CE/EE/mE

3E1102

Roll No. _____ Total No of Pages: 3

3E1102

B. Tech. IV - Sem. (Main) Exam., May - 2019

HSMC

Technical Communication

All branches

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[5×2=10]**

All questions are compulsory

Q.1 Define Technical Communication.

Q.2 What do you understand by print media?

Q.3 Name various forms of technical discourse.

Q.4 Distinguish between technical proposal and technical report.

Q.5 Mention various kinds of technical documents.

PART – B

(Analytical/Problem solving questions) **[4×10=40]**

Attempt any four questions

Q.1 Discuss the importance and characteristics of technical communication. [5+5=10]

Q.2 Discuss the barriers to effective speaking.

Q.3 Describe the techniques to interpret and summarize technical texts.

Q.4 Spot the error and correct the following sentences: [10×1=10]

(a) We have received no information.

(b) I and he are brothers.

(c) I have no any friends.

(d) We should not make noise.

(e) He has finished his letter last night.

(f) If I were rich I will help you.

(g) She came yesterday, doesn't she?

(h) The last bus had gone until we had to walk home.

(i) Will you male this letter immediately?

(j) A person who can neither read or write is illiterate.

Q.5 Draft an official email informing about the forthcoming meeting of your company regarding improving work atmosphere in the company. [10]

Q.6 Explain the importance and types of technical articles. [4+6=10]

PART – C

(Descriptive/Analytical/Problem Solving/Design Question) **[2×15=30]**

Attempt any two questions

Q.1 Describe four basic technical communication skills and how to develop these four essential skills of technical communication? [8+7=15]

Q.2 Imagine yourself as Mehul Kumar of Kanpur, write a job application with resume in response to the advertisement for the post of Technical Executive in Tata Motors Ltd. Andheri East, Mumbai. [7+8=15]

Q.3 Discuss the kinds of Technical Proposals. Draft the format of technical proposal. [8+7=15]

4E1224

Roll No. _____ Total No of Pages: 3

4E1224

B. Tech. IV - Sem. (Main) Exam., May - 2019
BSC Electrical & Electronics Engineering
4EX2 – 01 Biology
EE, EX

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[5×2=10]**

All questions are compulsory

Q.1 What is the scope of studying Biology for Engineering students?

Q.2 Give major differences between a Prokaryotic and Eukaryotic cell.

Q.3 Write basic differences between Mitosis and Meiosis cell division.

Q.4 Explain E. coli and D. Melanogaster as model organisms.

Q.5 Differentiate between DNA and RNA.

PART – B

(Analytical/Problem solving questions) **[4×10=40]**

Attempt any four questions

Q.1 Give fundamental differences between science and engineering by drawing a comparison between:

(i) eye and camera [5]

(ii) bird flying and aircraft [5]

Q.2 (a) Describe Mendel's law of segregation.

(b) A tall homozygous pea plant (DD) is crossed with a dwarf homozygous pea plant (dd). Show the schematic representation of this cross and state phenotypic and genotypic ratio of this cross. [3+7=10]

Q.3 (a) Discuss 'Lock and key' model displaying the mechanism of enzyme catalysis. [5]

(b) Describe enzyme kinetics and state on what factors does this kinetics depend. [5]

Q.4 (a) Explain briefly 'Gene mapping' and its advantages. [5]

(b) Explain 'Epistasis' with example of one dihybrid cross, in connection with gene interaction. [5]

Q.5 (a) Describe replication of DNA. [5]

(b) On the basis of molecular taxonomy, explain three major kingdoms of life. [5]

Q.6 (a) Describe microbial ecology. [5]

(b) Explain growth kinetics of micro-organisms. [5]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 (a) Why ATP is considered as an energy currency? [5]

(b) Explain: [5+5=10]

(i) Glycolysis and Krebs cycle

(ii) Photosynthesis

Q.2 Carbohydrates and proteins are the major constituents in human nutrition. Considering this, discuss : [10+5=15]

(i) Sugars, starch and cellulose

(ii) Amino acids and proteins

Q.3 Explain the following: [5+5+5=15]

(i) Classification of organisms based on ammonia excretion.

(ii) Importance of enzyme catalysis.

(iii) Single gene disorders in humans with examples.

4E1225

Roll No. _____ Total No of Pages: 3

4E1225

B. Tech. IV - Sem. (Main) Exam., May - 2019
ESC Electrical Engineering
4EE3 – 04 Electronic Measurement & Instrumentation
EE, EX

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[5×2=10]**

All questions are compulsory

Q.1 Explain comparison between Current transformer and Potential transformer.

Q.2 Explain the term 'standardization' of a potentiometer.

Q.3 What is the importance of the value of earth's resistance?

Q.4 Why is it preferable in bridge circuits, that the equations of balance are independent of Frequency? Explain.

Q.5 Explain why PMMC instruments are the most widely used instruments.

PART – B

(Analytical/Problem solving questions) **[4×10=40]**

Attempt any four questions

Q.1 What are the sources of errors in bridge circuit? What are the precautions and methods used to minimize the errors?

Q.2 Explain the working principle of single phase energy meter.

Q.3 Explain classification of Resistance, how Wheatstone bridge method is employed to measure Resistance?

Q.4 Discuss the measurement of power by two Wattmeter method.

Q.5 Explain construction and operation of slide wire DC potentiometer.

Q.6 Explain the following AC bridges with phasor diagrams.

(A) Heaviside Bridge

(B) Anderson Bridge

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 Draw the equivalent circuit and phasor diagram of a current transformer. Also derive the expression for ratio and phase angle errors.

Q.2 Explain the working of Co-ordinate AC potentiometer. How is it standardized? What are the functions of the transfer instrument and the phase shifting transformer?

4E1226

Roll No. _____ Total No of Pages: 3

4E1226

B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Electrical Engineering

4EE4 – 05 Electrical Machine – II

EE, EX

Time: 3 Hours **Maximum Marks: 120**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[10×2=20]**

All questions are compulsory

Q.1 What is meant by distribution factor and pitch factor? [2]

Q.2 Explain armature and field mmfs in AC machines. [2]

Q.3 Show that three phase current in a three phase winding always produce a rotating magnetic field. [2]

Q.4 State the operating conditions of the motor when the slip is either positive, greater than one or negative. [2]

Q.5 Explain why rotor of an induction motor can never attain synchronous speed? [2]

Q.6 Write short note on "Rotor resistance control". [2]

Q.7 Show that the starting torque of a single phase induction motor is zero. [2]

Q.8 Why single phase induction motor is not self-starting? [2]

Q.9 Define armature reaction, its bad effects on synchronous generator. [2]

Q.10 What is synchronizing of alternator? Write various methods of synchronizing. [2]

PART – B

(Analytical/Problem solving questions) **[5×8=40]**

Attempt any five questions

Q.1 Explain how in a synchronous motor by changing the field excitation it is possible to operate the motor from logging to leading power factor while keeping the load constant. [8]

Q.2 Describe with neat sketches the construction and principle of operation of a 3-phase induction motor. Why rotor of an induction motor can never attain synchronous speed? [8]

