189

5E3124

Roll No. : _____ Total Printed Pages : 3

5E3124

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical Engg.
5EE2 Microprocessors and Computer Architecture

Time : 3 Hours] [Total 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) Briefly explain the bus structures in 8085 microprocessor based circuits.
(b) Explain the programmed I/O data transfer.
(c) Differentiate between static and Dynamic memories.
(d) Explain the concept of physical and virtual memory.
4×4=16

OR

1 (a) Draw the memory map and block schematic of an 8085 based system having following specifications.
(i) 32 KB of program memory
(ii) 16 KB of data memory.
8

(b) Differentiate between absolute address decoding and linear select address decoding.
8

UNIT - II

2 (a) How does the Demultiplexing of Address Bus and Data bus takes place in 8085 microprocessor ? Explain.
8

(b) Draw and explain the timing diagram of fetch cycle of 8085 microprocessor with suitable example.
8

OR

2 (a) Differentiate between :
(i) Vectored and non-vectored interrupts
(ii) Edge-triggered and level-triggered interrupts.
8

(b) What are the various software interrupts in 8085 microprocessor ? Give their vector location in IVT.
8

UNIT - III

3 (a) Write 8085 assembly language program to store the contents of the Flag register in memory location 2000 H and load the flag register from Top of stack.
8

(b) Illustrate RIM and SIM instructions. Explain how these instructions can be used for serial data handling.
8

OR

3 (a) Describe the sequence of events that are followed for execution of PUSH and POP instructions in 8085 M.P.
4

(b) Explain the following instructions in Instruction set of 8085 MP.
(i) DAA (ii) DAD
(iii) PCHL (iv) RAL.
4

(c) Explain the syntax of different jump instructions in 8085 MP.
4

(d) Enumerate the data transfer instruction group of 8085 MP.
4

UNIT - IV

4 (a) Describe the response that an 8259 will make if it receives an interrupt signal on its IR3 and IR5 inputs at the same time. Assume fixed priority for the IR inputs. What response with the 8259 make if it is servicing an IRS interrupt and an IR3 interrupt signal occurs.
8

(b) Enumerate the sequence of instructions that you need to send to 8279 interfaced to 8085 MP to display 8888.
8

OR

4 (a) Interface a 4×4 keyboard using two 8255 ports and write a 8085 assembly language program to read the code of a pressed key. 8

(b) Explain why 8255 ports are divided into two groups ? Discuss how these groups are controlled in different modes of operation. 8

UNIT - V

5 (a) With the help of basic cell explain SRAM and DRAM. Discuss the advantages and disadvantages of the above memories. 8

(b) Explain the following terms with reference to DRAM
(i) Write cycle
(ii) Access time
(iii) Refresh
(iv) Read cycle. 8

OR

5 (a) Explain the following data transfer schemes.
(i) Interrupted I/O
(ii) DMA 8

(b) Explain the following terms :
(i) Memory seek time
(ii) Memory band width
(iii) Memory latency
(iv) Memory Hierarchy. 8

192

5E3125

Roll No. : _____

Total Printed Pages : 4

5E3125

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical & Electronics
5EX3 Control Systems

(Common with EE and EX)

Time : 3 Hours]

[Total 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 What is control system ? Explain the basic architecture of open loop and closed loop control system. Also gives merits and demerits of both system. 16

OR

1 Explain the term multivariability in control system. What is its significance in system ? 8

2 Verify the following statements :

(a) An automatic coffee maker is an example of open loop control system.

(b) Controlling of traffic by policeman is an example of closed loop control system.

4×2=8

UNIT - II

1 Derive the value of transfer function for an translational mechanical system. Also explain and generate expression for force current and force voltage analogy for this system. 8

