

4E 4172

Roll No. _____

[Total No. of Pages : 3]

4E 4172

B.Tech. IV Semester (Main) Examination, June/July - 2015
Electrical Engineering
4EE2A Circuit Analysis-II

Time : 3 Hours

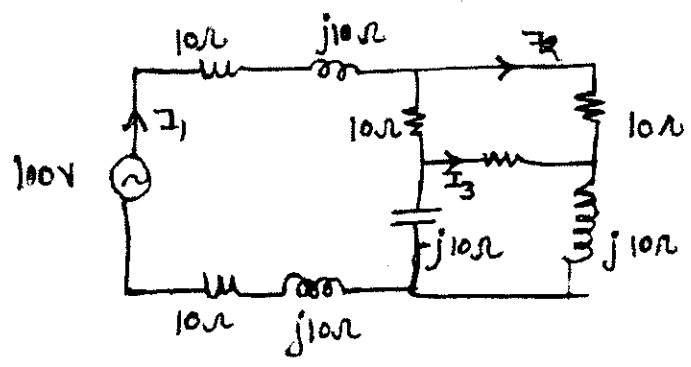
Maximum Marks : 80
Min. Passing Marks : 26

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.

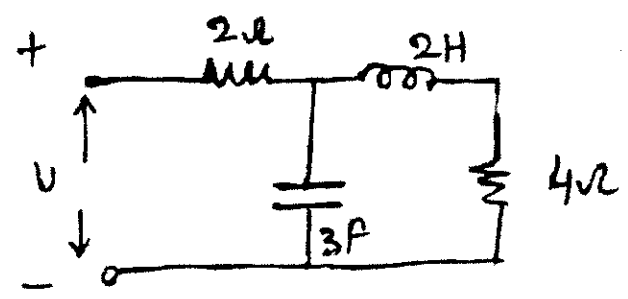
Unit - I

- 1. Explain the physical interpretation of complex frequency (6)
- 2. Analysis the circuit on loop current basis & hence find I_1, I_2 & I_3 (10)



OR

- 1. For the given network determine the transform impedance (8)

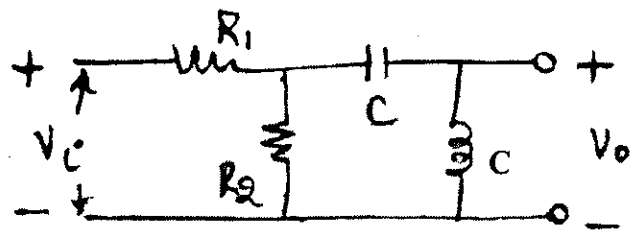


50

- 2. Obtain the transform admittance of the inductor by using time domain relationship of voltage & current (8)

Unit - II

- 1. Determine the $\frac{V_o(s)}{V_i(s)}$ of network shown below (8)



- 2. Find the time domain response for the network function $I(s) = \frac{3s(s+2)}{(s+1)(s+4)}$ (8)

OR

- 1. Show the effects of pole position on stability (8)
- 2. Check the stability of $p(s) = s^4 + 2s^3 + 4s^2 + 12s + 10$ (8)

Unit - III

- 1. Obtain foster I & foster II form for $Z(s) = \frac{s(s^2+4)}{(s^2+1)(s^2+9)}$ (16)

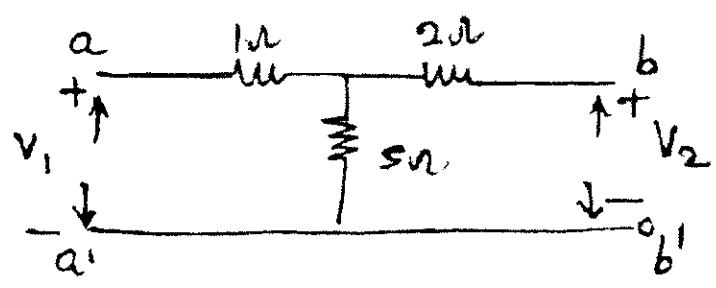
OR

- 1. Write down the properties of RC impedance function (8)
- 2. Check whether the given function is positive real function or not (8)

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

Unit - IV

- 1. Find the transmission parameters for the given circuit (8)



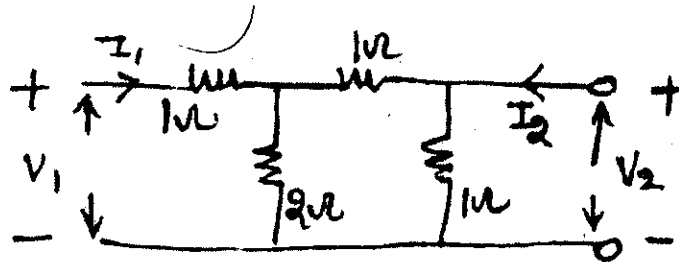
2. Derive the condition of reciprocity and symmetry in Z parameters

(8)

OR

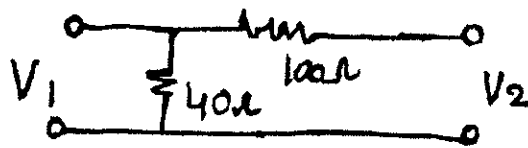
1. Explain image impedance calculate the value of image impedance of the following network

