5E5041

Roll No. : _____

Total Printed Pages : 3

5E5041

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Electrical & Electronics Engg.
5EX1A Power Electronics   (EX, EE)

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*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

1 (a) Explain constructional details as well transfer and output characteristics of MOSFET.

8

(b) Draw the circuit symbol and equivalent circuit for the Gate Turn Off Thyristor (GTO)) device and discuss its operation.

8

OR

1 (a) Explain constructional details and characteristics of TRIAC.

8

(b) Draw and explain IGBT with constructional detail, and various characteristics.

8

UNIT - II

2 (a) Explain the SCR with constructional details, characteristics and modes of operation.

8

(b) Draw the circuit for UJT relaxation oscillator with provision for frequency adjustment and spike waveforms and explain circuit.

8

OR

2 Name the various types of protections required for thyristor. Explain any two methods.

16

UNIT - III

3 (a) Explain with a neat circuit diagram and voltage waveforms the principal of operation of single phase half wave converter for R-load.

8

(b) Write short note on Ideal dual convertor.

8

OR

3 (a) Explain with a neat circuit diagram and voltage waveforms the principal of operation of single phase full wave convertor with free whiling diode.

8

(b) Explain with a neat circuit diagram and voltage waveforms the principal of operation of three phase full wave convertor.

8

UNIT - IV

4 (a) Explain with a neat circuit diagram and voltage waveforms the principal of operation of single phase semi convertor with continuous conduction.

8

(b) Why power factor improvement is required ? Explain excitation angle control for power factor improvement.

8

OR
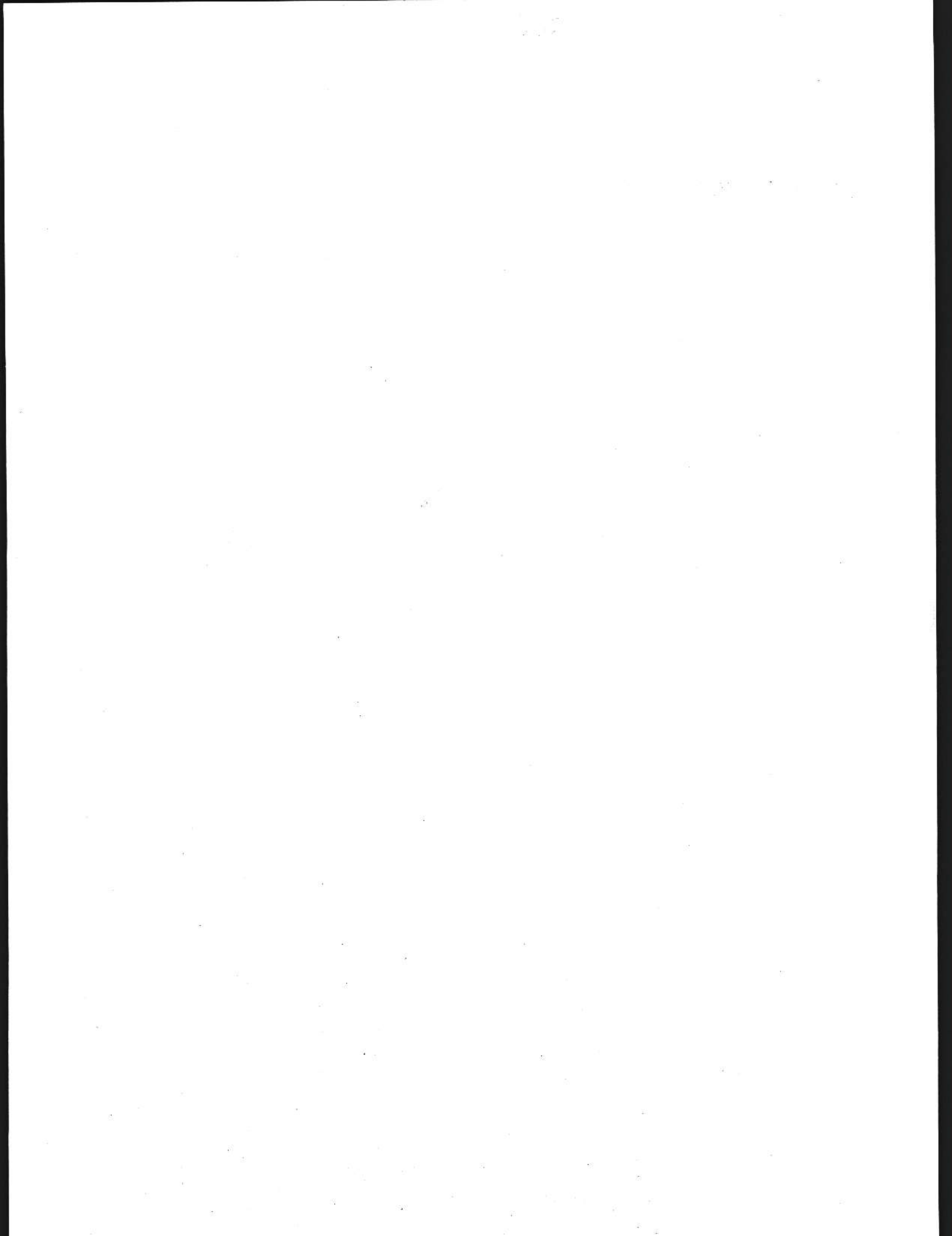
4 (a) Explain with a neat circuit diagram and voltage waveforms the principal of operation of three phase semi convertor with R-L Load.

