(DEC 211)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper - I : Mathematics - III

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define even function and give an example.

b) Write the form of Fourier series for $f(x)$ in the interval $-\pi < x < \pi$.

c) Define periodic function.

d) Define Fourier cosine transform.

e) State the Fourier integral theorem.

f) Define inverse Fourier transform.

g) Define Sine series.

h) Define shift operator E.

i) Define averaging operator μ.

j) State Newton's forward interpolation formula.

k) Write Stirling's formula.

l) Define numerical differentiation.

m) Write Trapezoidal rule.

n) Write Simpson's $\frac{1}{3}$ rule.

o) Define numerical integration.

UNIT - I

2) a) Obtain the Fourier series for $f(x) = e^{-x}$ in the interval $0 < x < 2\pi$.

b) Find the half-range cosine series for the function $f(x) = x^2$ in the range $0 \leq x \leq \pi$.

OR

c) Find the Fourier series to represent the function $f(x) = |\sin x|$ in the interval $-\pi < x < \pi$.

d) Obtain the first three coefficients in the Fourier cosine series for y, where y is given in the following table:

x:	0	1	2	3	4	5
y :	4	8	15	7	6	2

UNIT - II

3) a) Find the Fourier transform of $e^{-|x|}$ and deduce that $\int_0^\infty \frac{\cos xt}{1+t^2} dt = \frac{\pi}{2} e^{-|x|}$.

b) Find a real root of the equation $x^3 - 4x - 9 = 0$ correct to three decimal places, by the method of false position.

OR

c) Find the Fourier transform of

$$f(x) = \begin{cases} 1 \text{ for } & |x| < 1 \\ 0 \text{ for } & |x| > 1 \end{cases}$$

hence evaluate $\int_0^\infty \frac{\sin x}{x} dx$

d) Solve the following equations by Gauss-Seidal method:

$2x + y + 6z = 9; 8x + 3y + 2z = 13; x + 5y + z = 7.$

UNIT - III

4) a) Using Newton's forward formula, find the value of $f(1.6)$, if

x ;	1	1.4	1.8	2.2
$f(x)$:	3.49	4.82	5.96	6.5

b) Use Bessel's formula to obtain y_{25}, given $y_{20} = 24$, $y_{24} = 32$, $y_{28} = 35$, $y_{32} = 40$.

OR

c) Given the values:

x :	5	7	11	13	17
$f(x)$:	150	392	1452	2366	5202

Evaluate $f(9)$, using Lagrange's formula.

d) Find $y'(0)$ and $y''(0)$ from the following table:

x :	0	1	2	3	4	5
y:	4	8	15	7	6	2

UNIT - IV

5) a) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ using Trapezoidal rule.

b) Using Taylor's series method, compute $y(0.2)$ to three places of decimal from $\frac{dy}{dx} = 1 - 2xy$, given that $y(0) = 0$.

OR

c) Using Euler's method solve for y at $x = 0.1$ from $\frac{dy}{dx} = x + y + xy, y(0) = 1$, taking step size $h = 0.025$.

d) Using Runge-Kutta method of fourth order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x = 0.2$, take $h = 0.2$

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(DEC 212)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS AND COMMUNICATIONS

Paper - II : Circuit Theory

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) Define energy.

b) What is an ideal source?

c) Write the expression for total resistance when two resistances are connected in parallel.

d) 1μF, 2.2μF and 0.05μF capacitors are connected in series. What is the total capacitance?

e) Define tree.

f) What is tie set?

g) Nodal analysis is based on which law?

h) What is the condition for maximum power transfer?

i) Superposition theorem is applicable to which type of circuits?

j) Write the expression of equivalent resistance when star to delta transformation is done.

k) Define form factor.

l) Maximum power transfer theorem can be applied to which circuits?

