G 1431 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES—II (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

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

Part A

Each question carries 4 *marks.*

1. Compare salient pole and non-salient pole alternators
2. Explain briefly the constructional details of cylindrical pole alternator.
3. Write notes on single and double layer windings.
4. Explain armature effect in alternators.
5. What are the various methods for determining the regulation of an alternator ?
6. What is meant by ship test ? Explain.
7. Explain the power-angle characteristic of synchronous machines.
8. What are V and inverted V curves ? Explain.
9. What is meant by revolving magnetic field ? Explain.
10. Explain the methods to improve the response of an exciter.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Derive the e.m.f. equation of an alternator. (8 marks)

    (b) Calculate the e.m.f. of a 4 pole, 3-phase, star connected alternator running at 1,500 r.p.m. flux per pole 0.1 Wb, Total number of slots =48, conductors per slot (in two laryers) = 4, Coil span = 150°.

    (4 marks)

Or

12. (a) Explain the zero power factor method for obtaining voltage regulation. (6 marks)

    (b) Discuss any *one* method of synchronising of alternators. (6 marks)

Turn over

13. (a) A 3,300 V, star connected synchronous motor has a synchronous impedance of $0.4 + j\,5\Omega$ per phase. For an excitation e.m.f. of 4000 V and motor input power of 1,000 kW at rated voltage, Calculate the line current and power factor.

(8 marks)

(b) What is meant by hunting ? Explain. (4 marks)

Or

14. (a) Explain the methods of starting of synchronous motor. (6 marks)

(b) What is meant by synchronous condensor ? Explain. (6 marks)

15. (a) Explain the construction of V curves and O curves. (6 marks)

(b) Explain the two recation theory of salient poles machines. (6 marks)

Or

16. (a) What is meant by reluctance power ? Explain.

(b) A 400 V, 3-phase, star connected synchronous motor with $X_d = 6\Omega$ and $X_q = 4\Omega$ is running in parallel with an infinite bus. If its field current is reduced to zero, find the maximum reluctance power developed.

(12 marks)

17. (a) Discuss the stability limit of sycnhronous machines. (6 marks)

(b) Explain synchronising power and torque. (6 marks)

Or

18. Explain the constructional details and principle of operation Brushless alternator. (12 marks)

19. (a) Explain the static excitation methods used in synchronous machines.

(b) Explain the Khols primitive machines and develop the voltage, power and torque equations.

(12 marks)

Or

20. Write short notes on :

(a) Phone grouping.

(b) Integral and fractional slot winding.

(c) Skewed slots and harmonics.

(d) Short circuit ratio.

(12 marks)

[5 × 12 = 60 marks]

G 1440 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL POWER TRANSMISSION (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What are skin and proximity effects ? Explain.
2. What are GMD and GMR ? Explain.
3. What is meant by bundled conductors ?
4. Derive the expression for regulation of short transmission line.
5. Draw the phasor diagrams for nominal T and nominal II representation of transmission line.
6. What is meant by Ferrante effect ?
7. Draw the receiving and empower circle diagram and explain.
8. Write note on testing of insulators.
9. Define strong efficiency. What are the methods to improve strong efficiency ?
10. What are the main components of HVDC transmission ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

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

Or

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

13. Derive the expressions for sag of an overhead line suspended at different levels.

Or

14. An overhead line has ACSR conductor of 1.95 cm. diameter and a span of 244 m. The allowable tension is 3.56×10^4 N. Find (a) sag in still and conduction with no ice covering ; (b) Vertical sag when there is an ice covering of 0.96 cm. thickness and a horizontal wind pressure of 382 N/m.^{2} of projected area. Ice weighs 8920 N/m.^{3} (c) The line is carried by insulator strings 1.43 long. What should be the height of lowest cross arm for give a minimum ground clearance of 7.62 m. under bad whether conditions ? The conductor weight is 0.847 kg./m.

Turn over

15. (a) Describe the various types of insulators. (8 marks)

(b) A 3 unit insulator string is fitted with a guard ring. The capacitance of the link pins to metal work and guard ring can be asumed to be 15 % and 5 % of the capacitance of each unit. Determine the voltage distribution and string efficiency. (4 marks)

Or

16. A 200 km. long 3ϕ overhead line has a resistance of 48.7 Ω/phase, inductive resistance of 80.2 Ω/phase and capacitance (line to neutral) of 8.42 nF per km. It supplies a load of 13.5 MW at a voltage of 88 kV and power factor 0.9 lagging. Using nominal T current, find the sending end voltage current, regulation and power angle.

