Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8001

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (EC/ECT/CE/DC/ES) Examination May/June 2017

Advanced Digital Signal Processing

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i)Q.No. 5 & Q.No.10 are compulsory.
ii)Attempt any two questions from Q.1 to Q.4
iii)Attempt any two questions from Q.6 to Q.9
iv) Assume suitable data.

Section A

Q.1	A. Explain simple FIR digital Filter in detail.	07
	B. Explain Inverse system in detail.	08
Q.2	A. X(n)= [4,-1,3,2,-3,2,4,5,-2] determine and draw down sample version for D=3 , D=4	08
	B. Explain sampling rate conversion by rational factor.	07
Q.3	A. Explain design of IIR Filter using pade approximation in short.	06
	B. Implement two stage decimator with following specification. Fs=20,000 Hz D=100 , passband = 0 to 50 Hz Transition ripple = 0.01 Stopband ripple = 0.002	09
Q.4	A. Explain Computational complexity of digital Filter structure.	06
	B. Explain Interpolation process in detail.	09
Q.5	Write short note : (Any two) A)Least square design method B)Decimation by integer Factor C) Algebraic stability test.	10

Section B

Q.6	A. Explain relationship between Filter parameter and the autocorrelation sequence.	09
	B. Explain IIR Wiener Filter.	06
Q.7	A. Give the expression far power spectrum estimates of AR, MA & ARMA modes.	08
	B. Explain forward & backward linear prediction in short.	07
Q.8	A. Explain use of adaptive filter in echo cancellation.	08
	B . Explain LMS algorithm	07
Q.9	A. Explain Autoregressive (AR) & moving average (MA) process.	08
	B. What are power spectrum? Explain Welch, Bartlett methods.	07
Q.10	Write short note: (Any two) A) Burg Method B) Adaptive channel equalization C) Advantage of FIR adaptive Filter.	10

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Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8009

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Control System Engg.) Examination May/June 2017

Advance Control Theory

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Attempt any two question each from section A and section B

ii) Figure to the right indicates full marks

Section A

Q.1 a)Explain – field and vector space w.r.t 10

i) Axioms / conditions hold by them

ii) one example of each illustrating how they fulfill axioms as ,mentioned in (i)

b) A state space model { A, B, C, D} of a system is given as below: 10

$$A = \begin{bmatrix} -4 & -1 & 1 \\ 0 & -3 & 1 \\ 1 & 1 & -2 \end{bmatrix} \quad ; \quad B = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix} \quad ; \quad C = [\,-1 \;\; -10\,] \quad D = 0$$

Determine the controllability and obesrvability of a system

Q.2 a) Prove that – " In an 'n' – dimensional liner space, any set of 'n' linearly independent vectors forms a basis" 10

10

b) Explain the concept of controllability, reachability , observability and constructability

Q.3 a) Find rank, nullity, modal matrix and Vandermonde matrix for given matrix A, 10

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 1 & -1 \\ 3 & 2 & 1 \end{bmatrix}$$

10

b) Explain controllable and uncontrollable system with example. Also comment on the subspace

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Section B

Q.4 a) Consider the dynamical system 10

$$X = \begin{bmatrix} 0 & 1 \\ -1 & 3 \end{bmatrix} X + \begin{bmatrix} 0 \\ 2 \end{bmatrix} u$$

$$Y = [\,1 \quad 0\,]\, x$$

Design a state feedback controller so that closed loop poles are placed at s= -3 and s = -4

b) Explain generalized Nyquist and inverse Nyquist criterion 10

Q.5 a) What are the different types of state observers? Explain 10

b) Consider a 2 x 2 MIMO system with T.F 10

$$G(s) = \begin{bmatrix} \frac{4}{(s+1)(s+2)} & \frac{-0.5}{(s+1)} \\ \frac{1}{(s+2)} & \frac{2}{(s+1)(s+2)} \end{bmatrix}$$

i) Find Smith McMillan Form

ii) Build a RMFD for the model

Q.6 a) What are the effect of state feedback on controllability and observability? Explain 10

b) Obtain state space realization from T.F 10

$$G(s) = \frac{1}{s+2} \begin{bmatrix} s-1 & 4 \\ 4.5 & 2(s-1) \end{bmatrix}$$

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8013

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power System) Examination May/June 2017

Electrical Machine Analysis & Modeling

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Attempt any two question from each section
ii) Assume suitable data wherever necessary
iii) Figure to the right indicate full marks

Section A

Q.1	a) Derive the voltage equation of liner magnetic circuit. Also draw the equivalent circuit	10
	b) Derive the relation to find winding inductance in 3-ph, 2-pole symmetrical induction machine	10
Q.2	a) Derive the voltage equation in machine variables for D.C. shunt machine	10
	b) Explain dynamic performance of D.C machine during sudden change in load	10
Q.3	a) Explain the equation of transformation	10
	b) Apply Qdo transformation to the inductive element	10

Section B

Q.4	a) Derive the equation of transformation for rotor circuit of symmetrical induction machine	10
	b) Explain the dynamic performance of symmetrical induction machine during a 3 phase fault and machine terminal	10
Q.5	a) Derive the voltage equation in machine variables of 2- pole , 3-ph salient synchronous machine	10
	b) Explain the dynamic performance of synchronous machine during sudden change in input torque	10
Q.6	a) Explain Hydraulic turbine and their governor system	10
	b) Explain basic load modeling concept and explain any one model	10

Total No. of Printed Pages:02

SUBJECT CODE NO:- P-8018

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Drives & Control) Examination May/June 2017

Modern Control Theory

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Q.1 from section A and Q.6 from section B are compulsory. Solve any two questions from remaining from each section.

ii) Assume suitable data if necessary.

Section A

Q.1 (a) For $A=\begin{bmatrix} 3 & 2 & -1 \\ -2 & 1 & 0 \\ 4 & 3 & 1 \end{bmatrix}$ $b=\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ 05

Find representation of A with respect to the basis [b, Ab, A^2b]

(b) 05

Find Eigen values & Eigen vectors

$A=\begin{bmatrix} 0 & 1 & 0 \\ 3 & 0 & 2 \\ -12 & -7 & -6 \end{bmatrix}$

Q.2 (a) Obtain SS model in controllable and observable canonical form. 08

$\frac{Y(S)}{u(S)}=\frac{S+6}{S^2+5S+6}$

(b) 07

Obtain transfer function from

$A=\begin{bmatrix} 1 & 2 \\ -4 & -3 \end{bmatrix}$ $B=\begin{bmatrix} 1 \\ 2 \end{bmatrix}$ $C=[1 \quad 1]$

Q.3 (a) Obtain $\lambda = m^{-1}$ Am for $A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$ 08

(b) 07

What is STM? Derive properties.

Q.4 (a) Explain design of observer based state feedback control. 08

(b) Show that system cannot be stabilized if u= -kx For $A=\begin{bmatrix} 0 & 1 \\ 0 & 2 \end{bmatrix}$ $B=\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ 07

Q.5 Write short notes on:- 15

(i) Limit cycle

(ii) SS model of physical system.

(iii) Servo system design

Section -B

Q.6 (a) Derive describing function for saturation non-linearity. 05

(b) Explain relay control and related normality. 05

Q.7 (a) Derive the condition of continuous time Riccati Equation. 08

(b) Obtain K for $A=\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ $B=\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ $Q=\begin{bmatrix} 1 & 0 \\ 0 & \mu \end{bmatrix}$ R=1. 07

Q.8 (a) Obtain state feedback control. 08

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$A=\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$ $B=\begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$ $C=[1 \quad 0 \quad 0]$

$S_{1,2}= -1\pm j$, $S_3= -5$

Represent in SS form and find Observability $\frac{Y(s)}{u(s)}=\frac{10}{(s+1)(S+2)(S+3)}$.

(b) 07

Q.9 (a) What is asymptotic stability? Explain. 08

(b) Derive condition of state and output controllability. 07

Q.10 Write short notes on:- 15

(i) Isocline method

(ii) Minimal state observer designs

(iii) Optimal controller design

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8019
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/ECT/CE/DC/ES) Examination May/June 2017
Advanced Digital Communication System
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
i. Q. No. 05 and Q. No. 10 are compulsory.
ii. Solve any two questions from remaining questions in each section.
iii. Figures to right indicate full marks.
iv. Assume suitable data wherever necessary.

Section A

Q.1 a) Draw and explain a block diagram of DCS in detail. 07
b) Explain M. orthogonal and Bi – orthogonal signals. 08

Q.2 What is pulse analog modulation? Explain its various types in detail. 15

Q.3 Explain various methods of coherent detection in detail. 15

Q.4 a) Write a short note on GMSK. 07
b) Explain ML and MAP detection. 08

Q.5 Write a short note on (any two) 10
a) QPSK
b) Matched filter
c) Bit error rate.

