

F 9391

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL POWER TRANSMISSION (E)

(2002 Admissions onwards—Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. What is meant by transposing of transmission lines? Explain.
2. What are GMD and GMR? Explain.
3. Explain the factors affecting sag. Explain.
4. Discuss the effect of ice and wind loading on sag.
5. What are the various types of insulators? Explain, what is string efficiency?
6. What is meant by corona? Explain.
7. Explain the reactance earthing in detail.
8. Derive the voltage variation across a suspensions insulator.
9. What is meant by neutral grounding?
10. Write note on the requirements of EHV lines.

(10 × 4 = 40 marks)

Part B

11. Derive the inductance of three phase line with unsymmetrical spacing. (12 marks)
- Or*
12. Derive capacitance of three phase line with unsymmetrical spacing. (12 marks)
 13. A 3 phase 132kV, 50 Hz overhead line has ACSR conductors of equivalent copper area 1.5 cm² and effective diameter 39.8 mm; spaced equilaterally 8 m apart (a) Find line parameters. (b) Find charging current and charging MVA Resistivity of copper is $1.73 \times 10^{-6} \Omega\text{-cm}$.

(12 marks)

Or

14. Derive the expression for maximum sag of an overhead line suspended between two points at the same level.

(12 marks)

15. A 3ϕ 50Hz overhead transmission line has the following distributed parameters. Resistance = 28Ω . Inductive reactance = 63Ω capacitive susceptance = $4 \times 10^{-4}\Omega$. If the load at the receiving end is 75 mVA at 0.8 pf lagging with 132kV between lines, calculate. (a) voltage. (b) current. (c) power factor at the sending end (d) regulation and efficiency of transmission for this load. Use nominal π method. Draw the phasor diagram also.

(12 marks)

Or

16. (a) Write notes on tap changing transformer and booster transformer. (7 marks)
 (b) Explain the methods to reduce corona. (5 marks)
17. (a) Write notes on resistance, reactance and arc suppression coil earthing. (8 marks)
 (b) Write note on measurement of earthing resistance. (4 marks)

Or

18. (a) What are the various types of substations? Which are the substations components? (6 marks)
 (b) Draw the:
 (i) Single line schematic diagram of one bay in switch yard.
 (ii) Single bus arrangement of primary substation.
 (iii) Double bus arrangement of primary substation.

(6 marks)

19. (a) Describe the merits and demerits of HVDC transmission. (6 marks)
 (b) Write notes on main components of HVDC transmission. (6 marks)

Or

20. (a) Discuss the insulation requirements in EHV lines. (6 marks)
 (b) Write notes on EHV systems in India. (6 marks)

(5 × 12 = 60 marks)

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(Pages : 2)

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Sixth Semester

Branch—Electrical and Electronics Engineering

MICROPROCESSOR AND APPLICATIONS (E)

(2002 Admissions onwards—Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all the questions.

Part A

Each question carries 4 marks.

1. Define and explain T-state.
2. What is the significance of timing diagram ? Explain.
3. What is ALP ? Explain. Give examples.
4. What is look-up table ? What is its use ?
5. What is a stack pointer ? Explain.
6. Define and explain polling.
7. Differentiate ROM from RAM. Explain the difference.
8. What is Interfacing ? Why is it needed ?
9. State and explain the advantages of Asynchronous data transfer.
10. List and explain the addressing modes of Intel 8086. (10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Bring out the differences between Microcomputer and Microprocessor.

Or
12. Explain the Pin diagram and architecture of Intel 8085 with neat diagrams.
13. Write an ALP to find the largest and smallest number in a data array. Explain the steps in detail.

Or
14. Describe in detail the Instruction set of 8085.
15. Explain the types of Interrupt in Intel 8085 in detail.

Or
16. Explain the following :
 - (a) SIM and RIM Instructions.
 - (b) Software and Hardware Polling.

Turn over

16. Explain the following in detail.

(a) EPROM.

(b) ROM.

(c) DRAM.

(d) FPLA.

17. Explain the Internal organisation of memory chips with neat diagrams.

Or

18. Explain the following :

(a) Virtual memory.

(b) Cachememory.

(c) Associative mapping.

19. Give in account on "Handling multiple devices in I/O organisation.

Or

20. Write technical notes on :

(a) PCI.

(b) GPIB IEEE 488.

(5 × 12 = 60 marks)

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Reg. No. EEE

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Sixth Semester

Electrical and Electronics Engineering

CONTROL SYSTEM—I (E)

(2002 Admissions onwards—Supplementary)

Maximum : 100 Marks

Time : Three Hours

Graph sheets and Semi log sheets to be supplied.

Answer all the questions.

Part A

Each question carries 4 marks.