(8)



2. Find h - parameters of the network shown in figure

(8)



Unit - V

1. Derive the value of characteristic impedance for a T type constant k low pass filter

(8)

2. Write a short note on active filters

(8)

OR

1. Design a π section of m-derived Hpf having design impedance of 600Ω cut off frequency 4kHz and infinite attenuation at 3.6KHz

(8)

2. What do you understand by lattice filter. How a ladder filter network can be converted into lattice filter. find the cut off frequency for same

(8)

| | | |
|---------------|---|--------------------------|
| 4E4174 | Roll No. _____ | [Total No. of Pages : 3] |
| | <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">4E4174</div> <p>B.Tech. IV Semester (Main/Back) Examination, June/July - 2015</p> <p>Electrical Engg.</p> <p>4EE4A Generation of Electrical Power</p> | |

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.

Unit - I

1. a) What are the factors to be considered for selection of site for a thermal power station? (8)
- b) How pumped storage plant is advantageous during peak loads? (8)

OR

1. a) Discuss main parts of a nuclear reactor and their functions. (8)
- b) Explain the components of a gas turbine plant. What are the applications of gas turbine plant. (8)

Unit - II

2. a) Differentiate renewable and non-renewable energy sources with suitable examples. (8)
- b) Explain the sustainable energy system with its applications. (8)

OR

2. a) Write short note on Global warming. (8)
b) Explain the impact of thermal and hydro power stations on environment. (8)

Unit - III

3. a) A generating station supplied the following loads. 150 MW, 120 MW, 85 MW, 60 MW and 5 MW. The station has a maximum demand of 220 MW. The annual load factor of the station is 48%. Calculate
i) the number of units supplied annually
ii) the diversity factor and
iii) demand factor (8)
b) Discuss causes and effects of low power factor. (8)

OR

3. a) How power factor can be improved using synchronous condensers? (8)
b) A 1000 MW power station delivers 1000 MW for 2 hours, 500 MW for 6 hours and is shut down for rest of each day. It is also shut down for maintenance for 60 days annually. Calculate its annual load factor. (8)

Unit - IV

4. a) Discuss the effect of load factor on unit energy cost. (8)
b) How most economic power factor is calculated when KW demand is constant. (8)

OR

4. a) Define the term diversity factor and prove that load factor of supply system is improved by an increase in diversity of load. (8)
b) Write short note on energy conservation. (8)

Unit - V

5. a) Illustrate general tariff form. Also throw light on objectives of tariffs. (8)
- b) Describe the term spot (time differentiated) pricing. (8)

OR

5. a) Give comparative chart of thermal, hydro, nuclear and gas power plants. (8)
- b) Differentiate between peak load and base load plants. (8)
-

| | | |
|---------|---|--------------------------|
| 4E 4175 | Roll No. _____ | [Total No. of Pages : 3] |
| | <div style="border: 1px solid black; display: inline-block; padding: 5px; margin-bottom: 10px;">4E 4175</div> <p>B.Tech. IV Semester (Main/Back) Examination, June/July - 2015</p> <p>Electrical Engineering</p> <p>4EE5A Electrical Machines-II</p> <p>Common to EE and EX</p> | |

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.

Unit - I

1. a) Derive the emf equation of an AC machine having short pitched and distributed armature winding of three phases. (8)
- b) A 3-phase, 50-Hz, 2-pole, star connected turbo alternator has 54 slots with 4 conductors per slot. The coils are short pitched by 2 slots less than the pole pitch. If the machine gives 3300 v between lines on open circuit with sinusoidal flux distribution, determine the useful flux per pole (8)

OR

1. a) Explain how the rotating magnetic field is developed in AC machines (6)
- b) Explain how the electromechanical energy conversion takes place in AC machines? (6)
- c) What are the essential conditions for development of torque in AC machines? (4)

Unit - II

2. a) Draw the torque-slip characteristic of a 3-phase induction motor and explain it. Find condition of maximum torque. Show the effect of rotor resistance on torque slip characteristic. (8)
- b) A 10-hp, 4-pole, 50-Hz, 3-phase induction motor runs at 1450 rpm on full load. The stator copper loss is 231 W and the rotational loss is 343 W. Determine (I) shaft torque (II) mechanical power developed (III) air gap power (IV) rotor copper loss and (V) motor efficiency (8)

OR

- 2. a) The test data on a 3-phase star connected induction motor is given below-
 No load test:
 Line to line voltage = 400V,
 Input power = 1720 W
 Input current = 18A
 Friction and windage loss = 580 W
 Block rotor test; line to line voltage=50V
 Input power = 2500 W
 Input current == 60A
 Determine the equivalent circuit parameters if stator resistance is 0.15Ω per phase (8)
- b) Explain the problems of cogging and crawling in induction motors. How these are removed (8)

Unit - III

- 3. a) Draw the equivalent circuit of a single phase induction motor and explain its working principle (8)
- b) Explain the working of universal motor (8)