Q.3 Explain in detail why a single phase induction motor is not self-staring? Explain its operation based on double revolving filed theory. [4+4=8]

Q.4 Explain by help of neat diagram about cascade connection in induction motor. [8]

Q.5 Explain zero power factor characteristics and concept of Potier Triangle Method of voltage regulation of synchronous generator. [8]

Q.6 Explain 'V' and inverted 'V' curves for synchronous motor. [8]

Q.7 Explain mmf generation in distributed winding with the help of suitable diagrams and waveforms. [8]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[4×15=60]**

Attempt any four questions

Q.1 (a) Draw the torque slip characteristic of 3 phase induction motor and show with suitable derivation that maximum torque is independent of rotor resistance. [10]

(b) A 8-pole, 50Hz, 3-phase induction motor develops a maximum torque of 150 N-m at 650 rpm. The rotor resistance is 0.6 Ω / phase. Find torque at 4% slip. Neglect stator Impedance. [5]

Q.2 Explain various methods of speed control in 3-phase induction motor. [15]

Q.3 Write short notes on the following-

(a) Double revolving field theory. [5]

(b) Split phase induction motor. [5]

(c) Shaded pole single phase induction motor. [5]

Q.4 (a) Explain the two reaction theory of salient pole synchronous machines? [8]

(b) State the conditions for parallel operation of a synchronous generator. Explain the need of parallel operation. [7]

Q.5 Describe with the help of diagrams, the principle, construction and phasor diagram of synchronous motor at various excitation mode and derive expression for the power developed. [15]

4E1227

Roll No. _____

Total No of Pages: 4

4E1227

B. Tech. IV - Sem. (Main) Exam., May - 2019
PCC Electrical Engineering
4EE4 – 06 Power Electronics
EE, EX

Time: 3 Hours **Maximum Marks: 120**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only) **[10×2=20]**

All questions are compulsory

Q.1 Explain the safe operating areas of an IGBT.

Q.2 What do you mean by commutation of SCR? What are the different classes of forced commutation method?

Q.3 Explain the effect of freewheeling diode. Also justify the statement "Freewheeling diode improves the power factor of the system."

Q.4 Explain the working of single phase fully controlled bridge converter in rectifying mode.

Q.5 Why forced commutation is necessary for Chopper?

Q.6 What are the merits and demerits of voltage commutated chopper?

Q.7 Explain the time ratio control and current limit control of chopper.

Q.8 What are the differences between Series inverter and Parallel inverter?

Q.9 How are inverters classified?

Q.10 Explain 3-d current source inverters.

PART – B

(Analytical/Problem solving questions) **[5×8=40]**

Attempt any five questions

Q.1 A SCR has a V_g - I_g characteristics given as $V_g = 1.5 + 8\ I_g$. In a certain application, the gate voltage consists of rectangular pulses of 12V and of duration 50μs with duty cycle 0.2 –

(i) Find the value of R_g series resistor in gate circuit to limit the Peak Power dissipation in the gate to 5W.

(ii) Calculate the average power dissipation in the gate.

Q.2 A full wave full converter is having RE load (R = 100Ω, E = 50V). Determine the current through 100Ω load, if the thyristors are triggered at 30°. The converter is connected to a 20V 50Hz source.

Q.3 A Chopper circuit is operating on TRC principle at a frequency of 1 kHz on a 220V d.c supply. If the load voltage is 180V, calculate the conducting and blocking period of thyristor in each cycle.

Q.4 A buck boost converter is operated from a 24V battery and supplies an average load current of 2A. Its switching frequency is 50 kHz. Neglecting diode and switch drop, determine:

(i) Range of duty – cycle variation required to maintain the output voltage at 15V given that the battery voltage ranges from 26V in the fully charged state to 21V in the discharged state.

(ii) The Peak to Peak Choke ripple current for the nominal supply voltage given that the choke value is 500μH.

Q.5 The single phase half bridge inverter has a resistive load of 10Ω and the center tap dc input voltage is 96V. Compute-

(i) RMS value of the output voltage.

(ii) Fundamental component of the output voltage waveform.

(iii) First five harmonics of the output voltage waveform.

(iv) Fundamental Power consumed by the load.

(v) RMS Power consumed by the load.

Q.6 Design a single phase parallel inverter to feed a load at 220V, 50Hz and Peak load current is 2A.

V_{dc} = 40V, Specify the ratings of commutating component.

Q.7 For a three phase bridge inverter operating in 120° conduction mode, determine:

(i) dc voltage for a fundamental line voltage of 415V

(ii) rms line and phase voltage

(iii) Device voltage rating

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[4×15=60]**

Attempt any four questions

Q.1 (a) Explain the working of SCR on the basis of two transistor analogy.

(b) In brief explain turn – on and turn – off switching characteristics of IGBT.

Q.2 A three phase bridge rectifier using diodes, delivers power to a load of R = 10Ω at a dc voltage of 400V. Determine the ratings of the diodes and of the three phase delta – star transformer when TUF = 0.9541.

Q.3 (a) With the help of circuit diagram, explain the working of Step up / Step down Chopper.

(b) Enumerate the merits and demerits of load commutated chopper.

Q.4 A capacitor commutated 1 - ϕ bridge inverter is operated at 50Hz with load resistance of 5Ω. Thyristor turn – off time is 62μsec. Determine:

(i) Commutating capacitor 'C' for successful commutation of SCR

(ii) Load Current I_L

(iii) F critical for reliable commutation

(iv) R critical

Q.5 A three phase bridge inverter is fed from a 480V dc source. The inverter operates in 180° conduction mode and it supplies a purely resistive star connected load R = 10Ω/ phase. Determine:

(a) the rms value of load current

(b) rms value of thyristor current

(c) Power delivered to the load

(d) Average source current

4E1228

Roll No. _____ Total No of Pages: 3

4E1228

B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Electrical Engineering

4EE4 – 07 Signals & Systems

EE, EX

Time: 3 Hours **Maximum Marks: 120**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[10×2=20]**

All questions are compulsory

Q.1 What is signal? Define continuous time signal and discrete time signal.

Q.2 Differentiate between causal and non – causal systems?

Q.3 Give the relationship between unit impulse function, unit step function and unit ramp function.

Q.4 Discuss the following terms for LTI system –

(a) Invariability (b) Memory

Q.5 What are Dirichlet conditions?

Q.6 Give the relationship between Laplace Transform and Fourier Transform.

Q.7 What is the difference between linear and circular convolution?

Q.8 Discuss the significance of z – transform.

Q.9 Define the term sampling period and sampling rate.v

Q.10 What is Aliasing Phenomenon? How can aliasing be eliminated?

PART – B

(Analytical/Problem solving questions) **[5×8=40]**

Attempt any five questions

Q.1 The systems given below have input x(t) or x[n] and output y(t) or y[n] respectively. Determine whether each of them is stable, causal, linear and time – invariant –

(a) $y(t) = x(t^2)$ (b) $y[n] = 2x[n]u[n]$

Q.2 Find the convolution of the following signals –

$x(t) = e^{-2t}\, u(t)$; $h(t) = u(t + 2)$

Q.3 Obtain the trigonometric fourier series for the half wave rectified sine wave as shown in fig (a).