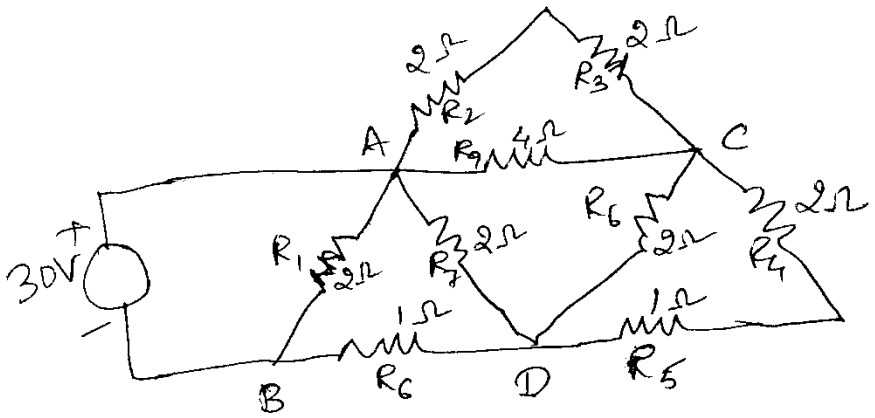
m) What is the total reactance of a series RLC circuit at resonance?

n) What is the resultant voltage in a closed balanced delta circuit?

o) Define Q-factor.

UNIT - I

2) a) Determine the current delivered by the source in the circuit.

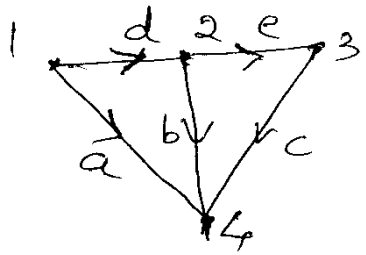


b) Discuss the inductors and capacitors in detail.

OR

3) a) What is a cutset? How cutset matrix is formed?

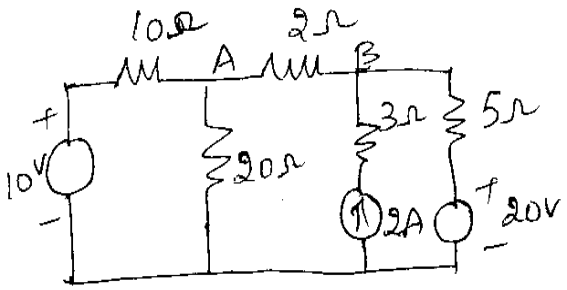
b) For the given graph, write the cutset matrix.



UNIT - II

4) a) State and explain Superposition theorem.

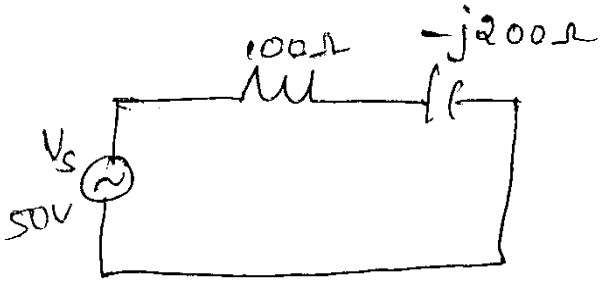
b) Find the voltage across 2Ω resistor by using superposition theorem in figure.



OR

5) a) Explain active, reactive and average powers in a circuit.

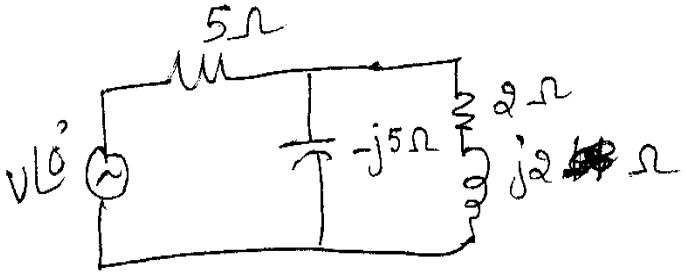
b) Determine the power factor, true power, reactive power and apparent power in the given circuit.



UNIT - III

6) a) Discuss about the power triangle and derive the expression for reactive power.

b) Determine the value of voltage source and power factor in the following network if it delivers a power of 100W to the circuit shown. Find also the reactive power drawn from the source.



OR

7) a) Discuss about Quality factor and its effect on bandwidth.