Section B

Q.6 Explain the pulse shaped design for channels with ISI. 15

Q.7 What are the various techniques of synchronization? Explain MMSE and spectral line methods in detail. 15

Q.8 Explain receiver performance over fading channels in details. 15

Q.9 a) Write a short note on characteristics of fading channel. 07
b) Explain symbol and sequence detection. 08

Q.10 Write a short note on (any two) 10
a) Viterbi algorithm
b) Modified duo-binary pulses
c) Symbol error rate.

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Total No. of Printed Pages:01

SUBJECT CODE NO:- P-8027

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Control System Engg.) Examination May/June 2017

Advance Processes Control

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Question 1 and 6 are compulsory.
ii) Attempt any two questions from each section.
iii) Assume suitable data if necessary.

Section A

Q.1	Attempt any five (brief answer):- 1. What is resolution & dead zone? 2. What are methods of error analysis? 3. What are systems of transducer? 4. What is unit operation? 5. What is material balance? 6. What is tuning of controller?. 7. What s controlled, manipulated variable. 8. State applications of Actuators.	10
Q.2	What are major steps in control system design? Explain with example.	15
Q.3	Explain with example materials of energy balance.	15
Q.4	What are different types of heat Exchangers? Explain any one with control system.	15
Q.5	Write short notes on:- (i) Process degree freedom (ii) Generalized measurement systems. (iii) Evaporator.	15

Section-B

Q.6	Attempt any five (brief answer):- 1. What reset control? 2. What is two position control? 3. State specifications of crystallizer. 4. What are gross errors? 5. What is process safety? 6. What is dynamic response? 7. What are optimum settings? 8. State limitations of PID controllers.	10
Q.7	What are different control strategies? Explain feed forward & ratio control system with example.	15
Q.8	What are hydraulic controllers? Explain and derive transfer function of Hydraulic PI controller.	15
Q.9	What are tuning methods? Explain.	15
Q.10	Write short notes on:- (i) Electronic PID controller (ii) Control valve (iii) CSTR	15

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Total No. of Printed Pages:01

SUBJECT CODE NO:- P-8031
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electrical Power System) Examination May/June 2017
Power System Planning & Eco. Operation
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.
ii) Assume the suitable data wherever necessary.

Section A

Q.1 (a) Explain aims of medium term strategy and short term strategies. 10

(b) What do you understand by integrated resources planning explain. 10

Q.2 (a) Draw and explain the organization of power industry in India. 10

(b) Explain the electricity supply act 1948. 10

Q.3 (a) Write the simulation programs for system planning. 10

(b) Write and explain all the forecasting techniques with diagram. 10

Section B

Q.4 (a) Write in brief about reactive load forecast. 10

(b) Discuss and derive the area frequency response characteristics of two area systems. 10

Q.5 (a) What is decentralized control? Explain. 10

(b) Discuss in brief system interconnection and integrated operations. 10

Q.6 (a) Discuss Quasi-saturation compensation and dynamic compensation. 10

(b) In a two bus system if P_{g_A} and P_{g_B} are the respective generations of power at buses A and B and, and if 10
P_{D_A} and P_{D_B} be the power demands, neglecting line loss in the interconnection, find an optimal load dispatch schedule for the system provided the cost functions are given by,

$F_{C_A}(P_{g_A})=\gamma_A + \beta_A P_{g_A} + \alpha_A P^2{}_{g_A}$ Rs/hr

$F_{C_B}(P_{g_B}) = \gamma_B + \beta_B P_{gB} + \alpha_B P^2{}_{g_B}$ Rs/hr

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Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8034
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Automation) Examination May/June 2017
Sensor Technology
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Question No.1 and 6 are compulsory.
ii)Answer any two questions from remaining questions each from Section A and Section B.
iii) Numbers shown in right side indicates full marks.

Section A

Q.1 Answer the following questions in brief (Any five): 10
a) What are the specific installation problems for the measuring devices?
b) What is meant by adjusted range in electronic and pneumatic transmitters?
c) What is the need of auto null sensor amplifier?
d) What is meant by offset voltage in LVDT?
e) State working principle of ultrasonic tactile sensor?
f)Draw a neat sketch of quarter bridge configuration in strain gauge measurement.

Q.2 a) What is a measurement system? Explain with the help of a block diagram. 07
b) Explain working principle of different proximity sensor for position sensing. 08

Q.3 a) Explain servo-type accelerometer with the help of neat block diagram, specifications and applications. 07
b)Explain one of the sensor technologies for torque measurement. 08

Q.4 a)What are the methods of force measurements? Explain any one in detail. 07
b)Explain bonded, unbounded, metal and semiconductor strain gauges in context to structure, material, range, specific characteristics ? 08

Q.5 a)Explain practical implementation of stain gauge in context to challenges during installation and remedies. 07
b)Explain smart transmitter with a neat block diagram and state its salient features as compared to conventional transmitter. 08

Section - B

Q.6 Answer the following questions in brief (Any five) 10
a) Draw a neat diagram of u-tube type manometer.
b) What is meant by static and dynamic pressure?
c) What is Reynolds number? What is its significance?
d) What are the types of thermistors?
e)What are the present trends in smart sensors?
f)What is the use of Gyroscope in robotic system?

Q.7 a)Explain with neat sketch the of McLeod Gauge . Explain Ionization gauge for principle of working vacuum pressure measurement. 07
b)With a neat diagram, explain the working of turbine flow meter and point out its advantages and limitations? 08

Q.8 a)What are the different types of differential pressure flow sensors? Explain any one in detail. 07
b) Explain any one mechanical type temperature sensor in detail. 08

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Q.9 a) Explain terminologies like information coding and integrated sensors in smart sensors. 07

b) Explain any two non-contact ranging sensors in context to working principle and their use in robot. 08

Q.10 a)Explain different configurations of Bourden tube and state the following in tabular form – typical sketch, range , material, application. 07

b)Explain thermocouple in context to working principle, types, cold-junction compensation. 08

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8035

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Drives & Control) Examination May/June 2017

Power Electronics

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.
ii) Use suitable data if required.

Section A

Q.1 Derive to expression for the following performance factors of single phase fully controlled bridge converter. 20
i)input displacement factor
ii)input harmonic factor
iii)input power factor
iv)Voltage ripple factor

Q.2 To input voltage to boost converter shown in fig 1) 5V. The average output voltage $E_0 = 20V$ and average load current $I_0 = 0.5A$. The switching frequency is 20 KHZ. To values of L=200μH and C=400 μF. Determine 20
i)Duty cycle ii)ripple current of inductor,ΔI iii)Peak current of inductor,I_2 and iv)The ripple voltage of filter capacitor, ΔVC.

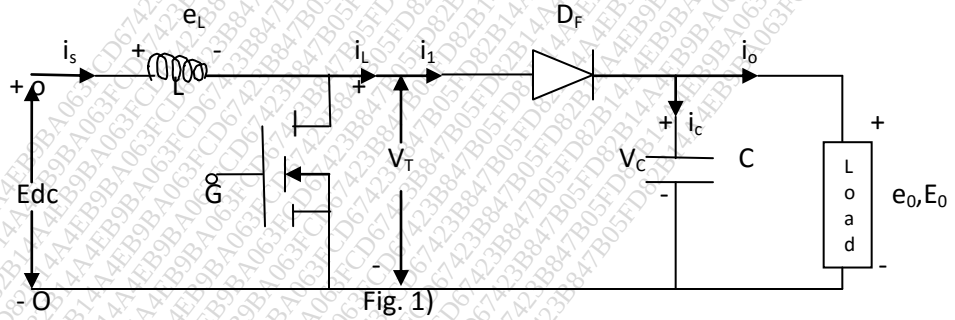

Fig. 1)

Q.3 With the help of neat circuit diagram & wave form derive the expression for a Single phase transistorized square wave Full bridge inverter for the following. 20
i)fundamental output voltage
ii)inverter gain
iii) rms output voltage
Distortion & harmonic factor. Assume R load.

