G 1258 (Pages : 2) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 606 L06—RENEWABLE ENERGY RESOURCES

(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. What are the limitations of renewable energy sources ?
2. Name three collectors requiring one axis sun tracking.
3. What are the major advantages and disadvantages of a solar PV system ?
4. What are the factors responsible for distribution of wind energy on the surface of earth ?
5. What are the main advantages and disadvantages of biomass energy ?

(5 × 3 = 15 marks)

Part B

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

6. Explain various aspects of energy conservation.
7. How is adequate supply of C02 maintained in a greenhouse ?
8. What do you understand by cell mismatch in solar module and what are its implications ?
9. Explain the major applications of wind power.
10. Comment on the origin and distribution of geothermal energy.

(5 × 5 = 25 marks)

Part C

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

11. (a) What is meant by renewable energy sources ? Explain in brief these energy sources with special reference to Indian context.

Or

(b) Draw schematic layout of a typical micro-hydro power station and explain the functions of each of its components.

12. (a) With the help of schematic diagram, explain the working of solar thermal water pump.

Or

(b) Describe the layout and working of a solar cooking system.

13. (a) Explain various factors contributing to losses and hence, reduction of efficiency of a solar cell.

Or

(b) Draw and explain an equivalent circuit of a practical solar PV cell.

14. (a) Describe various fuels used in fuel cells along with chemical reaction involved.

Or

(b) Describe the main considerations in selecting a site for wind generators.

15. (a) Explain the present status of development of ocean energy resources.

Or

(b) Explain different types of biofuels.

(5 × 12 = 60 marks)

G 1257 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 606 L 05—BIOMEDICAL ENGINEERING (Elective-I) (EE)

(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. What are the important systems of human body ?
2. What is Electroretinography ?
3. Explain the working of Heart-lung machine.
4. Describe the working of any one type of blood flow meter.
5. Draw the block schematic and explain the function of CT machine.

(5 × 3 = 15 marks)

Part B

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

6. What are the different types of transducers used in biomedical Engineering.
7. What are biopotential Recorders ?
8. What are the clinical uses of ECG ?
9. Write a note on artificial heart valve.
10. What is thermography ? Draw the block diagram of thermographic equipment and explain its function.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 15 *marks.*

11. Describe briefly how a man-instrument system works.

Or

12. What are the different types of transducers used in biomedical engineering practice ?

Turn over

13. Briefly describe about Heart Sounds. What is phonocardiography ?

Or

14. What are the important applications of EEG ?

15. What is a Pace-maker ? What are the different types of pace-makers used in biomedical engineering ?

Or

16. What are the different direct methods used for the measurement of blood pressure ?

17. Describe the working of ultrasonic diathermy.

Or

18. Describe the working of an artificial kidney machine.

(4 × 15 = 60 marks)

G 1235 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 605—MICROCONTROLLERS AND EMBEDDED SYSTEMS (EE)

(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 PSW.
2. Can you list the single bit instructions ?
3. What fact shows in polling ?
4. Which one is the important process in memory address decoding for RAM ?
5. How would you describe about the RISC ?

(5 × 3 = 15 marks)

Part B

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

6. Draw the main function and diagram of interrupts.
7. Which statements support the timing subroutines ?
8. How would you summarize the serial communication ?
9. Can you explain what is happening in the interfacing keyboard ?
10. Will you interpret in your own words about the PIC memory organization ?