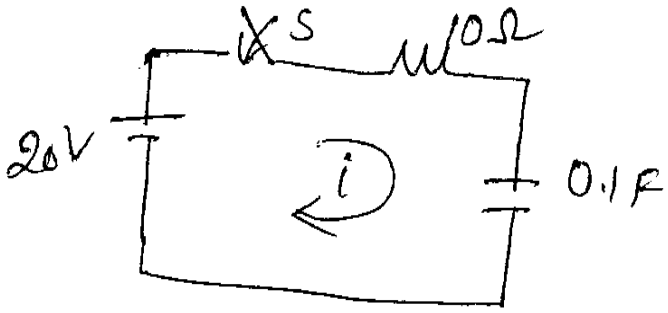
b) A current source is applied to parallel arrangement of R, L and C where R = 12Ω, L=2H and C = 3μF. Calculate the resonant frequency in rad/sec. Find the Quality factor. Calculate the value of bandwidth. Determine the lower and upper frequencies

of the bandwidth. Compute the voltage appearing across the parallel elements when the input signal is $i(t) = 10 \sin 1800t$.

UNIT - IV

8) a) Discuss about Initial value and final value theorems.

b) A series RC circuit consists of resistor of 10Ω and capacitor of 0.1F as shown in figure. A constant voltage of 20V is applied to the circuit at t = 0. Obtain the current equation. Determine the voltage across the resistor, and the voltage across the capacitor.



OR

9) Discuss the methods for power measurement in 3-ϕ circuits.

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B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper - III : Electronic Devices

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is electric field intensity?

b) What are intrinsic and extrinsic semiconductors?

c) Define Fermi level.

d) What is Zener breakdown?

e) What is Q-point?

f) Define α and β of a transistor.

g) Define early effect of transistor.

h) Give 4 differences between FET and BJT.

UNIT - I

2) a) Explain the motion of an charged particle under the influence of magnetic field.

b) Discuss the carrier concentration in an intrinsic semiconductor.

OR

3) a) Derive hall effect of a semiconductor.

b) Explain the classification of materials based on energy band diagram.

UNIT - II

4) a) Explain the principle of operation of a photo diode.

b) Explain the Zener diode breakdown under reverse bias with the help of VI characteristics.

OR

5) a) List the areas of applications of LED and explain its function.

b) Explain Quantitative theory of P-N junction diode.

UNIT - III

6) a) Explain how a transistor acts as an amplifier.

b) Write short notes on Thermal run away.

OR

7) a) Draw the input and output characteristics of a BJT in CE configuration and explain the same.

b) Draw a fixed bias circuit and derive an expression for the stability factor.

UNIT - IV

8) a) Draw Drain and Transfer characteristics of JFET and explain the operation of JFET.

b) Explain the function of UJT using electrical equivalent circuit.

OR

9) Explain about:

a) Enhancement MOSFET.

b) DIAC.

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(DEC 214)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper - IV : EMF Theory

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer ONE question from each unit ***(4×15 = 60)***

1) a) What is the physical significance of divergence of a vector field?

b) Under what conditions will the field intensity be solenoidal and irrotational?

c) Write Laplace's equation in cylindrical coordinates.

d) What is the condition for the field to be realizable as static magnetic field?

e) What is Polarization?

f) Differentiate between conduction current and displacement current.

g) Define propagation constant.

h) What are uniform plane waves?

i) What is a waveguide?

j) Define clearly dominant and degenerate modes.

UNIT - I

2) a) State Coulomb's law. Four like charges of 30μC each are located at the four corners of a square, the diagonal measures 8m. Find the force on a 100μC located 3m above the center of the square.

b) Derive the expression for energy stored in electrostatic fields.

OR

3) a) State Gauss's Law and its applications.

b) State and derive Poission's Equation.

UNIT - II

4) a) A uniform plane electromagnetic wave propagating in air is given by

$E = i_x \cos[wt - (2\Pi / \lambda)y]$

Derive by using the Maxwell's equations, the expression for the vector magnetic field.

b) Starting with Ampere's law, derive Maxwell's equation in integral form. Obtain the corresponding relation by applying the Stoke's theorem.

OR

5) a) Differentiate between phase velocity and group velocity.

b) Derive the Expression H for surface current distribution.

UNIT - III

6) Discuss in detail the Faraday's Law of Electromagnetic induction.

