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3E1711

Roll No. \_\_\_\_\_

Total No of Pages: 4

**3E1711**

**B. Tech. III Sem. (Main/Back) Examination Feb. 2014  
Electrical & Electronics  
3EX5 Electrical & Electronics Measurements**

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.*

2. \_\_\_\_\_

**UNIT-I**

Q.1 (a) Define the following for Gaussian distribution of data: [8]

- (i) Precision index
- (ii) Probable error
- (iii) Standard deviation of mean
- (iv) Standard deviation of standard deviation.

- (b) A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHz were recorded as 332, 347, 344, 335, 346, 344, 336 & 341. Calculate [8]
- (i) Standard deviation
- (ii) Variance

OR

- Q.1 (a) What are various sources of systematic errors? How do these errors influence the accuracy of measurements? [8]
- (b) A 0 – 200V voltmeter has a guaranteed accuracy of 4 percent at full scale reading. The voltage measured by this instrument is 100 V. Calculate the percentage limiting error for 100 V measurements. [8]

UNIT-II

- Q.2 (a) Why shielding and grounding is done in measuring instruments? Explain with few examples. [8]
- (b) Explain the ohmmeter part of an electronic multimeter. Describe how R X 1, R X 10 and R X 100 ranges are obtained in this instrument. [8]

OR

- Q.2 (a) Explain the working of electronic voltmeters which use rectifiers. Explain its d.c. and a.c. modes of operation. [8]
- (b) Explain the block diagram of vector impedance meter with applications, merits & demerits. [8]

**UNIT-III**

- Q.3 (a) An electrically deflected CRT has a final anode voltage of 1800 V and parallel deflecting plates 1.6 cm long and 4.5 mm apart. If the screen is 60 cm from the centre of deflecting plates. Find [8]
- (i) The deflection sensitivity of the tube
  - (ii) The deflection factor of the tube.
- (b) Explain the construction and working of seismic Accelerometer with neat Sketches. [8]

**OR**

- Q.3 (a) What are the different types of CRO Probes? Explain with suitable examples. [8]
- (b) Define the following: - [8]
- (i) Diaphragms
  - (ii) Load cell

**UNIT-IV**

- Q.4 (a) What do you mean by sweep errors. Explain the working of sweep frequency generators. [8]
- (b) Explain the block diagram of heterodyne wave analyzer. Discuss its applications, merits & demerits. [8]

OR

Q4. (a) Explain the working of frequency synthesized signal generators with neat diagram. [8]

(b) Explain what do you mean by Distortion? What are the various types of Distortion? Explain the principle of working of Harmonic distortion analyzer. [8]

UNIT-V

Q.5 (a) What are the different adhesives and protective coatings are used in strain gauge. [8]

(b) Draw and explain the various characteristics of thermocouples. Explain see back effect. [8]

OR

Q.5 (a) Explain the construction and working of Tachogenerators. Discuss its merits and demerits also. [8]

(b) Draw and explain the following characteristics of Transducers: - [8]

(i) Input characteristics

(ii) Output characteristics

(iii) Transfer characteristics

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3E1481

Roll No. \_\_\_\_\_

Total No of Pages: 4

3E1481

B. Tech. III – Sem. (Old Back) 2006-07, 07-08 and 08-09

Exam. Feb. 2014

Electrical Engg.

3EE1 POWER ELECTRONICS-I

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

*Instructions to Candidates:-*

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*Use of following supporting material is permitted during examination.*

1. \_\_\_\_\_

2. \_\_\_\_\_

### UNIT-I

- Q.1 (a) Sketch energy band diagrams of a metal, an insulator and a semiconductor that distinguishes between them. [8]
- (b) The abrupt P-N junction of Si has intrinsic concentration ( $n_i$ ) =  $1.5 \times 10^{10}/\text{cm}^3$ . If doping levels in n-type and p-type are to extent of  $N_D = 10^{15}/\text{cm}^3$  and  $N_A = 10^{16}/\text{cm}^3$ . Estimate all relevant values to draw the bond diagram of P-N junction formed. [8]

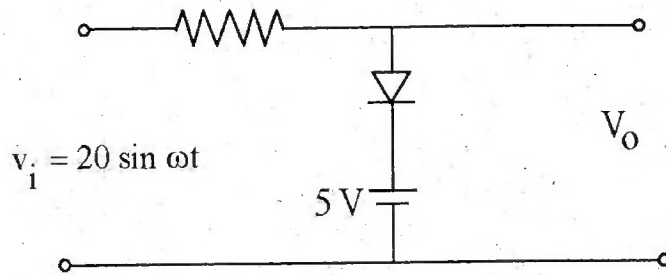
OR

- Q.1 (a) Write the difference between Avalanche breakdown and Zener breakdown. Any (b) Explain V-I characteristics of P-N junction diode and also explain the effect of temperature on V-I characteristics.