2 Find the C/R of given system (Fig 2-a) using Mason's gain formula.

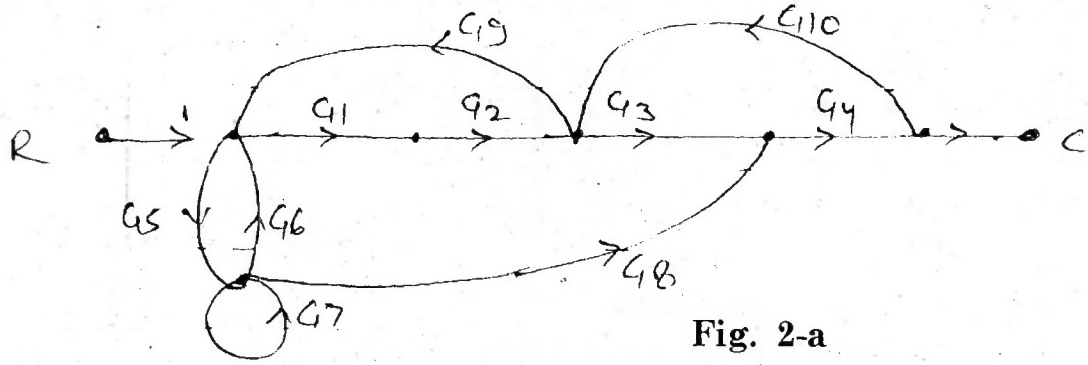

Fig. 2-a

8

OR

1 A armature controlled dc motor is supplied in with a from a 24 dc supply. The motor takes a current of 5 A on stalling and stalling torque being 0.915 nm. The motor runs at 1000 rpm taking current of 1 A. The moment of inertia and coefficient of viscous friction are 4×10^{-3} kg/m^2 and 1.5×10^{-3} NM/rad/sec. respectively. Determine transfer function of motor.

8

2 Determine C/D ratio for system shown in (Fig. 2-b)

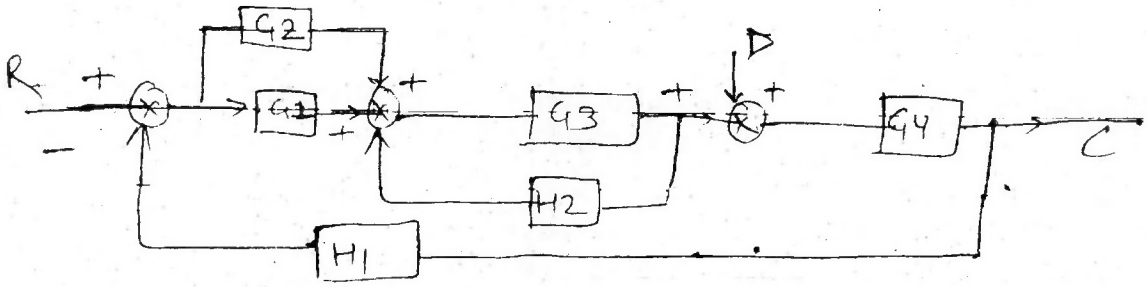

Fig. 2-b

8

UNIT - III

1 Write a short note on steady state errors, also derive the relation between various types of transfer function and steady state errors with ramp input. Find the steady state error of system

$$G(S) = \frac{100}{S(S+10)}$$ for unit ramp input.

16

OR

1 For open loop transfer function of a unity feedback control system is given below. Determine value of K and β such that the closed loop unit step response has $\omega_n = 3$ rad/sec and $\xi = 0.2$.

$$G(S) = \frac{K(S+2)}{(1+\beta)S^2 + 4S + 1}$$

8

2 The overall transfer function of a control system is given by

$$\frac{C(S)}{R(S)} = \frac{16}{S^2 + 1.6S + 16}$$

It is desired that the damping ratio be 0.8. Determine the value of rise time, peak time, maximum overshoot and steady state error for unit step input without any feedback.

8

UNIT - IV

1 A unity feedback system is characterized by the feed forward function

$$G(S) = \frac{50}{(S+1)(S+2)}$$

Draw the bodeplot for this and also find gain margin and phase margin of system.

12

2 Write down the procedure steps for plotting root locus.

4

OR

1 Draw the nyquist plot of given open loop transfer function $G(S)H(S) = \frac{15(1+4S)}{(S^2+100)(1+0.25S)}$. Determine its stability, gain margin and phase margin.

8

2 Investigate the stability of a unity feedback control system whose open loop transfer function is given by $G(S)=\frac{e^{-ST}}{S(S+2)}$. by using Routh Hurtwitz criterion.

8

UNIT - V

1 Write short notes on :

(a) Derivative Controllers

(b) Proportional Controllers.

8×2=16

OR

1 Why compensation is required in control system and explain the phase lead compensation.

8

2 The open loop transfer function of quality feedback control system is given by $G(S)=\frac{K}{S(1+0.2S)}$. Design a suitable compensator such that the system will have K_v = 10 and P.M. = 50.

