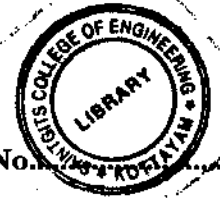# B.TECH. DEGREE EXAMINATION, MAY 2014

Fourth Semester

Branch : Applied Electronics and Instrumentation/Electronics and Communication/ Electronics and Instrumentation Engineering

AI 010 403/EC 010 403/EI 010 403—SIGNALS AND SYSTEMS (AI, EC, EI)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. Define Energy and power?

2. State convolution properties in relation to Fourier transform ?

3. Define DTFT.

4. Compare Butterworth and Chebyshev filters.

5. Define region of convergence. What are the Properties of ROC ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain the classification of signal with examples.

7. Explain about Gibbs phenomenon.

8. State and prove the following properties of DTFT.

   (i) Convolution ;   (ii) Correlation ;

   (iii) Multiplication ;   (iv) Symmetry Property.

9. Write a short note on magnitude response of Butterworth filter.

10. Explain any two properties of Z-transform.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Give the properties of convolution integral ?

Or

12. Find the natural and forced response of an LTI system given by

    $10dy\ (t)\ /\ dt + 2\ y\ (t) = x\ (t)$?

13. Find the Fourier transform given signal ;

    (a) Square ;

    (b) Triangular.

Or

14. Explain and derive convergence of Fourier series.

15. State and prove Parseval's theorem of DTFT, verify the same for the sequence :

    $x(n) = (0.5)n\ u(n)$?

Or

16. Find the DTFT of $x(n) = \{1, 1, 1, 1, 1, 1, 0, 0\}$.

17. Describe about time domain characteristics of ideal LPF.

Or

18. Explain in detail with necessary mathematical derivations :

    (a) Interpolation ;

    (b) Aliasing.

19. Give the relationship between Z-transform and Fourier transform.

Or

20. Find the Z-transform of $x(n)$ = an $u\ (n)$ and for unit impulse signal.

$(5 \times 12 = 60$ marks)

B.TECH. DEGREE EXAMINATION, MAY 2014

Fourth Semester

Branch : Applied Electronics and Instrumentation/Electronics and Communication/Electronics and Instrumentation/Instrumentation and Control Engineering

AI 010 404/EC 010 404/EI 010 404/IC 010 404—DIGITAL ELECTRONICS (AI, EC, EI, IC)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Explain the properties of Hamming codes. Mention its applications.

2. Define and explain : (i) Noise Margin ; (ii) Fan in ; (iii) Fan out.

3. What is the difference between combinational logic and sequential logic circuits ? Explain.

4. Mention the potential applications of flip flop. Explain any two in detail.

5. Draw the block diagram of PAL and explain it.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the principle of Duality with an example.

7. Explain the subfamilies of TTL in detail.

8. Differentiate latch from FFs. Explain the difference.

9. Explain the types of RAM in detail.

10. Define Hazard. Explain the types of Hazard in detail.

(5 × 5 = 25 marks)

Part C

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

11. (i) Explain : (a) Gray code ; (b) XS 3 code with examples.

    (ii) Explain hexa decimal and octal number system with examples.

Or

Turn over