Explain the different types of filter.
(b) A random variable V = b+X where X is a Gaussian distributed random variable with mean zero and variance σ^2 and b is constant. Show That V is a Gaussian distributed random variable with Mean b and variance σ^2.

Enrollment No……

Bachelor of Engineering
Fifth Semester Main Examination, Dec-2020
Microprocessors & Microcontrollers [EC504]
Branch-EC

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions. All questions carry equal marks.

Q.1 (a) Explain the working of 8255in BSR and I/O modes.
(b) Explain with help of block diagram the 8086 internal architecture?

Q.2 (a) Describe addressing mode of 8086.
(b) Explain feature and architecture of 8051?

Q.3 (a) Explain with the help of block diagram 6845 CRT controller.
(b) Explain architecture of 8051 micro controller?

Q.4 (a) Explain different JUMP instruction of 8086.
(b) Explain data transfer mode of DMA controllers?.

Q.5 (a) Explain maskeble and non-maskebal intrupts.

(b) Write short note on memory interfacing?

Q.6 (a) Write about EEPROM and EROM?
(b) Explain general purpose register in detail?

Q.7 (a) Write a short note on subruotin calls.
(b) What do you mean by Instruction queue?

Q.8 Explain the following memories:
i) Main memory
ii) Secondary memory
iii) Cache Memory

Enrollment No……

Bachelor of Engineering
Fifth Semester Main Examination, Dec-2020
Communication Network and Transmission Lines [EC-505]
Branch-EC

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions. All questions carry equal marks.

Q.1 (a) Explain the working with the help of diagram a constant resistance equalizer.
(b) Determine the input impedance of open and short circuit line.

Q.2 (a) Discuss insertion loss synthesis co-efficient matching technique.
(b) Find the Froster's first form the driving point impedance function
$Z = \frac{8(s^2+1)(s^2+9)}{s((s^2+4)}$

Q.3 (a) Discuss how the measurement of the input impedance can be used to locate a fault in a Cable.
(b) What is a low pass constant – k filter? Draw the characteristic curves for a constant k low pass filter.

Q.4 (a) What are lattice and bridge T-network? Explain a symmetrical bridge T-network.
(b) Write steps involved in reduction of complex network to T-section.

Q.5 (a) Define reflection coefficient and find out the expression for the same.
(b) What are micro strip lines and give its analysis.

Q.6 (a) Distinguish between symmetrical and asymmetrical attenuator.
(b) Explain the designing of constant – k high pass filter.

Q.7 (a) Explain SWR. What is step matching? Explain any one method of power measurement on line.
(b) Explain Strum theorem test.

Q.8 (a) Explain Bott-Duffin method.
(b) Design a chebyshev filter.