Section B

Q.4 State the need for reduction of harmonics in inverters? Explain the various methods used for reduction of harmonics in inverters. 20

Q.5 Explain why a three phase to single phase cycloconverter requires positive and negative group phase controlled rectifiers. Under what conditions, the group work as inverters or rectifiers? How the firing angles of the two converters controlled? 20

Q.6 Draw the block diagram of microprocessor based firing scheme for the three phase full bridge converter. Explain the firing angle control with the help of algorithm. 20

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Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8036
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electronics) Examination May/June 2017
Advanced Control System
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Q. No. 5 and Q.No.10 are compulsory.
ii) Solve any two questions fromQ.1, 2. 3, and 4 in section A
iii) Solve any two questions from Q .6, 7, 8, and 9 in section B
iv) Figures to the right indicate full marks
v) Assume suitable data wherever necessary and mentions it clearly

Section A

Q.1 a) Find the response of a system represented by the differential equation 07

$$\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 4y = 2r(t), where\ the\ intail\ conditions\ are$$

Y(0)=1, $\frac{dy}{dt}(o) = 0, and\ r(t) = 1, t \geq 0$ also find the steady state response

b) Explain in detail Mason 's signal flow gain formula 08

Q.2 a) What is the exact relationship between the static error constants and the steady state errors for ramp and parabolic inputs. Determine step, ramp and parabolic error coefficients 07

b) A certain feedback control system is described by the following transfer function 08

G (s)=$\frac{K}{s^2(s+20)(s+30)}$; $H(s) = 1$ determine steady state error coefficients .

Q.3 a) What does the Routh –Hurwitz criteria tell us? 07

b) Name sources of steady state errors 08

Q.4 a) Briefly describe an advantages that space techniques have over root locus techniques in the placement of closed loop poles for transient response design 07

b) For a series RLC circuit identify a set of state variables and obtain a set a first order differential equations in terms of state variables and write the state differential equation 08

Q.5 Write short notes on <u>any two</u> 10

a) Transfer function of DC motor
b) Mechanical accelerometer
c) Performance specifications in the frequency domain
d) State transition matrix

Section -B

Q.6 a) When designing a lag-lead network what difference is there in the design of the lag portion as compared to a separate lag compensator 07

b) Explain how phase lead design is done by Bode plot 08

Q.7 a) Explain in detail when a system is side to be controllable 07

b) Consider a system described as the transfer function 08

T(s)=$\frac{1}{s^3+a_2s^2+a_1s+a_0}$

Draw the flow graph model for this system and find its matrix differential equation

Q.8 a) Draw and explain the block diagram of a digital computer control system 07

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b) Explain how stability analysis of a sampled system can be done in z plane 08

Q.9 a) Explain briefly how to find the static error constant from the Bode magnitude plot 07

b) Explain frequency response as applied to physical system 08

Q.10 Write short notes on <u>any two</u> 10

a) Relative stability with Nyquist criterion
b) Specifications in frequency domain
c) Z Transform
d) Mapping contours

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8037
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/ECT/CE) Examination May/June 2017
Detection & Estimation Theory (El-1 on EC)
(Revised)

[Time : Three Hours] **[Max Marks :80]**

N.B
1. Q. No.1 & 6 are compulsory
2. Solve any two questions from remaining questions in each section.

Section A

Q.1	a)	Explain a linear and nonlinear estimation	05
	b)	Write a short note on 'correlation Receiver' in detection process	05
Q.2	a)	Explain in detail about basic concepts of detection theory used in communication systems	07
	b)	Explain performance bounds and approximation	08
Q.3		What do you mean by white Gaussian noise? explain detection of signals in white Gaussian noise by employing a large receiver system	15
Q.4	a)	Explain Neyman-Pearson criterion in details	08
	b)	Explain composite hypothesis system in communication engineering	07
Q.5	a)	Describe the various cases at the general Gaussian problems.	08
	b)	Explain binary hypothesis test in detail	07

Section B

Q.6		Write a short note on	05
	a)	RADAR and SONAR system	05
	b)	Kalman filters	
Q.7	a)	Explain M-ary detection in white Gaussian noises	08
	b)	Explain detection and estimation in non-white Gaussian noise	07
Q.8		Describe with suitable block diagram a modulation system with memory	15
Q.9	a)	Explain the whitening property and relation of it with wiener-Hoff equation	08
	b)	Explain AR and ARMA lattice ladder filters	07
Q.10		Explain the filters with respect to the following. i) Linear prediction ii) Optimum filter. Also state their property	15

Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8046
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Control System Engg.) Examination May/June 2017
Advanced Digital processing Systems
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 and Q.No.6 are compulsory. Attempt any two questions from the remaining questions in each section
ii)Figures to right hand side indicates full marks.

Section A

Q.1	a)	Give the classification of signals.	05
	b)	State properties of DFT and compute the DFT of DT signal x[n] =n 0≤n≤3 = 0 otherwise	05
Q.2	a)	Compute the convolution of the DTS signal x[n] ={ 1 2 1 2} with h [n] ={ 1 2 1} by using graphical method	08
	b)	Derive the impulse Invariant transformation for transforming analog system to digital system	07
Q.3	a)	Using DIT FFT algorithm, compute the DFT of DT sequence x[n] ={ 1 0 1 0 1 0 1 0 }	08
	b)	Derive the frequency response of linear phase FIR filter when impulse response is symmetric with center of symmetry at (N-1)/2 & N is even	07
Q.4	a)	Derive the relation between analog and digital poles of IIR filter using Bilinear transformation	08
	b)	Write the different window functions with expression in FIR design	07
Q.5	a)	Using all the representation way, represent the different standard signal in analog & discrete.	08
	b)	Compare the number computations required in direct DFT & FFT	07

Section B

Q.6	a)	In the IIR system given below the products are rounded to 4-bits (including sign bit) $H(t)=\frac{1}{(1-0.15t^{-1})(1-0.43t^{-1})}$ Find the output off noise power Direct form realization	05
	b)	a) What are wavelets? Give the expression for different types of wavelets.	05
Q.7	a)	What is multi resolution analysis? Give its usage in a signal processing application.	08
	b)	What is a poly phase structure? perform poly phase decomposition to decompose into a 2- section $H(t)=0.2+0.7t^{-1}+0.8t^{-2}+0.15t^{-3}+0.6t^{-4}+0.31t^{-5}+0.5t^{-6}+0.4t^{-7}+0.9t^{-8}$	07
Q.8	a)	consider the DT signal x[n] = { 1 2 3 4 5 6 7 8 9 10 11 12} Determine the downsampled version of the signals for sampling rate reduction factor a) D=2 b) D=3	08
	b)	Study the limit cycle behavior of the system described by w[n]=Q[aw[n-1]]+x[n]where w[n] is the output of the system and Q[.] is quantization Assume that Q=-0.875, x(0)=0.75 and x[n]=0for n>o	07

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choose 4 bits for quantization

Q.9 a) What is parseual's theorem? Define the terms scaling function and wavelet function in Haar. 08

b) The TF of an IIR filter is 07

$H(t)=\frac{1+0.7t^{-1}}{1-0.9t^{-1}}$

perform poly phase decomposition of H(t)to decompose into a) 2 section b) 4 Section

Q.10 15

Write short notes on any three

a) Process of upsampling with example.
b) Product quantization noise model of 2nd order IIR system
c) DWT
d) Effect of finite register length in DFT computations.

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SUBJECT CODE NO:- P-8047
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Embedded System) Examination May/June 2017
Design With Microcontroller
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Q.No.5 and Q.No.10 are compulsory.
ii) Solve any two questions from Q.No.1 to Q.No.4.
iii) Solve any two questions from Q.No.6 to Q.No.9.
iv) Figures to the right indicate full marks.

Section A

Q.1	(a)	List and explain the different processor status for AVR 82 bit microcontrollers.	08
	(b)	Draw and briefly describe the functions of Various registers i.e. Programmer's model for AVR 32 bit microcontrollers.	07
Q.2	(a)	Explain any four data transfer and load store instructions of AVR 32 bit microcontrollers giving examples.	08
	(b)	Write a small C/assembly instructions program for AVR 32 microcontroller for (i) Rotating a byte left by 4 bit (ii) Swap a byte in a registers	07
Q.3	(a)	What are the different operating features of PIC24FJ128GA microcontrollers? List and briefly explain power saving modes for the same.	08
	(b)	Draw and explain IVT (Interrupt Vector Table) concerned with 16 bit PIC microcontroller.	07
Q.4	(a)	Draw and explain CPU core block diagram for PIC24FJ128GA010, a 16 bit microcontroller from microchip.	08
	(b)	Draw and explain architecture of AVR32 microcontrollers.	07
Q.5		Write short notes on any two:- (a) MMU for AVR (b) Resister organization for PIC 24. (c) Oscillator configuration for PIC24. (d) AVR microcontroller.	10

Section B

Q.6	(a)	Explain with examples the functioning and working of instructions from PIC24 microcontrollers. (i) Math's instructions (ii) Logical instructions	08
	(b)	Explain various addressing modes of PIC 16 bit microcontrollers.	07
Q.7	(a)	Draw and explain the block diagram and working of RTC peripheral in PIC24.	08
	(b)	Explain the configuration steps for ADC, from PIC24 microcontrollers.	07
Q.8	(a)	What do you understand by data acquisition and manipulation in an embedded system? How it is done in PIC microcontrollers.	08
	(b)	What are the different tools required to build an embedded system using PIC microcontroller.	07
Q.9	(a)	Draw and explain the any 1 times mode and its operation associated with PIC microcontrollers.	08
	(b)	Explain various interrupts associated with PIC microcontroller.	07
Q.10		Write short notes on any two. (a) WDT for PIC (b) I/O ports associated with PIC (c) Serial communication in PIC using I2C/SPI. (d) Keyboard/display interfacing to PIC microcontrollers.	10

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Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8051

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power System) Examination May/June 2017

Computer Aided Power System Analysis

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.

ii) Assume suitable data if required

Section A

Q.1 a) The one line diagram of a power system shown in Fig.1. the three phase power and line voltage ranges are given below 10

Transformer :100MVA 23/115kv x=20%

Line: Z=j65Ω.