OR

7) a) Explain how the transformer and motional emf are produced.

b) State the inconsistency of Ampere's Law.

UNIT - IV

8) a) Derive the relation between E and H in uniform plane wave propagation. Define intrinsic impedance and give its physical significance.

b) Derive Poynting's Theorem.

OR

9) a) Derive the expression for attenuation "factor for TEM waves between parallel conducting planes".

b) Discuss the use of UHF lines as circuit elements.

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(DEC 215)

B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper - V : Digital Electronics

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) a) Convert $(286)_{10} = (\ )_8 = (\ )_{\text{Gray code}}$.

b) What are universal gates.

c) List advantages of hexadecimal number systems.

d) Draw the truth table of half subtractor.

e) What is even parity.

f) What is a Flip flop

g) List applications of counters

h) Draw the truth table of 'T' flip flop.

UNIT –I

2) a) Using a numerical example explain Excess 3 codes.

b) Simplify $F = \Sigma (2, 3, 5, 7, 10, 11, 12)$ and implement using. AOI logic.

OR

3) a) Explain step by step procedure to minimize.

b) Five variable Boolean function using K- map.

c) Write short notes on Alphanumeric code.

UNIT –II

4) a) Write short notes on Encoder & Decoder.

b) Explain with an example, error correction using Hamming code.

OR

5) a) Design a BCD to 7 segment decoder.

b) Explain the function of a carry look ahead adder.

UNIT -III

6) a) Draw the timing diagram and circuit and explain master slave JK flip flop.

b) Write short notes on parity generator.

OR

7) a) Design a 3 bit up – counting synchronous counter.

b) How do you convert JK to 'T' flip flop.

UNIT –IV

8) a) Compare MOS and CMOS families.

b***)*** Explain the features of PLA.

OR

9) Write short notes on:

a) RTL and TTL families.

b) Sequential programmable Devices.

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(DEC 216)

B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper - VI : Data Structures Using C

Time : 03 Hours **Maximum Marks : 75**

Answer Question No.1 is compulsory ***(15)***

Answer One question from each unit ***(4×15=60)***

1) Write a short notes on:

a) Hashing

b) Binary Search Tree

c) Heap sort

d) Recursion

e) Array

UNIT –I

2) Explain the list of operations (and) of a Linked list and their implementation using arrays.

OR

3) Explain Double linked list and write a 'C' program for single linked list.

UNIT –II

4) What is stack? Explain the applications of stack.

OR

5) Explain Queue implementation with arrays and linked lists.

UNIT –III

6) Explain Implementation of recursion. Write a 'C' program for recursion.

OR

7) Explain Bubble sort algorithm with an example.

UNIT –IV

8) Explain different types of Hashing techniques with an example.

OR

9) What is Binary Tree? Explain Binary [Tree] search Tree.

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(DEC 221)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper – I : Mathematics-IV

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) State Cauchy-Riemann equations in polar form.

b) Define derivative of a function f(z).

c) Define analytic function.

d) Define harmonic function.

e) Define singular point.

f) Define conjugate of a function.

g) State Cauchy's integral formula.

h) State Taylor's series.

i) Define Residue of a function f(z).

j) Define removable singularity.

k) Define simple pole of a function f(z).

l) Determine the poles of $f(z)=\frac{z-3}{z^2+2z+5}$.

m) Write Bessel's equation.

n) Write the expression for $P_3(x)$.

o) Write the orthogonal property of Bessel function.

UNIT - I

2) a) Show that f(z)=xy+iy is everywhere continuous but is not analytic.

b) Find the analytic function, whose real part is $\frac{\sin 2x}{(\cos h2y-\cos 2x)}$.

OR

3) a) Find the orthogonal trajectories of the family of curves $x^3-3xy^2= c$.

b) If f(z) is a regular function of z, prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)|f(z)|^2 = 4|f'(z)|^2$

UNIT - II

4) a) State and prove Cauchy's integral formula.

b) Expand the function f(z)=$\frac{z}{(z-1)(z-3)}$ for |z-1|<2 in Laurent's series.

