G 2176 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

CONTROL SYSTEM—I (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Part A

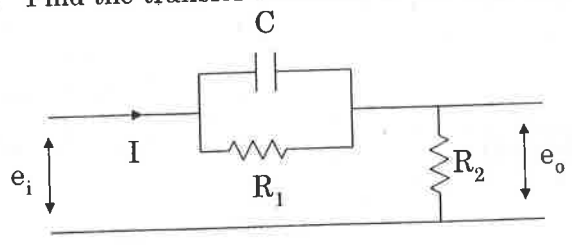
Answer **all** *the questions.*
Each question carries 4 *marks.*

1. Explain the application of Laplace transform to control systems.
2. Explain the Mason's gain formula.
3. Define and explain type and order of a system.
4. Define Error constants.
5. What is asymptotic stability ? Explain in detail.
6. Explain the advantages and applications of root locus technique.
7. What is Bode plot ? Explain in detail.
8. Differentiate phase margin from gain margin.
9. What are synchros ? Explain.
10. Explain the chracteristics of tachogenerators.

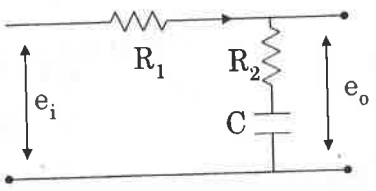
(10 × 4 = 40 marks)

Part B

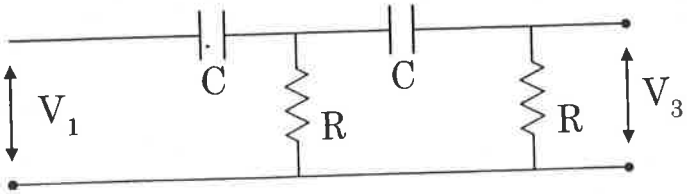
11. Find the transfer functions of the following networks :



Or



12. Draw the signal flow graph for the network shown below and hence find V_3/V_1.



Turn over

13. Define and explain the time domain specifications.

Or

14. The open-loop transfer function of an unity feedback control system is given by

$$C(s) = \frac{100}{s(s+2)(s+5)}.$$

For unit step input, find the time response of the closed loop system and determine percentage overshoot and the rise time.

15. Construct the root locus for the given function and find τ for K = 2.

$$GH(s) = \frac{K}{(s+1)\left(s^2+4s+4\right)}.$$

Or

16. Explain Routh's Hurwitz stability criterion. Choose the real value of K so that the system is just oscillatory for the function :

$$F(s) = s^4 + Ks^3 + (K+4)s^2 + (K+3)s + 4 = 0.$$

17. Draw the Bode plots for the function

$$G(s) = \frac{(1+sTa)(1+sTb)}{(1+sT_1)(1+sT_2)}$$

where $T_1 > T_a > T_b > T_2$.

Or

18. Find the gain margin and phase margin for $HG(s) = \frac{2(s+1)}{s^2}$. Also find w.

19. Find the breakaway point for the function

$$GH(s) = \frac{K}{s(s+1)(s+3)(s+4)}.$$

Or

20. Write technical notes on :

(a) Gyroscopes. (4 marks)

(b) Rotating amplifiers. (4 marks)

(c) Amplidyne. (4 marks)

[5 × 12 = 60 marks]

G 2185 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES—II (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Explain single layer and double layer winding.
2. Explain revolving magnetic field.
3. Explain "effects of harmonics on pitch and distribution factors'.
4. Draw the circuit model of synchronous machine.
5. Explain how proper synchronization is achieved in alternators.
6. Explain the principle of operation of synchronous motor.
7. Explain the construction of 'V' curves.
8. What is synchronous condenser ?
9. Compare synchronous and induction motors.
10. Explain the principle of operation of Brushless Alternators.