Load bus2 (S_2)=150mw+j5MVAr.

Load bus3 (S_3)= OMW+j20 MVAr.

It is required to maintain the voltage at bus 3 at $115<0^o$ Kv. Detrmine the voltage at buses 1&2

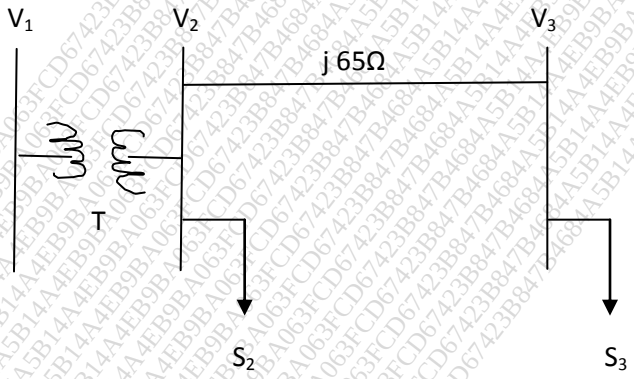

fig.1 Q 1(a)

b) Derive the symmetrical component for η phase system 10

Q.2 a) Analyze the single line open fault 10

b) Determine the sequence network for double line to ground fault on a three phase generator with fault on phases b & c through an impedance Z_f to ground. Assuming the generator is initially on no load. 10

Q.3 a) Derive the sequence impedance of three winding transformer. 10

b) The reactance data for a power system shown in fig.2 in PU on a common base is as follows. 10

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Item	X^1	X^2	X^0
G_1	0.1	0.1	0.05
G_2	0.1	0.1	0.05
T_1	0.25	0.25	0.25
T_2	0.25	0.25	0.25
Line 1-2	0.3	0.3	0.5

Compute the fault current in PU for a single file to ground fault at bus 1

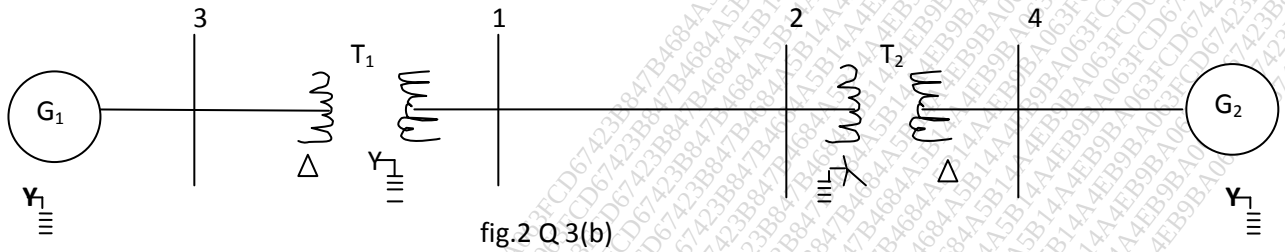

fig.2 Q 3(b)

Section B

Q.4 a) What do you understood by change of symmetry? Explain its importance in analyzing unbalanced faults. 10

b) What is kron's transformation matrix? Explain the use of this matrix to analyze SLG fault. 10

Q.5 a) What is simultaneous fault? How to analyze simultaneous fault using two part network theory? 10

b) A simple power system is shown in fig with simultaneous faults indicated by X's at faults points F and F'. the following system data is known: 10

Generator(A): $Z_1"=Z_2=j\ 0.12$, $Z_0=j0.1$, $E_A=1.1<<30^o$

Generator(B): $Z_1"=Z_2=j\ 0.15$, $Z_0=j0.13$, $E_B=1<0^o$

Transformer (T_1) $Z_1=Z_2=Z_0=j0.10$

Transformer (T_2) $Z_1=Z_2=Z_0=j0.12$

Transmission line $Z_1=Z_2=j0.5$, $Z_0=j1.0$

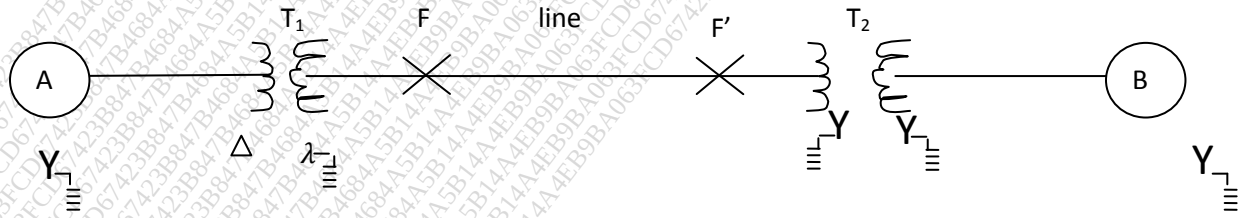

Fig.3 Q.5(b)

Q.6 Write short notes. (10x2) 20

i) Decoupled power flow method.

ii) Comparison of admittance and impedance matrix techniques.

2017

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8054

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Automation) Examination May/June 2017

Advanced Electrical Drives

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

i) Solve any three questions from each section

Section A

Q.1	A	Explain different parts of Electrical drives.	07
	B	Explain the classification of load torques.	08
Q.2	A	Draw & explain the analysis of the three phase fully controlled rectifier control of DC motor	08
	B	Explain various braking of DC motor.	07
Q.3	A	A 220v, 960rpm, 12.8 A separately excited DC motor has armature circuit resistance & inductance of 2Ω & 150 MH, respectively. It is fed from single phase half controlled rectifier with an AC source voltage of 230 V, 50Hz. Calculate : i) Motor torque $for\ \alpha = 60^o$ & speed=600 rpm ii) Motor speed for $\alpha = 60^o$ & torque=20 N-m	08
	B	Explain various speed control methods of Induction motor (3Ø).	07
Q.4		Write the short notes for notes for any two i. DC servo motor ii. PLL control iii. Closed loop position control.	10

Section B

Q.5	A	Explain rotor resistance control of induction motor speed control.	07
	B	What do you understand by voltage source inverter Induction motor drives?	08
Q.6	A	Explain self controlled synchronous motor drive employing load commutated thyristor inverter	08
	B	Draw the circuit connection for static scherbius drive and explain.	07
Q.7	A	Explain variable reduction motor features	07
	B	Explain drive circuit for stepper motor	08
Q.8	A	Write a short notes for any two	10
	B	a. Brushless DC motor b. Variable frequency control of synch motor.	

2017

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8055

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Drives & Control) Examination May/June 2017

Solid State Controlled Electrical Drives

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.

Section A

Q.1	A	Explain chopper control of separately excited DC motor.	10
	B	A 200 v , 875 rpm, 150A separately excited DC motor has an armature resistance of 0.06Ω. It is fed from a single phase fully controlled rectifier with an ac source voltage of 220v, 50 Hz. Assuming continuous conduction, calculate. i. Firing angle for rated motor torque and 750rpm ii. Firing angle for rated motor torque and (-500)rpm iii. Motor speed for $\alpha = 160^o$and rated torque.	10
Q.2	A	Explain the loading of an electric motor and its duty cycle with a simple diagram.	10
	B	List various breaking of D.C motor, explain one of them in detail.	10
Q.3	A	Explain transient response of closed loop drives system	10
	B	A 220v, 970 rpm, 100A D.C separately excited motor has an armature resistance of 0.05 Ω. It is braked by plugging from an initial speed of 1000 rpm calculate i) resistance to be placed in armature circuit to limit breaking current to twice the full load value ii) Breaking torque iii) Torque when the speed has fallen to zero	10

Section B

Q.4	A	Explain in detail static rotor resistance control in Induction motor	10
	B	A 440v, 50 Hz, 6pole, Y-connected wound rotor motor has the following parameters: R_s=0.5Ω, R'_r=0.4Ω X_s=X'_r=1.2Ω, X_m=50Ω, stator to rotor turns ratio is 3.5. Motor is controlled by static rotor resistance control. External resistance is chosen such that the breakdown torque is produced standstill for a duty ratio of zero. Calculate the value of external resistance .How duty ratio should be varied with speed so that the motor accelerates at maximum torque.	10
Q.5	A	Explain in detail about the closed loop speed control of 3-phase VSI fed induction Motor.	10
	B	Explain how n induction motor is brought to stop by i. Plugging ii. Dynamic breaking	10
Q.6	A	Explain torque angle control of synchronous motor	10
	B	Explain sub and super synchronous operation in Induction motor.	10