(5 × 5 = 25 marks)

Part C

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

11. Draw and explain the embedded system with suitable diagram.

Or

12. Give a description about the elements of 8051 architecture.

Turn over

13. Discuss in detail about the types of instruction in 8051.

Or

14. With the help of neat diagram explain the different addressing mode.

15. Write in detail about timer/counter programming in 8051.

Or

16. Explain in detail about RS232.

17. Comment on the interfacing of stepper motor with suitable diagram.

Or

18. Illustrate the ADC and DAC to 8051 with neat block diagram.

19. Briefly describe PIC 16F877 architecture.

Or

20. List and explain the different cause of interrupt structure in PIC 16F877.

(5 × 12 = 60 marks)

G 1171 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Communication Engineering

ELECTRONIC INSTRUMENTATION (L)

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the objectives of engineering measurement in detail.
2. Define and explain rise time, response time and settling time.
3. Explain the principle of digital encoders.
4. State and explain photo electric effect.
5. Explain the principle of pulse telemetry.
6. Differentiate PPM and PDM. Explainthe difference.
7. Explain the principle of Wein Bridge in detail.
8. Explain the specification and applications of Distortion analyzer.
9. Define and explain strain measurement.
10. Explain the significance and principle of D/A Multiplexing with a diagram.

(10 × 4 = 40 marks)

Part B

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

11. Explain the performance characteristics of electronic instruments in detail. Also explain static and dynamic errors.

Or

12. (a) Explain the features of processing digital information in detail.
    (b) Explain the types of errors occur in an electronic instrumentation system, in detail.

13. Explain the selection criteria for transducers. Also explain the principle of operation of Piezo electric type transducer.

Or

14. (a) Discuss in principle of capactive transducer in detail.

(b) Give an account on "Electromechanical type transducers".

15. Explain the classification of telemetering system in detail.

Or

16. Explain the following in detail :—

(a) PDM ; (b) RF Telemetry ; (c) Generation of PPM and PDM.

17. (a) Explain the principle of Owen' bridge with a neat diagram.

(b) Give an account on "Signal Analyzer".

Or

18. Explain the principle of spectrum analyzer with a neat block diagram.

19. Explain the concept of pressure measurement with a neat diagram.

Or

20. Explain the difference between D/A multiplexing and A/D multiplexing with examples.

(5 × 12 = 60 marks)

G 1170 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

MICROPROCESSORS AND APPLICATIONS (E)

(Old Scheme – Prior to 2010 Admissions)

[Supplementary / Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. What is Assembly Language ?
2. List the main applications of 8-bit microprocessors.
3. Define Machine cycle.
4. Define Instruction cycle.
5. What are the main functions for interfacing a keyboard ?
6. Define the purpose of CRT controller.
7. List the major sections of the 8279 keyboard/display interface.
8. What are non-programmable and programmable I/O ports ?
9. What are the limitations of 8085 ?
10. Define Interrupt I/O.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*

Each question carries 12 *marks.*

11. With a neat diagram, explain the architecture of 8085 microprocessor. Discuss the functions of various signals in 8085.

Or

12. Explain the Applications of microprocessors.

13. Explain in detail about the types of addressing modes in 8085 microprocessor with examples.

Or

14. Explain in detail about 8085 instruction timing and execution.

15. Explain in detail about arithmetic instructions.

Or

16. Explain in detail about the software and hardware polling.

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

Or

18. Describe the 8085 Interrupts.

19. Explain in detail about keyboard and display interface.

Or

20. Explain in detail about CRT controller and graphics controller chip.

(5 × 12 = 60 marks)

G 1160 (Pages : 2) Reg. No.....

Name.....

B.TECH DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

DIGITAL SIGNAL PROCESSING (E)

(Old scheme—Prior to 2010 Admissions)

[Supplementary/Mercy chance]

Time : Three Hours Maximum : 100 Marks

Part A

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

1. When do you say a system is causal ?
2. What is BIBO Stability ? What is necessary and sufficient condition for BIBO stability ?
3. Give any *two* properties of DFT ?
4. What is decimation-in-time algorithm ?
5. What are the Properties of ROC ?
6. State parseval's relation for Z-transforms.
7. What are the merits and demerits of FIR filters ?
8. In the design of FIR digital filters, how is Kaiser window different from other windows ?
9. Give the equation for the order N, major, minor and axis of an ellipse in case of Chebyshev filter.
10. What are the advantages and disadvantages of bilinear transformation ?

