

F 3573

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010
Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES—II (E)

(Prior to 2007 admission—Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all the questions.

Part A

1. Explain constructional features of cylindrical and salient pole machines.
2. Discuss different types of armature windings.
3. What is synchronous reactance ?
4. Explain potier method.
5. Discuss synchronizing of alternator.
6. Explain starting torque and pull-in torque.
7. What is hunting or surging ?
8. Explain steady state stability limit.
9. Discuss different types of excitation systems.
10. Explain the methods of increasing the response of an exciter.

(10 × 4 = 40 marks)

Part B

11. (a) Discuss about synchronous machines and its types with neat diagrams. (6 marks)
- (b) Explain the following term :—
 - (i) Skewed slots.
 - (ii) Revolving magnetic field.

(6 marks)

Or

12. (a) Write notes on "selection of alternators". (6 marks)
- (b) Explain distribution factor and coil span factor. (6 marks)
13. (a) A 3-phase, star connected alternator supplies a load of 10 MW at p.f. of 0.85 lagging and at 11 kV (terminal voltage). It's resistance is 0.1 ohm per phase and synchronous reactance 0.66 ohm per phase. Calculate the line value of e.m.f. generated.
- (b) Explain the slip test for finding X_d and X_q .

(6 marks)

Or

Turn over

- 14. Explain losses and efficiency of synchronous machines. (12 marks)
- 15. (a) Discuss load sharing. (6 marks)
- (b) Explain method of starting of synchronous motor. (6 marks)

Or

- 16. (a) Explain the method of synchronising. (6 marks)
- (b) Explain the principle of operation of synchronous motor with phasor diagram. (6 marks)
- 17. Explain power angle characteristics of cylindrical rotor and salient pole machines. (12 marks)

Or

- 18. Derive the condition for maximum power output of a synchronous generator connected to infinite bus bars and operating at constant excitation. (12 marks)
- 19. (a) Explain exciter ceiling voltage. (6 marks)
- (b) Write notes on dynamic representation of generalised machines. (6 marks)

Or

- 20. Explain the principle of operation and constructional features of brushless alternators. (12 marks)
- [5 × 12 = 60 marks]

(10 × 4 = 40 marks)

Part B

- 11. (a) Discuss about synchronous machines and its types with neat diagrams. (8 marks)
- (b) Explain the following term:—
 - (i) Synchronous speed
 - (ii) Revolving magnetic field
- 12. (a) Write notes on "selection of alternators". (6 marks)
- (b) Explain distribution factor and coil span factor. (6 marks)
- 13. (a) A 3-phase star connected alternator supplies a load of 10 MW at p.f. of 0.85 lagging and at 11 kV (terminal voltage). Its resistance is 0.1 ohm per phase and synchronous reactance 0.6 ohm per phase. Calculate the line value of a.c. generated. (6 marks)
- (b) Explain the slip test for finding X_s and X_d .

Total over

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Sixth Semester

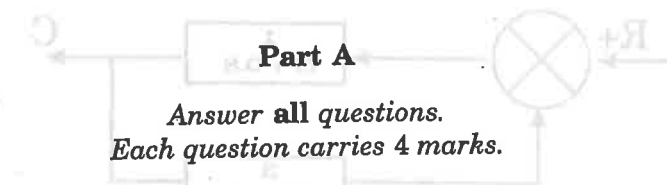
Branch : Electrical and Electronics Engineering

CONTROL SYSTEMS – I (E)

(Prior to 2007 Admissions – Supplementary)

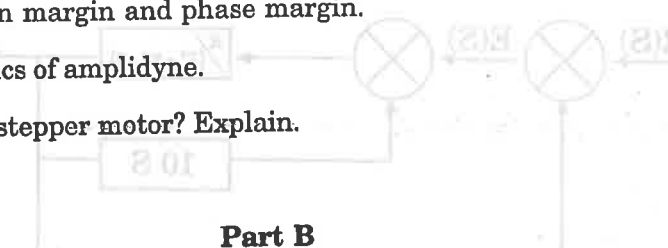
Time : Three Hours

Maximum : 100 Marks



Answer all questions.
Each question carries 4 marks.