8

(b) Explain effect of load and source impedance on power factor.

8

UNIT - V

5 (a) Explain principle of chopper operation. Give its control strategies.

8

(b) Explain the working of current commutated chopper.

8

OR

5 (a) Discuss the classification of choppers in detail.

8

(b) Explain the working of voltage commutated chopper.

8

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*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

1 (a) Draw the pin diagram of 8085 microprocessor and explain its various pins.

8

   (b) Explain various type of interrupts available in 8085 microprocessor.

8

OR

1 (a) Explain the programming model of 8085 with suitable block diagram.

8

   (b) How address lines are multiplexed ? Expain in detail with help of latching circuit diagram.

8

UNIT - II

2 (a) Explain the following instructions of the 8085 microprocessor.

    (i) LHLD

    (ii) DAD

    (iii) PCHL

    (iv) DAA

$2 \times 4 = 8$

   (b) Draw the timing diagram of STA and explain it.

8

OR

2 (a) Explain various addressing modes of 8085 using suitable examples.

8

   (b) Write a program to transfer one block of data into another block in same order.

8

UNIT - III

3 (a) Explain 8259 chip with the help of block diagram.

8

   (b) Define working of A/D converter with the help of diagram.

8

OR

3 (a) Explain programmable peripheral interface (8255) chip with the help of pin diagram.

8

   (b) Draw a block diagram of 8253 and explain it.

8

UNIT - IV

4 (a) Draw the block diagram of 8086 microprocessor and explain the following :
    (i)   Pipelining concept
    (ii) Segmented memory concept
    (iii) Extended register concept
                                                                                    8

   (b) Explain various addressing modes of 8086.
                                                                                    8

OR

4 (a) Draw the pin diagram of 8086.
    (i)   M/IO
    (ii) QS1 and QSO
    (iii) READY
    (iv) Address/Status Bus
                                                                              2×4=8

   (b) Differentiate between 8085 and 8086.
                                                                                    8

UNIT - V

5 (a) Define PAL and PLA using suitable diagram.
                                                                                    8

   (b) Write short notes on :
    (i)   SDRAM
    (ii) RDRAM
                                                                              4×2=8

OR

5 Write short notes on :
    (i)   Primary and secondary memory
    (ii) Static and Dynamic memory
    (iii) Virtual and Physical memory
    (iv) Flash and cache memory
                                                                             4×4=16

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Roll No. : _____

5E5043

5E5043

B. Tech. (Sem. V) (Main & Back) Examination, November - 2018
Electrical & Electronics Engg.
5EX3A Control Systems

Time : 3 Hours]

[Maximum Marks : 80
[Min. Passing Marks : 26

*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. Semi-logrithmic paper _____ 2. NIL _____

UNIT - I

1 (a) Find the overall transfer function $\dfrac{C(s)}{R(s)}$ of the system shown in figure.