(10 × 4 = 40 marks)

Part B

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

11. Discuss the classification of discrete time systems with examples.

Or

12. Check whether the following system $y(n) = \text{sgn}[x(n)]$ is :

(a) Static *or* dynamic. (b) Linear *or* non-linear.

(c) Causal *or* non-causal. (d) Time invariant *or* variant.

Turn over

13. Find the circular convolution of $x_1(n) = \{1\ 2\ 3\ 1\}$ and $x_2(n) = \{4\ 3\ 2\ 2\}$.

Or

14. Find the 8 point DFT of the sequence

$$x(n) = \begin{cases} 1 & 0 < n < 7 \\ 0 & \text{otherwise} \end{cases}$$

using DIT. FFT.

15. Compute the invers Z-transform of

$X(Z) = (z + 0.5) / (z + 0.6)(z + 0.8), |z| > 0.8$, using residue method.

Or

16. Explain the properties of Z-transforms.

17. Using a rectangular window technique design a low pass filter with pass band gain of unity, cut off frequency of 1000 Hz and working at a sampling frequency of 5 KHz. The length of the impulse response should be 7.

Or

18. Design an ideal high pass filter with a frequency response

$$H_d\left(e^{j\omega}\right) = 1, \quad \pi/4 \le |\omega| \le \pi$$
$$= 0, \quad |\omega| < \pi/4$$

Find the transfer function H (z) using Hanning window. Plot the magnitude response.

19. Design an analog Butterworth filter for the given specifications.

$$0.9 \le |H(j\Omega)| \le 1, \quad 0 \le |\Omega| \le 0.2\,\pi$$
$$|H(j\Omega)| \le 0.2, \quad 0.4\,\pi \le |\Omega| \le \pi.$$

Or

20. Design a digital Butterworth filter satisfying the constraints

$$0.707 \le \left|H\left(e^{j\omega}\right)\right| \le 1 \text{ for } 0 \le \omega \le \pi/2$$
$$\left|H\left(e^{j\omega}\right)\right| \le 0.2 \text{ for } 3\pi/4 \le \omega \le \pi \text{ with T} = 1 \text{ sec}$$

Using bilinear transformation.

(5 × 12 = 60 marks)

G 1194 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 601—POWER GENERATION AND DISTRIBUTION (EE)

(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. Draw the layout of steam power plant.
2. Define Diversity factor.
3. Explain about Kelvin's Law.
4. How will you estimate the power loss in distribution system ?
5. Briefly discuss about types of energy audit.

(5 × 3 =15 marks)

Part B

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

6. Give detailed classification of hydro turbine.
7. Explain in detail about plant capacity factor.
8. What are all the design consideration of distribution feeder ?
9. Explain the method of voltage drop computation based on load density.
10. Discuss in detail about need for energy management.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Explain the various types of reactor used in Nuclear power plants.

Or

12. Explain the various components involved in steam power plant with neat sketches.

13. Explain the various types of tariffs involved in power generation and distribution system.

Or

14. A system has a straight line annual load duration curve with maximum and minimum Demands of 15 MW and 5MW respectively. The annual cost characteristics of base load and peak load stations are respectively. The annual cost characteristics of base load and peak station are respectively given by :

    Cl = (Rs. 1,00,000 + Rs. 100/KW + 6P/K Whr)

    C2 = (Rs. 80,000 + Rs. 60/KW + 8P/K Whr)

    Determine the operating schedule of peak load station for minimum annual cost. Hence Determine the overall cost per K Whr.