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Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8056
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Communication) Examination May/June 2017
Advanced Radiation System
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i)Solve two full question from each section
ii) Assume suitable data (if necessary)
iii) Figure to the right indicate full marks

Section A

Q.1 a) What are planar antennas? How these differ from conventional (3D) antennas? Explain their design issues and constraints 08

b) List the parameters which decide the antenna's performance Also briefly explain the measurement techniques of each of these parameters 12

Q.2 a) Design 2 x2 CMSA array using corporate feed with following specification 14
a= 15 mm, f = 5 GK_2, Er= 3.0, h = 1.6mm,
Redge = 150Ω dx = dy = 0.5 λ_0

b) With suitable geometry explain the operation of cpw fed antenna 06

Q.3 Write short notes on 20
i)c p w and micro strip feed
ii) Axial ratio
iii) Antenna efficiency & radiation efficiency
iv) cavity model
v) method of moments & MNM model

Section B

Q.4 a) Explain end fire and broadside arrays 06

b) List and explain all possible technique of exciting circular polarization. Also explain the way of calculating AR bandwidth 14

Q.5 a) Why does micro strip antenna in its conventional form offers narrow bandwidth? Explain various techniques to improve it. 10

b) With neat sketch explain coplanar capacitive coupled probe fed microstrip antenna 10

Q.6 Write short notes on 20
i) Slot antennas
ii) Active antennas
iii) Miniaturized antennas
iv) Handset & Base station antennas
v) Micro machined antennas

2017

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8059

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Digital Communication) Examination May/June 2017

RF MEMS

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Answer any two question from each section

Section A

Q.1	a) What is photolithography? Explain steps of photolithography in detail.	10
	b) Explain RF switches and micro relays with diagram explain series and shunt switches	10
Q.2	a) Explain dynamics of switching operation, derive the expression for switching speed	10
	b) How shunt capacitive switches operate? Explain with diagram	10
Q.3	a) How does PIN diode act as RF switch? Explain series Pin switch and shunt PIN switch , give application	10
	b)What is micro machined inductor? explain in detail	10

Section B

Q.4	a) Explain switched delay line phase shifter. write down the application of phase shifter	10
	b) Write down design equation of micro machined transmission line .Explain in detail	10
Q.5	a) Write down principle of modeling of mechanical filter. Give mathematical modeling equation for torsional mode rod resonator	10
	b) What is micro machined RF Filter? Explain electrostatic coupled beam structure	10
Q.6	a) Explain in detail micro machined filter using comb drive	10
	b) Give the design expression for L W and edge (input) impedance of microstrip antenna. Design all the parameters for E_r= 4.4 h = 0.78mm and f_o = 10Gh$_2$	10

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Total No. of Printed Pages:01

SUBJECT CODE NO:- P-8067

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Control System Engg.) Examination May/June 2017

Intelligent Control System

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.

Section A

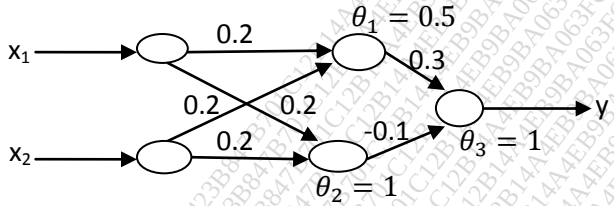
Q.1 (a) Explain in detail delta and perceptron learning rule? 10

(b) Explain multilayer ANN in detail? 10

Q.2 (a) Explain the algorithm for EBP? 10

(b) Explain difference in delta and generalized delta learning rule? 10

Q.3 (a) Compute the output for following Neural network. 12



x_1	x_2	y
0	0	
1	0	
1	1	
1	0	

(b) Explain direct adaptive and Model reference adaptive control based on NN? 08

Section B

Q.4 (a) Explain classical relation and fuzzy relations in detail? 10

(b) Find the following:- 10

(i) A∪ B, (ii) A∩ B (iii) $\bar{A} \cup \bar{B}$ (iv) A∩ $\bar{B}$

A=$\left\{\frac{1}{2}+\frac{0.3}{3}+\frac{0.4}{4}+\frac{0.8}{5}\right\}$

B=$\left\{\frac{0.3}{2}+\frac{0.6}{3}+\frac{0.4}{4}+\frac{0.7}{5}\right\}$

Q.5 (a) Explain the designing of PI like FKBC? 10

(b) Explain the defuzzification methods? 10

Q.6 (a) Explain the structure of a FKBC? 10

(b) Explain the temp controller of heat exchanger using fuzzy logic controller? 10

2017

Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8073
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electrical Power System) Examination May/June 2017
Power System Dynamics & Stability
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Answer any two questions from each section.
ii) Assume suitable data, if required.

Section A

Q.1 a) What is the classical model of a synchronous machine? What are the assumptions made in the classical model? Explain the dynamic of a synchronous machine. 10

b) A single live diagram of a system is shown in fig 1. 10

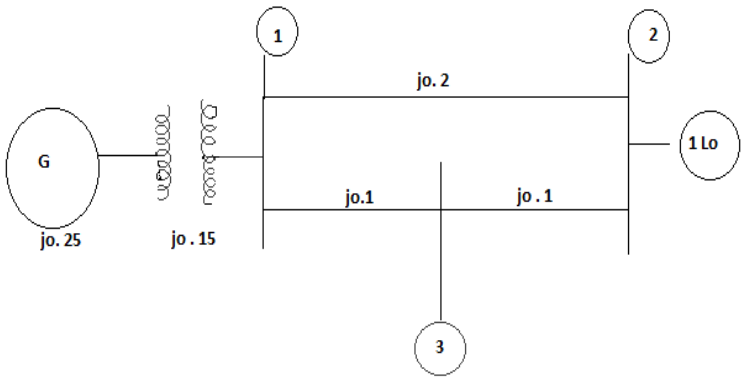


Fig 1. SLD for Q.# 1 (b)

All the values are in per unit on a common base. The power delivered into bus. 2 (an infinite bus having a voltage of ⊥ p. u.)1.0p.u. at 0.80 power factor lagging. Obtain the power angle equation and swing equation and swing equation for the system. Neglect all losses

Q.2 a) Explain the equal –area criterion for the stability of an alternator supplying infinite bus-bars via an inductive inters connector. 10

b) b) A loss free generator supplies 50 MW to an infinite bus, the steady-state limit of the system being 100 MW. Determine whether the generator will remain in reactance synchronism if the prime-mover input is abruptly increased by 30 MW. 10

Q.3 a) For the synchronous generator explain 10
i) Direct axis synchronous -reactance
ii) Quadrature –axis synchronous- reactance
iii) Direct axis transients open-circuit time constant T'_{do}
iv) Direct-axis transient start-circuit time constant T'_{d}

b) Explain the flux-linkage state space modes of synchronous machine. 10

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Section-B

Q.4	a)	What are the main requirements of excitation system? Explain the brushless excitation system for synchronous generator.	12
	b)	Explain the role of Automatic voltage regulator in the operation of synchronous generator-in improving stability.	08
Q.5	a)	Explain the use of FACTS devices for power system stability- enhancement.	10
	b)	With the help of block diagram, explain the generator excitation system-dynamics.	10
Q.6	a)	Explain the phenomenon of sub-synchronous frequency oscillations in multi machine power system with reference to stability.	10
	b)	A 12 MVA, 5000 volts, 3 phase, 4 pole 50 HZ alternator is connected to infinite bus-bars. The short circuit current is 4-times the normal full load current and the moment of inertia of the rotating system is 22000 kg-m^2. Determine the frequency of oscillation of the generator system.	10

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8076
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Automation) Examination May/June 2017
Micro Controller & its Applications
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
1. Q.1 & Q. 6 are compulsory. Attempt any two questions from remaining in each section.
2. Figures to the right indicate full marks.