17. (a) Discuss the reaction interference effect on power transmission line. (6 marks)

(b) Wrie notes on visual and disruptive critical voltages and corono loss and its minimization. (6 marks)

Or

18. (a) Write notes on neutral grounding, resistance and reactance earthing. (8 marks)

(b) Write notes on arc-suppression coil grounding. (4 marks)

19. (a) Discuss the advantages and disadvantages of HVDC transmission. (6 marks)

(b) Draw the layout of components of HVDC transmission and explain. (6 marks)

Or

20. (a) Explain the need for EHV transmission. (6 marks)

(b) Write notes on BHV system in India. (6 marks)

[5 × 12 = 60 marks]

G 1457 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Branch : Electrical and Electronics Engineering

MICROPROCESSORS AND APPLICATIONS (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What is timing diagram ? Explain.
2. What are Opcode and Mnemonics ? Explain.
3. State any *five* differences between Intel 8085 and 8086.
4. Write the steps to find a square of a number from look-up table.
5. Explain the stack operations with examples.
6. What are CISC and RISC processors ?
7. Differentiate ROM from RAM.
8. What are PPI devices ? Give examples.
9. Explain the potential applications of microprocessors in system design.
10. Explain the features of 8275 CRT controller.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Broadly differentiate Microprocessors from Microcomputers.

Or

12. Draw the architecture of 8085 and explain it in detail.

13. Explain the different addressing modes of Intel 8085 in detail.

Or

14. Write an ALP to arrange a given data array in ascending and descending orders. Explain the steps.

15. Explain the types of Interrupts in Intel 8085 in detail.

Or

16. Explain in detail the software and hardware polling.

Turn over

17. Draw the block diagram of 8255 and explain in detail.

Or

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

19. Explain the procedure for interfacing ADC 0808 with a μp with a neat diagram.

Or

20. Differentiate Intel 8085 from Intel 8086 microprocessors.

(5 × 12 = 60 marks)

G 1466 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Electrical and Electronics Engineering

COMPUTER ORGANISATION (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the features and applications of Digital Computer.
2. Explain the basic bus structure in detail with a diagram.
3. Explain the working of fast adder with a neat diagram.
4. Give an account on "One Stage ALU"
5. Explain the applications of PLA devices.
6. Define and explain (i) Cache memory ; (ii) Flash memory.
7. What is direct mapping ? Explain.
8. What is address translation ? Explain in detail.
9. Explain the steps to enable an interrupt.
10. Differentiate synchronous from asynchronous buses.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 *marks.*

11. Explain the functional block diagram of a digital computer with a neat sketch.

Or

12. Explain the organization of a processor of a Digital Computer with a neat diagram.
13. Explain the principle of serial and parallel adders with neat diagrams in detail.

Or

14. Explain the principle of carry look a head adder with a neat sketch.

Turn over

15. Explain the construction, organization principle and applications of semiconducter RAM.

Or

16. Give an account on :

(i) PROM ; (ii) EPOM ; (iii) PLA.

(4 + 4 + 4 = 12 marks)

17. Explain the principle of associative mapping and memory interleaving.

Or

18. Give an account on (i) Virtual memory ; (ii) Memory interleaving.

19. Explain in detail the basic ideas of USB and SCSI.

Or

20. Write a technical note on ""RS 423 serial bus standards".

(5 × 12 = 60 marks)

G 1422 (Pages : 3) Reg. No.....EEE

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Electrical and Electronics Engineering

CONTROL SYSTEM—I (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Graph sheets and Semi-log sheets to be supplied.

Part A

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

1. Discuss the advantages and disadvantages of closed loop system.
2. Draw the block diagram of the circuit shown in Fig. 1 below :

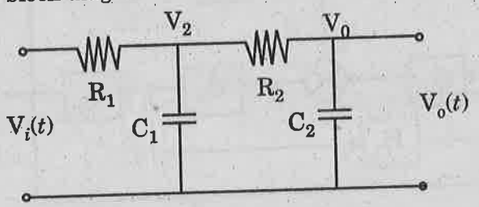


Fig. 1

3. Derive the relation $\frac{e(s)}{R(s)} = \frac{G(s)}{1 + G(s)H(s)}$ with an usual notations.
4. Mention four rules of block diagram reduction.
5. With suitable examples explain type and order of a system.
6. Briefly explain the integral derivative and PID control.
7. What is meant by non-minimum phase systems ? Explain.
8. What are Gain crossover and phase cross over frequencies ?
9. Explain DC and AC servo motors.
10. Explain with sketches, the operation of gyroscopes. What are their applications ?