15. Determine the most economical section for a 3-phase line 8 km long, to supply a load ata a constant voltage of 33 KV. During each 24hr. period the load is 3000 KW for 10 hrs., 2,000 KW for 6 hrs, and 1000 KW for 8 hrs. at unity p.f. The capital cost per km of line is rs. (6250 + 5000a) where a is in Sq.cms., interest and depreciation charges are 8% and the cost of energy is paise 5 per unit

Or

16. With neat sketch, explain the operation of ring and radial distribution in power system?

17. Discuss in detail about AC three phase three wire system.

Or

18. A 3-phase 4-wire 400 volts system feeds a balanced load of 480 kW at p.f. 0.8 and loads of 50 kW and 200 kW at unity p.f. when connected between respective phases. Determine the current in each line and in the neutral wire of the system.

19. What are the methods of energy savings in motors and lighting system ?

Or

20. Explain in detailed about demand side energy management system.

(5 × 12 = 60 marks)

G 1212 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 603—CONTROL SYSTEMS (EE)

(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. What is a gyroscope ? What are the different types and their applications ?
2. What is meant by frequency domain analysis ? Explain.
3. What are minimum phase and non-minimum phase systems ? Explain.
4. Realize lag compensator using Operational Amplifier. What is its transfer function ?
5. What are state variables and phase variables ?

(5 × 3 = 15 marks)

Part B

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

6. Explain how gain margin and phase margin can be obtained from bode plot ?
7. What is meant by polar plots ? What are steps to plot the polar plots ?
8. State and explain Nyquist stability criterion.
9. What is state transition matrix ? What are its properties ?
10. What are controllable and Observable canonical forms ?

(5 × 5 = 25 marks)

Part C

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

11. The open loop transfer function of a system is given by :

$$G(s)\,H(s) = \frac{2}{s(1+0.5s)(1+0.05s)}.$$

Determine the phase–crossover frequency, Gain cross–over frequency, G.M. and P.M.

Or

12. Sketch the polar plot for the transfer function : $G(s) = \dfrac{K}{s^2(1+s\tau_1)(1+s\tau_2)}$.

13. For a unity feedback system, $G(s) = \dfrac{5(s^2+2s+100)}{s^2(s+5)(s^2+3s+10)}$. Find the step, ramp and parabolic error co–efficients.

Or

14. Using Nyquist stability criterion, comment on the stability of the system

$$G(s)\,H(s) = \frac{4s+1}{s^2(s+1)(2s+1)}.$$

15. Design a suitable compensator using root locus technique for a system with open loop transfer function $G(s) = \dfrac{16}{s(s+4)}$ so that, K_v = 20 sec^{-1} without having much change in the original pole locations.

Or

16. Design a suitable phase lag compensating network for $G(s) = \dfrac{K}{s(1+0.1s)(1+0.2s)}$ that will meet the specifications K_v = 30 sec^{-1} and P.M $\geq 40°$.

17. Diagonalize the matrix $A = \begin{bmatrix} 0 & 1 & -1 \\ -6 & -11 & 6 \\ -6 & -11 & 5 \end{bmatrix}$.

Or

18. Obtain the tranfer function of the state model :

$\dot{X} = AX + BU$ and $Y = CX + DU$ with commonly used notations.

19. Show that eigen values remain stationary under similarity transformation.

Or

20. (a) Find the state transition matrix $A = \begin{bmatrix} \sigma & -\omega \\ \omega & \sigma \end{bmatrix}$.

(b) For the system shown, find the response to unit step input with initial conditions :

$$x(0) = \begin{bmatrix} 0 \\ 0 \end{bmatrix}; \begin{bmatrix} \dot{x}_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u.$$

(5 × 12 = 60 marks)

G 1203 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 602—INDUCTION MACHINES (EE)

(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. Draw the phasor diagram of three-phase induction motor.
2. What is necessity of speed control in Induction motor ?
3. What are the different methods of starting for induction motor ?
4. Give the application of repulsion motor.
5. Briefly discuss the characteristics of stepper motor.

(5 × 3 = 15 marks)

Part B

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

6. Explain the operating characteristics from circle diagram for induction motor.
7. Explain in detail about starting of slip ring motors.
8. Explain about revolving field theory.
9. Give the expression for induced e.m.f. in a commutator winding.
10. Discuss in detail about application of BLDC motor.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Explain the detailed construction and working principle of Three-phase induction motor and its types.