8

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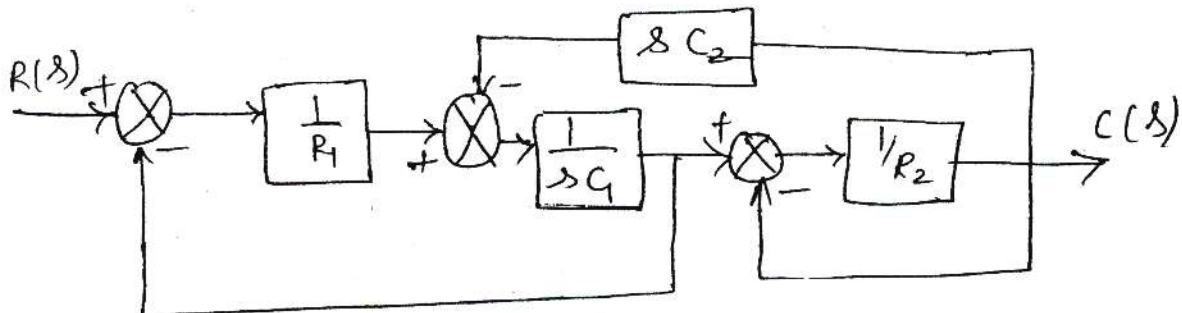
(b) Apply the gain formula to the signal graph show in figure to find transfer function.
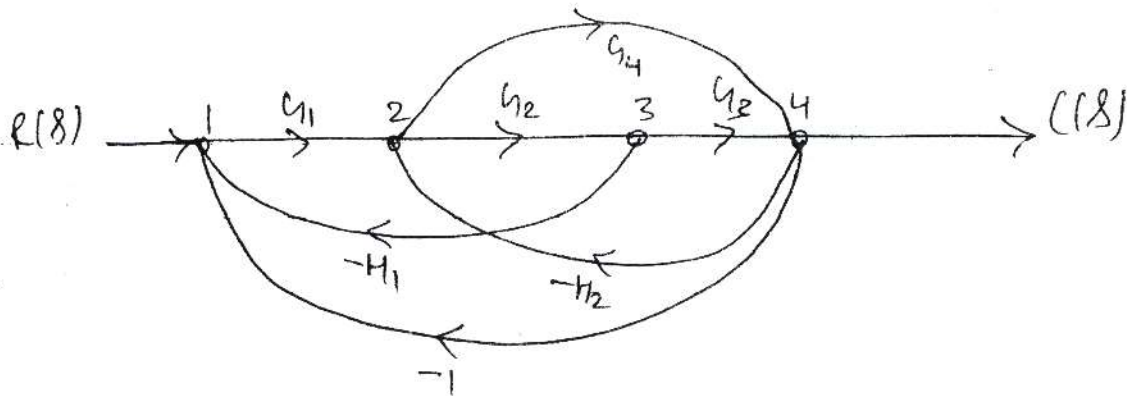
8

OR

1 (a) Explain the close loop and open loop control system with example.

8

(b) Explain force-voltage and force current analogy with complete details.

8

UNIT - II

2 (a) Derive the response of a second order underdamped system given by

$$\frac{C(s)}{R(s)} = \frac{W_n^2}{s^2 + 2\xi W_n s + W_n^2}$$ for unit step input.

12

(b) The response of a servo mechanism is given by $C(t) = 1 + 0.2\ e^{-60t} - 1.2\ e^{-10t}$ when given a unit step i/p. Obtain damping ratio and undamped natural frequency.

4

OR

2 (a) For the system shown in figure find steady state error for

(i) Unit step input

(ii) Unit Ramp input
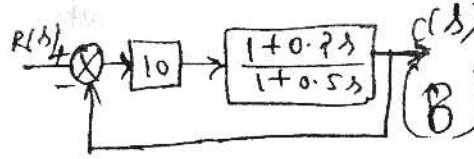
8

(b) Unity feedback control system is characterized by an open loop transfer function.

$$G(s) = \frac{k}{s(s+4)}$$

Determine the value of K so that the dumping factor of the system is 0.5. For this value of K find the settling time, peak overshoot and time to peak overshoot for step input.

8

UNIT - III

3 (a) Comment on the stability of the system whose characteristic equation is given below

$$s^4 + 3s^3 + 6s^2 + 12s + 8 = 0$$

8

(b) What is the difference between absolute and relative stability ?