Section A

Q.1	a)	Explain role of program counter –in 8051.	05
	b)	What is role of parity flag & overflow flag in 8051?	05
Q.2	a)	Explain various selection criteria of micro controllers.	08
	b)	Explain various ports of 8051. Also, write a note on alternate use in expended mode.	07
Q.3	a)	What is assembler? Explain benefits of assembly language programming.	08
	b)	Write an ALP for –placing any numbers in internal RAM location 3 CH & increment it until the number equals 2Ah	07
Q.4	a)	Write a note on immediate addressing of 8051, with suitable example.	08
	b)	Explain working of pins $\overline{RST}, \overline{PSEN}, \overline{EA}, \&\ ALE$ in detail.	07
Q.5	a)	Explain instruction for increment, decrement, multiplication & division used in ALP.	08
	b)	Write a detailed note on types of memory.	07

Section B

Q.6	a)	Explain delay – cycle instructions with example.	05
	b)	Explain CLR & RR instructions.	05
Q.7		How can we get the pulses at port bit P1.1 using toggling? Assume the pulse intervals are $100\mu s$ using 8 – bit T1 in 8051, where T = $1\mu s$ & O/P is 0 for $50\mu s$ intervals & 1 for $50\mu s$ intervals. Draw related timing diagram.	15
Q.8	a)	Write a note on serial communication interrupt of 8051.	08
	b)	Write a note on serial communication in microcontroller.	07
Q.9		With the help of interfacing diagram of 8051 with LCD, program the LCD controller for 4 - bit mode for using the controller pins 14 – 11 only fewer port bits.	15
Q.10	a)	Write a note on interfacing of 8051 to external memory.	08
	b)	Write a note on interrupt priority of 8051.	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8078

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Drives & Control) Examination May/June 2017

Advanced Digital Signal Processing

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
1) Solve any three questions from each section.
2) Assume suitable data wherever necessary.

Section A

Q.1 a) State & explain the properties of Fourier transform. 07

b) Explain Nyquist criteria. 03

c) Explain Gibbs phenomenon. 03

Q.2 a) Determine the following discrete times are 08
1) Static or Dynamic
2) Linear or Nonlinear
3) Time variant or time invariant
4) Causal or non-causal
5) Stable or unstable.

Systems →

i. $y(n) = x(n) + 3x(n+4)$
ii. $y(n) = x(-n)$
iii. $y(n) = \sum_{k=-\infty}^{\infty} x(k)$

b) Prove that, 'shifting in time' and 'folding' operations. Are not commulative. 05

Q.3 a) Design a low pass FIR filter satisfy the following specifications. 10

$\propto_p \leq 0.5dB, \propto_s \geq 31dB, \omega_p = 10rad/sec, \omega_s = 25\, rad/\sec \;\; \omega_{sf} = 100rad/sec.$

b) Enlist desirable & undesirable features of FIR fitter. 03

Q.4 a) For the analog transfer function $H(s) = \frac{1}{(s+1)(s^2+s+1)}$, Ddetermine H(z). 10
using impulse invariance method. Assume $T = 1sec.$

b) What are the limitations of Impulse invariance method? 03

Q.5 Write short note on (any two)

a) Warping effect & its remedy 07

b) Filter structures. 07

c) Matched z – transform method. 07

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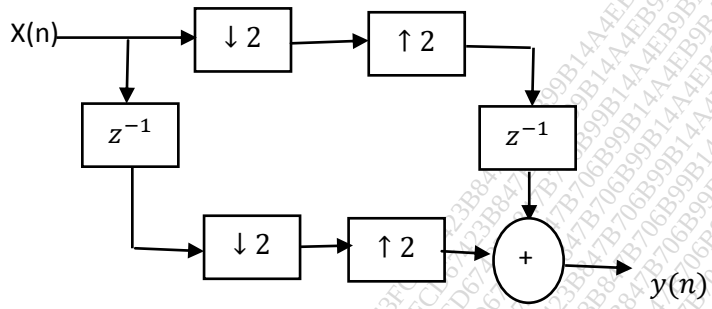
Section B

Q.6 a) Draw & explain generalized architecture of digital signal processor. 08

b) Write FIR filter algorithm for any general purpose digital signal. 05

Q.7 a) Find the relation between $x(n)$ & $y(n)$ of a multirate system shown in fig. 07



b) State and explain the identities of multirate sampling. 06

Q.8 a) What is the need of adaptivity? Give two examples where adaptive filtering is used. 07

b) Explain how Noise introduced in the system can be minimized. 06

Q.9 a) Explain in detail real time, LMS adaptive filtering implementation. 06

b) Explain polyphase decomposition of FIR fitter. 07

Q.10 Write short note on (any two)

a) General purpose architecture of DSPs. 07

b) Arbitrating rate sampling rate converter 07

c) Window HOFF LMS algorithm. 07

SUBJECT CODE NO:- P-8079
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electronics) Examination May/June 2017
El-1 Advanced Satellite Communication
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i. Q. No. 5 & Q. No. 10 are compulsory.
ii. Attempt any two question from remaining in each section.

Section A

Q.1	a)	Write a note on orbital spacing.	07
	b)	Write a note on faraday notation in the atmosphere.	08
Q.2	a)	Explain brief history of satellite communication.	07
	b)	How to calculate angle of evaluation?	08
Q.3	a)	What is transponder in satellite? Explain single conversion transponder for 6/4 GHz band.	07
	b)	What is bit rate, symbol rate, occupied bandwidth of the link?	08
Q.4	a)	What is atmospheric absorption? Explain cloud attenuation&tropospheric scintillation.	07
	b)	Explain coherent & non – coherent detection used for demodulation in satellite comm.	08
Q.5	a)	Explain rain effect on antenna Noise.	05
	b)	Write a note on link Budgets.	05

Section B

Q.6	a)	What is system Nosie temperature? How does it affect the C/N & G/T ratios?	07
	b)	What is Carson's rule? Explain FM in satellite communication.	08
Q.7	a)	Explain QPSK modulator &demodulator in detail.	07
	b)	Explain TDMA frame structure.	08
Q.8	a)	Explain calculation of link margins for VSAT – STAR network.	07
	b)	Explain different antennas used in VSAT.	08
Q.9	a)	Explain position location in GPS.	07
	b)	Explain DBS-TV receiver in detail.	08
Q.10	a)	Explain downlink design concept	05
	b)	FDMA	05

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8136

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (EC/ECT/CE/DC/ES) Examination May/June 2017

Advanced Optimization Techniques

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.
ii) Figures to the right indicate full marks.
iii) Assume suitable data if necessary.

Section A

Q.1	a) Explain Design variables and variable bounds	10
	b) Explain flow chart of the optimal design procedure	10
Q.2	a) Explain Bounding phase method with suitable example	10
	b) Solve using Region elimination method $f(x) = x^2 + 54/x$	10
Q.3	a) Explain secant method in detail with suitable example	10
	b) Write a short note on (any two) i) Newton Raphson Method ii) Exhaustive Search Method iii) Internal halving method	10

Section B

Q.4	a) Explain direct search method along with algorithm of Box's Evolutionary Optimization method.	10
	b) Write a short note on (any two) i) Caushy's (steepest descent) method ii) Sensitivity analysis iii) Complex search method	10
Q.5	a) Explain Gradient based method	10
	b) Explain Transformation methods	10
Q.6	a) Explain penalty function method	10
	b) Explain differences between GA's and traditional method.	10

Total No. of Printed Pages:2

SUBJECT CODE NO:- P-8148

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power Systems) Examination May/June 2017

Advanced Power Electronics

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B Answer any two full questions from each section.

Section A

Q.1 a. What is the principle of operation of buck converter & explain its working with help of waveforms. 10

b. Describe half bridge and full bridge converters configuration. Enumerate its advantages. 10

Q.2 a. what is the principle of phase control? Also derive the performance parameters of a single phase full wave ac controller with RL load. 10

b. A single phase full wave ac voltage controller in figure I has a resistive load of R=10Ω and the input voltage is V_s=120V (rms) 50Hz. The delay angles of thyristors T_1 and T_2 are equal $\alpha_1 = \alpha_2 = \alpha = \frac{\pi}{2}$. Determine (a) the rms output voltage V_o^2 . (b) The input Pf. (c) The average current of thyristors I_A and (d) the rms current of thyristors I_R 10

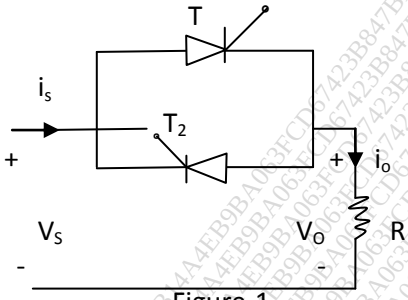


Figure-1

Q.3 a. Explain working of single phase full wave controller with inductive loads? Draw the waveforms for the output voltage v_o and output current i_o and voltage across T_1 10

b. A three phase ac voltage controller. Supplies a Y connected resistive load of R= 5Ω and the line to line input voltage is V_s =208V at 50Hz. Plot the PF against the delay angle α for (a) the full wave controller in figure 2 10