UNIT-II

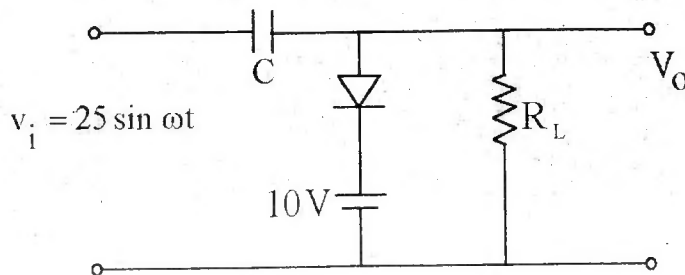
UNIT-II

- Q.2 (a) Explain the load line concept of a diode and also describe the small signal model. (b) Draw the output of the following circuit if the input is sine wave.



OR

- Q.2 (a) Explain the full wave single-phase rectifier in detail. Also define peak average. (b) Draw the output of the following circuit.



UNIT-III

- Q.3 (a) Explain input and output characteristics of common emitter configuration with by pass capacitor. [10]
- (b) What do you understand by operating point of a transistor? Explain. [6]

OR

- Q.3 (a) What is the need of biasing in transistor and also explain potential divider biasing. [8]
- (b) Determine the resulting change in emitter current for a change in the collector current of 2 mA with its  $\alpha = 0.98$ . [4]
- (c) Obtain  $I_C$ ,  $\beta$  and  $I_{CEO}$  in case a BJT having  $I_E = 10\text{mA}$ ,  $I_{CO} = 0.5 \mu\text{A}$  and  $\alpha = 0.98$ . [4]

UNIT-IV

- Q.4 (a) Explain FET small signal model. [8]
- (b) Write the difference between enhancement and depletion type of field effect transistor (any five) [8]

OR

- Q.4 (a) Explain the characteristics of depletion type N-channel MOSFET. [10]
- (b) Obtain the minimum value of  $V_{OS}$  of an n-channel JFET operating in the pinch-off region with  $V_P = -4\text{V}$ ,  $V_{GS} = -2\text{V}$  and  $I_{DSS} = 10\text{mA}$ . Calculate the corresponding value of  $I_D$ . [6]

**UNIT-V**

Q.5 (a) Explain the R-C coupled amplifier in detail. [10]

(b) Describe the frequency response of common source Amplifier. [6]

**OR**

Q.5 Write short note on following (any Four)

(i) Miller's theorem.

(ii) Darlington pair.

(iii) Effect of coupling capacitor.

(iv) Effect of bypass capacitor.

(v) Dual of Miller's theorem.

[4x4=16]



<b>3E1482</b>	Roll No. _____	Total No of Pages: <b>3</b>
	<b>3E1482</b> <b>B. Tech. III – Sem. (Old Back) 2006-07, 07-08 and 08-09</b> <b>Examination Feb.2014</b> <b>Electrical Engg.</b> <b>3EE2 COMPUTER PROGRAMMING-I</b>	

**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.*

1. \_\_\_\_\_

2. \_\_\_\_\_

### UNIT-I

- Q.1 (a) What are main features of object oriented Programming? Explain with Example? [12]
- (b) Explain Command line arguments with Suitable Example? [4]

### OR

- Q.1 (a) Explain the following terms with Suitable program Code [12]
- (i) Data Abstraction & Encapsulation.

- (ii) Inheritance
- (iii) Polymorphism
- (iv) Dynamic binding

(b) Explain Structure & pointer types?

[4]

## UNIT-II

Q.2 (a) Differentiate between three visibility labels:-

Public, Private & Protected Members? What is the use of making a Method private inside a class?

[12]

(b) Differentiate between object & a class with Example?

[4]

OR

Q.2 Explain the term inheritance? Design two classes to show the multiple inheritance?