(10 × 4 = 40 marks)

Part B

11. (a) The stator of 3-phase, 16 pole alternator has 144 slots and there are 4 conductors per slot connected in two layers and the conductors of each phase are connected in series. If the speed of the alternator is 375 r.p.m, calculate the e.m.f. generator per phase. Resultant flux in the air gap is 5×10^{-2} webers/pole sinusoidally distributed. Assume coil span 150°. (6 marks)

    (b) Explain constructional features of salient pole machines. (6 marks)

Or

12. (a) Draw and explain different types of armature winding. (6 marks)

    (b) What is meant by phase grouping ? (6 marks)

13. (a) Explain parallel operation of alternators. (6 marks)

    (b) Discuss about synchroscope. (6 marks)

Or

Turn over

14. (a) Discuss two reaction theory. (6 marks)

(b) Describe slip test measurement of Xd, Xq. (6 marks)

15. (a) Explain synchronising power and torque. (6 marks)

(b) Explain load sharing. (6 marks)

Or

16. (a) Explain starting of synchronous motors. (6 marks)

(b) Discuss hunting in synchronous machine. (6 marks)

17. (a) Explain power angle characteristics of cylindrical rotor and salient pole machines. (6 marks)

(b) Write notes on steady state stability limit. (6 marks)

Or

18. Explain construction of V-curves inverted V-curves and O-curves. (12 marks)

19. (a) Explain methods of increasing the response of an exciter. (6 marks)

(b) Explain the Kronls primitive machine and develop the voltage, power and torque equations. (6 marks)

Or

20. (a) Explain the static excitation methods used in synchronous machines. (6 marks)

(b) Explain the constructional features of Brushless alternators. (6 marks)

($5 \times 12 = 60$ marks)

G 2194 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL POWER TRANSMISSION (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. Define "skin effect" and peroximity effect in transmission line.
2. Explain the effect of earth on line capacitance.
3. Short note on "testing of insulators".
4. What is Damper ? Explain.
5. Describe tap changing transformer.
6. Explain the need of voltage control in transmission line.
7. What is corona ? Explain the various methods used to reduce corona.
8. Explain the reactance earthing in detail.
9. What are the limitations of EHV AC transmission ?
10. What are the advantages of HVAC transmission ?

(10 × 4 = 40 marks)

Part B

11. Derive the inductance of three-phase line with unsymmetrical spacing.

Or

12. Derive the capacitance of three-phase line with symmetrical spacing.

13. What is Line insulator ? Explain its types in detail.

Or

14. (a) What is sag ? Explain. (4 marks)

    (b) A three-phase line is supported by a string of three similar insulators. If the voltage across the lowest unit is 20 kV, shunt capacitance between earth and insulator is $1/20^{th}$ of the capacitance insulator. Find the line voltage. (8 marks)

15. Derive the ABCD constants and phase diagram of a transmission line.

Or

Turn over

16. (a) Explain Ferranti effect. (4 marks)

(b) Explain the analysis of medium line by T method. (8 marks)

17. (a) Discuss the radio interference effect of power transmission line. (6 marks)

(b) Explain the method used for measuring earth resistance. (6 marks)

Or

18. Short notes on :

(a) Lower footing resistance. (4 marks)

(b) Neutral grounding. (4 marks)

(c) Grounding transformer. (4 marks)

19. What is EHV transmission ? Explain in detail.

Or

20. Write short notes on :

(a) Graztz circuit. (6 marks)

(b) EHV systems in India. (6 marks)

[5 × 12 = 60 marks]

G 2202 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

DIGITAL SIGNAL PROCESSING (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. List out the advantages and disadvantages of DSP.
2. List out any *four* properties of DFT.
3. Distinguish between linear and circular convolution of two sequences.
4. What is FFT ? Why FFT is needed ?
5. State the initial value theorem and the final value theorem.
6. Draw the parallel form structure of IIR filter.
7. What are the desirable and undesirable features of FIR filters ?
8. What is the principle of designing FIR filter using frequency sampling method ?
9. What is meant by impulse invariant method of designing IIR filter ?
10. Give the equation for the order of N and cut-off frequency ΩC of Butterworth filter.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Explain the classifications of Discrete time systems. (4 marks)

(b) Determine the convolution of two sequences :

$$x(n) = \{3, 2, 1, 2\},\ h(n) = \{1, 2, 1, 2\}$$
$$\uparrow$$

(8 marks)

Or

12. (a) State and prove the convolution property of DTFT. (6 marks)

(b) Find the Fourier transform of $x(n) = \left(\frac{1}{2}\right)^{n-1} u(n-1)$. (6 marks)

Turn over

13. Compute 4-point DFT of the following sequences using (a) DIT ; (b) DIF algorithm :

$x(n) = \{1, 2, 3, 4\}$

$x(n) = \{1, 1, -1, -1\}$.