OR

- 3. a) Explain the double revolving field theory of single phase induction motor (8)
- b) Describe the working of stepper motor with its diagram (8)

Unit - IV

- 4. a) Draw the phasor diagram for lagging power factor and derive the output power equation of a salient pole synchronous generator. Also draw its power angle characteristic (12)
- b) What are the benefits of having rotating field system in large size synchronous generators? (4)

OR

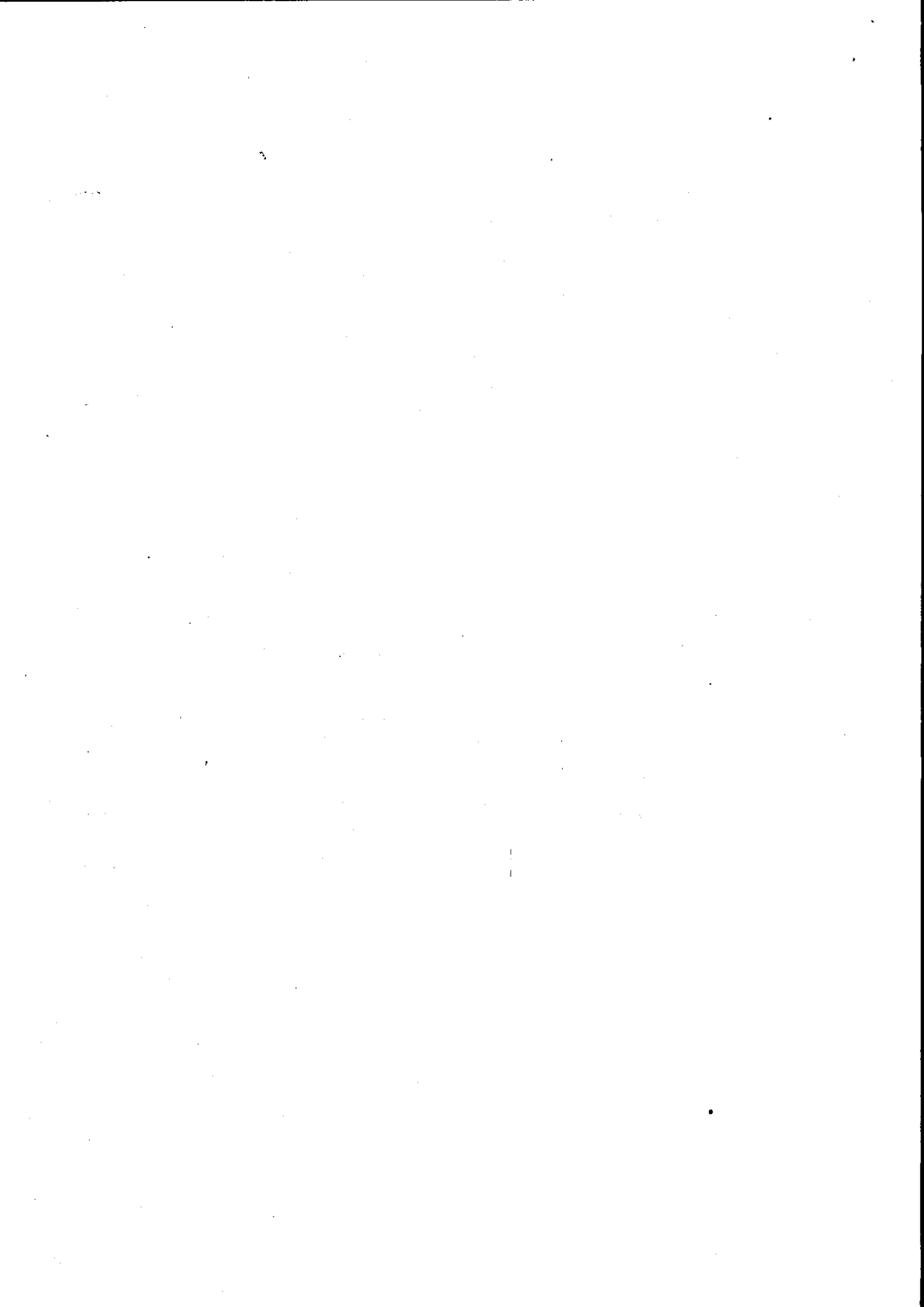
- 4. a) Draw the equivalent circuit of a synchronous generator. Also draw the phasor diagram for leading power factor current supplied by generator and write voltage balance equations (10)
- b) A 3-phase, 10 KVA, 400V, 50Hz star connected alternator supplies the rated load at 0.8 power factor lagging. If the armature resistance is 0.5Ω and synchronous reactance is 10Ω , find the torque angle and voltage regulation (6)

Unit - V

5. a) What is hunting of synchronous machines and how it can be eliminated. (8)
b) With the help of phasor diagram show the power factor control of synchronous motor through change of excitation (8)

OR

5. a) Explain working of synchronous condenser with its phasor diagram. (8)
b) Draw and explain V-curves of a synchronous motor at different loads (8)
-



Roll No. _____

[Total No. of Pages : 3]

4E 4176

4E 4176

B.Tech. IV Semester (Main) Examination, June/July - 2015

Electrical Engineering

4EE6A Advance Engg. Mathematics-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.