How does an object of derive class access the members of base class?

[16]

## UNIT-III

Q.3 What is Constructor? Differentiate constructor & destructor? Write a copy Constructor

to copy one object into another object with an example?

[16]

OR

Q.3 Write a Short note on

[4x4=16]

- (i) Function & operator overloading
- (ii) Constructor & destructor
- (iii) Scope resolution Operator
- (iv) Inline function.

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## UNIT-IV

Q.4 What is virtual function? Why do we need virtual function? Explain. [8]

(a) How does it behave when invoked through

(i) A pointer to a base class

(ii) Object of a derived class

(b) Why do we need to make a function virtual? Explain with the help of Suitable Example? [8]

OR

Q.4 (a) What is friend function in C++? What are the risks associated with the use of friend function? [12]

(b) Explain the C++ program Structure with Example? [4]

## UNIT-V

Q.5 Describe file handling modes and corresponding flags with example in C++? [16]

OR

Q.5 What is template Class? What is template function? Also Explain the Input- output formatting operations in C++? [16]

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Total No of Pages: 3

3E1483

B. Tech. III – Sem. (Main &amp; Back) Examination Feb. 2014

Electrical Engg.

3EE3 Circuit Analysis - I

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. Unit of quantities used / calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. \_\_\_\_\_

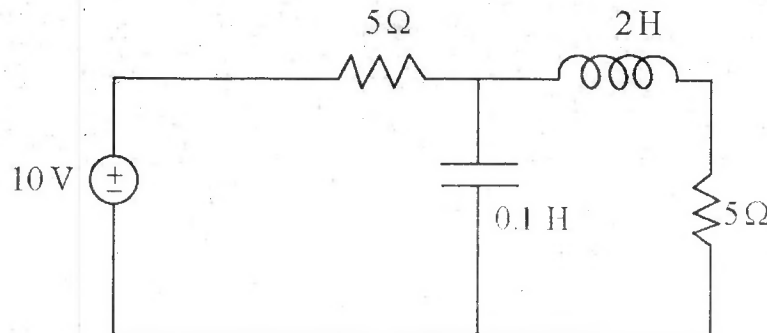
2. \_\_\_\_\_

**UNIT-I**

Q.1 (a) Explain various circuit elements and characteristics in details.

(b) Draw the dual of the following network.

[10+6=16]



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**OR**

Q.1 Explain the concept of selectivity & Q factors in A.C. circuits with the help of appropriate example. [16]

**UNIT-II**

Q.2 (a) Derive superposition theorem and explain it with an example.

(b) Write short note on Incidence Matrix.

[10+6=16]

**OR**

Q.2 (a) What is duality? Explain various methods of obtaining dual Network in detail.

(b) Write short note on Cut-sets.

[10+6=16]

**UNIT-III**

Q.3 What is the relationship between line voltage and phase voltage, line current and phase current for balanced 3 phase delta connected load? Explain with the help of phasor diagram. [16]

**OR**

Q.3 (a) What do you mean by power triangle. Explain active & reactive Power with example.

(b) Derive relation between three phase delta and three phase star.

[10+6=16]

**UNIT-IV**

Q.4 State and explain the response of linear Network to Non-sinusoidal periodic waves.[16]

**OR**

- Q.4 (a) Explain the different kind of symmetry in non sinusoidal waves.  
(b) Derive formulae for average value & effective value for half wave rectified waveform. Also calculate form factor for this waveform. [8+8=16]

**UNIT-V**

- Q.5 (a) Explain the concept of time domain and frequency domain analysis of circuit.  
(b) Find expression for step response of R-L series circuits. [10+6=10]

**OR**

- Q.5 Write short note on:  
(a) Shifting theorem.  
(b) Laplace transform & application to circuit operations. [8+8=16]

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Roll No. \_\_\_\_\_

Total No of Pages: 4

3E1485

B. Tech. III – Sem. (Main/Back) Examination Feb. 2014

Electrical Engg.

3EE5 Electrical Measurements

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. \_\_\_\_\_

2. \_\_\_\_\_

**UNIT-I**

Q.1 (a) Discuss the following types of errors in moving Iron Instruments.

- (i) Hysteresis Error.
- (ii) Temperature Error.
- (iii) Error due to stray Magnetic Field.
- (iv) Error due to change in Frequency.