8

196

5E3126

Roll No. : _____ Total Printed Pages : 3

5E3126

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical Engineering
5EE4 Gen. of Elect. Power

Time : 3 Hours] [Total 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 Nuclear fission and Nuclear fusion type of Nuclear power plant. What are advantages of nuclear generation ? 8

(b) Explain Hydro power plant, who are they classified ? 8

OR

1 (a) Explain open cycle and closed cycle gas turbine plants. 8

(b) In a nuclear power plant explain schemes with boiling water Reactor, heavy water reactor and fast breeder reactor. 8

UNIT - II

2 (a) Explain the conversion of solar energy into electrical energy in a solar power plant. 8

(b) What are Renewable energy source who are they different compare to non-renewable energy source ? 8

OR

[Contd

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

(b) What are impact of thermal and nuclear power plant on our environment ? 8

UNIT - III

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

(b) The annual load duration curve of a small hydroplant is 438 x 10^4 kWh of energy during the year. It is a peak load plant with 20% annual load factor. Find station capacity. If plant capacity factor is 15% find reserve capacity of plant. 8

OR

3 (a) What is chronological curve and who are they different from load duration curve? Why is load forecsting necessary ? 8

(b) Define following terms for a power station.
(i) Demand factor
(ii) Load factor
(iii) Capacity factor
(iv) Diversity factor 8

UNIT - IV

4 (a) Explain concept of co-generation and energy conservation. 8

(b) Explain the following :
(i) Capital cost of plant
(ii) Annual fixed cost of plant
(iii) Operating cost of plant
(iv) Depreciation 8

OR

4 (a) Calculate most economic power factor when kVA demand is kept constant. 8

(b) Explain effect of load factor on unit energy cost. Also explain role of load diversity in power system economics. 8

UNIT - V

5 (a) Discuss various types of reserve and size of power plant. 8

(b) An industrial undertaking has connected load of 100 kW. The maximum demand is 80 kW. On an average each machine work for 60% time. Find the yearly expenditure on electricity if the tariff is Rs. 6000 + Rs. 700 per kW of maximum demand per year + Re. 1.80 per kwh. 4

(c) Explain objectives of tariffs and General Tariff. 4

OR

5 (a) Give a comprehensive comparison of thermal, hydro and nuclear power source. 8

(b) Discuss different types of tariffs used for charging the consumers of electric energy. 8

199

5E3127

Roll No. : _____ Total Printed Pages : 4

5E3127

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical and Electronics Engg. (Common with EE & EX)
5EX5 T & D of Elec. Power (Transmission and Distribution of Electrical Power)

Time : 3 Hours] [Total 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 are the types of primary and secondary distribution systems ? Explain. 8

(b) Distinguish between a feeder distributor and service main. Draw a single line diagram representing elements of a transmission system. 8

OR

1 (a) Explain and describe Kelvin's law for conductor size and also explain its limitation. 8

(b) Describe basic network of power system. Also explain effect of system voltage on size of conductor and losses. 8

200

UNIT - II

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

8

(b) A transmission line conductor having a diameter of 19.5 mm weighs 0.85 kg/m. The span is 275 m the wind pressure is 33 kg/m^2 of projected area with ice coating of 13 mm. The ultimate strength of the conductor is 8000 kg. Calculate the maximum saf if the factor of safety is 2 and ice weighs 910 kg/m^2.

8

OR

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

8

(b) Describe the stringing chart, derive its equations and graph. Also explain its uses.

8

UNIT - III

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

8

(b) Discuss the concept of geometric mean distance. How this concept be used to find the inductance of composite conductor?

8

OR

3 (a) Show how the capacitance of double circuit three phase line can be calculated. Assume complete transposition. 8

(b) Write technical notes on :
(i) Skin effect in conductor
(ii) Proximity effect
(iii) Line transposition
(iv) GMD and GMR. 8

UNIT - IV

4 (a) Derive the expression for A, B, C and D constants of a long transmission line in terms of line parameters. 12

(b) Write technical note on Ferranti effect. 4

OR

4 (a) Explain the phenomenon of corona. Derive its equation, what are the factors affecting corona. 8

(b) A three phase equilateral transmission line has a total corona less of 53 kW at 106 kV and loss of 98 kW at 110.5 kV. What is the critical disruptive voltage ? What is corona loss at 113 kV ? 8

UNIT - V

5 (a) Name the different types of insulators used in power system. Give the use of each insulator and explain them. 8

(b) Describe general construction of cable. What are the necessary requirements of a cable ? 8

OR

202

5 (a) Derive the formula for electric stren in a single core cable. What is stren maximum ? Where is minimum ?

8

(b) A three phase overhead transmission line is being supported by three disc insulators. The potential across top unit and middle unit are 8 kV and 11 kV respectively. Calculate.

(i) Ratio of capacitance b/w pin and earth to self capacitance of each unit.

(ii) The line voltage

(iii) String efficiency.