8

OR

3 (a) Explain the construction and working of ac servomotor.

8

(b) Obtain G(s) H(s) from the given equation and draw complete root locus for this control system.

$$s(s+4)(s^2 + 4s + 20) + k = 0$$

8

UNIT - IV

4 Draw the bode plot for the transfer function with unity feedback.

$$G(s) = \frac{0.50(1+0.5s)}{s(1+3s)(1+5s)}$$

  16

OR

4 (a) Draw the polar plot for Transfer function
    G(s) = (S / S + 1)

  8

 (b) Write down the advantage of frequency response analysis.

  8

UNIT - V

5 Write a short note on proportional derivative and integral controllers.

  16

OR

5 Write down the merits and demerits of phase-lag Lead compensation.

  16

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5E3126

Total Printed Pages : 3

5E3126

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Electrical Engineering
5EE4(O) Generation of Electrical Power

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*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

1   (a) Draw the schematic diagram of a modern thermal power station and explain its operation with important components.

8

    (b) Explain advantages of nuclear generation. What points are considered in the site selection of this plant ?

8

OR

1   (a) Explain different types of hydro turbines. Explain their application with construction features.

8

    (b) Write short notes on fissile and fertile materials.

8

UNIT-II

2   (a)   Explain the impact of thermal and nuclear power on the environment.

8

(b)   Write short notes on greenhouse effect (global warming).

8

OR

2   Write short notes on :
(a)   energy generated by wind
(b)   solar
(c)   tidal energy
(d)   Indian energy scene.

4×4

UNIT-III

3   Explain the following terms :
(i)   demand factor
(ii)   diversity factor
(iii)   load factor
(iv)   capacity factor

4×4=16

OR

3   (a)   Explain the working of synchronous condensers.

8

(b)   What are the causes and effects of low power factor ?

8

UNIT-IV

4   (a)   What is depreciation ? Explain sinking fund method with neat diagram.

8

(b)   A power plant has an initial cost of Rs. 2×10^8. Assuming a salvage value of 20% and useful life of 20 years. Find
(i)   Rate of depreciation by fixed percentage method.

(ii)   Find remaining balance at the end of 10th year.

8

OR

4 (a) Explain energy conservation and cogeneration.

8

(b) Calculate the most economic power factor when kVA demand is constant.

8

UNIT-V

5 Write short notes on :

(i) General tariff form

(ii) Objective of tariff

(iii) Two part tariff

(iv) Spot pricing

4×4=16

OR

5 (a) Explain some key factors which play important role in selection and location of power plants.

8

(b) Write short notes on base load and peak load plants with suitable diagrams.

8

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B. Tech. (Sem. V) (Main & Back) Examination, November 2018
Electrical & Electronics Engg.
5EX4A Database Management System

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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

1 (a) What is DBMS ? How are data stored in DBMS ? Explain.

7

   (b) Differentiate between following :
   (i) Generalization and specialization
   (ii) Partial and total participation
   (iii) Degree and cordinality of a relation.

$3 \times 3 = 9$

OR

1 (a) What is role of E-R model in database design ? Draw an E-R diagram for bank management system.

8

   (b) Describe structure of a DBMS. How it is different from RDBMS ?

8

UNIT - II

2 (a) Explain the following :
    (i) Full and partial functional dependency.
    (ii) Transitive dependency
    (iii) Join dependency

                                              $3 \times 3 = 9$

(b) Write short note on denormalization.

                                              7

OR

2 (a) Define functional dependency ? Explain Armstrong's axioms or rules with example.

                                              8

(b) Discuss insertion, deletion and modification anomalies. Why are they considered bad ?

                                              8

UNIT - III

3 (a) What do you mean by a view in SQL ? What are its advantages ? How the view types effect the DML operation on view ?

                                              8

(b) What is a trigger ? What is the difference between a trigger and procedure ?

                                              8

OR

3 (a) Write short notes on : (any two)
    (i) Embedded SQL
    (ii) Dynamic SQL
    (iii) ODBC

                                            $4 \times 2 = 8$

(b) Describe different DML operations.

                                              8

UNIT - IV

4   (a)   What is the difference between a clustering index and a secondary index ?