[8]

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- (b) Explain why PMMC instruments are the most widely used instruments. Discuss their advantages and disadvantages. [8]

OR

- (a) What is Phantom Loading? Explain with an example how it is more advantageous than testing with direct loading. [8]
- (b) Describe the construction and working of a two element Induction Type energy meter. [8]

## UNIT-II

- Q.2 (a) Draw the equivalent circuit and Phasor diagram of a potential transformer. Derive the expressions for its ratio and phase angle errors. [8]
- (b) Discuss the major sources of errors in current transformers. Describe the design and constructional features used in current transformers to reduce the errors. [8]

OR

- (a) Explain two wattmeter method of measuring power in three phase circuits. [8]
- (b) Define the following terms as used for instrument transformers.
- (i) Transformation ratio
  - (ii) Nominal ratio
  - (iii) Turns ratio
  - (iv) Ratio Correction Factor
  - (v) Burden [8]



UNIT-III

Q.3 (a) Explain with the help of a suitable diagram, how A.C. Potentiometer's can be used for:-

- (i) Calibration of Voltmeters.
- (ii) Calibration of ammeters.
- (iii) Calibration of wattmeters and energy meters. [8]

(b) In the measurement of power by a polar potentiometer, the following readings were obtained:

Voltage across a  $0.2\Omega$  standard resistance in series with the load =  $1.46 \angle 32^\circ$

Voltage across a 200:1 potential divider across the line =  $1.37 \angle 56^\circ$  V

Estimate the current, Voltage, power and power factor of the load. [8]

OR

(a) Draw the circuit diagram of a Crompton's Potentiometer and explain its working. [8]

(b) Explain the term "Standardization" of a potentiometer. Describe the procedure of Standardization of a D.C. potentiometer. [8]

UNIT-IV

Q.4 (a) What are the different problems associated with measurement of low resistances. Explain the principle of working a Kelvin's Double Bridge. [8]

(b) Describe the working of a Carey Foster slide wire Bridge. [8]

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OR

- (a) What is the importance of the value of Earth's Resistance? What are the Factors which influence its value? Describe the fall of potential method for measurement of earth resistance. [10]
- (b) A Kelvin bridge is balanced with following Constants: Outer ratio arm  $100\Omega$  and  $1000\Omega$ , Inner arms, ratio  $99.92\Omega$  and  $1000.6\Omega$ , Resistance of link  $0.1\Omega$  and Standard resistance of  $0.00377\Omega$ . Calculate the value of unknown resistance. [6]

UNIT-V

- Q.5 (a) Why is it preferable in bridge circuits, that the equations of balance are independent of frequency? Explain. [6]
- (b) Give the equations of balance for an Anderson's bridge. Draw the phasor diagram for conditions under balance. Discuss the advantages and disadvantages of the bridge. [10]

OR

- (a) Explain how Wien's Bridge can be used for experimental determination of frequency. Derive the expression for frequency in terms of bridge parameters. [8]
- (b) Describe the working of Hay's bridge for measurement of inductance. Why is this bridge suited for measurement of Inductance of high Q coils? [8]

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Total No of Pages: 4

3E1486

B. Tech. III Sem. (Old Back) 2006-07, 07-08 and  
08-09 Exam. Feb. 2014

Electrical Engg.

3EE6.1 MATHEMATICS III

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.*

1. NIL2. NILUNIT - I

Q.1 (a) Prove that

$$(i) \quad L [ t \sin at ] = \frac{2as}{(s^2 + a^2)^2}$$

$$(ii) \quad L [ \sin at - at \cos at ] = \frac{2a^3}{(s^2 + a^2)^2} \quad [4+4=8]$$

(b) Using Laplace transform, solve the equation:

$$(D^2 - 3D + 2)x = 1 - e^{2t}, \quad x(0) = 1, \quad x'(0) = 0. \quad [8]$$

OR

SEM - OBJECT ORIENTED PROGRAMMING

Q.1 (a) Obtain inverse Laplace transform of the function:

$$\frac{s}{(s+1)^2 (s^2+1)} \quad [8]$$

(b) Solve

$$\frac{\partial v}{\partial t} = 2 \frac{\partial^2 v}{\partial x^2}$$

$$v(0, t) = 0, \quad v(5, t) = 0, \quad v(x, 0) = 10 \sin 4\pi x. \quad [8]$$

UNIT - II

Q.2 (a) Define Fourier transform. Obtain the Fourier sine and cosine transform of  $f(x)$ ,

where

$$f(x) = \begin{cases} 1, & \text{for } 0 < x < a \\ 0, & \text{for } x > a \end{cases} \quad [8]$$