OR

5) a) Evaluate $\int_c \frac{\cos \Pi z}{z^2-1} dz$ around a rectangle with vertices$2\pm i$,$-2\pm i$ by using Cauchy's integral formula.

b) Obtain the expansion of $\frac{(z-1)}{z^2}$ in a Taylor's series in powers of (z-1) and determine the region of convergence.

UNIT - III

6) a) Find the residue of f(z)= $\frac{z^3}{(z-1)^4(z-2)(z-3)}$ at its poles and hence evaluate $\oint_c f(z)dz$ where c is the circle |z| = 2.5.

b) Solve in series the differential equation $\frac{d^2y}{dx^2}+xy=0$.

OR

7) a) Prove that $\int_0^{2\pi} \frac{d\theta}{a+\cos\theta} = \frac{2\pi}{\sqrt{a^2-1}}$ $(a>1)$.

b) Solve in series the equation $9x(1-x)\frac{d^2y}{dx^2} - 12\frac{dy}{dx} + 4y = 0$, by using Frobenius method

UNIT - IV

8) a) Express $J_6(x)$ in terms of $J_0(x)$ and $J_1(x)$.

b) Prove that $\int_{-1}^{1} P_m(x)\, P_n(x)dx = \frac{2}{2n+1}$, for m = n.

OR

9) a) Show that

i) $\frac{d}{dx}[x^n J_n(x)] = x^n J_{n-1}(x)$.

ii) $\frac{d}{dx}[x^{-n} J_n(x)] = -x^{-n} J_{n+1}(x)$.

b) Express $4x^3-2x^2-3x+8$ in terms of Legendre polynomials.

(DEC 222)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS AND COMMUNICATIONS

Paper – II : Electronics Circuits -I

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define ripple factor.

b) Define PIV and TUF of a rectifier.

c) What is meant by h- parameter.

d) Why do we need a inductor filter.

e) Draw the network parameters for two port devices.

f) What is meant by distortion in amplifier.

g) List advantages of FET amplifier over BJT amplifier.

h) Draw a Π section filter.

UNIT - I

2) a) Explain with neat figures the function of a half wave rectifier.

b) Give the significance of capacitor filter.

OR

3) a) Explain the operation of a full wave rectifier with filter.

b) Compare half wave, full wave and Bridge rectifiers.

UNIT - II

4) a) Determine the h-parameters from the characteristics of CB configuration.

b) Explain the Miller effect.

OR

5) a) Draw a neat figure and explain emitter coupled difference amplifier.

b) Write short notes on Darlington pair.

UNIT - III

6) a) A CE amplifier is driven by a voltage source of internal resistance $r_s = 800\Omega$ and the load impedance is a resistance $R_L = 1000\ \Omega$. The h-parameters are $h_{ie} = 1k\Omega$, $h_{re} = 2 \times 10^{-4}$, $h_{fe} = 50$ and $h_{oe} = 25\ \mu A/V$. Compute current gain, input resistance, voltage gain and output resistance using exact analysis.

b) Give the analysis of a CE amplifier using the approximate analysis.

OR

7) a) Explain the single state CE amplifier response.

b) With neat figure explain CE short circuit current gain measurement.

UNIT - IV

8) a) Draw a RC coupled amplifier and explain.

b) Explain the action of a FET amplifier at low frequency in CG configuration.

OR

9) Write explanatory notes on:

a) FET – CS amplifier at high frequencies.

b) Give the features of direct coupled amplifier.

EEE

(DEC 223)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS AND COMMUNICATIONS

Paper – III : Transmission Lines & Waves

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define propagation constant.

b) Define wavelength, velocity of propagation and group velocity.

c) What is meant by infinite line?

d) Define reflection coefficient and standing wave ratio.

e) Write short note on smith chart.

f) Give the characteristics of TM waves.

g) Explain about attenuation in parallel plane guides.

h) Why TEM wave is impossible in rectangular wave guides.

i) Draw the electric and magnetic field configuration for TM_{01} mode in circular waveguides.

j) List out the features of symmetrical strip transmission lines.

UNIT - I

2) a) Derive an expression for the characteristic impedance Z_o and propagation constant P in terms of primary constants.

b) The primary constants of a cable are:

R = 80Ω /km

L = 2 mH / km

C = 0.07 μF/km

G = 0.3 $\mu\Omega$ /km

Calculate the secondary constants at frequency of 1000 Hz.