1. Differentiate open loop system from closed loop system.
2. Explain the significance of signal flow graph.
3. What is the need for pole-zero plot? Explain.
4. Give an account on PID control.
5. What is stability? Explain the concept of stability.
6. Explain the procedure to construct root loci in detail.
7. What are the advantages of polar plots?
8. Define the explain gain margin and phase margin.
9. Write the characteristics of amplidyne.
10. What are the types of stepper motor? Explain.



(10 × 4 = 40 marks)

Answer all the questions.

Each question carries 12 marks.

11. State and prove all the properties of Laplace transform. (12 marks)

Or

12. Derive Mason's gain formula. Explain the significance of this formula. (12 marks)

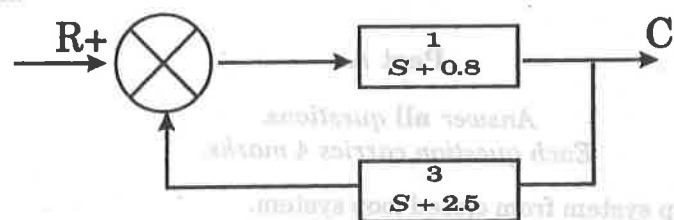
Turn over

13. For a system whose $GH(s) = \frac{10}{s(s+1)(s+2)}$. Find the steady state error when it is subjected

to the input $r(t) = 1 + 2t + 3t^2/2$. (12 marks)

Or

14. Determine the type and the static error coefficients of the system given in figure. Determine the transient response of the system for unit step input.



(12 marks)

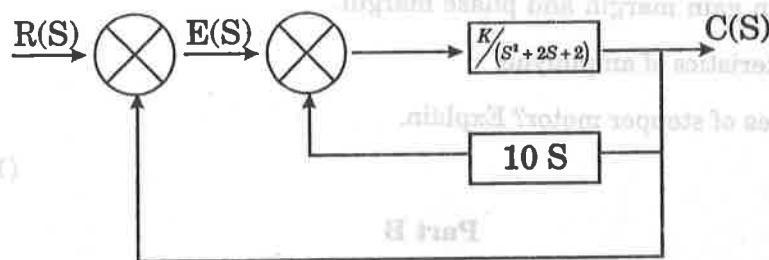
15. Explain the Routh Hurwitz stability criterion. For the characteristic equation.

$$F(s) = s^6 + s^5 - 2s^4 - 3s^3 - 7s^2 - 4s - 4 = 0.$$

Find the number of roots falling in the right half and the left half of the S plane. (12 marks)

Or

16. For the block diagram shown in figure draw the root locus diagram and find $C(s) / R(s)$ for $k=0.25$.



(12 marks)

17. Determine graphically the gain margin and phase margin for the system whose open loop transfer

$$\text{function is } GH(s) = \frac{2}{s(s+1)(s+\frac{1}{4})}$$

(12 marks)

Or

18. For the function $GH(s) = \frac{10(1+2s)}{s(s+1)(s^2+2s+4)}$ draw the Bode plot. (12 marks)

19. Explain the Nyquist stability criterion in detail. (12 marks)

Or

20. Write technical notes on :

- (a) DC and AC Servo motors.
- (b) Gyroscopes.
- (c) Magnetic Amplifier.

(4 + 4 + 4 = 12 marks)

[5 × 12 = 60 marks]

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Reg. No.....

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL POWER TRANSMISSION (E)

(Prior to 2007 Admission—Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all the questions.

Part A

1. Explain the effect of earth on line capacitance of transmission line.
2. What is geometric mean distance ?
3. Short note on "string efficiency".
4. What is sag in transmission line ?
5. Explain the Ferranti effect in transmission line.
6. Describe about power circle diagram.
7. Discuss the radio interference effect of power transmission lines.
8. Short note on measurement of earthing resistance.
9. What is meant by economic distance of DC transmission ?
10. What are the limitations of EHV AC transmission ?