(b) Prove that

$$(i) \quad \bar{F}_C \{f'(x); s\} = -\sqrt{\frac{2}{\pi}} f(0) + s \bar{F}_S \{f(x); s\}.$$

$$(ii) \quad \bar{F}_S \{f'(x); s\} = -s \bar{F}_C \{f(x); s\}. \quad [4+4=8]$$

OR

$$Q.2 (a) \quad \text{Show that } \int_0^\infty \frac{\cos \lambda x}{1+\lambda^2} d\lambda = \frac{\pi}{2} e^{-x}, \quad x \geq 0. \quad [6]$$

(b) Solve  $\frac{\partial v}{\partial t} = \frac{\partial^2 v}{\partial x^2}$ ,

given that  $v_x(0, t) = 0$ , and  $v(x, 0) = \begin{cases} x, & 0 \leq x \leq 1 \\ 0, & x > 1 \end{cases}$

$v(x, t)$  is bounded and  $x > 0, t > 0$ .

[10]

### UNIT - III

Q.3 (a) Find the Fourier series to represent  $f(x)$  given by:

[8]

$$f(x) = \begin{cases} x & \text{for } 0 \leq x \leq \pi \\ 2\pi - x & \text{for } \pi \leq x \leq 2\pi \end{cases}$$

(b) Obtain the expansion for  $y$  from the following table up to the first harmonic:

$x$	:	0	1	2	3	4	5
$y$	:	9	18	24	28	26	20

[8]

OR

Q.3 (a) Find a series of cosines of multiples of  $x$  to represent  $x \sin x$  in the interval  $(0, \pi)$ .

[8]

(b) Prove that the shortest distance between two given points in a plane is a straight line.

[8]

### UNIT - IV

Q.4 (a) Define an analytic function and determine the analytic function whose real part is  $\cos x \cos y$ .

[8]

(b) Find the bilinear transformation which maps the points  $z = 1, i, -1$  into the points  $w = i, 0, -i$ .

Hence find the image of  $|Z| < 1$ .

[8]

OR

Q.4 (a) Discuss the transformation

$$w = Z + \frac{1}{Z}, \quad z \neq 0. \quad [8]$$

(b) State and prove Cauchy's integral theorem. [8]

### UNIT - V

Q.5 (a) Expand  $f(z) = \sin z$  in a Taylor's series about  $z = \frac{\pi}{4}$ . [8]

(b) Expand  $f(z) = \frac{1}{(z+1)(z+3)}$  in a Laurent series valid for

(a)  $1 < |z| < 3$       (b)  $z > 3$       (c)  $0 < |z+1| < 2$ . [8]

OR

Q.5 (a) Find the residues of  $f(z) = \frac{z^2 - 2z}{(z+1)^2(z^2 + 4)}$  at all its poles in the finite plane. [8]

(b) Evaluate the following integral by contour integration:

$$\int_0^{2\pi} \frac{d\theta}{(1 + a^2 - 2a \cos\theta)}, \quad 0 < a < 1. \quad [8]$$

<b>3E1708</b>	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 2px;">4</span>
<p><b>3E1708</b></p> <p><b>B. Tech. III Sem. (Old Back) 2006-07, 07-08 &amp; 08-09</b></p> <p><b>Feb. 2014</b></p> <p><b>Electrical and Electronics</b></p> <p><b>3EX2 OBJECT ORIENTED PROGRAMMING</b></p> <p><b>USING C++</b></p>		

**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.*

1. \_\_\_\_\_

2. \_\_\_\_\_

### UNIT-I

Q.1 (a) Explain the main features and advantages of C. How unary operators are used in C. Explain the types? [8]

(b) What is pointer in C? How is pointer variable is declared. Give the difference between the structure and an array? [8]

OR

- Q.1 (a) What do you mean by Command line argument. How it's implemented. Explain text file handling too? [8]
- (b) What is single & doubly linked list, explain the difference between them? [8]

UNIT-II

- Q.2 (a) How does object oriented approach works. Explain Public, Private and protected data members? [8]
- (b) Give the concept of class and object in OOP. How the dynamic binding is useful in C++. [8]