(10 × 4 = 40 marks)

Turn over

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Obtain the transfer function of the mechanical system shown in Fig. 2 below :

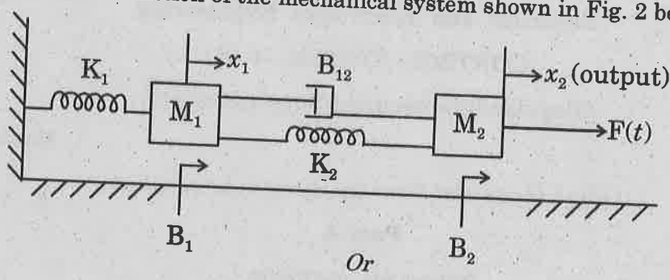


Fig. 2

Or

12. Determine the ratio $e(s)/R(s)$ for the system shown in Fig. 3 below :

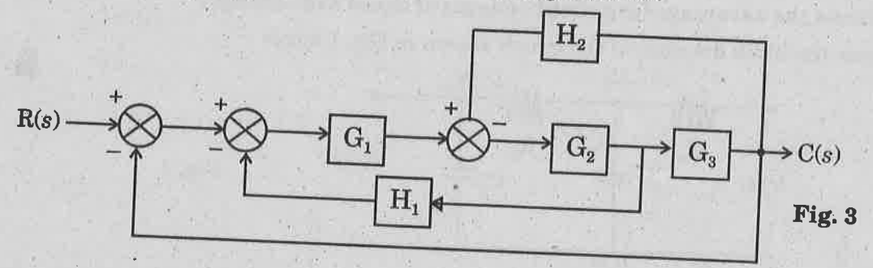


Fig. 3

13. Obtain the signal flow graph for the system shown in Fig. 4 and find the ratio C/R using Mason's gain formula.

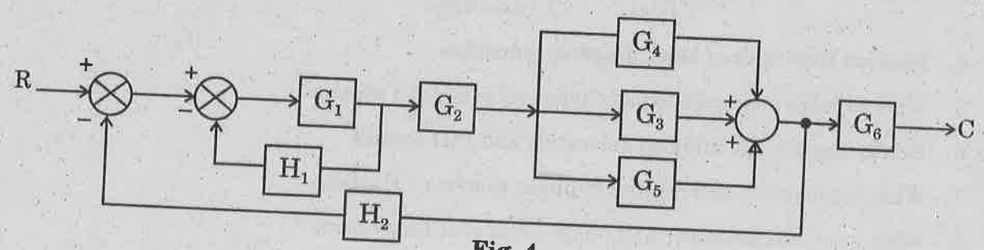


Fig. 4

Or

14. Determine the value of K such that the damping ratio is 0.5 for the system shown in Fig. 5 below. Also calculate the values of rise time and maximum overshoot for a step input.

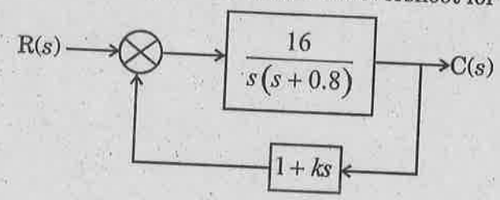
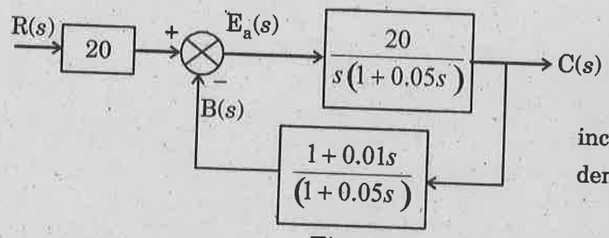


Fig. 5

15. Determine the actuating signal $E_a(s)$ for the system in Fig. 6 shown below. Calculate the positive error constant for unit step input.



include inside the box as denominator

Fig. 6

Or

16. Sketch the polar plot for $G(s) = 10/s(s+1)$.

17. Draw the root locus for $G(s) = \dfrac{K(s+1)}{(s-1)(s+2)(s+4)}$

Or

18 Using Nyquist stability criterion, determine the stability for the system with open-loop transfer function $G(s)H(s) = \dfrac{K(s+3)}{s(s-1)}$.