OR

3) a) Prove that an infinite line is equivalent to a finite line terminated in its Z_o.

b) The characteristic impedance of a uniform transmission line is 2039, 5Ω at frequency of 800 Hz. At this frequency the propagation constant was found to be 0.054 $\angle 87.9^o$. Determine the values of the line constants R, L, G and C.

UNIT - II

4) a) Derive an expression for the input impedance of a loss-free line of length L when the load end

i) short circuited and

ii) open circuited

b) The S.C and O.C impedance at 800Hz of a transmission line 40 km long are 3200 $\angle -80^o$ Ω and 1300 $\angle 80^o$ respectively. Calculate the line constants R, L, G and C.

OR

5) a) Define the terms reflection coefficient and VSWR and obtain the relation between reflection co-efficient and VSWR.

b) A 30 m long loss-less transmission line with Z_o = 50Ω operating at 2MHz is terminated with a load Z_L = 60 + j40Ω. If the velocity of propagation on line is 0.6 times that of light, find the following:

i) Reflection co-efficient

ii) Standing wave Ratio

iii) Input impedance

UNIT - III

6) a) Derive the field components of TE waves between parallel plates propagating in Z- direction.

b) Explain why TEM wave is impossible in rectangular waveguides.

OR

7) a) Derive expressions for TE waves in rectangular waveguides.

b) Write about attenuation factor and Q – factor of rectangular waveguides.

UNIT - IV

8) a) Derive expressions for TE waves in circular waveguides.

b) Explain about symmetrical strip transmission lines.

OR

9) Give the solutions to the field equations in cylindrical co-ordinates.

EEE

(DEC 224)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper – IV : Network Analysis & Synthesis

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) What are the conditions to be fulfilled by an attenuator?

b) What is the function of high pass filter?

c) What is the difference between network synthesis and network analysis.

d) Draw the ideal characteristics of band pass filters.

e) What is a transfer function?

f) Write basic equations representing transmission parameters.

g) Mention any two properties of positive real function.

h) Which impedances are called image impedances of the network?

i) What is complex frequency?

j) What is the formula used for characteristic impedance in pass band filters.

k) What is the significance elements in Cauer form.

l) What is a bilateral network?

m) What are the properties of admittance function?

n) What is meant by full series equalizer?

o) How elements in the network are realized in second fosterform?

UNIT - I

2) a) Derive the expressions of ABCD parameters in terms of Y- parameters.

b) For the network shown in fig 1, Determine the transfer impedance and transfer admittance.

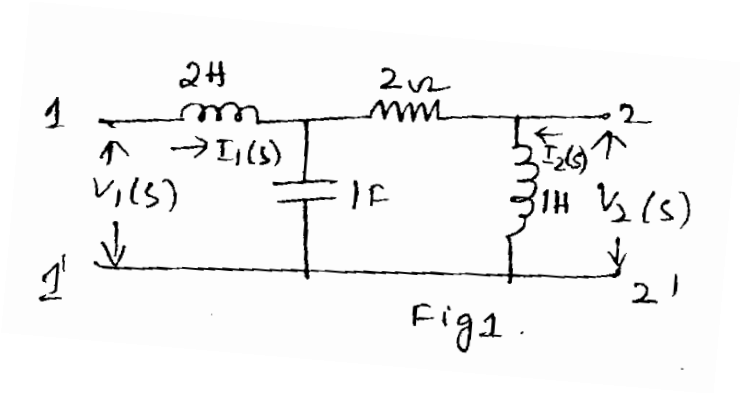

Fig 1.

OR

3) a) Explain the properties of driving point function.

b) Draw the pole-zero diagram and hence obtain the time domain response, verify result analytically $V(s)=\frac{(5s+5)}{((s+2)(s+7))}$.

UNIT - II

4) a) Explain the procedure followed in designing a k-high pass filter.

b) For a π-section filter network shown in Fig 2. Calculate the cut-off frequency and phase shift at 10KHz. What is the value of nominal impedance in the pass band.