                             8

   (b)   Describe static and dynamic hashing.

                             8

OR

4   (a)   Describe the similarities and differences between B-tree and B^+ tree.

                             8

   (b)   What is hash file organization ? What is hash index ?

                             8

UNIT - V

5   (a)   What are database failure ? Explain database recovery.

                             8

   (b)   Explain concurrency control. What is lock based protocol ?

                             8

OR

5   (a)   What is 'lock' in DBMS ? What is difference between lock-based, time-stamp based and validation based protocols for concurrency control.

                          2+6=8

   (b)   What is 'dead-lock' and 'live-lock' in DBMS ? Give two dead lock prevention scheme.

                             8

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5E5045

Roll No. : _____

Total Printed Pages : 3

5E5045

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Electrical & Electronics Engg.
5EX5A Transmission & Distribution of Electrical Power (EE, EX)

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*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

1   (a)   Describe basic network of power system. Also explain effect of system voltage of conductor and losses.

8

    (b)   Compare the volume of conductor material required for a d.c. two wire system and A.c. three-phase three-wire system on the basis of equal maximum difference between conductor and earth.

8

OR

1   (a)   Explain Kelvin's law for determination of conductor size. Discuss its practical limitations.

8

    (b)   Write short note on Radial, Ring Main and Interconnectd system.

8

UNIT - II

2 (a) Explain method of calculating sag and tension of conductor in a power system.

8

(b) A transmission line has a span of 240 meters. Find the weight of the conductor per meter length if the sag ultimate tensile strength and factor of safety are 1.6 meters, 5200 kg and 2 respectively.

8

OR

2 (a) Describe the various types of conductor material used transmission and distribution system.

8

(b) What are the causes of vibrations in overhead transmisson lines ? How can these vibration be damped out ?

8

UNIT - III

3 (a) How is the inductance of a single phase two wire line calculated ? Describe the process how you will calculate the inductance of each conductor here due to internal and external flux linkage.

12

(b) Explain briefly the skin effect in a transmission line.

4

OR

3 (a) Draw phasor diagram of a short transmission lines and derive an expression for voltage regulation.

8

(b) Explain the capacitance of three phase line with symmetrical spacing.

8

UNIT - IV

4   (a)   Derive the expression for A, B, C and D constants of a long transmission line in term of line parameters.

10

(b)   Write short note on Ferranti effect.

6

OR

4   (a)   Explain the phenomenon of Corona. What are the factors affecting corona?

8

(b)   Write short note on interference of power line with communication circuits.

8

UNIT - V

5   (a)   Name the different types of insulators used in power system along with the use of each insulator and explain pin type insulator in detail.

8

(b)   What is string efficiency ? Define the method of improving string efficiency.

8

OR

5   (a)   Derive a formula for electric stress in single core cable. Where is stress maximum ? Where is it minimum ?

8

(b)   Describe general construction of underground cable. What are the necessary requirement of a cable ?

8

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Roll No. : _____

Total Printed Pages : 3

5E5047

B. Tech. (Sem. V) (Mercy Back) Examination, November 2018
Electrical Enggineering
5EE6.2A Principle of Communication System   (EE, EX)

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*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

1   (a)   What do you understand by noise temperature and noise bandwidth ? Explain with suitable mathematical expression.

8

(b)   Derive an expression for calculating effective input noise temperature.

8

OR

1   (a)   What is noise figure ?

4

(b)   Derive an expression for noise figure and equivalent noise temperasture is cascaded circuit.

12

UNIT - II

2 (a) What is frequency translation ?

4

   (b) Tabulate merits and demerits of AM-DSB and AM-SSB.

12

OR

2 (a) What do you unerstand by modulation ?

4

   (b) "How AM DSB and SSB signals are detected ? Draw neat diagram in support of your answer.

12

UNIT - III

3 (a) Tabulate advantages and disadvantages of narrow band and wide band FM.

8

   (b) How FM signal is generated ? Draw neat diagram in support of your answer.

8

OR

3 (a) Why pre-emphasis and de-emphasis is done in FM system ? Explain with neat circuit.

8

   (b) Explain following terminology in reference to FM :

   (i)   Threshold in FM

   (ii) PLL demodulator.