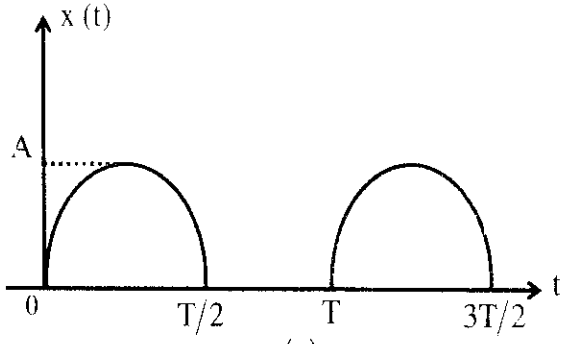


Fig (a)

Q.4 Prove the following properties of CTFT –

(a) Duality Property (b) Modulation Property

Q.5 State and prove the initial value and final value theorem for Laplace transform.

Q.6 Find the z – terms of the following discrete time signals –

(a) $x[n] = n\, a^n\, u[n]$ (b) $x[n] = u[n] - u[n - 3]$

Q.7 Determine the Nyquist rate and Nyquist interval corresponding to each of the following signals –

(a) $x(t) = 1 + \cos(2000\,\pi\, t) + \sin(400\,\pi\, t)$

(b) $x(t) = \frac{\sin(4000\,\pi\, t)}{\pi t}$

(c) $x(t) = \left[\frac{\sin(4000\,\pi t)}{\pi t}\right]^2$

(d) $x(t) = \text{sinc}(50\pi t)\ \text{sinc}(100\,\pi t)$

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[4×15=60]**

Attempt any four questions

Q.1 Verify Parseval's theorem for the following discrete time sequence-

$$x[n] = \left(\frac{1}{2}\right)^n u[n]$$

Q.2 A system has transfer function H(s) as given below. Determine response h(t) assuming that –

(i) System is causal (ii) System is stable

$$H(s) = \frac{s^2 + 5s + 9}{(s+1)(s^2 - 2s + 10)}$$

Q.3 Find the inverse Z – transform of the following function using partial fraction expansion-

$$x(z) = \frac{1 - \frac{1}{2}z^{-1}}{1 + \frac{3}{4}z^{-1} + \frac{1}{8}z^{-2}}$$

for the following ROC –

(a) $|z| > \frac{1}{2}$ (b) $|z| < \frac{1}{4}$ (c) $\frac{1}{4} < |z| < \frac{1}{2}$

Q.4 Describe all the properties of DFT in detail.

Q.5 State and prove the sampling theorem. Also explain interpolation with zero – order hold circuit.

4E1229

Roll No. _____ Total No of Pages: 2

4E1229

B. Tech. IV - Sem. (Main) Exam., May - 2019
PCC Electrical Engineering
4EE4 – 08 Digital Electronics
EE, EX

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[5×2=10]**

All questions are compulsory

Q.1 Find the value of x in $(A1x)_{16} = (274)_{10} + (1001)_2$.

Q.2 Draw the truth table for $Y = (A' B + C)D$

Q.3 Find the minimum no. of NAND gate when $Y = A' B$ is implemented using NAND gate only.

Q.4 Calculate the no of selection line required when a 16×1 mux is implemented using 4×1 mux.

Q.5 Write the full form of CPLDs.

PART – B

(Analytical/Problem solving questions) **[4×10=40]**

Attempt any four questions

Q.1 Implement a XNOR gate using NAND gate only.

Q.2 Simplify $Y = \sum m (0, 1, 2, 5, 6, 7) + d (8, 9, 10)$ using K – map.

Q.3 Implement combinational logic $Y = \sum m (0, 1, 2, 4, 6)$ using mux.

Q.4 Draw the state diagram of a 4 bit down counter.

Q.5 Draw the circuit diagram of any two Dynamic memory cell.

Q.6 Draw the R – 2 R ladder type D/A converter which accepts 4 bit digital input. Find its analog output for the digital input 1101 when reference supply is 9 volt.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 Simplify $Y = \sum m (4, 5, 11, 12) + d (8, 9)$ and implement it.

Q.2 Design MOD – 17 synchronous counter and draw its counting state.

Q.3 Draw the block diagram of a successive approximation A/D converter and explain its working. Also compare its total time in terms of clock to convert the signal as 6 bit output.

4E4120

Roll No. _____

Total No of Pages: 4

4E4120

B. Tech. IV Sem. (Back) Exam., May - 2019
Electrical Engineering
4EE1A Analog Electronics
Common to EE, EX, EC, and EI

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT- I

Q.1 Find the type of feedback in amplifier shown in fig. – 1. If the resistances are $R_c = 10k\Omega$, $R_f = 400k$, $R_s = 10k\Omega$ and h – parameter value are: [4+3×4=16]

$h_{ie} = 2k\Omega$ $h_{fe} = 30$ $h_{re} = h_{oe} = 0$

Then calculate the value of

(i) A_{vf} (ii) R_{if} (iii) R_{of}

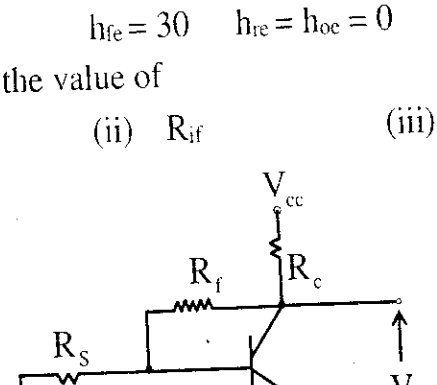


fig. – 1

OR

Q.1 (a) Design a voltage amplifier with voltage series feedback to reduce its open loop voltage gain variation with temperature from 50% to 0.5%. Assume the h – parameter values are: [12]

$h_{ie} = 10\Omega$ $h_{fe} = 40$ $h_{ve} = h_{oe} = 0$

(b) How gain band width product changes with positive and negative feedback? Justify your answer with expressions. [4]

UNIT- II

Q.2 (a) Calculate the node voltages in fig – 2 under both stable states at node A, B, C, D

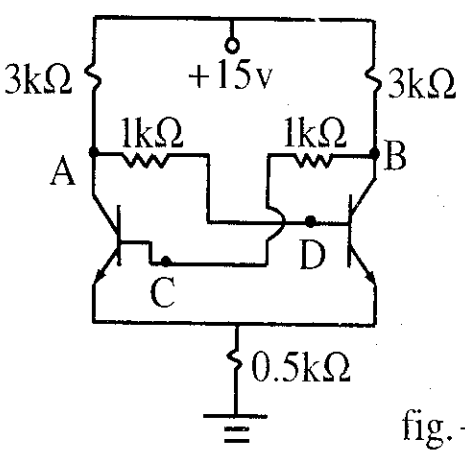


fig. – 2

Assume $h_{FE} = 50$, $V_{CE\,sat} = 0.2$ $V_{BE\,sat} = 0.8v$ [12]

(b) How we define the stability of an oscillator? Compare the stability range of different oscillators? [4]

OR

Q.2 (a) Design a clock generator using a stable multivibrator such that its duty cycle is 60% and clock frequency is f = 10KHz. [8]

(b) Find the expression of β (S) in a Wien bridge oscillator and Draw the frequency response of β (S). Also locate the oscillation frequency on it if : [8]

A (S) = 30 at S = jw = 10.