1. Discuss merits and demerits of open and closed loop control systems.
2. What is meant by block diagram? Obtain the block diagram of the network shown in Fig. 1.

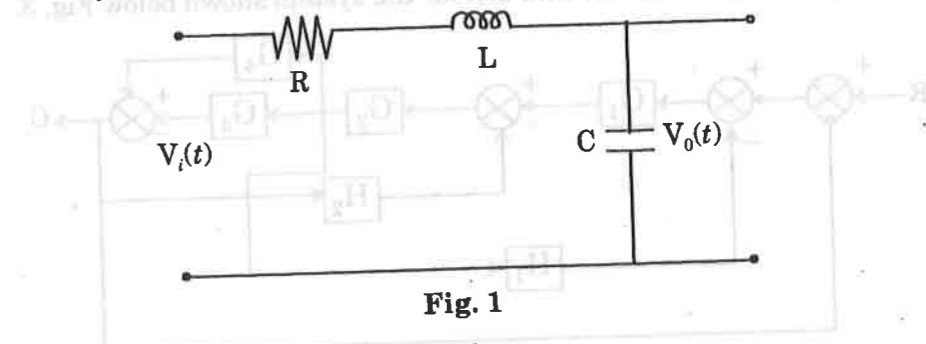


Fig. 1

3. Explain the terms related to signal flow graph.
 - (a) Node and branch.
 - (b) Source node and sink node.
 - (c) Closed loop and self loop.
 - (d) Path gain and loop gains.
4. Explain the Mason's gain formula
5. Obtain the Laplace transforms of standard test signals.
6. Derive the error constants K_p , K_v , K_a for types 0 system with step input.
7. Explain the principle of operation of stepper motor.
8. What are tacho generators? Explain.
9. What are synchros? Explain.
10. Distinguish between Rotating amplifier and Magnetic amplifier.

(10 × 4 = 40 marks)

Turn over

Part B

Answer all questions.
Each question carries 12 marks.

11. Derive the transfer function of a field controlled dc motor.

Or

12. Plot the poles and zeros of the network shown in Fig. 2 below :

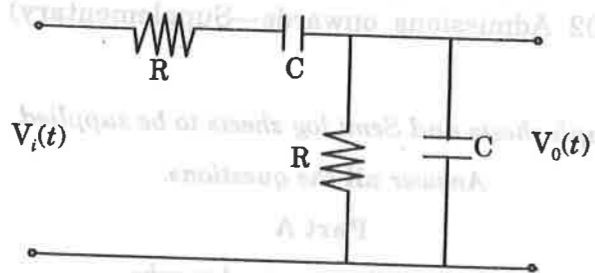


Fig. 2

where $R = C = 1$.

13. Using block diagram reduction rules find C/R for the system shown below Fig. 3.

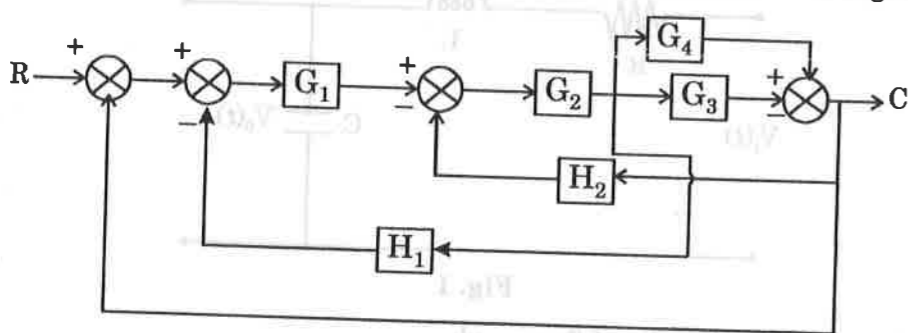


Fig. 3

Or

14. For a closed loop system with $G(s) = \frac{1}{s} + 5$ and $H(s) = 5$, determine the generalized error coefficients and the error series.

15. A servomechanism is represented by the differential equation $\frac{d^2\theta}{dt^2} + 10 \frac{d\theta}{dt} = 150 E$ where $E = (r - \theta)$ is the actuating signal. Calculate the value of damping ratio, undamped and damped frequency of oscillations.

Or

16. Using Routh's stability criterion, ascertain the stability for each of the following

(a) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$.

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

17. Explain the procedure for plotting root locus.

Or

18. Explain the Nyquist criterion to determine stability of a system.

19. Sketch the polar plot for $G(s) = \frac{20}{s(s+1)(s+2)}$.

Or

20. Draw the bode plot for the transfer function $G(s) = \frac{50}{s(1+0.25s)(1+0.1s)}$.

From the graph determine.

- (a) Gain cross over frequency.
- (b) Phase cross over frequency.
- (c) GM and PM.