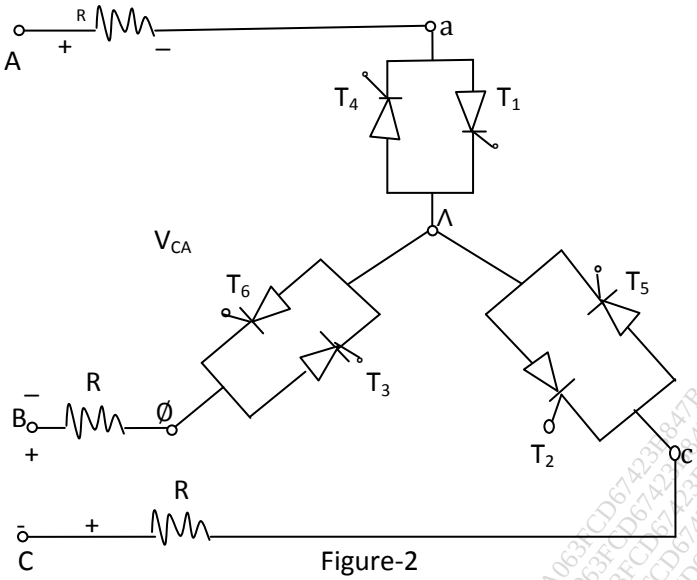


Figure-2

Section B

Q.4	a. Explain all the gate drive techniques in detail		10
	b. Describe in detail the techniques for optimizing the base drive of a BJT.		10
Q.5	a. Write the drawback of SPWM? Also describe and suggest other techniques offering improved performance with waveforms.		10
	b. A single phase full bridge inverter which uses a uniform PWM with two pulses per half cycles has a load of R=5Ω α=15 mH and C=25μF. The dc input voltage is V_s =220v. Express the instantaneous load current i_o (t) in a Fourier series for m=0.8, f_o =50Hz.		10
Q.6	a. Explain the circuit operation and equivalent circuits of series resonant inverter		10
	b. A parallel resonant inverter delivers a load power of P_L=2Kw at a peak sinusoidal load voltage of V_p =170v and at resonance. The load resistance is R=10Ω. The resonant frequency is f_o=25KHz. Determine (a) The dc input current I_s (b) The quality factor Q_p if it is required to reduce the load power to 500w by frequency control so that μ=1.25 (C) the inductor L (d) The capacitor C		10

SUBJECT CODE NO:- P-8153
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/ECT/CE/DC/ES) Examination May/June 2017
Audio Signal Processing & Coding
(Revised)

[Time:ThreeHours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Q.No.5 from Section –A and Q. No.10 from Section – B are compulsory.
ii) Solve any two questions from Q. No.1,2,3, 4 from Section-A and any two questions from Q. No.6,7, 8, 9 from Section – B.
iii) Assume suitable data, if necessary

Section A

Q.1	a) Define Speech? Explain in detail the process of speech production.	08
	b) Explain voiced and unvoiced decision making of speech signal	07
Q.2	a) Explain pitch period measurement using spectral domain	08
	b) Write note on Wavelet transformation of speech	07
Q.3	a) Explain time domain model for speech processing in detail	07
	b) Explain the procedure for finding format frequencies using log spectrum	08
Q.4	a) Describe cepstral analysis of speech in detail	07
	b) What is auditory filter bank? How will you convert the frequency in Hz to frequently on MEL scale? Also explain MEL scale filter	08
Q.5	Write short notes on (any two) i) Lossless Tube model for speech signal ii) Audio file formats. iii) Homomorphic processing.	10

Section – B

Q.6	a) With the help of block diagram explain delta modulation? Also state its advantages	08
	b) Give detail comparison of different Waveform coding techniques.	07
Q.7	a) Explain filter bank simulation method for short time analysis	08
	b) Describe in detail spectrographic display.	07
Q.8	a) Explain – i) Pitch detection and ii) Format estimation	08
	b) Discuss in detail linear filtering interpretation of short time spectral analysis.	07
Q.9	a) With the help of diagram explain Dolby AC3 system.	08
	b) Explain in detail emotion recognition from speech	07
Q.10	Write short notes on (any two) i)MPEG-2 advanced audio coding system ii) Multimode speech coding iii) HMM based speech recognition	10

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8165

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power Systems) Examination May/June 2017

Digital Protection of Power System

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
1. Solve any two questions from each section.
2. Assume suitable data whenever required.

Section A

Q.1	a)	Why digital protection is necessary? What are its advantages? Compare with electromechanical based protection.	10
	b)	Discuss an evolution of micro – processor and its history. What is current scenario?	10
Q.2	a)	Explain the amplitude comparator showing all input and its outputs.	10
	b)	How can A/D converter ADC 0809 be used to read any instantaneous value of ac voltages? Draw block diagram and explain.	10
Q.3	a)	Explain with neat diagram solid protection of transmission line.	10
	b)	Explain with suitable example. The electromagnetic transient program.	10

Section B

Q.4	a)	Draw & explain CT modeling.	10
	b)	How DSP helps in power system protection? Explain with example.	10
Q.5	a)	Draw & explain configuration of microprocessor based control for load shedding. Draw flow chart.	10
	b)	Explain with neat diagram solid state protection for differential relay scheme.	10
Q.6	a)	Draw & explain configuration of microprocessor based control for distance protection scheme. Draw flow chart.	10
	b)	How DFT employed for protection? What is its objective? Write Fourier representation of signals.	10

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8171
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electronics) Examination May/June 2017
Advanced Power Electronics
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) solve any two question from each section
ii) Assume suitable data wherever necessary
iii) Figure to the right indicate full marks

Section A

Q.1 a)What are the attributes of an ideal switch? Explain the testing procedure for measurement of thyristor parameters 10

b) Explain with near diagram speed control of induction motor using micro controller system 10

Q.2 a) With the help of suitable circuit diagram explain various protection of thyristor 10

b)A three phase thyristor bridge with 400 V, 50HZ 3Ø supply is feeding a separately excited dc motor. The motor parameters are ; rated current 50 A, resistance 0.1 Ω ,back emt constant 0.3 V / rpm. calculate: 10
i) No load speed; if no load current is 5 A and firing angle is 30^{o}
ii) Firing angle to obtain speed of 1600 rpm at rated current

Q.3 a) Explain the operation of resonant series converter 10

b) Explain in detail zero voltage switching method 10

Section B

Q.4 a) What are the recent terms in development of variable speed drives? Explain 10

b) A step down chopper has an input voltage of 200 V. it is feeding on RLE load having R = 2Ω, L = 10 mh, E = 20 V. The chopping cycle has a time period of 1000 μs and thyristor is on for 300 μs in each cycle, calculate: 10
i) Find whether load current is continuous or hot
ii) Find maximum and minimum value of output current
iii) Find average value of output current

Q.5 a) Explain bipolar and unipolar PWM techniques in case of inverter 10

b) Explain the various filters used in inventers 10

Q.6 Derive the expressions for average output voltage, RMS supply current, RMS n^{th} Harmonic current, displacement angle, supply power factor, displacement factor and harmonic factor in SPWM control scheme for improvement of power factor 20

2017

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8185

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power Systems) Examination May/June 2017

HVDC Transmission

(Revised)

[Time:ThreeHours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve the two questions From each section.

ii) Assume suitable data wherever necessary.

Section A

Q.1	a. Explain basis configuration of three phase converter. i.e. Graetz Bridge circuit. What are its objectives? Draw its output waveforms.	10
	b. Draw block diagram of current controller. How extinction angle control is achieved in it? Explain.	10
Q.2	a. What are the types of AC Filters? Explain any one in detail.	10
	b. What are the methods of control in MTDC system? Explain any one in detail.	10
Q.3	a. Discuss AC-DC systems in terms of Ac-DC interaction, Analysis & necessity of its modelling.	10
	b. What are the types of basic firing angle schemes? Explain in detail.	10

Section B

Q.4	a. What are the causes and types of overvoltage occur in converter station? How overvoltage protection given in converter station? Explain.	10
	b. What is system simulation? Explain in terms of number of tools required, its requirement & design with number of system studies.	10
Q.5	a. what is non-characteristic harmonic? What are its sources & Causes? Explain effect of firing angle error and unbalanced voltage on it.	10
	b. What is the solution of AC-DC power flow? Explain.	10
Q.6	Solve the three.	20

a. Comparison of AC & DC transmission.

b. Need of PLC-RI filter & its carrier frequency

c. Specify area of application for MTDC system.

d. Use of earth & sea return.

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8191
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/ECT/CE) Examination May/June 2017
Image & video Processing
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
i. Q. No. 1 and 5 are compulsory.
ii. Solve any two questions from remaining questions in each sections.