UNIT- III

Q.3 Find the expression of: [2×8=16]

(i) Unity gain and

(ii) 3 – dB frequency of for a emitter follower using hybrid – π model

OR

Q.3 (a) Calculate the hybrid - π model parameter if the value of h – parameters are: [8]

$h_{ie} = 10k\Omega$, $h_{fe} = 40$ $hre = 10^{-3}$ $hoe = 0.001$

Assume the collector current $I_c = 10mA$

(b) Give the reasons for different capacitive parameter in hybrid - π model. Also find the expression for emitter Junction capacitance in terms of Junction parameter (viz – depletion width and diode resistance). [8]

UNIT- IV

Q.4 Draw the circuit diagram and draw their frequency response of : [2×8=16]

(i) Single tuned amplifier

(ii) Stagger tuned amplifier

OR

Q.4 Define the following for tuned amplifier: [2×8=16]

(i) Q – factor

(ii) Bandwidth

And find their expression for single tuned amplifier.

UNIT- V

Q.5 Write the basic difference between power amplifier and small signal amplifier with respect to: [4×4=16]

(i) Construction

(ii) Efficiency

(iii) Distortion

(iv) Bandwidth

OR

Q.5 Draw the circuit diagram of : [2×8=16]

(a) Class – B Push pull Amplifier and

(b) Class – A Push pull Amplifier

Also explain their working difference.

4E4172

Roll No. _____ Total No of Pages: 4

4E4172

B. Tech. IV Sem. (Back) Exam., May - 2019

Electrical Engineering

4EE2A Circuit Analysis - II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

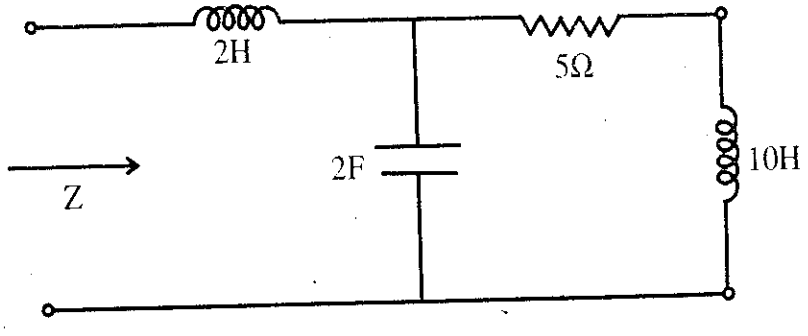
Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

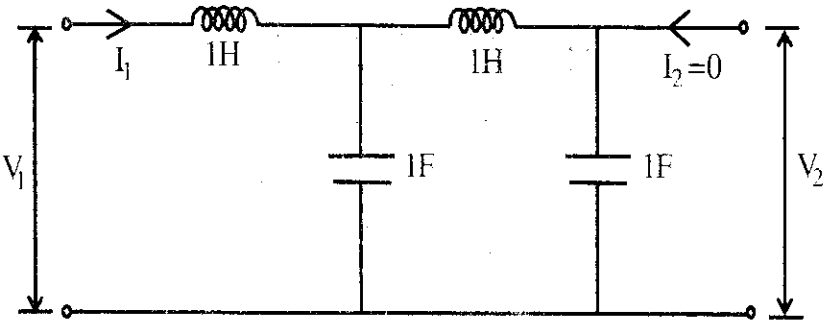
Q.1 (a) Explain the concept of complex frequency. [8]

(b) What is the impedance and admittance functions in the circuit of given figure in complex frequency domain? [8]



OR

Q.1 (a) What is the driving point and transfer impedance of the network shown in figure? [8]



(b) Explain the driving point impedance and transfer impedance with suitable circuit diagram. [8]

UNIT- II

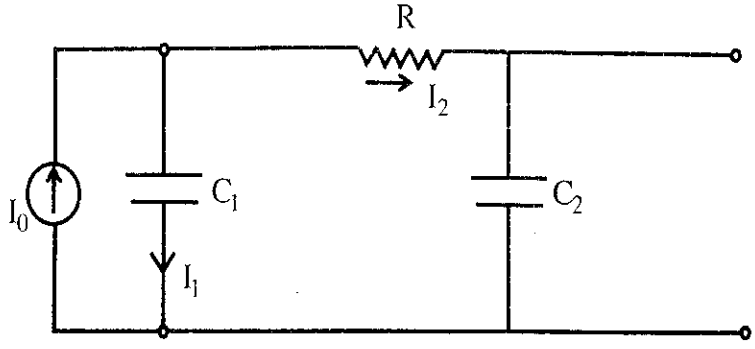
Q.2 (a) Explain the necessary conditions for transfer functions. [8]

(b) A current transfer function is given by $I(S) = \frac{5S}{(S+2)(S^2+2S+2)}$. Obtain its time domain response. [8]

OR

Q.2 (a) Explain the restriction on location of poles and zeros in driving point functions. [8]

(b) Obtain the current transfer ratio of the network shown in figure. [8]



UNIT- III

Q.3 (a) A function is given by - [8]

$$z(s) = \frac{s^3+5s^2+9s+3}{s^3+4s^2+7s+9}$$

Find the positive realness of the functions.

(b) Find the first form of Cauer of RC netwcrk - [8]

$$z(s) = \frac{(s+3)(s+6)}{(s+1)(s+5)}$$

OR

Q.3 (a) The driving point impedance of a one port reactive is given by [8]

$$z(s) = 4\frac{s(s^2+4)}{(s^2+1)(s^2+16)}$$

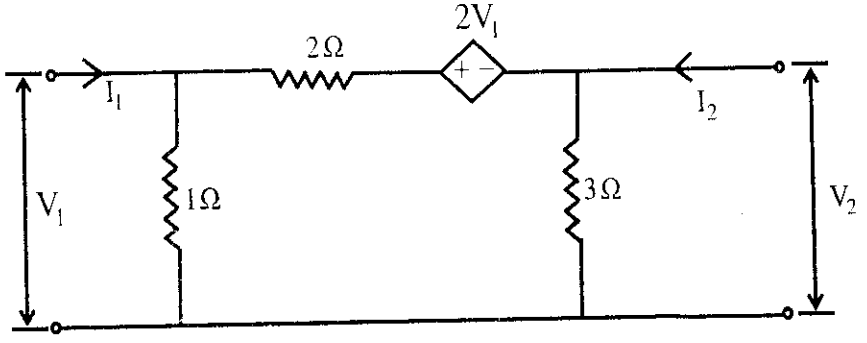
Obtain the foster forms of LC network realisation.