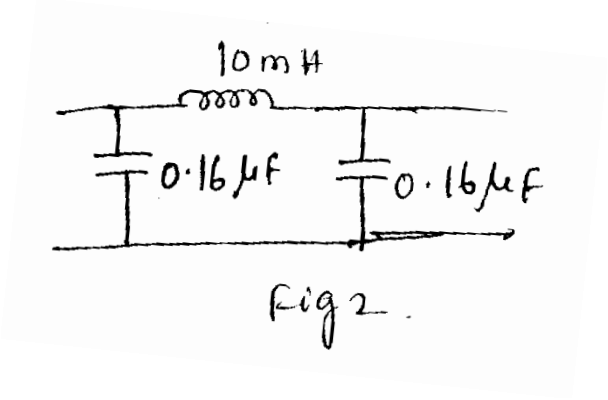

Fig 2.

OR

5) a) Derive α, β and Z_o for m-derived low pass filter.

b) Determine the cut-off frequency and design impedance for the T-section shown in fig 3.

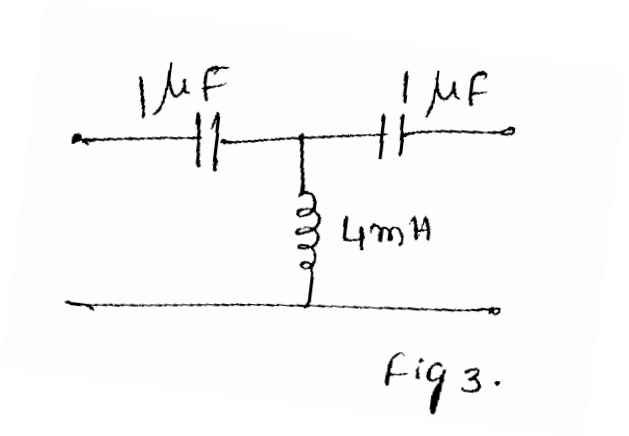

Fig 3.

UNIT - III

6) a) What is meant by attenuator? Derive necessary equations for T-type attenuator.

b) Design an attenuator to operate on a characteristic resistance of 500 ohms to provide attenuation of 15dB.

OR

7) a) Derive necessary expressions to design a series equalizer.

b) Design a full shunt equalizer for design resistance R_o = 600 ohms and attenuation at frequencies of 600Hz and 1200 Hz.

UNIT - IV

8) a) Explain the role of circuit elements L_o, C_o, L_n, & C_n in the second foster form.

b) The driving point impedance of a one port L C network is given by $z(s) = \frac{3.(s^2+1)(s^2+16)}{s(s^2+9)}$. Obtain the first and second foster form of equivalent network.

OR

9) a) List out the properties of positive real functions.

b) Driving point impedance of an L C network is given by $z(s) = \frac{s^4+10s^2+2}{s^2+4s}$. For this function determine the second cauer network.

EEE

(DEC 225)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS AND COMMUNICATIONS

Paper – V : Electrical Technology

Time : 3 Hours **Maximum Marks: 75**

Answer question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Write the emf equation of a D.C machine.

b) Why starter is necessary to start a D.C motor?

c) Write the emf equation for a long shunt D.C compound machine.

d) Give any two applications of D.C compound motors.

e) What are the disadvantages of Swinburne's test?

f) Define % regulation up in a transformer.

g) Write the expression for conductance.

h) Why single phase induction motor is not self starting?

i) What are the various starters used for starting single phase Induction motor?

j) What are the advantages of fractional horse power motors?

k) What is the other name of synchronous impedance method.

l) What is armature reaction?

m) What are the different types of rotors in alternators.

n) Under which conditions a synchronous motor will fail to pull into step?

o) Write the advantages of stepper motors?

UNIT - I

2) a) Derive an expression for emf in a DC machine.

b) A shunt generator has a full load current of 196 A at 220V. The stray losses are 720w and the shunt field coil resistance is 55Ω. If it has a full load efficiency of 88%, find the armature resistance. Also, find the load current corresponding to maximum efficiency.

OR

3) a) Explain how Swinburne's Test is conducted on D.C machines.

b) What are the various losses occurring in DC machines? How they can be reduced.

