

F.D

BE ~~Comp~~ - Sem VII
Elex

1915114

QP Code : MV-19968

(3 Hours)

[Total Marks : 100

- N. B. : (1) Question No. 1 is compulsory.
 (2) Attempt any four questions from remaining questions.
 (3) Assume suitable data if necessary.

1. (a) Compare Butterworth, Chebyshev and Elliptic filter. 20
 (b) Compare FIR and IIR filter
 (c) Explain the concept of subband coding
 (d) Prove that symmetric and even length linear phase FIR filter have one compulsory zero at -1

2. Design digital lowpass Butterworth filter for the following specifications 20
 $0.92 \leq |H(e^{j\omega})| \leq 1 \quad f \leq 1200 \text{ Hz}$
 $|H(e^{j\omega})| \leq 0.003 \quad f \geq 5000 \text{ Hz}$
 Assume sampling frequency of 12000 Hz. Use Bilinear transformation technique for the design

3. (a) Explain the frequency transformation method in analog domain. 10
 (b) Explain the procedure of design of FIR filter using frequency sampling technique. 10

4. (a) Design digital FIR filter for the following specifications 10
 $H_d(e^{j\omega}) = 3e^{-j3\omega} \quad 0.35\pi \leq \omega \leq 0.55\pi$
 $= 0 \quad \text{otherwise}$
 Use Hanning window for the design.
 (b) What is an adaptive filter? What are its advantages? Which type of problems can be solved using adaptive filters. 10

5. (a) Explain weiner filter and its application 10
 (b) Explain Quadrature mirror filtering 10

6. (a) Explain with suitable example, the concept of polyphase interpolation. Compare it with single phase interpolation. 10
 (b) Explain Gibb's phenomenon and explain how it can be reduced. 10

7. Write short notes on :- 20
 - (a) FDNR and its properties
 - (b) Switched capacitor filter
 - (c) Higher-order filters
 - (d) matched z-Transform.

Con. 10559-14.





QP Code : MV-20099

(3 Hours)

[Total Marks : 100

- N. B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of the remaining six questions.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data wherever required but justify it.

1. Answer the following :- 20
 - (a) Compare symmetrical and asymmetrical semi-converter.
 - (b) What is meant by voltage commutation and current commutation.
 - (c) Compare series and parallel inverter.
 - (d) What is four quadrant DC - drive.

2. (a) Explain sinusoidal pulse modulation as used in PWM inverter. 10
 (b) A load commutated chopper fed from 230 V d.c. source has a constant load current of 50 A. For a duty cycle of 0.4 and chopping frequency of 2kHz. 10
 Calculate :-
 - (i) Value of commutating capacitor.
 - (ii) Average output voltage.
 - (iii) Circuit turn off time for 1-pair of SCRs.
 - (iv) Total commutation interval.

3. (a) Explain the working of a single phase series inverter with appropriate circuit and waveforms. 10
 (b) Explain constant torque and constant power operation of separately excited DC motor. Give schematic diagram of control unit. 10

4. (a) A single phase fully controlled bridge with 230 V, 50 HZ supply feeds continuous ripple free current of 20A. If $L_s = 2.5$ mH. 10
 - (i) Calculate overlap angle for firing angle 60° .
 - (ii) What will be the new value of overlap angle for same firing angle if load is reduced by 50%.
 (b) Draw and explain the variable voltage and variable frequency control method for 3-phase squirrel cage induction motor. What is the significance of (V/F) ratio control. 10

5. (a) A single phase full converter is used to drive separately excited dc shunt motor with $R_a = 0.25 \Omega$. Motor rating are 220 V, 750 rpm, 50 A. If input voltage to converter connected to armature is 250 V a.c. 50 Hz. 10
 Calculate :-
 - (i) Firing angle delay for 500 rpm at rated torque.
 - (ii) Speed of motor for firing angle $\alpha = 60^\circ$ at half load.
 (b) Explain the working of Jone's chopper with the help of various waveforms. 10

[TURN OVER