(b) Find the range of values of m in P(s). So that P(s) is Hurwitz. [8]

UNIT- IV

Q.4 (a) Derive the condition of reciprocity and symmetry in ABCD parameters. [8]

(b) Find the z-parameters of circuit shown in given figure :- [8]



OR

Q.4 (a) Explain the Cascade connection of two port network. [8]

(b) Derive the expression of input and output impedances in terms of z-parameters. [8]

UNIT- V

Q.5 (a) Derive the value of characteristics impedance for π - type k - type High Pass filter. [8]

(b) Design a m - derived T - section low pass filter having cut - off frequency (f_c) = 7kHz, design impedance $R_o = 600\Omega$ and frequency of infinite attenuations $f_\alpha = 10.5$ kHz. [8]

OR

Q.5 (a) Derive the impedance characteristics of m-derived low pass filter. [8]

(b) Design a T and π section constant k type high pass filter having cut off frequency of 12 kHz and nominal impedance R_o=500Ω. Also find :- [8]

(i) Its characteristics impedance and phase constant at 24 kHz and

(ii) Attenuation at 4 kHz.

4E4122

Roll No. _____

Total No of Pages: 4

4E4122

B. Tech. IV Sem. (Back) Exam., May - 2019
Electronics Instrumentation & Control Engineering
4EI3A Electrical Measurement

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT- I

Q.1 (a) Explain the working of attraction type moving iron instrument with the help of neat diagram. Describe the method of producing controlling and doming torques in it. Explain why their meter can be used on both a.c and d.c [8]

(b) The relationship between inductance of a moving iron ammeter. The current and position of the pointer is as follows - [8]

Reading (A)	.8	1	1.2	1.4	1.6	1.8	2
Deflection (degree)	16.5	26	36	46.5	57	70	2
Inductance (μn)	527.8	573.9	575	576.2	577.3	578.35	579.45

Calculate the deflecting torque when the current 1.5 A and 2.1 A

OR

Q.1 (a) Describe the construction and working of PNMC instrument. Derive the equation for deflection if the instrument is spring controlled. [8]

(b) A moving coil instrument has the following data - [8]

Number of turn = 100, Width of coil = 20 mm

Depth of coil = 30 mm, flux density in the gap = .1Wb/m^2

Calculate deflecting torque when carrying a current of 10 mA. Also calculate deflection if the control spring constant is 2×10^{-6} Nm/degree.

UNIT- II

Q.2 (a) Draw the equivalent circuit and phasor diagram of current transformer. Derive the expression for ratio and phase angle error. [8]

(b) A current Transformer with a bar primary has 300 turns in its secondary winding. The resistance and reactance of the secondary circuit are 1.5Ω and 1Ω respectively including the Transformer winding. With 5A flowing in the secondary winding the magnetizing mmt is 100A and the iron loss in 102 W. Determine the ratio and phase angle errors. [8]

OR

Q.2 (a) When two wattmeter method is used for measurement of power in a three phase balance circuit, comment upon the reading of the two wattmeter's under following conditions. Support your answer by drawing phasor diagram. Assume that the system is star connected.

(i) When the power factor is unity [4]

(ii) When power factor is zero lagging. [4]

(b) A 3 – phase 500V Motor Load has a power factor of .4. Two Wattmeters are connected to measure the input. They show the input to be 30 kW. Find the reading of each instrument. [8]

UNIT- III

Q.3 (a) Describe the construction of a co-ordinate type a.c potentiometer. How is it standardized? [8]

(b) A co-ordinate type potentiometer is used for determination of impedance of a coil and the result obtained are voltage across a 1Ω resistor in series with the coil + .238 V on in phase dial and -0.085 on quadrature dial.

Voltage across a 10 : 1 potential divider used with the coil 0.3375 V on in phase dial and 0.232V on quadrature dial. Calculate Resistance and reactance of coil. [8]

OR

Q.3 (a) Describe with the help of suitable diagram how a d.c potentiometer can be used for –

(i) Calibration of a voltmeter [4]

(ii) Calibration of an ammeter [4]

(b) During the measurement of a low resistance using a potentiometer, the following readings were obtained-

Voltage drop across low resistance under test = 0.4221V

Voltage drop across a 0.1Ω standard Resistance = 1.0235V

Calculate the value of unknown resistance, current, and the power loss in it. [8]

UNIT- IV

Q.4 What is the importance of the value of earth resistance? What are the factors which influence its value. Describe the fall of potential method for measurement of Earth Resistance. [16]

OR

Q.4 (a) Draw the circuit of a Kelvin's Double Bridge used for measurement of low resistances. Derive condition for balance. [8]

(b) A Kelvin's bridge is balanced with the following constants:

Outer ratio arm :100Ω and 1000Ω

Inner arm ratio 99.92Ω and 1000.6Ω

Resistance of link 0.1Ω

Standard Resistance 0.00377Ω

Calculate value of unknown resistance. [8]

UNIT- V

Q.5 Describe the working of Hay's bridge for measurement of inductance. Derive the equations for balance and draw the phasor diagram under balance condition. Why is this bridge suited for measurement of inductance of high Q coils? [16]

OR

Q.5 Derive the equations of balance for an Anderson's bridge. Draw the phasor diagram for condition under balance. Discuss advantages and disadvantages of bridge. [16]

4E4174

Roll No. _____ Total No of Pages: 3

4E4174

B. Tech. IV Sem. (Back) Exam., May - 2019
Electrical Engineering
4EE4A Generation of Electrical Power

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Draw the schematic diagram of thermal power plant. And explain superheat steam, economiser, pulverising plant, and air-preheater. [8]

(b) Distinguish between : fissile and a fertile material, fusion and fission. [8]

OR

Q.1 (a) Draw the schematic diagram Hydro power plant. And explain surge tank, forebay, spillway, and penstock. [8]

(b) Write a short note on combined gas and steam cycle plants. [8]

UNIT- II

Q.2 (a) How can solar energy are converted into electrical energy? Give a diagram showing the elements of such a plant. [8]

(b) Write short notes on Green House Effect (Global Warming). [8]

OR

Q.2 (a) Explain generation of electrical energy by help of wind. [8]

(b) What is the future of non-conventional energy sources in India? [8]

UNIT- III

Q.3 (a) Define following terms for a power station. [8]

(i) Demand factor

(ii) Load factor

(iii) Capacity factor

(iv) Diversity factor

(b) What do you understand by the load curve and load duration curve? [8]

OR

Q.3 (a) What do you mean by power factor? What are disadvantage of low power factor and how it can be improved? [8]

(b) The maximum demand of a power plant is 40 MW. The capacity factor is 0.5 and the utilization factor is 0.8. Find – [8]

(i) Load factor

(ii) Plant capacity

(iii) Reserve capacity

(iv) Annual energy production

UNIT- IV

Q.4 (a) Explain the following : [8]

(i) Capital cost of plant

(ii) Operating cost of plant

(iii) Annual fixed cost of plant

(iv) Generation cost of plant

(b) The equipment in a power station costs ₹ 156000 and has a salvage value of ₹ 6000 at the end of 25 years. Determine the depreciated value of the equipment at the end of 20 years on the following methods: [8]

