G 6879 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

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.

Part A

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

1. Distinguish between salient and non-salient pole alternators.
2. Explain single layer and double layer windings.
3. Write note on integral and fractional slot windings.
4. A 3ϕ 16 pole alternator has star-connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb, fine distributed and speed is 375 r.p.m. find the frequency, phase and line e.m.f.
5. Explain effect of armature reaction under unity lag and load power factors of an alternator.
6. What is meant by regulation of an alternator ? Explain. What are various methods to pre-determine the regulation ?
7. Discuss the inter connectation and loading sharing of alternators.
8. What is meant by reluctance power ? Explain.
9. Discuss the excitor ceiling voltage and excitation limits.
10. Discuss the methods of increasing the response of an excitor.

(10 × 4 = 40 marks)

Part B

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

11. (a) Derive the distribution factor of a.c. winding used in alternator. (8 marks)

    (b) A polyphase stator is wound for four poles and has a double layer winding placed in total of 48 slots. Find the distribution factor. (4 marks)

Or

12. (a) Explain the effect of power factor on generated voltage at (a) UPF ; (b) lagging p.f. (c) leading p.f. (6 marks)

(b) A 100 kVA 2300 V, Δ – connected polyphase alternator has an effective armature resistance per phase of 4 Ω and armature reactance per phase of 11 Ω. At rated load, find the generated voltage for : (i) u.p.f ; (ii) 0.8 leading of p.f. (6 marks)

13. Explain e.m.f, m.m.f and Potier methods of predetermination of regulation of an alternator. (12 marks)

Or

14. (a) Explain with current diagrams, the method to find *xd* and *xq* of a salient pole alternator. (8 marks)

(b) A salient pole synchronous machine with 4 pole a.c winding is charged coupled to a prime-mover and excited with a current of 50 Hz frequency. The rotor winding is open. The perphase voltage and current for a phase of machine are 30 V, 25 V, 10 A and 6.5 A. Find *Xd* and *Xq*. (4 marks)

15. Two alternators A and B are operating in parallel on no-load have the following data :—

Capacity A 100 MW
B 75 MW

Speed regulation linear in each case. For alternator A speed drop from no-load to full load = 3% Alternator B the speed drop is also 3%. Calculate the load shared and the bus frequency, when the total connected load is 125 MW and the no load frequency is 50 Hz. (12 marks)

Or

16. Describe with neat diagram any one method of synchronising of alternator. (12 marks)

17. Explain the principle of operation of synchronous motors. What are the methods of starting of such motors. (12 marks)

Or

18. (a) Explain the construction of V, inverted V and O curves. (8 marks)

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

19. (a) Write notes on dynamic representation of generalised machines. (6 marks)

(b) What are the different types of exetation systems. (6 marks)

Or

20. (a) Describe the constructional features of Brushless alternators. Discuss their applications. (8 marks)

(b) Describe the excitation methods and regulation of brushless alternators. (4 marks)

[5 × 12 = 60 marks]

G 6888 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Sixth Semester

Branch—Electrical and Electronics Engineering

ELECTRICAL POWER TRANSMISSION (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain skin effect and proximity effect.
2. Why transmission lines are transposed ? Explain.
3. Find the loop inductance and reactance per km of a single phase overhead line consisting of two conductors each 1.213 cm diameter. The spacing between conductor is 1.25 metres and frequency is 50 Hz.
4. What is meant by bundled conductors ? Explain.
5. Explain geometric mean radius and geometric mean distance.
6. Describe the Ferranti effect.
7. Explain how transmission lines are classified ?
8. What are the various types of insulators ?
9. Write note on factors affecting sag.
10. Explain the need for EHV transmission.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

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

(12 marks)

Or

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

Turn over

13. (a) Describe the effect of earth on the capacitance of a line. (6 marks)

(b) Find the capacitance between the conductors of a single phase 10 km long line. The diameter of each conductor is 1.213 cm. The spacing between the conductor is 1.25 m. Also find the capacitance of each conductor to neutral.