(10 × 4 = 40 marks)

Part B

11. (i) What is Skin effect ? (4 marks)
- (ii) Derive the capacitance of three phase line with unsymmetrical spacing. (8 marks)

Or

12. Derive the inductance of three phase line with symmetrical spacing. (12 marks)

13. A three-phase line is supported by a string of three similar insulators. If the voltage across the lowest unit is 25 kV, shunt capacitance between earth and insulator is 1/10 th of the capacitance of insulator. Find the line voltage and string efficiency. (12 marks)

Or

14. Describe about line insulators in detail. (12 marks)

15. (a) What are the losses in an open circuited line ? (6 marks)

- (b) What is booster transformer ? Explain. (6 marks)

Or

Turn over

16. (a) Derive the ABCD constants and phase diagram of a transmission line. (6 marks)
 (b) Explain the different methods of voltage control in transmission lines. (6 marks)
17. What is Corona ? Explain in detail. (12 marks)

Or

18. Write short notes on :

- (i) Neutral grounding. (4 marks)
 (ii) Arc suppression coil earthing. (4 marks)
 (iii) Radio interference effect. (4 marks)

19. Explain EHV AC transmission in detail. (12 marks)

Or

20. (a) Explain the various kinds of d.c. links in HVDC. (8 marks)
 (b) Why the D.C. transmission is not used below a particular distance ? (4 marks)

[5 × 12 = 60 marks]

(10 × 4 = 40 marks)

Part B

11. (i) What is Skin effect ? (4 marks)
 (ii) Derive the capacitance of three phase line with unsymmetrical spacing. (8 marks)

Or

12. Derive the inductance of three phase line with symmetrical spacing. (12 marks)
 13. A three-phase line is supported by a string of three similar insulators. If the voltage across the lowest unit is 25 kV, shunt capacitance between earth and insulator is 1/10th of the capacitance of insulator. Find the line voltage and string efficiency. (12 marks)

Or

14. Describe about line insulators in detail. (12 marks)
 15. (a) What are the losses in an open circuited line ? (6 marks)
 (b) What is booster transformer ? Explain. (6 marks)

Or

Turn over

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Reg. No.....

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

MICROPROCESSORS AND APPLICATIONS (E)

(Prior to 2007 admissions only)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

1. Define Microprocessor and Microcomputer. Explain the difference between them.
2. Write about General purpose registers in 8085.
3. Explain different addressing modes in 8085.
4. Write a 8085 assembly language program to generate a delay of 0.1 sec for the given crystal frequency of 2 MHZ.
5. What are the interrupts available in 8085 ? Explain.
6. What is meant by Polling ? Explain.
7. Draw the schematic diagram of memory and I/O interfacing.
8. Explain the operating modes of 8255.
9. What is meant by Synchronous and Asynchronous data transfer ?
10. Write short notes on DMA Controller.

(10 × 4 = 40 marks)

Part B

11. Draw the internal architecture of 8085 and explain the functions.

Or

12. (a) Draw the timing diagram for opcode fetch operation.
(b) Draw the timing diagram for memory read operation.
13. Explain 8085 Instruction sets with examples.

Or

Turn over

14. Write an Assembly language program to perform BCD Addition using subroutine.

15. Explain Hardware interrupts in 8085 with neat diagram.

Or

16. Discuss Hardware and Software Polling.

17. Explain memory mapped I/O and I/O mapped I/O schemes.

Or

18. Draw the block diagram of 8255 PPI Chips and explain its operation.

19. (a) Explain Synchronous and Asynchronous data transfer schemes.

(b) Draw and explain a circuit for interfacing a stepper motor to 8085.

Or

20. Explain interfacing of 8279 with 8085 and write a program to illustrate its working.

(5 × 12 = 60 marks)

- 1. Define M. (10 × 4 = 40 marks)
- 2. Explain different addressing modes in 8085.
- 3. Write a 8085 assembly language program to generate a delay of 0.1 sec for the given crystal frequency of 2 MHz.
- 4. What are the interrupts available in 8085? Explain.
- 5. What is meant by Polling? Explain.
- 6. Draw the schematic diagram of memory and I/O interfacing.
- 7. Explain the operating modes of 8255.
- 8. What is meant by Synchronous and Asynchronous data transfer?
- 9. Write short notes on DMA Controller.