(i) Straight line method

(ii) Diminishing value method

(iii) Sinking fund method at 5% compound interest annually

OR

Q.4 (a) Calculate most economical power factor when KVA demand is constant. [8]

(b) Discuss the various methods of the depreciation of the plant. [8]

UNIT- V

Q.5 (a) Discuss the objectives of tariffs? What is the general form of tariff? Describe the block meter rate and Hopkinson demand rate tariffs. [8]

(b) Distinguish between operating and spinning reserve. [8]

OR

Q.5 (a) What considerations govern the selection of site for a hydro power plant? [8]

(b) Calculate annual bill of a consumer whose maximum demand is 100kW, pf= 0.8 lagging and load factor = 60%. The tariff used is ₹ 75 per kVA of maximum demand plus 15 paise per kWh consumed. [8]

4E4175

Roll No. _____ Total No of Pages: 4

4E4175

B. Tech. IV Sem. (Back) Exam., May - 2019

Electrical Engineering

4EE5A Electrical Machines - II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Graph Paper 2. NIL

UNIT- I

Q.1 (a) How can we eliminate r^{th} normonic by using short pitch winding? [4]

(b) What are the advantages of distributed winding? [4]

(c) 3ϕ, 16 poles, Synchronous Generator has resulting air gap flux of 0.06 wb/pole. The flux is distributed sinusoidally over the pole. The stator has 2 slots per pole per phase and 4 conductors per slot are accommodated in two layers the coil span is 150° electrical. Calculate the phase and line voltage when machine rms at 325 rpm. [8]

OR

Q.1 (a) Proof - [8]

$Q_m = \frac{2}{p} Q_e$

Q_m = Angle of rotation (mechanical)

Q_m = " " " (electrical)

(b) Also proof graphically if we interchange the terminal of 2 – phase supply the direction of R.M.F. (rotating magnetic field) [8]

UNIT- II

Q.2 (a) Why iron losses are neglected on rotor side in 3 - ϕ I. M. [4]

(b) How can we separate the iron losses and friction and wind age losses in 3 - ϕ I. M.? [4]

(c) Why starter is not used in slip ring induction motor? [2]

(d) Why low slip region is called stable region and high slip region is called unstable region in torque slip characteristic? [6]

OR

Q.2 Draw the circle diagram from no load to and S.C. test of a 3 - ϕ, 14.92 kW, 400V, 6 pole I. M. from the following test result (lime values) [16]

No load : 400 – V 11A p.f. = .2

Short Circuit 100 – V 25 A p.f. = .4

Rotor cu – losses at stand – still the half the total cu – losses.

From the diagram find out –

(a) line current slip, efficiency and p.f. at full load

(b) Max torque

UNIT- III

Q.3 (a) How can we perform block rotor test in 1 -ϕ inducation motor. Also draw the equivalent electrical circuit diagram during this condition? [8]

(b) Explain the basic principle of stapper motor. [8]

OR

Q.3 (a) What is the reason that single phase induction motor is not self starting? [4]

(b) What is the use of copper ring in pole show in phase split induction motor? [4]

(c) Explain the basic principle of single phase synchronous motor. [8]

UNIT- IV

Q.4 (a) What is the operating region of synchrmonous generator during full load condition. (according to B – H curve) [4]

(b) Proof $X_d \geq X_q$ [4]

Where X_d = direct axis reactance

X_q = Quadrature axis reactance

(c) Write down the all step of MMF methods. Also draw the phasor diagram if we igone the armature resistance. [8]

OR

Q.4 (a) Draw the graph between Z_s v/s I_f [4]

Where Z_s = synchronous impedance

I_f = field current

(b) Also explain the reason why is "passimastic result" obtained in the voltage regulation by using synchronous impedance method. [4]

(c) What are the necerrary and sufficient conditions for synchronizing of altermators. [8]

UNIT- V

Q.5 (a) Why synchronous motor is not self starting? [6]

(b) Draw the torque slip characteristic of synchronous motor. [4]

(c) What is the impact of change in load on armature current and P. F. (Power factor) during normal excitation. Draw the phasor diagram. [6]

OR

Q.5 (a) 20 pole, 693V, 50 Hz, 3 ϕ, y connected synchronous motor is operating at no load and synchronous reactance of 10Ω (assuming $R_a = 0$) if rotor is returned by 0.5° (mech.) from its synchronous position. Compute [14]

(i) Rotor displacement in electrical degree.

(ii) Armature EMF/phase

(iii) Armature current.

(iv) Power drawn by motor

(v) Power develop by armature.

How will these quantities change when motor is lodded and displaced by 5° (mech.)

(b) If the load is dead constant on operating condition then how much induced E.M.F. is induced in damper bar/winding. [2]

4E4176

Roll No. _____ Total No of Pages: 3

4E4176

B. Tech. IV Sem. (Back) Exam., May - 2019

Electrical Engineering

4EE6A Advanced Engineering Mathematics – II

EE, EX

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Find the value of y = f(x) at x =12 for the following data- [8]

x	:	10	15	20	25	30	35
f(x)	:	35.3	32.4	29.2	26.1	23.2	20.5

Q.1 (b) Use Lagrange's interpolation formula to find f(10), from the following data- [8]

x	:	5	6	9	11
f(x)	:	12	13	14	16

OR

(a) Find by Newton-Rephson method a root of the equation $x^3-3x-5 = 0$ [8]

(b) Find the real roots of the equation $x^3-x^2-2 = 0$. Correct to three decimal places by Regula - falsi method. [8]

UNIT- II

Q.2 (a) Evaluate $\int_0^1 \frac{1}{1+x^2}\,dx$ by using- [8]

(i) Trapezoidal rule

(ii) Simpson's $\frac{1}{3}$ rule

(b) Use Picard's method to solve $\frac{dy}{dx} = x + y$, $y(0) = 1$ (up to third order of approximations). Also find the approximate values of y(0.1) & y(0.2). [8]

OR

Q.2 (a) If $\frac{dy}{dx} = x + y^2$. Use Range – Kutta method to find an approximate value of y for $x = 0.2$; given that $y = 1$, where $x = 0$. [8]

(b) Find the value of y at $x = 0.1$ by Euler's method for the given equation $\frac{dy}{dx} = \frac{y-x}{y+x}$; $y = 1$ at $x = 0$. [8]

UNIT- III

Q.3 Prove that- [4×4=16]

(i) $n\,Pn(x) = (2n-1)\,x\,P_{n-1}(x) - (n-1)P_{n-2}(x)$, $n \geq 2$

(ii) $(n+1)\,Pn(x) = P'_{n+1}(x) - P'n(x)$

(iii) $\frac{d}{dx}[x^n Jn(x)] = x^n J_{n-1}(x)$, $n \geq 0$

(iv) $2\,Jn'(x) = J_{n-1}(x) - J_{n+1}(x)$.

