Bachelor of Engineering
Fifth Semester Main Examination, December 2021
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 natural sampling .
(b) Define the following –
i) Mean   ii) Variance   iii) Standard deviation

Q.2 (a) What is vocoder ?: Explain working of channel vocoder.
(b) Define autocorrelation and power spectral density What is relation between these.

Q.3 (a) Define coding. Explain the properties of channel coding.
(b) Define probability . Explain the properties of probability function.

Q.4 (a) Write down the difference between analog and digital system.
(b) Explain the properties of power spectral density of digital data.

Q.5 (a) Define ASK write down the uses of ASK with example.
(b) Define QPSK. Draw and explain the phasor diagram of QPSK.

Q.6 (a) Explain the concept of inter symbol interference with diagram.
(b) Derive the expression for probality of error for BPSK.

Q.7 (a) Define equalizer . Explain any one different types of equalizer.
(b) Explain the properties of matched filter.

Q.8 (a) Draw and explain the block diagram of adaptive delta modulation.
(b) Define filter. Explain the different types of filter.

Bachelor of Engineering
Fifth Semester Main Examination, December 2021
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 with the help of block diagram of 8086 internal Architecture.
        (b) Explain the working of 8255 in BSR and I/O modes ?

Q.2   (a) Explain data transfer mode of DMA .
        (b) Explain addressing modes of 8086.

Q.3   (a) Explain addressing mode of 8051 in detail.
        (b) With the help of block diagram explain the architecture of 8051.

Q.4   (a) Explain different JUMP instruction of 8086 ?
        (b) Explain with the help of block diagram 6845.

Q.5   (a) What are the challenges in embedded system design ?
        (b) Explain maskable and non-maskable interrupts.

Q.6   (a) Write short note on memory interfacing.
        (b) Explain PIN Diagram of 8086.

Q.7   (a) Define assembly language program development tools in detail.
        (b) Write about EEPROM and EROM ?

Q.8   (a) Explain general purpose register in detail.
        (b) Write short note on 8086 interrupt ?

Bachelor of Engineering
Fifth Semester Examination, December 2021
Communication Network and Transmission Lines [EC505T]
Branch-EC

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

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

Q.1 (a) Distinguish between symmetrical and Asymmetrical attenuator.
(b) What is Lattice and bridge T-Network? Explain a symmetrical bridge T-Network.
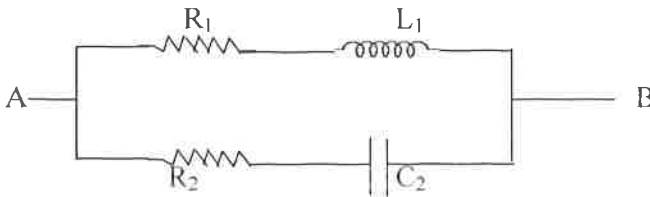
Q.2 (a) Discuss chebyshev approximation for low pass filter.
(b) Describe low pass to high pass frequency transformation.

Q.3 (a) Realise the given function in foster I form.

$$z(s) = \frac{2(s^2+1)(s^2+3)}{s(s^2+2)}$$

(b) Discuss insertion loss synthesis coefficient matching technique.

Q.4 (a) Obtain inverse network of the network shown in figure.

(b) Derive expression for reflection coefficient and transmission coefficient.

Q.5   (a) Derive the relationship between standing wave ratio and Magnitude of reflection coefficient.

(b) A low loss line with $Z_0=70\Omega$ is terminated in an impedance $Z_R = 115 - j80\Omega$. The wavelength of the transmission in 2.5 m using the given smith chart find the following.

i) SWR

ii) Maximum and Minimum line impedance

iii) Distance between the load and first voltage Maxima

Q.6   (a) Explain Bott-Duffin Method.

(b) Explain strum's theorem test.

Q.7   (a) Derive design equation for full series equalizers.

(b) Test, whether the polynomial $S^4 + 7S^3 + 6S^2 + 21S + 8$ is Hurtwitz.

Q.8   Write short note on:

i) SWR & VSWR

ii) Smith chart

iii) Quarter wave transfer

Bachelor of Engineering
Fifth Semester Examination, December 2021
Electromagnetic Theory [EC501T]
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) Define gradient, Divergence and curl of vector field with the help of suitable example.
(b) Describe Coulomb's law. Explain electric field intensity due to line charge.

Q.2   (a) Define dipole and dipole movement for electrostatic fields.
(b) State and prove the divergence theorem.

Q.3   (a) Explain Biot-Savart's law.
(b) State and prove uniqueness theorem.

Q.4   (a) Obtain boundary condition for magnetic field.
(b) Define current density. Also derive expression of conduction current density and conversion current density.

Q.5   (a) State and prove poynting vector theorem.
(b) Explain Maxwell's equation in integral and differential form.

Q.6   (a) What do you mean by circular polarization?
(b) Explain :

i) Complex permittivity
ii) Loss tangent
iii) Skin depth

Q.7   (a) Define reflection coefficient and transmission coefficient. Derive relationship between them.
(b) What do you mean by skin depth? Explain clearly.

Q.8   Write short note on (any three) -

i) Magnetic vector potential for source in free space
ii) Transmission line analogy
iii) Frequency dispersive propagation
iv) Group velocity and phase velocity
v) Complex permittivity

Bachelor of Engineering
Fifth Semester Main Examination, December 2021
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.

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 hock diagram of an electronic telephone ?

Q.2   (a) Explain with the help of diagram multichannel TDM system.

      (b) Explain with the help of diagram lagers of OSI ?

Q.3   (a) What is digital exchange? also explain local office telephone exchange?

      (b) Define multiplexing what are the different types of multiplexing ?

Q.4   (a) Explain line encoding in detail with the help of example.

      (b) Write short notes on:- (i) VRC (ii) LRC

Q.5   (a) What is caller ID and when it us used? Also explain the function of telephone set?

      (b) Differentiate between FDM and WDM. Also write advantage and disadvantage of WDM.

Q.6   (a) What is topology. Explain it along with its type.

      (b) What are the step involved in creating a hamming code ?

Q.7   (a) What do you understand by switching? Explain The principles of packet switching.

      (b) Explain Shannon theorem along with its proof.

Q.8   (a) Define modem. Explain different types of modem which are used in communication system.

      (b) Explain hamming code error correction technique.