UNIT - II

4) a) Draw and explain the phasor diagram of a transformer on load with leakage reactance.

b) Discuss the various losses occurring in a transformer and the methods to reduce them.

OR

5) a) A 600 – KVA, 1-ϕ transformer when working at u.p.f has an efficiency of 92% at full load and also at half load. Determine its efficiency when it operates at unity p.f and 60% of full load.

b) Explain how O.C test can be conducted on transformers.

UNIT - III

6) a) Explain how rotating field is produced in induction motors when 3 – ϕ and 2 - ϕ supply is given.

b) The stator of a 3-ϕ induction motor has 3 slots per pole per phase. If supply frequency is 50 Hz. calculate

i) number of stator poles produced and total number of slots on the rotor.

ii) speed of the rotating stator flux (or magnetic field).

OR

7) Discuss the starting methods of single phase Induction motors. Also discuss their advantages and disadvantages.

UNIT - IV

8) a) Discuss the principle and constructional features of an alternator in detail.

b) List out the applications of alternator.

OR

9) a) The stator of a 3- phase, 16-pole alternator has 144 slots and there are 4 conductors per slot connected in two layers and the conductors of each phase are connected in series. If the speed of alternator is 375 rpm, calculate the emf induced per phase. Resultant flux in the air gap is 5×10^{-2} webers per pole sinusoidally distributed. Assume coil span as 150^{o} electrical.

b) Discuss briefly about the methods of starting of synchronous machines.

EEE

(DEC 226)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELECTRONICS & COMMUNICATIONS

Paper – VI : Signals & Systems

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) a) Define periodic and aperiodic signals.

b) Define Sampling theorem.

c) Check for periodicity of $\cos(0.01\pi n)$

d) Distinguish between Deterministic and random signals.

e) Define odd and even signals.

f) Define ROC.

g) State convolution property of fourier transform.

h) Define Noise-figure.

UNIT - I

2) a) Find the fourier transform of X (t-2) e^{it}.

b) Explain evaluation of mean square error.

OR

3) a) List and explain properties of fourier transforms.

b) Write short notes on orthogonality in complex functions.

UNIT-II

4) a) Explain causality and stability of a signal. Give examples for each.

b) Write short notes on Paley –Wiener criterion.

OR

5) a) Give relation between Bandwidth and Rise time

b) Explain convolution with its graphical interpretation.

UNIT - III

6) a) Discuss sources of noise in Signals.

b) Explain measurement of Noise- figure.

OR

7) a) Explain Noise- figure of an amplifier.

b) Write short notes on effective input noise temperature.

UNIT - IV

8) a) State and explain Bayes theorem.

b) Explain power spectral density.

OR

9) a) Explain types of random variables.

b) Explain Ergodic process.

(DEC / DME / DCE 227)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Second Year)

ELEC & COMMU and MECHANICAL and CIVIL ENGINEERING

Paper – VII : Environmental Science

Time : 3 Hours **Maximum Marks: 75**

Answer Question No.1 is compulsory ***(15)***

Answer one question from each unit ***(4×15 = 60)***

1) Write briefly on:

a) Composting.

b) Global Warming.

c) Nuclear Reactor at Nagarjuna Sagar

d) Kolleru lake –aquaculture in AP

e) Wet Lands

f) Water shed management

g) Nuclear Hazards

h) Cloud Seeding.

i) Water logging

j) Indoor Airpollution

k) Flood

l) Soil Erosion

m) Hot Spots.

n) Thermal pollution

o) Salinity.

UNIT - I

2) Discuss about present environmental issues on global concern.

OR

3) a) Define renewable and non renewable resources.

b) Discuss about the energy resources.

UNIT - II

4) Discuss causes, effects and control measures of water pollution.

OR

5) Discuss about the

a) Resettlement and rehabilitation of people.

b) Urban problems related to energy.

UNIT - III

6) Write a detailed explanation about local polluted site of your choice.

OR

7) What is 'Sustainable Development' ? Discuss the concept of Sustainable Development.

UNIT - IV

8) Discuss about the air and water prevention and control of protection act.

OR

9) Discuss the salient features of the Environment Act,1986.