19. The closed loop transfer functions of a system is $\dfrac{e(s)}{R(s)} = \dfrac{50}{s(1+sT)(1+0.5s)+50}$. Find the value of T such that the system is driven on to the verge of instability and the resulting frequency of oscillations.

Or

20. Sketch the Bode plot for the system with $G(s) = \dfrac{10}{s(1+0.5s)(1+0.1s)}$. Determine the gain and phase crossover frequencies.

(5 × 12 = 60 marks)

G 1448 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2012

Sixth Semester

Branch : Electrical and Electronics Engineering

DIGITAL SIGNAL PROCESSING (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Check whether the signal $x[n]=30\cos\left(\frac{4n\pi}{30}+\frac{\pi}{5}\right)$ is periodic or not. If periodic, determine the fundamental period.
2. List the advantages and disadvantages of Digital Signal Processing.
3. State and explain the symmetry property of DFT.
4. Compute the DFT of the sequence $x[n]=1+n, 0\le n\le 3$ using DIF FFT algorithm.
5. Obtain the cascade realization of the filter with system function

$$H(z)=\left(1+2z^{-1}+z^{-2}\right)\left(2+3z^{-1}+2z^{-2}\right)$$

Using minimum number of multipliers.

6. State and prove the shifting property of one sided Z transform.
7. Compare different window functions.
8. List the desirable characteristics of a good window function.
9. Impulse invariant transformation is a many to one transformation. Explain.
10. What are the key features of TMS320C family processors ? (10 × 4 = 40 marks)

Part B

Each full question carries 12 *marks.*

11. (a) Check whether the given signals are energy signal or power signal.

(i) $x[n]=(-0.5)^n\,U[n]$.

(ii) $x[n]=\{-3,-2,-1,\underset{\uparrow}{2},2,1\}$ (6 marks)

(b) Find the Discrete Time Fourier Transform (DTFT) of $x[n]=4(2)^n\,U(-n)$. (6 marks)

Or

Turn over

12. (a) Determine whether or not the system described by the following impulse response is Stable and Causal.

(i) $h[n] = (3)^n \, U[-n]$.

(ii) $h[n] = h[n] = \sin\left(\frac{n\pi}{2}\right)$.

(8 marks)

(b) List any *four* properties of DTFT. (4 marks)

13. Consider the sequence $x[n] = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$, with 10 point DFT given by X[k], $0 \le k \le 9$. Evaluate the following without computing the DFT.

(a) X[0].

(b) X[5].

(c) $\sum_{k=0}^{9} X[k]$.

(d) $\sum_{k=0}^{9} |X[k]|^2$.

(12 marks)

Or

14. Develop an 8 point Radix 2 DIF FFT algorithm giving all necessary steps. Draw the flow graph. (12 marks)

15. (a) Determine the inverse Z Transform of $X(z) = \frac{z(z^2 - 4z + 4)}{(z-1)(z-2)(z-4)}$ for all possible ROC's.

(8 marks)

(b) Determine the Z Transform and ROC of $x[n] = n(2)^n \, U[-n]$. (4 marks)

Or

16. Obtain the direct form I, direct form II, cascade and parallel realizations of the system characterized by

$$H(z) = \frac{\left(1 + \frac{1}{5}z^{-1}\right)}{\left(1 - \frac{1}{2}z^{-1} + \frac{1}{3}z^{-2}\right)\left(1 + \frac{1}{4}z^{-1}\right)}.$$

(12 marks)

17. Design filter with the following specifications using Hamming window. Take N = 7.

$$H_d(e^{jw}) = e^{-j3w} \quad 0 \le |w| \le \frac{\pi}{4}$$

$$= 0 \quad \frac{\pi}{4} \le |w| \le \pi.$$

(12 marks)

Or

18. Design a low pass filter with pass band gain of unity and cut off frequency of 1000Hz and working at a sampling frequency of 5 kHz, using Hanning window. Take N = 7.

(12 marks)

19. For the analog transfer function $H(s) = \frac{s}{((s+0.1)^2 + 9)}$, determine H($z$) using

(a) impulse invariant method and

(b) bilinear transformation.

Take T = 1 sec. (12 marks)

Or

20. Design a digital Butterworth filter to satisfy the following constraint using bilinear transformation

$$0.707 \le |H(e^{jw})| \le 1, \quad 0 \le w \le 0.2\pi$$

$$|H(e^{jw})| \le 0.1, \quad 0.5\pi \le w \le \pi.$$

(12 marks)

[5 × 12 = 60 marks]