Part B

11. Draw the internal architecture of 8085 and explain the functions.

Or

12. (a) Draw the timing diagram for opcode fetch operation.

(b) Draw the timing diagram for memory read operation.

13. Explain 8085 Instruction sets with examples.

Or

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Reg. No.....

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

COMPUTER ORGANISATION (E)

(Prior to 2007 admissions only)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. Draw the functional block diagram of digital computer.
2. Explain Machine Cycle.
3. Draw and explain the circuit diagram of lookahead adder.
4. Write notes on ALU.
5. Compare static RAM with dynamic RAM.
6. What is meant by programmable logic device ? Give examples.
7. Explain Cache memory.
8. Write notes on virtual memory.
9. What is interrupt ? What are the interrupts available ?
10. Discuss serial bus standards.

(10 × 4 = 40 marks)

Part B

11. Draw and explain the organisation of CPU.

(12 marks)

Or

12. (i) Explain different bus structures.
- (ii) Explain hard wired control.
13. Draw and explain 4 bit parallel Adder Circuit.

(6 marks)

(6 marks)

(12 marks)

Or

Turn over

14. Draw and explain 2's complement subtractor circuit.

(12 marks)

15. Write notes on :

(a) Semiconductor RAM

(4 marks)

(b) EPROM.

(4 marks)

(c) Flash memory.

(4 marks)

Or

16. (a) With neat diagram explain PAL.

(6 marks)

(b) Explain the applications of FPLA.

(6 marks)

17. Explain various cache mapping scheme.

(12 marks)

Or

18. Write notes on :

(a) Memory interleaving.

(6 marks)

(b) Virtual memory.

(6 marks)

19. Discuss different types of interrupts.

(12 marks)

Or

20. Write notes on "data communication interfaces and standards".

(12 marks)

[5 × 12 = 60 marks]

Part B

11. Draw and explain the organisation of CPU.

(12 marks)

Or

12. (i) Explain different bus structures.

(6 marks)

(ii) Explain hand wired control.

(6 marks)

13. Draw and explain 4 bit parallel Adder Circuit.

(12 marks)

Or

Turn over

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

DIGITAL SIGNAL PROCESSING (E)

(Prior to 2007 admissions)

[Supplementary]

Maximum : 100 Marks

Time : Three Hours

Answer all questions.

Part A

1. What are the elements of signal processing system and write the advantages of DSP ?
2. Define causality and stability.
3. List any four properties of DFT.
4. Compare DIT and DIF algorithms.
5. State and prove linearity and time shifting property of z-transform.
6. Distinguish between IIR and FIR filters.
7. What is the necessary and sufficient condition for linear phase characteristics in FIR filter ? Compare Hamming window with Kaiser window.
8. Give the expression for the frequency response of :
 - (a) Hanning Window.
 - (b) Hamming Window.
9. List out the properties of Butterworth and Chebyshev Low pass filter.
10. State the features of TMS 320 C family processors. (10 × 4 = 40 marks)

Part B

11. (i) Explain the properties of discrete time Fourier transform. (6 marks)
- (ii) Find $x(n)$ for the given Fourier transform $X(e^{j\omega}) = e^{-j\omega/2}$ for $-\pi \leq \omega \leq \pi$. (6 marks)

Turn over

12. Find the frequency response of the system having impulse response

$$h(n) = \frac{1}{2} \delta(n) + \delta(n-1) + \frac{1}{2} \delta(n-2).$$

(12 marks)

13. (i) State and prove time shifting property of DFT.

(6 marks)

(ii) Find the DFT of the sequence

$$x(n) = \begin{cases} 1, & 0 \leq n \leq 7 \\ 0 & \text{otherwise} \end{cases}$$

by using DIF algorithms.

(6 marks)

14. An 8 point sequence is given by $x(n) = \{2, 2, 2, 2, 1, 1, 1, 1\}$. Compute 8 point DFT of $x(n)$ by radix-2 DIT FFT.

(12 marks)

15. (i) Discuss the properties of z -transform.