Unit - I

1. a) The observed values of a function are respectively 168, 120, 72 and 63 at the four positions 3, 7, 9 and 10 of the independent variable. What is the value of $f(6)$? (8)

- b) Solve the system

$$27x + 6y - z = 85$$

$$6x + 15y + 2z = 72$$

$$x + y + 54z = 110$$

Using Gauss-seidel method (8)

OR

1. a) Use Stirling's formula to find u_{11} , given that

$$u_0 = 3010, \quad u_5 = 2710, \quad u_{10} = 2285,$$

$$u_{15} = 1860, \quad u_{20} = 1560, \quad u_{25} = 1510,$$

$$u_{30} = 1835 \quad (8)$$

- b) Fit a second degree parabola to the following data taking X as independent variable

| | | | | | | | | | |
|-----|---|---|---|---|---|---|---|---|---|
| X : | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|-----|---|---|---|---|----|----|----|----|---|
| Y : | 2 | 6 | 7 | 8 | 10 | 11 | 11 | 10 | 9 |
|-----|---|---|---|---|----|----|----|----|---|

(8)

Unit - II

2. a) Find the first derivative of $f(x)$ at $x=0.4$ from the following table

| | | | | |
|--------|---------|---------|---------|---------|
| x | 0.1 | 0.2 | 0.3 | 0.4 |
| $f(x)$ | 1.10517 | 1.22140 | 1.34986 | 1.49182 |

(8)

- b) Using Euler's modified method, obtain a solution of the equation

$$\frac{dy}{dx} = x + \sqrt{y} = f(x, y) \text{ with initial condition } y=1 \text{ at } x=0 \text{ for the range } 0 \leq x \leq 0.4$$

in steps of 0.2 (8)

OR

2. a) using Simpson's "1/3" rule, show that $\int_0^1 \frac{dx}{1+x} = \log_e 2 = 0.69315$ (8)

- b) Solve the equation $\frac{dy}{dx} = x + y$ with initial condition $y(0)=1$ by Runge-kutta fourth order method, from $x=0$ to $x=0.2$ with $h=0.1$ (8)

Unit - III

3. a) State and prove orthogonal property of Bessel's function (8)

- b) For Legendre's function prove:

$$nP_n(x) = (2n-1)xP_{n-1}(x) - (n-1)P_{n-2}(x) \quad (8)$$

OR

3. a) State and prove orthogonal property of legendre's function (8)

- b) For Bessel's function, prove

$$\frac{d}{dx}[x^n J_n(x)] = x^n J_{n-1}(x); n \geq 0 \quad (8)$$

Unit - IV

4. a) A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six (8)

- b) Thirteen cards are drawn simultaneously from a pack of 52 cards. If ace count 1, face cards, 10 and others according to their denomination. find the expectation of the total score in 13 cards (8)

OR

4. a) Suppose 300 misprints are distributed randomly throughout a book of 500 pages. find the probability that a given page contains
- exactly 2 misprints
 - 2 or more misprints
- (8)
- b) In a normal distribution, 31% of the items are under 45 and 8% are over 64 find mean and standard deviation of the distribution. given that if

$$f(z) = \frac{1}{\sqrt{2\pi}} \int_0^z e^{-\frac{x^2}{2}} dx, \text{ then } f(0.5) = 0.19, f(1.41) = 0.42 \quad (8)$$

Unit - V

5. a) Calculate correlation coefficient using rank correlation method for following data
- | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|
| x: | 68 | 64 | 75 | 50 | 64 | 80 | 75 | 40 | 55 | 64 |
| y: | 62 | 58 | 68 | 45 | 81 | 60 | 68 | 48 | 50 | 70 |
- (8)
- b) Find the Z-transform of $\{a^n \sinh n\theta\}; n \geq 0$
- (8)