8

203

5E3129

Roll No. : _____ Total Printed Pages : 3

5E3129

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical Engg.
5EE6.2 Principle of Communication System

Time : 3 Hours] [Total 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) Evaluate the expression for equivalent noise temperature in two port cascade network. 8

(b) Explain the following :

(i) Noise bandwidth

(ii) Resistor noise. 8

OR

1 (a) The noise figure of the individual stage of a two-stage amplifier is 2.03 and 1.54 respectively. The available power gain of the first stage is 62. Evaluate the overall noise figure. 8

(b) Derive noise figure in terms of available gain and hence derive the formula for noise figure of a cascaded system. 8

204

UNIT - II

2 (a) Determine the power content of each of the sidebands and of the carrier, of an AM signal that has a percentage modulation of 85% and contains 1200 W of total power. 8

(b) Explain SSB modulation by phase shift method. 8

OR

2 (a) Explain AM superhetrodyne receiver with neat block diagram. 8

(b) What are the generating methods for SSB-SC signal ? 8

UNIT - III

3 (a) Differentiate between FM and PM. How one can be generated from the other ? 8

(b) Explain the role of pre-emphasis and de-emphasis in FM system. 8

OR

3 (a) A single tone FM is represented by the voltage equation as :
$V(t) = 12 \cos (6 \times 10^8 t + 5 \sin 1250 t)$
Determine the following :
(i) Carrier frequency
(ii) Modulating frequency
(iii) Modulation index
(iv) Maximum frequency deviation. 8

(b) Explain the PLL demodulator used in FM. 8

UNIT - IV

4 (a) Calculate the output signal to noise ratio of square law demodulator. 8

(b) Calculate the output signal to noise ratio of envelope detector. 8

OR

4 (a) Explain why FM is better than AM. Calculate signal to noise ratio for FM and AM. 8

(b) Prove that for a DSB-SC system there is an improvement in SNR by a factor of 2. 8

UNIT - V

5 (a) Why sampling is required in digital communication ? Explain natural and flat-tip sampling. 8

(b) Compare PPM and PWM. How PPM can be obtained from PWM ? 8

OR

5 (a) Explain the generation and demodulation method of PAM. 8

(b) Compare the PAM, PPM and PWM with neat diagram. 8

206

5E3123

Roll No. : _____ Total Printed Pages : 4

5E3123

B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Electrical Engineering
5EE1 Power Electronics - III (Common with Electrical & Electronics)

Time : 3 Hours] [Total 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 and draw the switching characteristics of Power MOSFET.

(b) Explain principle of operation of Thyristor using Two-Transistor model.

OR

1 (a) Explain and draw the switching characteristics of the power IGBT.

(b) Write various factors which influences the turn-off time of thyristor. Explain how the turn-off time can be minimized ?

UNIT - II

2 (a) Explain the series operation of thyristor. How SCRs suffer from unequal voltage distribution across them during their turn-on and turn-off processes ?

(b) Explain how SCR is protected against high dv/dt.

OR

2 (a) Explain in detail RC Full Wave triggering circuit for thyristor along with circuit diagram and related waveforms.

(b) Find the number of thyristors each with a rating of 500 V and 75A required for each branch of a series-parallel combination for a circuit for a total voltage and current rating of 7.5 kV and 1 kA. Assume derating factor of 14%.

UNIT - III

3 (a) Describe working of a single-phase two quadrant converter with RL load through the waveforms of supply voltage, load voltage, load current and voltage across thyristor. Also, derive expressions for load voltage and input power factor.

(b) A 220 V, 50 Hz, one-pulse SCR controlled converter is triggered at a firing angle of 60° and the load current extinguishes at an angle of 220°. Find the circuit turn off time, average output voltage and the average load current for R = 7 ohms and L = 3mH.

OR

3 (a) A single-phase dual converter is operated from a 200 V, 50 Hz supply and the load resistance is R = 20 ohms. The circulating inductance is L_r = 50 mH; delay angles are α_1 = 50° and α_2 = 130°. Calculate the peak circulating current and the peak current of converter1.

(b) Explain principle of operation of single-phase dual converter without circulating current in detail.

UNIT - IV

4 (a) Describe the working of a single-phase two-pulse semi converter with RL load through the waveforms of supply voltage, load voltage, load current and voltage across thyristor. Also, derive expressions for load voltage and input power factor.

(b) Explain Pulse width modulation control technique of power factor improvement along with circuit diagram and waveforms.

OR

4 (a) A single phase full converter is supplied from 220 V, 50 Hz source. If load resistance R = 8 ohms and source has an inductance of 1.5 mH for a firing angle delay of 60° determine :

(i) Average output voltage

(ii) The angle of overlap.

(b) Explain Sinusoidal Pulse width modulation control technique of power factor improvement along with circuit diagram and waveforms.

UNIT - V

5 (a) Explain Voltage commutated chopper along with circuit diagram and waveforms.

(b) Explain working principle of type-C Chopper along with circuit diagram and waveforms.

OR

5 (a) Describe the working of buck-boost regulator along with relevant circuit diagram and waveforms.

(b) Derive the expressions for steady-state maximum and minimum current for type-A chopper.