Section A

Q.1	a)	Explain Gibbs Random field in details.	05
	b)	Explain video segmentation in details.	05
Q.2	a)	Explain basic concept of multiscale image decompositions and wavelet	08
	b)	Explain Morphological filters in detail.	07
Q.3	a)	Explain image restoration algorithms in detail.	08
	b)	Explain image zooming in details.	07
Q.4	a)	Describe JPEG lossless image compression standards in details.	08
	b)	Draw and explain general lossless coding system.	07

Section B

Q.5	a)	Explain process of image scanning and sampling.	05
	b)	Explain MPEG- 1 standards in detail.	05
Q.6	a)	Explain finger – print as biometric in detail.	08
	b)	Explain image sampling and quantization.	07
Q.7	a)	Explain block diagram of generalized video compression system.	08
	b)	Explain object based video coding with example.	07
Q.8	a)	Explain the concept of video interpolation.	08
	b)	Describe fundamental of Human perception and image quality.	07

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8208

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power Systems) Examination May/June 2017

Flexible AC Transmission

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i)Solve any two Questions from each section.
ii)Assume suitable data whether necessary.

Section A

Q.1	a)What are the possible benefits from FACTS technology?	10
	b)With neat sketches explain the operation of STATCOM.	10
Q.2	a)What are the advantageous of TCSC & Explain the different mode of operation.	10
	b)Explain HVDC Vs FACTS in details.	10
Q.3	Write short note on any four i)Shunt compensator ii)Role of SVC iii)Basic types of FACTS controller iv)Static VAR compensator v)Thyristor switched series capacitor.	20

Section 'B'

Q.4	a)Explain in details the phenomenon of sub-synchronous resonance (SSR).	10
	b)What is the Role of NGH-SSR Damping scheme as a FACTS controller in transmission line.	10
Q.5	a)Explain the basic principle and operation of UPFC with neat diagram.	10
	b)Explain the objectives of voltage and phase angle regulators.	10
Q.6	Write short note on any four. i)Hybrid phase angle regulators. ii)IPFC iii)Thyristor controlled braking resistor. iv)Switching convertor based voltage and phase. v)Multifunctional FACTS controller.	20

Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8218
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/CE/DC) Examination May/June 2017
Elective-II: Wireless communication Networks
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B
i. Q.5 and Q.10 are compulsory.
ii. Solve any two questions from Q.1, 2 3 & 4 in sections A.
iii. Solve any two questions from Q.6, 7, 8, & 9 in section B.
iv. Figures to the right indicate full marks.

Section A

Q.1	a)	Disuses interference and system capacity in cellular telephony.	08
	b)	Explain interference suppression and power control in cellular telephony.	07
Q.2	a)	Explain the channel assignment schemes used is cellular telephony.	08
	b)	Explain the transmission hierarchy in wireless network.	07
Q.3	a)	Discuss the wireless data series of wireless network.	08
	b)	Explain wireless network protocol used for networks access.	07
Q.4	a)	What is a network? What are its types? Explain.	08
	b)	Discuss physical and medium access control layers of a wireless LAN.	07
Q.5	Write short note on (any two)		10

i. IEE802.II
ii. UMTS
iii. HIPERLAN

Section B

Q.6	a)	Discuss Bluetooth security.	08
	b)	Discuss radio layer and baseband layer of Bluetooth.	07
Q.7	a)	Explain traditional TCP.	08
	b)	Explain TCP over 2.5/3G wireless networks.	07
Q.8	a)	Explain MAC layer scheduling and connection admission in mobile communication.	08
	b)	Do the theoretical analysis of cellular mobile networks.	07
Q.9	a)	Discuss link manager protocol in Bluetooth.	08
	b)	Explain teletraffic modelling.	07
Q.10	Write short note on (any two)		10

i. 802.15
ii. Mobile IP
iii. DSR

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Total No. of Printed Pages:01

SUBJECT CODE NO:- P-8253

FACULTY OF ENGINEERING AND TECHNOLOGY

M.E. (Electrical Power Systems) Examination May/June 2017

Elective-II: Special Topics in Power System

(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Solve any two questions from each section.
ii) Assume suitable data if required.
iii) All questions carry equal marks.

Section A

Q.1	a)	Explain in detail following power quality problems with their causes and effects on power systems. 1) Sag 2) Swell 3) Harmonics 4) Transients 5) Under voltage & Overvoltage	10
	b)	Explain in detail various harmonics creating loads.	05
	c)	Explain in detail propagation of harmonics in power system.	05
Q.2	a)	Explain in detail series & parallel resonance condition occurring in power system.	10
	b)	Explain in detail various mitigation techniques of harmonics.	10
Q.3	a)	Define reliability & explain in general reliability function.	05
	b)	Explain in detail Markov process.	05
	c)	Explain in detail generation reliability & distribution system reliability.	10

Section B

Q.4	a)	Explain in detail functions of SCADA system.	10
	b)	Explain in detail common features of to all SCADA systems.	10
Q.5	a)	Explain in detail alarm function, security control ad control actions during various operating states of power system.	10
	b)	Explain in detail integration of measurement control and protection functions by SCADA system.	10
Q.6	a)	Explain in detail with diagram the utilization of SCADA system in substation.	10
	b)	Explain in detail SCADA system configurations.	10

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Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8269
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Electronics) Examination May/June 2017
Digital System Design
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i)Q.1 and Q.5 is compulsory
ii)And solve any two questions from each section from remaining.
iii)Assume suitable additional data if necessary.

Section A

Q.1 Design a synchronous JK Flip-Flop CKT having one input and one output. The CKT outputs a 1, whenever three consecutive 1's are observed, otherwise output will be '0'. 10

Q.2 a) Explain how the ASM chart differs from a conventional flow chart. 07
b)Describe the structural modeling.s 08

Q.3 Plot the k-map of the function f(A,B,C,D) =Σ 0,2,4,6,8,9,11,12,14,15 & determine hazard free implementation using 15
i)NAND gates ii)NOR gates.

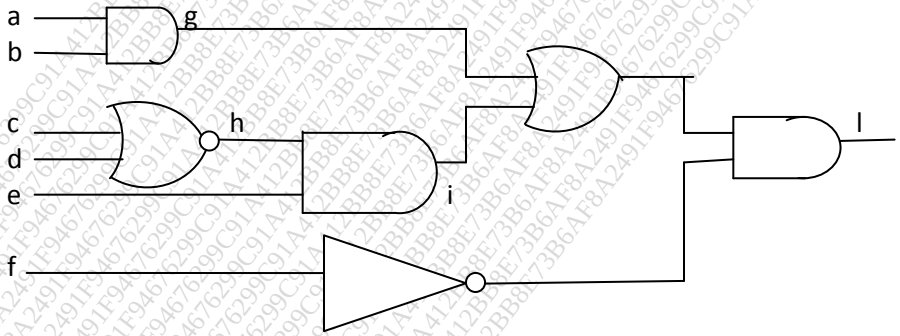
Q.4 Define fundamental mode circuits, what do you understand by critical & non-critical races? How can a critical race be prevented in the design of a CKT? 15

Section B

Q.5 Explain single & multiple stack-fault model with example. 10

Q.6 a) Design serial adder. Using JK Flip-Flop. 10
b) Explain Fast adder. 05

Q.7 For the CKT shown in fig generate a test for the fault g-s-a-1. Determine all the other faults detected by this test. 15



Q.8 Write short note on
a)Dynamic Hazards Elimination 07
b)Describe PAL with example. 08

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Total No. of Printed Pages:1

SUBJECT CODE NO:- P-8276
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (EC/ECT/CE/ES) Examination May/June 2017
VLSI Design (El-I on EC/ECT/CE)
(Revised)

[Time : Three Hours] **[Max Marks :80]**

Please check whether you have got the right question paper.

N.B i) Attempt any two questions from each section.
ii) Assume suitable data wherever necessary.

Section A

Q.1 a) Explain the following terms of second order effects. 10
(i) Body effect
(ii) Mobility variation
(iii) Channel length modulation
(iv) Sub-threshold conduction
b) Explain power dissipation in CMOS circuits in detail 10

Q.2 a) Draw CMOS NAND gate. Describe DC characteristics, multi input NAND gate and propagation time delay. 10
b) Write short notes on 10
(i) Static and dynamic design strategies
(ii) Differential inverter

Q.3 a) Describe design techniques for large fan-in and optimizing performance for combinational network in static COMS design. 10
b) Explain following terms of BICMOS inverter 10
i) Switching characteristics
ii) Wide swing BICMOS inverter

Section B

Q.4 a) Describe dynamic Latches & Registers-c^2mos 10
b) What are the properties of Schmitt trigger? What is main use of Schmitt trigger? How to implement Schmitt trigger in CMOS? Explain with diagram. 10

Q.5 a) How to minimizing the power consumption by using parallelism? 10
b) Describe power and speed trade-off in data path structures in details. 10

Q.6 a) Explain memory architecture and building blocks with diagram. 10
b) Write short not on 10
(i) The address Decoders
(ii) Non-volatile read-write memories