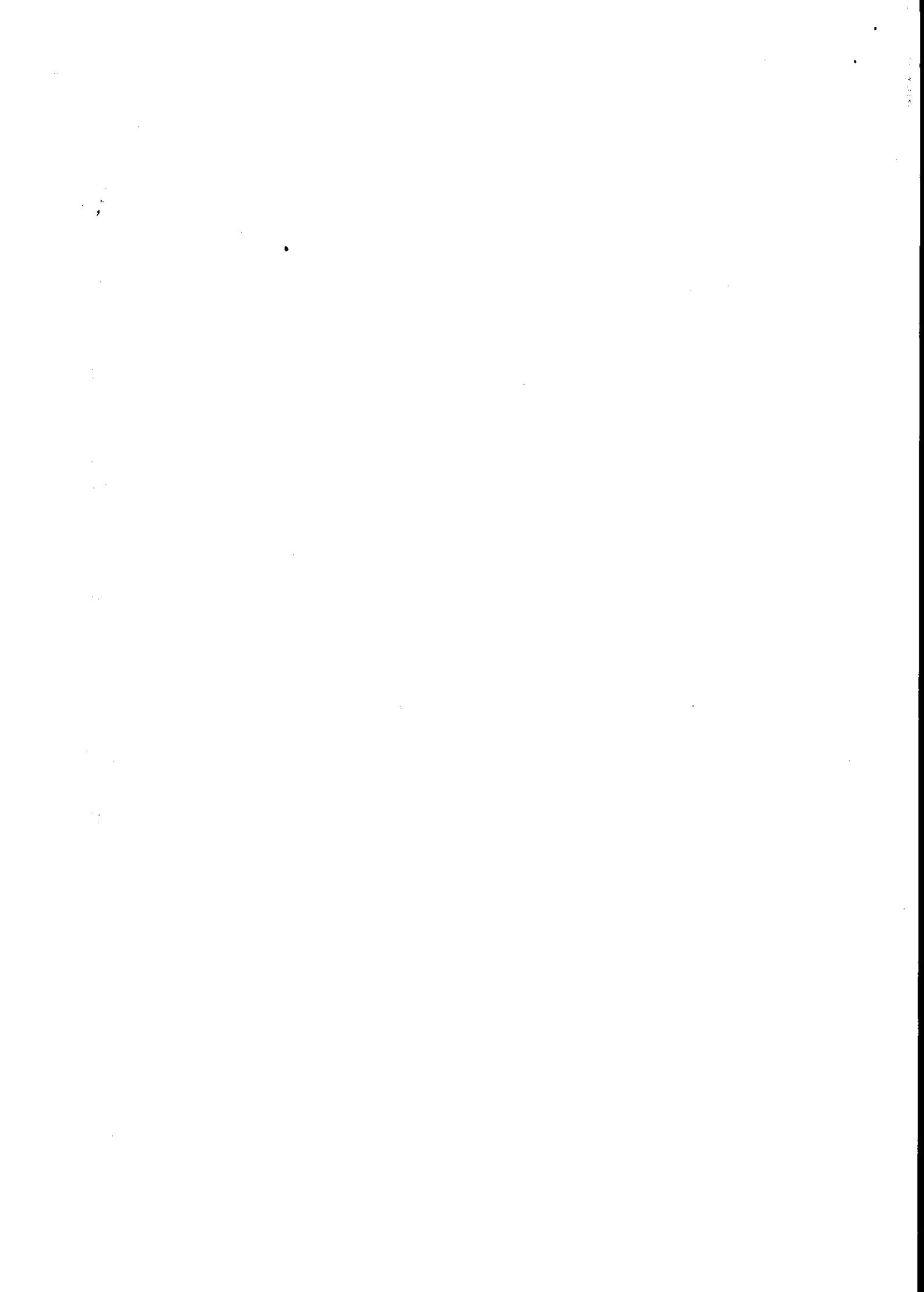
OR

5. a) Find the two lines of regression for data given below

$$n = 18, \quad \sum x = 12, \quad \sum y = 18,$$

$$\sum x^2 = 60, \quad \sum y^2 = 96, \quad \sum xy = 48 \quad (8)$$

- b) Find $Z^{-1} \left[\frac{Z}{(2-z)(2z-1)} \right]$ by partial fraction method
- (8)



| | | |
|---|----------------|--------------------------|
| 4E2109 | Roll No. _____ | [Total No. of Pages : 3] |
| 4E2109 | | |
| B.Tech. IV Semester (Back) Examination, June/July - 2015 | | |
| Electrical Engg. | | |
| 4EE1 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.

Unit - I

1. a) Give brief amount of different feedback topologies. (8)
- b) In a negative feedback amplifier, the gain without feedback is 100, feedback factor is B is 1/25 and input voltage is 50 mv Calculate
 - i) Gain with feedback
 - ii) Feedback factor
 - iii) Feedback voltage
 - iv) Output voltage (2+2+2+2)

OR

1. a) Drive expression for output resistance in voltage series feedback amplifier. (8)
- b) An RC coupled amplifier has a voltage gain of 1000 $f_1=50\text{Hz}$, $f_2=200\text{KHz}$ and a distortion of 5% without feedback. Find the amplifier voltage gain, Lower and upper frequencies and distortion when a negative feedback is applied with feedback ratio 0.01. (8)

Unit - II

2. a) Sketch a schmitt trigger. Circuit and Explain its working principle. (8)
- b) Explain the Barkhausen criterion for sustained oscillations. Draw the RC phase shift oscillator circuit and Describe its working. (8)

OR

- 2. a) Write short note on Bistable multivibrator. (8)
- b) In a Transistorised Hartley oscillator if $L_1=0.1\text{mH}$, $L_2=10\mu\text{H}$ and mutual inductance between coil = $20\mu\text{H}$,
Calculate the value of Capacitor C_1 of oscillatory circuit to obtain the frequency of 4110 KHz (8)