(6 marks)

Or

14. A 15 km long 3 phase overhead fine delivers 6 MW at 11 kV at a power factor 0.8 lagging line loss is 12% of the power delivered. Line inductance is 1.1 mH per km per phase. Calculate :

(i) Sending end voltage and regulation ;

(ii) Power factor of the load to make zero regulation ;

(iii) The value of capacitor to be connected at the reducing and to reduce regulation to zero.

(12 marks)

15. Derive the ABCD constants and draw the phasor diagram of a short transmission line.

(12 marks)

Or

16. A 3ϕ 50 Hz overhead transmission line has the following distributed constants. Resistance = 28 Ω Inductive reactance = 32 Ω capacitive Susceptance = 4×10^{-4} υ. If the load at the receiving end is 75 MVA at 0.8 p.f. lagging with 132 kV between lines calculate (i) voltage ; (ii) current ; (iii) power factor at the sending end ; (iv) regulation ; (v) efficiency of transmission for this load. Use nominal T method.

(12 marks)

17. (a) Write notes on testing of insulators. (6 marks)

(b) Describe the phenomena of corona. (6 marks)

Or

18. (a) Describe the various types of substations. (8 marks)

(b) Write a note on neutral grounding. (4 marks)

19. (a) Discuss the advantages and disadvantages of HVDC transmission. (8 marks)

(b) Write note on the main components of HVDC transmission. (4 marks)

Or

20. (a) Discuss the insulation requirements in EHV lines. (8 marks)

(b) Write notes on EHV systems in India. (4 marks)

[5 × 12 = 60 marks]

G 6905 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

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. Differentiate Microprocessor from Microcomputer.
2. What are Opcode and Mnemonics ? Explain.
3. Write an ALP to find the algebraic sum of a data array.
4. Define and explain look-up table.
5. What are subroutines ? Explain in detail.
6. Differentiate Software polling from Hardware polling.
7. What are PPI Devices ? Explain. Give examples.
8. What is address space partitioning ? Explain.
9. What is the principle of DMA controller ?
10. What are the types of stepper motor ? Explain.

(10 × 4 = 40 marks)

Part B

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

11. What is ALU ? Explain in detail.

Or

12. Draw a neat block diagram of Intel 8085 Microprocessor and explain it in detail.
13. Explain the different addressing modes of Intel 8085 in detail.

Or

14. Write an ALP to arrange a data array in ascending and descending order. Explain the procedure in detail.

Turn over

15. Explain in detail the Interrupt structure of Intel 8085 with a neat sketch.

Or

16. Explain in detail the software and hardware polling.

17. Explain the procedure to Interface I/OS using decoders in detail.

Or

18. Draw the block diagrams of 8155 and 8255 and explain in detail.

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

Or

20. Write short notes on :

    (a) Interfacing of stepper motor withup. (6 marks)

    (b) Operation of Intel 8086. (6 marks)

[5 × 12 = 60 marks]

G 6914 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Sixth Semester

Branch—Electrical and Electronics Engineering

COMPUTER ORGANIZATION (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *the questions.*

Part A

Each question carries 4 *marks.*

1. Differentiate Digital Computer from Analog Computer.
2. Explain the basic concept of hardwired control in detail.
3. What is a 3 bit adder ? Explain with an example.
4. Explain 2's complement addition with an example.
5. Define and explain the memory parameters.
6. Differentiate static RAM from Dynamic RAM.
7. What is the principle of associative mapping ? Explain.
8. What is memory interleaving ? Explain in detail.
9. Explain the types of Interrupts in detail.
10. Give an account on 'RS 232'.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 *marks.*

11. Explain the functional block diagram of a digital computer in detail.

Or

12. Explain the basic concept of Micro programmed Vs hard wired control.
13. Explain the principles of fast adder and carry look ahead adder with neat diagrams.