OR

Q.3 (a) Show that- [8]

(i) $J\frac{1}{2}(x) = \sqrt{\frac{2}{\pi x}}\sin x$

(ii) $J-\frac{1}{2}(x) = \sqrt{\frac{2}{\pi x}}\cos x$

(b) Show that $\int_{-1}^{1} pn(x)\,dx = 0$, $n \neq 0$ [8]

UNIT- IV

Q.4 (a) In a bolt factory, machines A, B and C manufactures respectively 25%, 35% & 40% of the total bolts. Of their outputs 5%, 4% & 2% are respectively defective bolts. A bolt is drawn at random from the product & is found to be defective. What are the probabilities that it is manufactured by machines A, B and C? [8]

(b) Two balls are drawn from an urn containing 2 white, 3 Red and 4 Black balls, one by one without replacement. What is the probability that at least one ball is red. [8]

OR

Q.4 (a) A coin is tossed five times, what is the probability of getting at least 3 heads. [8]

(b) Find the mean and variance of the Poisson distribution. [8]

UNIT- V

Q.5 (a) Find the coefficient of correlation for the following data- [8]

x	:	10	14	18	22	26	30
y	:	18	12	24	6	30	36

(b) Find the z-transform of $f(n) = \begin{cases} a^{-n} & ; n \geq 0 \\ a^{n} & ; n < 0 \end{cases}$ [8]

OR

Q.5 (a) Find the correlation coefficient and the equations of regression lines for the following values of x and y- [8]

x	:	1	2	3	4	5
y	:	2	5	3	8	7

(b) Find the sequence $\{f(n)\}$; if $F(z) = \frac{2z}{(z-2)^2}$ for $|z| > 2$ [8]

4E4125

Roll No. _____ Total No of Pages: 2

4E4125

B. Tech. IV Sem. (Back) Exam., May - 2019
Electronic Inst. & Control Engineering
4EI6A Electrical Technology

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

Attempt any ***five questions,*** *selecting* ***one question*** *from* ***each unit.*** *All questions carry* ***equal*** *marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Write a technical note on types of DC-generators. [8]

(b) A 4-pole, d.c. generator has a wave wound armature with 792 conductors. The flux per pole is 0.0121 Wb. Determine the speed at which it should be run to generate 240V on noload. [8]

OR

Q.1 Write a short note on: [4×4=16]

(a) DC motor principle

(b) Significance of back emf in DC motor

(c) Speed Regulation in DC motor

(d) Condition for maximum power in DC motor

UNIT- II

Q.2 (a) State the General principle with advantage and disadvantage of an Induction motor. [8]

(b) Briefly explain Phase-Wound Rotor. [8]

OR

Q.2 (a) Briefly explain the relation between torque and slip in an induction motor. [8]

(b) A 3-phase induction motor has a 4-pole, y-connected stator winding. The motor runs on 50-Hz supply with 200V between lines. The motor resistance and stand still reactance per phase are 0.1 - 2 and 0.9 – 2. Calculate- [8]

(i) The total torque at 4% slip

(ii) The maximum torque

(iii) The speed at maximum torque if the ratio of the rotor to stator turns is 0.67, neglect stator impedance.

UNIT- III

Q.3 (a) Briefly explain the principle of operation of a synchronous motor. [8]

(b) A 75- kW, 3ϕ, y-connected, 50Hz, 440V cylindrical rotor synchronous motor operates at rated condition with 0.8 p.f. leading. The motor efficiency excluding field and stator losses, is 95% and synchronous reactance =2.5 – 2. Calculate- [8]

(i) Mechanical power developed

(ii) Armature current

(iii) Back emf

(iv) Power angle

(v) Maximum torque of the motor

OR

Q.3 (a) Explain power flow within a synchronous motor and state different power states in a synchronous motor. [12+4=16]

(b) Write a short note on power developed by a synchronous motor.

UNIT- IV

Q.4 (a) Explain the effect of increase in voltage on transmission line efficiency. [8]

(b) Write down the advantages of high voltage transmission system. [8]

OR

Q.4 (a) What do you mean by transmission and distribution system and why it is required? [8]

(b) Draw a single line diagram of typical power system, locate various sections of it. [8]

UNIT- V

Q.5 (a) Write a technical note on electrical faults and explain- [10+6=16]

(i) Phase to phase fault

(ii) Phase to ground fault

(b) Explain the need of protection in electrical system.

OR

Q.5 (a) State and describe over current relay. [8]

(b) Define with block diagram of static relay. [8]

4E2109

Roll No. _____ Total No of Pages: 3

4E2109

B.Tech. IV - Sem (Back) Exam., May - 2019

Electrical Engineering

4EE1(O) Power Electronics-II

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Derive an expression for the voltage gain of an amplifier of gain A when subjected to negative feedback with a feedback of fraction β. [8]

(b) An amplifier with open loop voltage gain of 1000 delivers 10W of power output at 10% second harmonic distortion when input is 10mV. If 40dB negative feedback is applied and output power is to remain at 10 W, determine required input signal V_s and second harmonic distortion with feedback. [8]

OR

Q.1 (a) State and explain Nyquist's stability criterion for feedback amplifiers. [8]

(b) Discuss the effect of negative feedback on- [8]

(i) Distortion

(ii) Output impedance

(iii) Input impedance

UNIT- II

Q.2 (a) Draw the circuit of RC phase shift oscillator and deduce the expression for condition of sustained oscillation and frequency of oscillation. [8]

(b) Draw the circuit of tuned collector BJT oscillator and explain its working. Also calculate the frequency of oscillation and condition for sustained oscillation. [8]

OR

Q.2 (a) A bistable multivibrator using n – p – n transistor having $h_{FE(min)} = 30$. Leakage current = 0.5μA at 25°C, $V_{CE(sat)} = 0.3$ Volts, $V_{BE(sat)} = 0.7$ volts, $I_{E(sat)} = 30$ mA, $V_{CC} = 10V$, $V_{BB} = -10$ Volts, $V_{BE(off)} = -0.5V$. Find R_1, R_2 and R_C so that bistable multivibrator will operate upto junction temperature of 65°C. [8]

(b) Distinguish between astable, monostable and bistable multivibrator on the basis of their operation and working principle. [8]

UNIT- III

Q.3 (a) Sketch the circuit of a differentiator and logarithmic amplifier using OP – AMP. [6]

(b) Write short notes on - [10]

(i) Analog computation

(ii) Sample and Hold circuit design with OP – AMP

OR

Q.3 (a) Explain the block diagram of OP – AMP stating function of each block in detail. [8]

(b) A non – inverting amplifier with a gain of 150 is ruled at 25°C. What will be the change in the output voltage if the temperature rises to 55°C for an input offset voltage drift of 0.15mV/°C? [8]

UNIT- IV

Q.4 (a) Why timer 1C was the given name 1C 555? What are its essential building blocks? [8]

(b) Write short notes on – [8]

(i) Voltage regulator

(ii) Monolithic regulator

OR

Q.4 (a) Name the important parts of series regulators power supply using discrete components. Explain briefly. [10]

(b) What is the function of voltage regulators? [6]

UNIT- V

Q.5 (a) What is meant by cross over distortion in class – B amplifier? Explain how it is overcome in class – AB Operation. [8]

(b) What do you mean by Harmonic Distortion in Amplifier? Prove that the total output power P is expressed as –

$P = (1 + D^2) P_1$ [8]

Where D → Total harmonic distortion

P_1 → Power delivered at fundamental freq.