Unit - III

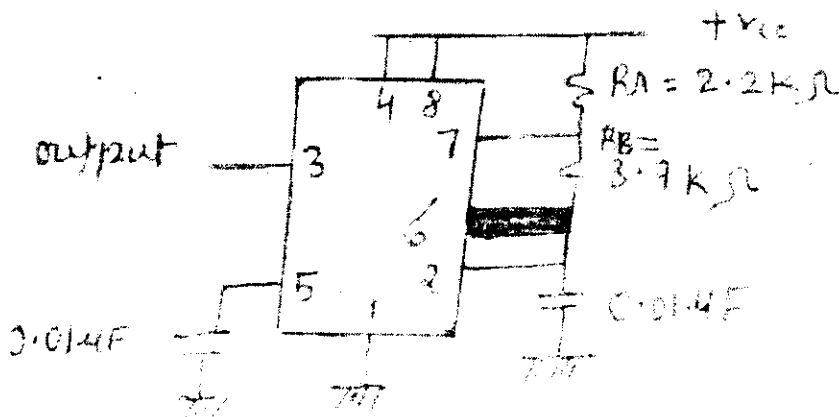
- 3. a) Describe function of an Op-Amp as.
 - i) Inverter
 - ii) Scale changer
 - iii) Integrator
 - iv) Differentiator. (2+2+2+2)
- b) A 10 mV, 1 KHz sinusoidal signal is applied to the input of an op-amp integrator for. Which $R_f = 100\text{ k}\Omega$ and $C = 1\mu\text{F}$. Find the output voltage. (8)

OR

- 3. a) Explain logarithmic and antilog amplifier using Op-Amp. (8)
- b) Describe the characteristic of an ideal OP-Amp. (8)

Unit - IV

- 4. a) Explain an Astable multivibrator using 555 IC. (8)
- b) In Fig.1 calculate the pulse width of positive negative pulses and calculate the free running frequency. (8)



OR

4. Write down short note on any two

- a) Peak detector
- b) Regulated power supplies
- c) A to D converter.

(8+8)

Unit - V

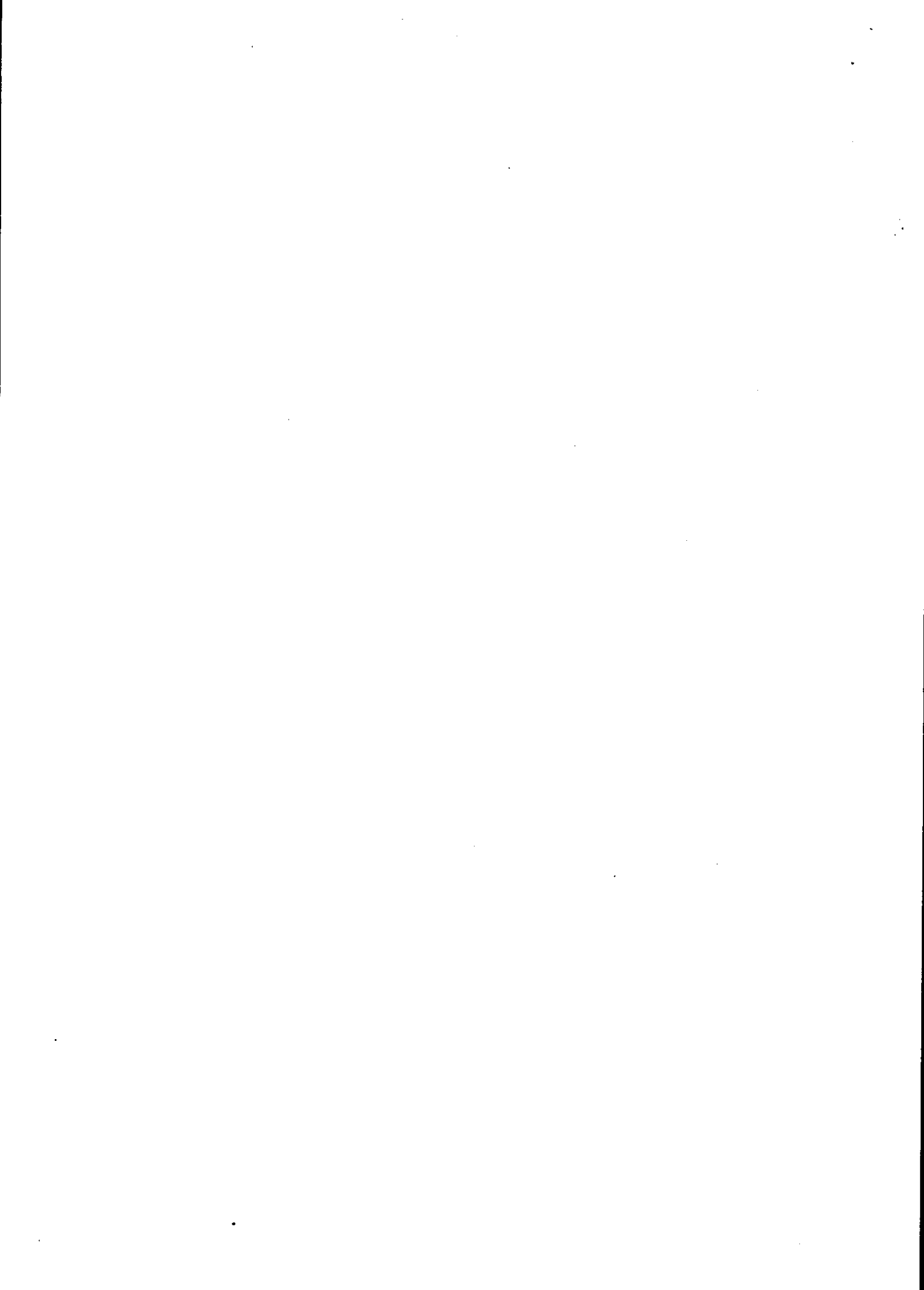
5. a) Explain the general features of audio power amplifiers. Also explain the working of class A power amplifier (8)
- b) A power transistor operated in class A operation delivers a maximum of 6w to a 8Ω load with the supply voltage of 25V. The Q point is adjusted for a symmetrical swing calculate
- i) Step down turn ratio.
 - ii) Peak calculator current
 - iii) Efficiency.