Or

14. Explain the steps to design an ALU.

Turn over

15. Explain the Internal organisation of memory chips with a neat diagram.

Or

16. Explain the following :—

(a) Direct mapping ;

(b) Set Associative mapping ;

(c) Address translation.

(4 + 4 + 4 = 12 marks)

17. Explain the construction of SRAM and semiconductor RAM with neat diagrams.

Or

18. Explain the following in detail :—

(a) Flash memory ; (b) E^2 PROM ;

(c) UVPROM ; (d) Cache memory.

(3 + 3 + 3 + 3 = 12 marks)

19. Explain the principles of Enabling and Disabling of Interrupts with neat diagram.

Or

20. Explain in detail the basic ideas of :

(a) USB ; (b) PCI and

(c) SCSI.

(4 + 4 + 4 = 12 marks)

[5 × 12 = 60 marks]

G 6896 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

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. Determine whether the signal $x[n] = \cos^2(2\pi n)$ is periodic or not. If periodic, determine the fundamental period.
2. Determine the stability of the system given by the impulse response.

   $h[n] = 0.5^n\, u[n] + 1.5^n\, u[n]$
3. State and prove shifting property of DFT.
4. Define DFT and FFT. What are the advantages of FFT compared to DFT?
5. State any *four* properties of ROC in Z domain.
6. Realize the filter with impulse response $h[n] = \{4,3,2,1,2,3,4\}$ using minimum number of multipliers.
7. What is Gibb's phenomenon? Explain the methods used to control this in FIR filter design.
8. Explain the principle of designing FIR filter using frequency sampling method.
9. For the analog transfer function $H(s) = \dfrac{1}{(s+1)(s+2)}$, determine $H(z)$ using impulse invariant method. Take T = 1 sec.
10. What are the key features of TMS320C family processors?

(10 × 4 = 40 marks)

Turn over

Part B

Each question carries 12 *marks.*

11. (a) List any *four* applications of DSP. Explain any *one* in detail. (6 marks)

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

(i) $x[n] = 2^n\, U[-n]$

(ii) $x[n] = U[n] - U[n\text{-}6]$ (6 marks)

Or

12. (a) Sketch the elementary discrete time signals. (4 marks)

(b) Determine the Discrete Time Fourier Transform of the following sequences.

(i) $x[n] = \left(\frac{1}{2}\right)^{n-1} U[n-1]$

(ii) $x[n] = n(0.5)^{2n}\, U[n]$ (8 marks)

13. (a) What is the improvement in speed in terms of numbers of complex additions and multiplications in calculating 1024 point DFT of a sequence using Direct computation and FFT algorithm. (6 marks)

(b) If $x[n] = 2\delta[n] + \delta[n-1] + \delta[n-3]$, find 5 point IDFT of $Y(k) = X^2(k)$, where $X(k)$ and $Y(k)$ are the 5 point DFT of the sequences $x[n]$ and $y[n]$ respectively. (6 marks)

Or

14. Obtain the response of the system with input $x[n] = \{1, 1, 2\}$ and impulse response $h[n] = \{1, 1\}$ using radix 2 DIT FFT algorithm. (12 marks)

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

(8 marks)

(b) Determine the Z – Transform and ROC of $x[n] = \left(\frac{1}{2}\right)^n [U(n) - U(n\text{–}6)]$. (4 marks)

Or

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

$y[n] + 0.1\, y[n\text{–}1] - 0.2\, y[n\text{–}2] = 3x[n] + 3.6\, x[n\text{--}1] + 0.6\, x[n\text{–}2]$.

(12 marks)

17. Design filter with the following specifications using Hanning 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. Using frequency sampling method, design a band pass filter with the following specifications.

Lower cutoff frequency	: 1000 Hz
Upper cutoff frequency	: 3000 Hz
Sampling Frequency	: 8000 Hz
Order of the filter, N	: 7

(12 marks)

19. For the analog transfer function $H(s) = \dfrac{1}{(s + 0.5)(s^2 + 0.5s + 2)}$, determine $H(z)$ using (i) impulse invariant method and (ii) bilinear transformation. Take T = 1 sec.