(6 marks)

(ii) Determine the inverse z -transform of $x(z) = \frac{1}{1 - 1.5z^{-1} + 0.5z^{-2}}$.

(6 marks)

16. Obtain the direct form I, direct form II cascade and parallel form realization for the system

$$y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2).$$

(12 marks)

17. Design a FIR bandpass digital filter satisfying the following specifications : —

$$f_{p1} = 20\text{Hz} \quad \alpha_p = 0.5 \text{ dB}$$

$$f_{p2} = 30\text{Hz} \quad \alpha_s = 30 \text{ dB}$$

$$f_{s1} = 10\text{Hz}, \quad f_{s2} = 40\text{Hz} \quad F = 100\text{Hz}.$$

(12 marks)

18. Explain FIR filter design using frequency sampling method.

(12 marks)

19. Design a digital Butterworth filter satisfying the constraints :

$$0.707 \leq |H(e^{j\omega})| \leq 1 \text{ for } 0 \leq \omega \leq \frac{\pi}{2}$$

$$|H(e^{j\omega})| \leq 0.2 \text{ for } \frac{3\pi}{4} \leq \omega \leq \pi$$

with $T = 1$ sec using impulse invariant method.

(12 marks)

Or

20. Draw and explain the architecture of TMS 320 C family processors.

(12 marks)

[5 × 12 = 60 marks]

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2010

Seventh Semester

Branch—Electrical and Electronics Engineering

SYSTEM DESIGN WITH MICROCONTROLLERS (E)

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Where are GFO and GFI flags stored in 8051. Describe its configuration.
2. Write a note on the bit address able area of 8051.
3. Enumerate the difference between MOVX and MOVC instructions.
4. Name the only flag that gets affected during Rotate instruction in 8051. Give its significance.
5. Differentiate between ACALL and LCALL instruction of 8051.
6. Explain the methods of introducing time delays in 8051.
7. Differentiate between multiple keys and rapid key hit of a keyboard.
8. How does 8051 handle multiple interrupts for small systems ?
9. Describe the specifications of ROM and RAM for which 8051 may be used independently.
10. How do you check to ensure that microcontroller can fetch and execute programs from EPROM.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Describe the different modes of operation of timers in 8051.

Or

12. Interrupt handling play an important role in real time programming. How is this incorporated in 8051 ?
13. Write a note on bit level logical operations in 8051.

Or

14. The number A6h is placed somewhere in external RAM between locations 0100h and 0200h. Find the address of that location and put the address in R6 (LSB) and R7 (MSB).

Turn over

15. Explain how lookup table technique is made efficient in 8051.

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16. Write a program to take a character in A register, transmit it, accommodate delay for the transmission time and then return to the calling program. Assume Timer 1 is to be set at baud rate of 2400 and delay for one 10-bit character is 5 ms.

17. Write short notes on different types of display devices familiar with.

(Regulator's supplementary)

18. Write a program that can digitize an input voltage and store the value in external RAM location 4000 h to 43 E7h. The inputs have to be sampled in every 100 μs.

19. With a neat block diagram, explain how a stand alone microcontroller can be designed.

Or

20. Explain the configuration of PLC with a diagram.

1. Where are GPO and GFI flags stored in 8051. Describe its configuration. (5 marks)
2. Write a note on the bit addressable area of 8051.
3. Enumerate the difference between MOVX and MOVC instructions.
4. Name the only flag that gets affected during Rotate instruction in 8051. Give its significance.
5. Differentiate between ACALL and LCALL instruction of 8051.
6. Explain the methods of introducing time delays in 8051.
7. Differentiate between multiple keys and rapid key hit of a keyboard.
8. How does 8051 handle multiple interrupts for small systems?
9. Describe the specifications of ROM and RAM for which 8051 may be used independently.
10. How do you check to ensure that microcontroller can fetch and execute programs from EPROM. (10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

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Or

12. Interrupt handling play an important role in real time programming. How is this incorporated in 8051?

13. Write a note on bit level logical operations in 8051.

Or

14. The number Agh is placed somewhere in external RAM between locations 0100h and 0200h. Find the address of that location and put the address in R6 (LSB) and R7 (MSB).