(2+3+3)

OR

5. a) What is meant by cross over distortion is class-B amplifier. Explain how it is overcome in class AB operation (8)
- b) A class B push full amplifier hu $V_{cc}=50V$, The collector voltage swings from V_{cc} down to 10V with input signal. If the transistors used an maximum power dissipation rating of 20w,
- Calculate
- i) Load presented by output transformer.
 - ii) Power output.
 - iii) D.C. power input.

(3+3+2)



| | | |
|--|----------------|--------------------------|
| 4E2110 | Roll No. _____ | [Total No. of Pages : 3] |
| 4E2110 | | |
| B.Tech. IV Semester(Back) Examination, June/July - 2015 | | |
| Electrical Engg. | | |
| 4EE2 Digital Electronics | | |

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.

Unit - I

1. a) Perform the following decimal subtraction in BCD by 9's complement method.
 - i) 305.5 - 168.8
 - ii) 679.6 - 885.9 (8)
- b) Given the 8-bit data word 01011011, generate the 12 bit composite word for the hamming code that corrects and detects single errors. (5)
- c) Define EBCDIC code using suitable example. (3)

OR

1. a) Convert the following into Gray number
 - i) $3A7_{16}$
 - ii) 527_8
 - iii) 652_{10} (8)
- b) Given that $292_{10} = 1204$ in some number system, find the base of that system. (4)
- c) Briefly explain the ASCII code. (4)

Unit - II

2. a) Reduce using mapping the following expression and implement the real minimal expression in universal logic.

$$f = \sum m(0, 2, 4, 6, 7, 8, 10, 12, 13, 15) \quad (10)$$

- b) Realize the X-OR function using
- AOI logic
 - NAND logic
 - NOR logic
- (6)

OR

2. a) Use the tabular procedure to simplify the given expression.
 $F(v, w, x, y, z) = \sum m(0, 4, 12, 16, 19, 24, 27, 28, 29, 31)$ in sop form and draw the circuit using NAND gates. (10)
- b) Reduce the expression in pos form
 $F(A, B, C, D) = \sum m(0, 1, 2, 3, 4, 5) + d(10, 11, 12, 13, 14, 15)$ (6)

Unit - III

3. a) With the help of a neat diagram, explain the working of IIL NAND and NOR logic. (10)
- b) What are the merits and demerits of various logic families. (6)

OR

3. a) With the help of a neat diagram, explain the working of a two input ECL OR/NOR gate. (8)
- b) Draw the circuit diagram and explain the working of a two input
- CMOS NAND gate
 - NOR gate (CMOS) (8)

Unit - IV

4. a) Draw the block diagram (logic) and explain a parallel adder/subtractor using 2's complement System. (8)
- b) Implement the following function with a MUX $F(a, b, c) = \sum m(1, 3, 5, 6)$ choose 'a' and 'b' as select inputs (8)