(12 marks)

Or

20. Design a high pass digital Butterworth filter to satisfy the following specifications using bilinear transformation.

Stop band attenuation	= 18 dB
Pass band Edge	= 150 Hz
Pass band attenuation	= 1 dB
Stop band Edge	= 100 Hz
Sampling Frequency	= 1 kHz.

(12 marks)

[5 × 12 = 60 marks]

G 6870 (Pages : 3) Reg. No.....EEE

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Sixth Semester

Branch—Electrical and Electronics Engineering

CONTROL SYSTEMS—I (E)

(Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Graphs sheets and semi-log sheets to be supplied.

Part A

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

1. Draw a general block diagram for a closed loop control system and explain.
2. Define transfer function ? Why it is called the external description of the system ?
3. Briefly explain the standard test signals.
4. Derive the time response of a first order system to unit step input.
5. What is meant by BIBO and Asymptotic stabilities ? Explain.
6. What are polar plots ? Explain.
7. What are phase margin and gain margin ? Explain.
8. State and explain Nyquist stability Criterion.
9. Explain the principle of operation of magnetic amplifier.
10. What are gyroscopes ? Explain. Mention their applications.

(10 × 4 = 40 marks)

Part B

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

11. Derive the transfer formation of an armature controlled de motor.

(12 marks)

Or

Turn over

12. Find the transfer function of the network shown below :

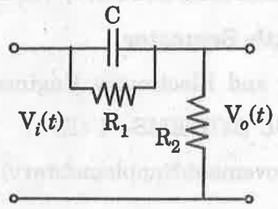

Fig.1.

(12 marks)

13. Find C/R for the signal flow graph shown below.

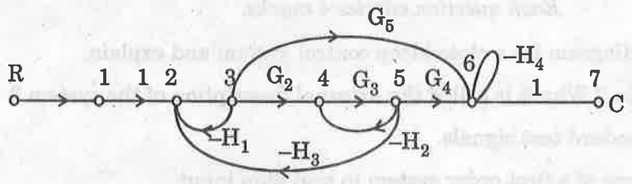

Fig.2.

(12 marks)

Or

14. Derive the effect of parameter variation in a closed loop system. (12 marks)

15. For the mechanical system shown below the parameters are m = 100 kg, f = 1000 N/m/sec k = 1000 N/m. A step force of 100 N is applied to the system at t = 0. The system is initially at rest. Find the output response.

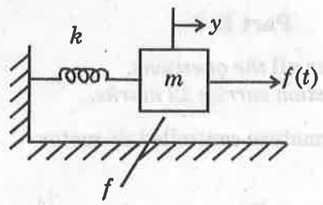

Fig.3.

(12 marks)

Or

16. For the unity feedback system with $G(s) = \frac{125}{s(s+10)}$ find (i) peak overshoot ; (ii) settling time for unit step input ; (iii) steady state error for inputs (1) 5 ; (2) 5t ; (3) 5 t^2.

(12 marks)

17. The open loop transfer function of a unity feedback system is given by $G(s) = \frac{k}{s(s+3)\left(s^2 + s^{+1}\right)}$.

Determine the values of k that will change sustained oscillation in the closed loop system. What is the oscillation frequency.

(12 marks)

Or

18. Sketch the root locus of the system with open-loop transfer function :

$$G(s)H(s) = \frac{k(s+1)}{s(s-1)\left(s^2 + 4s + 16\right)}.$$

(12 marks)

19. Determine the stability of the system whose open loop transfer function :

$$G(s)H(s) = \frac{1}{s(1+2s)(1+s)}.$$

What are the Gain and phase margins ?

(12 marks)

Or

20. Sketch the Bode plot for the system with :

$$G(s) = \frac{ks^2}{(1+0.2s)(1+0.02s)}.$$

Determine the system gain k for the gain cross-over frequency of 5 rad/sec.

(12 marks)

[5 × 12 = 60 marks]