(12 marks)

Or

14. Explain the properties of DFT. (12 marks)

15. (a) Find the inverse z-transform of $X(z) = \log\left(1 - 0.5z^{-1}\right); |z| > 0.5$ using differentiation property. (6 marks)

(b) Find the z-transform of $x(n) = \left(-\frac{1}{5}\right)^n u(n) + 5\left(\frac{1}{2}\right)^{-n} u(-n-1)$. (6 marks)

Or

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

$$y(n) = \frac{5}{6} y(n-1) + \frac{1}{6} y(n-2) = x(n) + 2x(n-1).$$

(12 marks)

17. Determine the filter co-efficients $h(n)$ obtained by sampling :

$$Hd\left(e^{jw}\right) = e^{-j(N-1)w/2}, \quad 0 \le |w| \le \pi/2$$
$$= 0 \quad , \quad \pi/2 \le |w| \le \pi$$

for N = 7.

Or

18. Explain FIR filter design using windows. (12 marks)

19. For the given specifications design an analog Butterworth filter :

$0.9 \le |H(j\Omega)| \le 1$ for $0 \le \Omega \le 0.2\pi$

$|H(j\Omega)| \le 0.2$ for $0.4\pi \le \Omega \le \pi$.

(12 marks)

Or

20. Describe the features of TMS320C family processor with neat diagram. (12 marks)

[5 × 12 = 60 marks]

G 2211 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

MICROPROCESSOR AND APPLICATIONS (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain T state, machine cycle and instruction cycle.
2. Draw and explain 8085 bus structures.
3. Discuss classifications of 8085 instructions.
4. Write a 8085 program to generate a delay of 0.6 Sec for the given crystal frequency of 5 MHz.
5. Define stack pointer and stack.
6. Explain 8085 interrupts.
7. Differentiate memory mapped I/O and I/O mapped I/O.
8. Explain the features of 8255.
9. Write short notes on interfacing microprocessor to stepper motor.
10. Compare 8085 microprocessor with 8086 processor.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Draw the architecture of 8085 microprocessor and explain main parts in it.

Or

12. Draw the timing diagram for MVI A, 08.

13. (a) Write a program to arrange numbers in descending order. (6 marks)

    (b) Write a assembly level program and multiply 2, 8-bit numbers. (6 marks)

Or

14. (a) Write a program to find a greatest number in an array. (6 marks)

    (b) Write a program to divide two 8 bit numbers. (6 marks)

Turn over

15. Explain stack pointer and stack operation with example.

Or

16. (a) What are the types of interrupts in 8085 ? Explain in detail the hardware interrupts. (6 marks)

(b) What do you mean by polling in 8085 ? (6 marks)

17. Explain the I/O mode operation of 8255 in detail.

Or

18. Explain the interfacing of Alpha numeric displays to Microprocessors.

19. Explain how ADC chip can be interfaced with Microprocessor.

Or

20. Draw the internal architecture of 8086.

[5 × 12 = 60 marks]

G 2220 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2010

Sixth Semester

Branch : Electrical and Electronics Engineering

COMPUTER ORGANISATION (E)

(Regular—2007 admissions ; Supplementary—Prior to 2007 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What is microprogrammed control ? Explain.
2. Discuss bus structures.
3. Draw and explain the circuit diagram of 2's complement adder.
4. What is meant by one stage ALU ? Explain.
5. Discuss Flash memory.
6. What are the applications of FPLA ?
7. What is meant by memory interleaving ?
8. Discuss mapping functions.
9. What is synchronous asynchronous buses ?
10. Explain DCI.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Draw the functional block diagram of digital computer and explain each block in its.

Or

12. (a) Compare Microprogrammed control and hardwired control. (6 marks)

    (b) Discuss about typical operation cycle. (6 marks)

13. Explain the operation of serial and parallel adder circuit with neat diagram.

Or

14. Explain multiplication and division operations.

Turn over

15. Explain the following :—

(a) Main memory. (4 marks)

(b) Auxiliary memory. (4 marks)

(c) E^2 PROM. (4 marks)

Or

16. (a) Compare PAL with PLA. (6 marks)

(b) Explain simple programmable logic devices any one. (6 marks)

17. Draw and explain internal organisation of memory chips.

Or

18. Explain the following :—

(a) Cache memory. (6 marks)

(b) Associative mapping. (6 marks)

19. Explain how CPU handles multiple devices.

Or

20. Explain RS232 and RS423 bus standards.

[5 × 12 = 60 marks]