(5 × 12 = 60 marks)

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES-II (E)

(2002 Admissions onwards—Supplementary)

Maximum : 100 Marks

Time : Three Hours

*Answer all questions.
Graph sheets to be supplied.*

Part A

Each question carries 4 marks.

1. Explain with diagrams, the constructional details of salient pole alternators.
2. Discuss the methods of excitation of the serial winding of an alternator.
3. What is meant by pitch factor, distribution factor and winding factor ?
4. Discuss the suppression of harmonics in alternators.
5. What is meant by regulation of an alternator ? Explain.
6. Discuss the two-reactance concept of salient pole synchronous machines.
7. What is meant by reluctance power ? Explain.
8. Discuss the transient conditions of operation of alternators.
9. What is meant by synchronous condenser ? Explain.
10. Explain the methods of increasing the response of an exciter. (10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. (a) Derive the pitch and distribution factor of an a.c. winding. (6 marks)
(b) A 3 φ 8-pole 750 r.p.m. star-connected alternator has 72 slots on the armature. Each slot has 12 conductors and the winding is short chorded by 2 slots. Find the pitch, distribution and winding factor. (6 marks)

Or

12. (a) Explain the armature reaction is effect on alternators at various power factors. (8 marks)
(b) Explain the m.m.f. method. (4 marks)

Turn over

13. The open-circuit, short-circuit and full load zero power factor tests on a 6-pole, 440 V 50 Hz 3 phase Y connected alternator is shown below :

Field current A	:	2	4	6	7	8	10	12	14	16	18
OC terminal voltage	:	156	288	396	440	474	530	568	592	—	—
SC line current	:	11	22	34	40	46	57	69	80	—	—
2 PF terminal voltage	:	—	—	—	0	80	206	314	398	460	504

Find the regulation for full-load output at 40 A at rated voltage and 0.8 p.f lagging by 2 PF method. The effective resistance between any two terminals is 0.3Ω .

Or

14. A 1500 kVA, 6600 V, 3 ϕ , star-connected alternator with a resistance of 0.4Ω and reactance of 6Ω per phase, delivers full-load current at 0.8 p.f. lagging, and at normal rated voltage. Estimate the terminal voltage for the same excitation and load current at 0.8 power factor leading.

(12 marks)

15. (a) Explain the two-reaction theory. (6 marks)
 (b) Explain the construction of two reaction diagrams. (6 marks)

Or

16. A 10 kVA, 380 V, 50 Hz, 3 ϕ , star-connected salient pole alternator has direct axis and quadrature axis reactances of 12Ω and 8Ω respectively. The armature has a resistance of 1Ω per phase. The generator delivers rated load at 0.8 p.f. lagging with terminal voltage being maintained at rated value. If the load angle is 16.15° , determine the direct axis and quadrature axis component of armature current and excitation voltage.

(12 marks)

17. (a) Explain the principle of operation of a synchronous motor. What is meant by hunting? (6 marks)

- (b) Explain the methods of starting of synchronous motors. (6 marks)

Or

18. A 2000 V, 3 ϕ , star-connected synchronous motor has an effective resistance and synchronous reactance of 0.2Ω and 2.2Ω per phase respectively. The input is 800 kW at normal voltage and the generated e.m.f. is 2500 V. Calculate the line current and power factor.

(12 marks)

19. Describe the principle of operation and constructional details of brushless alternator.

Or

20. (a) Explain the Krouls primitive machine and develop the voltage power and torque equations. (6 marks)
 (b) Explain the static excitation methods used in synchronous machines. (6 marks)

[5 × 12 = 60 marks]

B.TECH. DEGREE EXAMINATION, NOVEMBER 2011**Sixth Semester**

Branch : Electrical and Electronics Engineering

DIGITAL SIGNAL PROCESSING (E)

(2002 Admissions onwards—Supplementary)

Time : Three Hours

Maximum : 100 Marks

*Answer all questions.***Part A***Each question carries 4 marks.*

1. Explain the classifications of Discrete Time Signals.
2. Differentiate between energy and power signals.
3. State and prove convolution property of DFT.
4. Compute the DFT of the sequence $x[n] = n, 0 \leq n \leq 3$ using DIT FFT algorithm.
5. Obtain the linear phase realization of the filter with impulse response $h[n] = \{1, 2, 3, 4, 3, 2, 1\}$.
6. Explain what is meant by ROC in Z domain.
7. Compare the different window functions.
8. What are the advantages and disadvantages of frequency sampling method of designing FIR filter?
9. Compare Butterworth and Chebyshev filters.
10. Explain frequency warping in bilinear transformation.

(10 × 4 = 40 marks)

Part B*Each question carries 12 marks.*

11. (a) Consider a system whose output $y(n)$ is related to the input $x(n)$ by $y(n) = \sum_{k=-\infty}^{\infty} x(k)x(n+k)$.