Or

12. A 400 V,40 h.p., 50 Hz, three-phase induction motor gave the following test data :

    No Load test : 400 V, 20A, 1200 W.

    Blocked rotor test : 100 V, 45 A, 2750 W.

    Stator d.c. resistance per phase is 0.01 Ω.

    The ratio of a.c. to d.c. resistance is 1.5. The friction and windage loss is 300 W. Calculate the circuit elements of approximate equivalent circuit of the motor.

13. Explain the different types speed control technique for induction machine.

Or

14. A 3-phase squirrel cage induction motor takes a starting current of 6 times the full-load current. Find the starting torque as a percentage of full-load torque if the motor started (a) Direct on line ; (b) through a star- delta starter ; full-load slip of the motor being 4 percent.

15. Explain the detailed construction and working principle of synchronous induction motor.

Or

16. A 50 Hz split phase induction motor has a resistance 5 Ω and an inductive reactance of 20 Ω in both main and auxiliary winding. Determine the value of resistance and capacitance to be added in series with auxiliary winding to send the same current in each winding with the phase difference of 90 degree.

17. Discuss in detail about Reluctance and Hysteresis Motor.

Or

18. Explain in detail about single-phase series motor and commutator motor.

19. Explain the construction and working principle of BLDC motor.

Or

20. Discuss the detailed construction, working principle and application of switched reluctance motor.

(5 × 12 = 60 marks)

G 1131 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

CONTROL SYSTEMS I (E)

(Old Scheme—prior to 2010 Admissions)

[Supplementary/Mercy Chance]

Time : Three Hours Maximum : 100 Marks

Part A

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

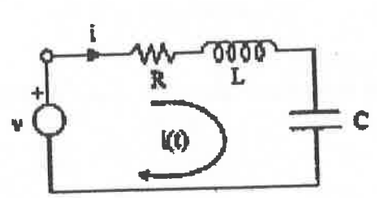
1. What is control system ? What are the *two* major types of control system ?
2. What are the components of feedback control system ?
3. What are the *three* constants associated with a steady state error ?
4. What are the main advantages of generalized error co-efficients ?
5. Define BIBO stability. What is the necessary condition for stability ?
6. What is the necessary and sufficient condition for stability ?
7. What are the main advantages of Bode plot ?
8. What is Bode plot ?
9. What is synchro ?
10. State Nyquist stability criterion.

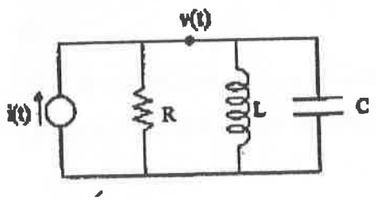
(10 × 4 = 40 marks)

Part B

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

11. Obtain the : (i) Differential equation and ; (ii) Transfer function for the circuits below.



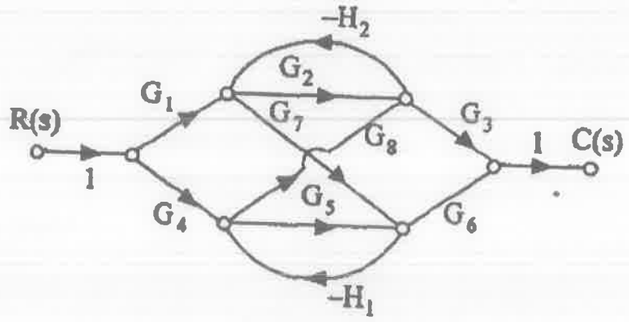


Or

Turn over

12. (i) Write any *four* rules of block diagram reduction technique.

(ii) Reduce the signal flow graph given below using mason's gain formula.