OR

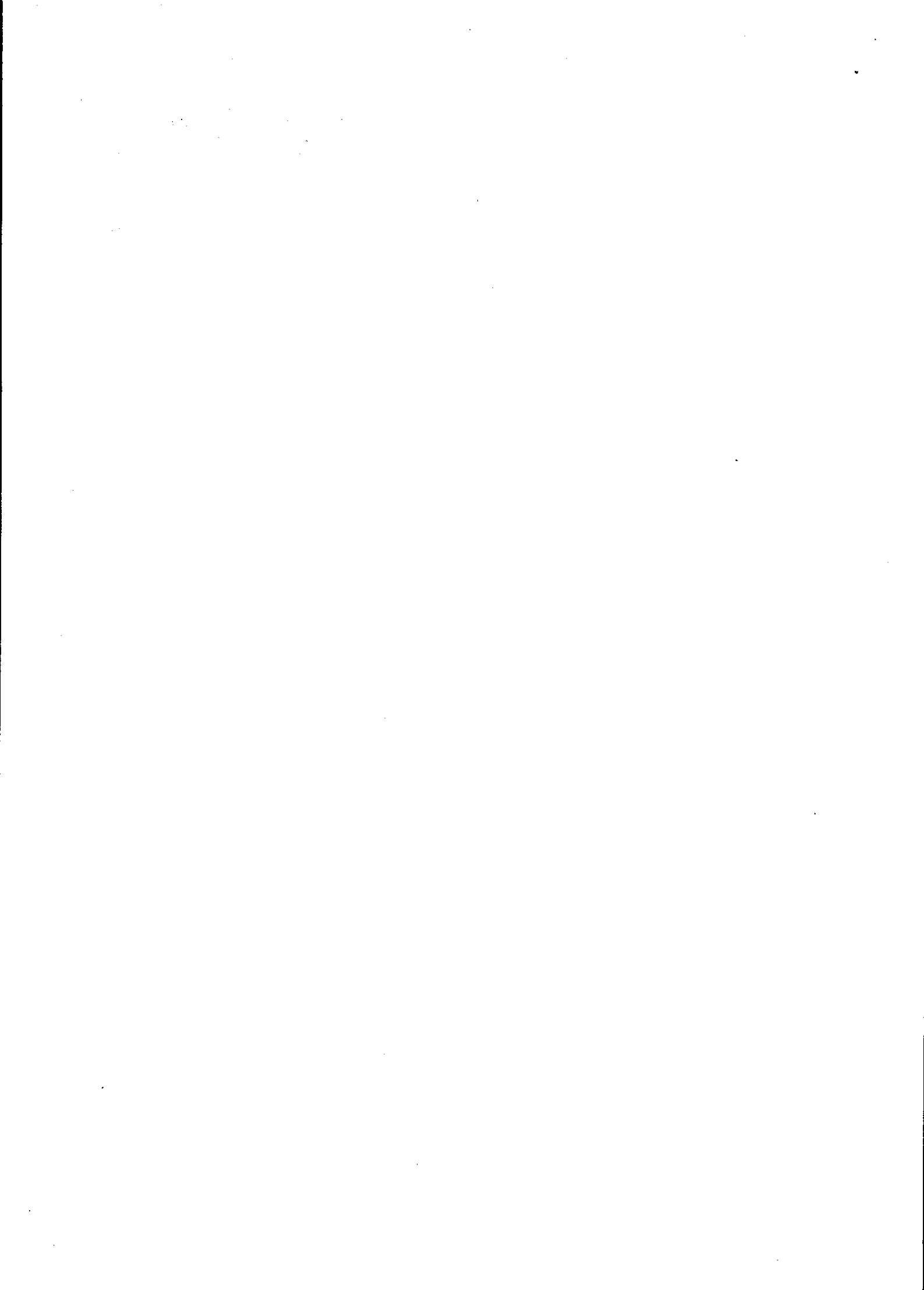
4. a) Explain the working of (10)
- BCD Adder
 - 4 bit comparator
- b) Realize a look-ahead-carry adder (6)

Unit - V

5. a) With a neat diagram, explain the working at a bidirectional shift register. (8)
b) Design a synchronous MOD-6 counter using J-K flip flops. (8)

OR

5. a) Design a synchronous BCD counter using J-K flip flops. (10)
b) Convert a J-K flip flop into
i) SR flip flop
ii) D flip flop (6)
-



Roll No. _____

[Total No. of Pages : 2]

4E2112**4E2112****B.Tech. IV Semester (Back) Examination, June/July - 2015****Electrical Engg.****4EE4 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.

Unit - I

1. Explain following shell commands of UNIX:

- | | | |
|-----------|------------|----------|
| a) touch | b) cp | |
| c) rm | d) ls | |
| e) mkdir | f) bc | |
| g) factor | h) lagname | (8×2=16) |

OR

1. Explain following shell commands of UNIX:

- | | | |
|-----------|-------------|----------|
| a) try | b) banner | |
| c) dspace | d) ulimit | |
| e) Cal. | f) grep | |
| g) tail | h) compress | (8×2=16) |

Unit - II

2. a) Discuss cursor movement commands in vi Editor? (8)
- b) Discuss line word and character movement commands in Vi editor? (8)

OR

2. a) Explain set commands available in vi editor? (8)
- b) Write and explain modes of operation in vi editor? (8)

Unit - III

- 3. a) Explain the virtual machine also write the Advantages of the virtual machine?(8)
- b) Distinguish between Application and Applet? How can an Applet be Executed? (8)

OR

- 3. a) Write a short notes on:
 - i) Array declaration in Java
 - ii) Java Byte Code. (2×4=8)
- b) Explain Java Interfaces and their purpose? (8)

Unit - IV

- 4. a) How Relational operators works in Java give suitable example? (8)
- b) Explain Control statements with example? (8)

OR

- 4. a) Explain the type conversion and type casting with an example? (8)
- b) Explain the differences between for loop and while loop with the help of an example? (8)

Unit - V

- 5. a) What is package? How you will create a package? Write all steps to create and Import a package? (8)
- b) What is Interfaces? How did it support the concept of Multiple Inheritance?(8)

OR

- 5. a) Write a short note on:-
 - i) Mouse and keyboard Interfaces.
 - ii) Abstract window tools (Awt) and Controls. (2×4=8)
- b) Explain Any five Java String Handling function with Example? (8)