Determine whether or not the system is stable and causal.

(6 marks)

- (b) State and prove any three properties of DTFT.

(6 marks)

*Or***Turn over**

12. Determine the Discrete Time Fourier Transform of the following sequences :

$$(a) \quad x(n) = 1, |n| \leq N_1 \\ = 0, |n| > N_1$$

(4 marks)

$$(b) \quad x(n) = 0.5^n u[n] + 2^n u[-n-1].$$

(4 marks)

$$(c) \quad x(n) = n(0.4)^{3n} U[n].$$

(4 marks)

13. (a) If $x(n) = \delta[n] + 3\delta[n-1] + 2\delta[n-3] + 6\delta[n-4]$, find a finite length sequence $y[n]$ that has a 6 point DFT $Y(k)$ given by $Y(k) = W_3^{2k} X(k)$, where $X(k)$ is the DFT of $x[n]$.

(6 marks)

(b) What is the improvement in speed in terms of number of complex additions and multiplications in calculating 1024 point DFT of a sequence using Direct computation and FFT algorithm ?

(6 marks)

Or

14. Compute the DFT of the sequence $x(n) = \{-1, 2, 0, 2, 1\}$. Sketch the magnitude and phase spectrum.

(12 marks)

15. (a) Find the inverse Z-Transform of $X(z) = \frac{z}{(z-3)(z-2)^2}$ for all possible ROCs. (8 marks)

(b) Find the Z-Transform of the sequence $x(n) = 0.5^n u[n] + 1.5^n u[-n-1]$. (4 marks)

Or

16. Realize the filter described by the following difference equation in Direct form II, cascade and Parallel forms :

$$y[n] = -\frac{3}{8} y[n-1] + \frac{3}{32} y[n-2] + \frac{1}{64} y[n-3] + x[n] + 3x[n-1] + 2x[n-2].$$

(12 marks)

17. Design an ideal FIR high pass filter with cutoff frequency $\frac{\pi}{4}$ rad/sec and $N = 11$ using Hanning window.

(12 marks)

Or

18. A low pass filter has the desired frequency response

$$H_d(e^{j\omega}) = e^{-j3\omega} = 0 \leq \omega \leq \frac{\pi}{2} \\ = 0 \quad \frac{\pi}{2} \leq \omega \leq \pi$$

Determine $h[n]$ based on frequency sampling technique. Take $N = 7$.

(12 marks)

19. Design a low pass digital Chebyshev filter to satisfy the following specifications using bilinear transformation :

Stop band attenuation = 18 dB

Pass band Edge = 100 Hz

Pass band attenuation = 1 dB

Stop band Edge = 150 Hz

Sampling Frequency = 1 kHz

(12 marks)

Or

20. With a neat block schematic explain the features of TMS 320C family processor.

(12 marks)

[5 × 12 = 60 marks]

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B.TECH. DEGREE EXAMINATION, NOVEMBER 2011

Sixth Semester

Branch—Electrical and Electronics Engineering

MICROPROCESSOR AND APPLICATIONS : (E)

(2002 Admissions onwards—Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer all the questions.

Part A

Each question carries 4 marks.

1. Define and explain T-state.
2. What is the significance of timing diagram ? Explain.
3. What is ALP ? Explain. Give examples.
4. What is look-up table ? What is its use ?
5. What is a stack pointer ? Explain.
6. Define and explain polling.
7. Differentiate ROM from RAM. Explain the difference.
8. What is Interfacing ? Why is it needed ?
9. State and explain the advantages of Asynchronous data transfer.
10. List and explain the addressing modes of Intel 8086. (10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. Bring out the differences between Microcomputer and Microprocessor.

Or
12. Explain the Pin diagram and architecture of Intel 8085 with neat diagrams.
13. Write an ALP to find the largest and smallest number in a data array. Explain the steps in detail.

Or
14. Describe in detail the Instruction set of 8085.
15. Explain the types of Interrupt in Intel 8085 in detail.

Or
16. Explain the following :
 - (a) SIM and RIM Instructions.
 - (b) Software and Hardware Polling.

Turn over

17. Explain the memory mapped I/O and I/O mapped I/O schemes in detail.

Or

18. Explain how to Interface LED and matrix keyboard with Microprocessor.

19. Explain the principle of DMA controller 8257 with a neat diagram.

Or

20. Write short notes on :

(a) Synchronous data transfer.

(b) 8275 CRT controller.

(5 × 12 = 60 marks)

Answer all the questions.

Part A

Each question carries 4 marks.

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2. What is the significance of timing diagram? Explain.
3. What is ALP? Explain. Give examples.
4. What is look-up table? What is its use?
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Part B

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