13. Explain the working of Synchro transmitter and receiver.

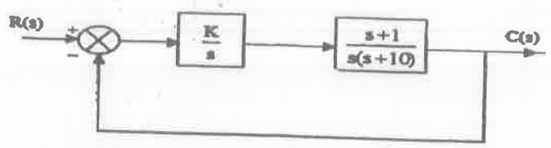
Or

14. Find the time response of a first order system for various standard inputs.

15. Write the rules for constructing the root locus.

Or

16. Sketch the root locus of the system below.



17. Given the open loop transfer function $G(s)\,H(s) = \frac{1}{s}(s+1)(2s+1)$ of a unity feedback system. Find the gain margin and phase margin using polar plot.

Or

18. Write the step by step procedure for plotting the magnitude plot and phase plot of a open loop system represented by the transfer function $G(s)$.

19. Find gain margin and phase margin for unity feedback system with :

$G(s) = \frac{K}{s(0.5s+1)(0.05s+1)}$ when $k = 1$, also find the 'k' value for 15 db gain margin and 45 degree phase margin.

Or

20. Explain in detail about DC and AC servo motors.

(5 × 12 = 60 marks)

G 1223 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Sixth Semester

Branch : Electrical and Electronics Engineering

EE 010 604—DIGITAL SIGNAL PROCESSING (EE)

(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 linear systems and causal systems.
2. Find DTFT of $x(n) = e^{2n}$ for all n.
3. What are the features of Chebyshev filters ?
4. What is Gibb's phenomenon ?
5. Explain the quantization error in digital filters.

(5 × 3 = 15 marks)

Part B

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

6. Determine the Z transform of $x(n) = \sin\left(\frac{\pi n}{2}\right) u(n)$.
7. Find the DTFT of the sequence $x(n) = \{1, 2, 3, 4\}$.
8. Draw the Direct Form-I of the system given by :

   $y(n) = 0.5\, y(n-1) - 0.25 y(n-2) + x(n)$.
9. Explain the FIR filter design by frequency sampling method.
10. Describe the principle of speech processing.

(5 × 5 = 25 marks)

Turn over

Part C

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

11. Find the convolution sum of the given sequences :

$x_1(n) = \{0, 1, 2, 3, 4, 5\}$ and $x_2(n) = \{1, -1, 1, -1\}$.

Or

12. Determine the impulse response of the system determined by the equation :

$y(n) - 5y(n-1) + 6y(n-2) = x(n)$.

13. Draw the flow graph of 16 point DFT using DIT-FFT algorithm.

Or

14. Find the 8 point DFT of the sequence $x(n) = \{1, -1, 0, 1, -1, 0, 1, 1\}$.

15. Using bilinear transformation design a Butterworth digital filter from the following specifications

$f_{pass} = 1000$ Hz

$f_{stop} = 1500$ Hz.

α_s = 20 dB.

Sampling frequency = 5kHz.

Or

16. A system is defined by the following difference equation

$$y(n) - 3y(n-1) + \frac{1}{2}y(n-2) = x(n) + 2x(n-1).$$

Implement the system using :

(a) Parallel form.

(b) Cascaded form.

17. (a) What is the need of different windows in FIR filter design.

(b) Give expression and frequency response of Kaiser window and Hamming window.

Or

18. Consider an FIR filter of length M = 4 for which the frequency response is specified as :

$H_r(0) = 1 ; w = 0.$

$H_r(\pi/2) = \frac{1}{2} ; w = \pi/2.$

Determine the unit sample response $h(n)$.

19. With a block schematic explain the architecture of TMS 320 C 54 Digital Signal Processor.

Or

20. Determine the variance of the round off noise at the out put of the two cascade realizations of the filter with the system function

$H(z) = H_1(z) . H_2(z).$

where $H_1(z) = \frac{1}{1 - \frac{1}{2}z^{-1}}$, $H_2(z) = \frac{1}{1 - \frac{1}{4}z^{-1}}$.

(5 × 12 = 60 marks)