OR

- Q.2 (a) What does inheritance mean in oops? Explain the different types and give the difference between multiple and multilevel inheritance. [8]
- (b) How can we categorized the inheritance on the basis of access data members in derived class from the base class. [8]



UNIT-III

Q.3 (a) Explain the friend function with an example. How the inline function improve the performance. Explain? [8]

(b) Explain the enhanced characteristic of C++ over C? [8]

OR

Q.3 (a) Explain the constructor and its type. What is the use of destructor, describe briefly? [8]

(b) Can we overload operators and functions in oops, concept, if yes, then explain both of the above? [8]

UNIT-IV

Q.4 (a) What are the class and derived class in inheritance. Explain Hybrid inheritance with an example. [8]

(b) What is the Virtual function. How it is declared and defined. Explain with an example? [8]

OR

Q.4 (a) Explain Single and Multiple inheritance with suitable example? [8]

(b) Give the brief description about pointers to object. [8]

UNIT-V

Q.5 (a) Explain the templates we used in C++? [8]

(b) Write Short note on:

(i) Input / output flags.

(ii) Formatting operations.

[4×2=8]

OR

Q.5 (a) What is file handling in C++. Explain briefly? [8]

(b) Explain the Working with text files? [8]

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<b>3E1484</b>	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 2px;">3</span>
	<b>3E1484</b> <b>B. Tech. III – Sem. (Old Back) 2006-07, 07-08 and 08-09</b> <b>Examination Feb. 2014</b> <b>Electrical Engg.</b> <b>3EE4 ELECTRICAL MACHINES-I</b>	

**Time: 3 Hours**

**Maximum Marks: 80**  
**Min. Passing Marks: 24**

*Instructions to Candidates:-*

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*Use of following supporting material is permitted during examination.*

1. \_\_\_\_\_

2. \_\_\_\_\_

**UNIT-I**

Q.1 (a) Draw & Explain Schematic Diagram of flow of Energy while conversion of Mechanical Energy to Electrical Energy. [8]

Q.1 (b) Explain phenomena of Energy Balance with Suitable example? [8]

**OR**

Q.1 (a) Explain phenomena of Energy Conversion by help of a labeled Diagram? [8]

- (b) Describe briefly the concept of Electromechanical Energy Conversion with its uses & application. [8]

## UNIT-II

- Q.2 (a) Explain Construction & Working of DC Generators. [8]
- (b) Explain phenomena of armature reaction, commutation & method of improving commutation in DC Generators? [8]

### OR

- Q.2 (a) A DC generator has an armature emf of 110V when the useful flux per pole is 20mWb & the speed is 800 rpm, calculate the generated emf.
- (a) With the same flux & a Speed of 1000 rpm
- (b) With flux per pole of 24 mWb & Speed of 900 rpm. [8]
- (b) Explain Concept of Rosenberg generator [8]

## UNIT-III

- Q.3 (a) Describe Principle of back EMF & phenomena of torque production in DC motor. [8]
- (b) Explain Hopkinson test for DC Motor. [8]

### OR

- Q.3 (a) Describe Starting & Speed Control of DC motor in detail? [8]
- (b) A 460 V Series motor runs at 500 rpm, taking a Current of 40 A. Calculate the Speed & Percentage change in torque if the load is reduced so that the motor is taking 30 Amp. Total resistance of armature & field circuits is  $0.8\Omega$  assume flux and field current to be proportional.

**UNIT-IV**

- Q.4 (a) Explain Sumpner's Back to Back test for Transformers. [8]
- (b) Describe Construction, type & emf equation for transformers? [8]

**OR**

- Q.4 (a) Explain Switching Currents in transformer also explain separation of losses. [8]
- (b) A single phase transformer working at unity P.F. has an efficiency of 90% at both half load & at full load at 500W. Determine the efficiency at 75% full load & maximum efficiency. [8]

**UNIT-V**

- Q.5 (a) For a Polyphase Transformer, Explain effect of 3d winding connections on harmonics. [8]
- (b) Compare Bank of 3 Single phase transformer & three phase core type transformer [8]

**OR**

- Q.5 (a) Explain briefly about open delta connection with its uses? [8]
- (b) Explain phenomena of tertiary winding in polyphase transformer? [8]

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