8

327

UNIT - IV

4 (a) Derive an equation for calculating signal to noise ratio in SSB-SC.

        8

  (b) How noise is calculated in envelope detector ?

        8

OR

4 (a) With the help of neat diagram explain super hetrodyne receiver.

        8

  (b) Calculate S/N ratio of any one FM demodulation. Explain the parameters involved in the SNR.

        8

UNIT - V

5 (a) Define sampling. Why it is important in pulse modulation system ?

        8

  (b) Draw neat diagram of PPM demodulation and explain its working.

        8

OR

5 (a) Tabulate and explain merits and demerits of PWM and PPM systems.

        8

  (b) Explain how PAM signal is generated. Draw neat diagram in support of your answer.

        8

Roll No. : _____

5E5046

Total Printed Pages : 4

B. Tech. (Sem. V) (Main & Back) Examination November / December 2018
Electronics Engineering
5EE6.1A Optimization Techniques

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

*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

1 (a) What is Optimization technique ? Give five applications of optimization in engineering.

8

(b) A firm manufacturing two types of electrical items, A and B can make a profit of Rs. 20 per unit of A and Rs. 30 per unit of B. Each unit of A requries 3 motors and 2 transformers and each unit of B requires 2 motors and 4 transformers. The total supply of these per month is restricted to 210 motors and 300 transformers. Type B is an expert model requiring a voltage stabilizer, which has a supply restricted to 65 units per month. Formulate above as a linear programming problem for maximum profit.

8

OR

1 (a) Describe various mathematical programming methods used in operation research.

8

(b) The data for two foods x_1 and x_2 are given below :

	Per unit		minimum
	x_1	x_2	requirements
Prices	60 paise	21 paise	
Calories	1000	2000	3000
Proteins	25 gms.	100 gms.	100 gms

Fomulate the LPP for minimizing expenditure on food.

8

UNIT - II

2 (a) Minimize $z = \frac{1}{2}\left(x^2 + y^2 + z^2\right)$

Subjected to $x - y = 0$

$x + y + z - 1 = 0$

by any suitable method.

8

(b) Find the optimum value of the function $f(x) = (x-2)^4$ and also state if the function attains a maximum or minimum at $x = 2$.

8

OR

2 (a) Find the extreme point of the function.

$f(x_1 y) = x^3 + y^3 + 2x^2 + 4y^2 + 6$

8

(b) Show that the height of the cylinder of maximum volume inscribed in a sphere of radius (r) is

$\dfrac{2r}{\sqrt{3}}$

8

UNIT - III

3   (a)   Solve the following problem by using Big M-method.

Max. $z = 3x + 2y + 2$

Subjected to $-3x + 4y + z = 7$

$-3x + 2y + 2z = 8$

and $x, y, z \geq 0$

8

OR

(a)   Use simplex method to solve LPP

Minimize $Z = x_1 + 4x_2$

Subjected to $2x_1 + x_2 \geq 4$

$x_1 + 7x_2 \geq 7$

and $x_1, x_2 \geq 0$

8

(b)   Solve graphically the problem :

Min. $z = 3x + 5y$

Subjectd to $-3x + 4y \leq 12$

$2x - y \geq -2$

$x \leq 4, \ y \geq 2$

and $x, y \geq 0$

8

UNIT - IV

4 (a) Minimize $f = 2x^2 + y^2$ from the starting point $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$ using the univariate method.

8

(b) Find the minimum of the function $f(x) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$ and starting point is $x_1 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$ by using Newton's method.

8

OR

4 Find the maximum of the function $f(x) = x(5-x)$ in the interval $[0, 8]$ using golden section method. It is given that the function is unimodel in this interval.

8

UNIT - V

5 Min. $f(x) = x^2 + 2y^2$

subjected to $2x + 5y - 10 \le 10$

by using exterior penalty method and final solutions for $r = 1, 10$ and $r \to \infty$.

16

OR

5 Min $f(x) = (x_1 - 1)^2 + (x_2 - 2)^2$

Subjected to $4 - x_1 - x_2 \ge 0$

$2 - x_1 + x_2 \ge 0$

$x_1, x_2 \ge 0$

using complex method with the starting point $\begin{bmatrix} 0.5 \\ 1.5 \end{bmatrix}$

16