OR

Q.5 (a) What do you understand by class A, B and C power amplifiers? [10]

(b) What are advantages of push – pull amplifiers over that of a single transistor amplifier? [6]

4E2110

Roll No. _____ Total No of Pages: 4

4E2110

B. Tech. IV Sem. (Back) Exam., May - 2019

Electrical Engineering

4EE2(O) Digital Electronics

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Convert the following :

(i) $(B2F8)_{16} = (?)_8$ [2]

(ii) $(113.2)_8 = (?)_2$ [2]

(iii) $(A2B.1A)_{16} = (?)_{10}$ [2]

(iv) $(1101011.110101)_2 = (?)_8$ [2]

(v) $(74.1A)_{16} = (?)_2$ [2]

(b) Write short notes on "Error detecting and correcting" codes. [6]

OR

Q.1 (a) Find the value of base/radix for a given number system:

(i) $(1000)_x = [(11)_2]^3$ [3]

(ii) $(23)_x + (12)_x = (101)_x$ [3]

(b) Convert the following binary numbers into gray equivalent :

(i) 11011011101 [2]

(ii) 0111011010 [2]

(c) Perform the following decimal subtractions for use with the BCD code :

(i) $546_{10} - 429_{10}$ [3]

(ii) $429_{10} - 546_{10}$ [3]

UNIT- II

Q.2 (a) Reduce the Boolean expression using laws of Boolean algebra :

(i) $A\left[B+\overline{C}\left(\overline{AB+A\overline{C}}\right)\right]$ [4]

(ii) $A\overline{B}C + B + B\overline{D} + AB\overline{D} + AC$ [4]

(b) Simplify the following Boolean expression using K-map -

$Y = (A + B + C + D)(ABCD)$

Also draw the logic circuit of the given Boolean and find the total no. of input gate leads. [8]

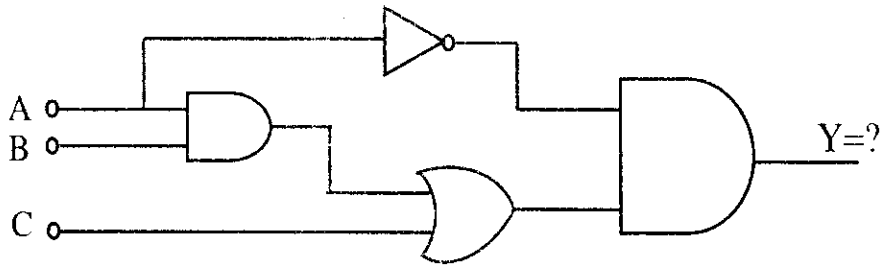
OR

Q.2 (a) Minimize the following Boolean function using Quine-McCluskey Method- [8]

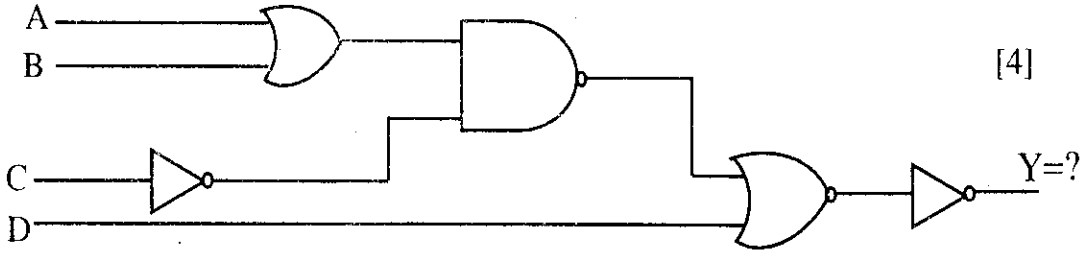
$f(A,B,C,D) = \Sigma_m (1,2,5,6,9) + \Sigma_m (10,11,12,13,14,15)$

(b) Find out the Boolean Expression for the given logic diagrams :

(i) [4]



(ii) [4]



UNIT- III

Q.3 (a) Define the following of logic families :

(i) fan-out [2]

(ii) figure of merit [2]

(iii) Noise Immunity [2]

(iv) Wired logic [2]

(b) Compare the characteristics of TTL, ECL, RTL and CMOS. [8]

OR

Q.3 (a) Explain the use of following in logic families :

(i) Clamping diodes [2]

(ii) Open Collector & Open Emitter output [2]

(iii) Schottky diode [2]

(iv) Totem pole output [2]

(b) Draw the circuit diagram of the following :

(i) 2 Input ECL OR gate [4]

(ii) 2 Input CMOS NOR Gate [4]

UNIT- IV

Q.4 Draw the logic diagram and show all implementation steps of :

(i) BCD to Excess -3 encoder [4]

(ii) 4 bit binary serial adders [4]

(iii) 2 bit multiplier [4]

(iv) Parity Generator 2 checkers [4]

OR

Q.4 (a) Design a 4-bit Binary to BCD code converter and draw the logic diagram. [10]

(b) Implement the following logic function using an 8 × 1 Multiplexer -

$F(A, B, C, D) = \Sigma_m(1, 3, 4, 11, 12, 13, 14, 15)$ [6]

UNIT- V

Q.5 (a) Convert the following :

(i) J-K FF to S-R FF [4]

(ii) D FF to J-K FF [4]

(b) Draw the logic circuit for Asynchronous modulo-10 counter and draw its wave form. [8]

OR

Q.5 (a) Draw the state diagram of :

(i) JK Flip Flop [4]

(ii) 4-bit binary counter [4]

(b) Design a sequence detector to detect a serial input sequence 1010. Draw its state diagram, state table, state assignment table and final implemented circuit. [8]

4E2112

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4E2112

B. Tech. IV Sem. (Back) Exam., May - 2019
Electrical Engineering
4EE4 (O) Computer Programming - II

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT- I

Q.1 (a) Explain any five Basic commands by taking examples. [8]

(b) What is grep command & chmod command? Explain with examples [8]

OR

Q.1 (a) How can we create a file? Explain various commands with example. [8]

(b) What is Directory? How can we create, remove the directory & update the directory. [8]

UNIT- II

Q.2 Explain VI editor with example. [16]

OR

Q.2 What is cursor movement commands & string replacement command? Explain. [16]

UNIT- III

Q.3 (a) What is Java byte code & virtual machine? Explain. [8]

(b) Explain various application & applets of Java. [8]

OR

Q.3 (a) Explain various types of data-types used in Java. [8]

(b) How can we use arrays in Java? Explain. [8]

UNIT- IV

Q.4 Explain Arithmetic operators, bitwise operators & relational operators. [16]

OR

Q.4 What is operator precedence? Explain & also explain switch statements & loop statements with example. [16]

UNIT- V

Q.5 (a) What is applet? Define the applets with examples. [8]

(b) What is Interface? Explain. [8]

OR

Q.5 What is package? How can we do the importing & defining of the packages? Explain. [16]
