T.E. E.E. Sem. VI. 11/02/2014

P & S E. Backup

2013-14 (Reg.)

QP Code : MV-18285

(3 Hours) [Total Marks : 100

N.B. – 1. Question **01** is compulsory.
2. Answer any **FOUR** questions out of remaining **SIX** questions.
3. All the diagrams should be neatly written in pencil.

Q.1 a) Explain the phenomena of capacitor switching.

b) Write down the technical details & selection procedure for mcb & mccb ?

c) Explain the Significance of TSM and PSM.

d) Explain the working principle of ELCB & the ratings available.(5 marks each)

Q.2 a) Define Restriking voltage, TRV and RRRV. Derive expressions for restriking voltage, Max RV, RRRV & max. RRRV (12)

b) In a 132KV system, the inductance and capacitance of the system upto the fault point is 0.4H and 0.015 micro farads repectively. Calculate the maximum restriking voltage, natural frequency of oscillations and max RRRV (10)

Q.3 a)Explain the stepped distance protection used in power system. Justify the need for such protection (10)

b) The neutral point of three phase 100 MVA, 11 KV alternator is earthed through resistance of 6 ohms. The relay is set to operate when there is an out of balance current of 1A.The CTs have a ratio of 1000/5A.What percentage of winding is protected against an E/F. What should be the minimum value of earthing resistance required to protect 90% of winding. (10)

Q.4 a)Explain the restricted earth fault protection used for Generator (10).

b)What are the various protections given for Induction Motor (10)

Q.5 a)Vacuum Circuit Breaker-Explain the working principle. (10)

b)Write a neat diagram of ACB & explain the different parts and working principle(10)

Q.6 a)What is the difference between Field Suppression & Field failure protections? For which equipment it is required and how the scheme works. Explain. (10)

b)Write a detailed note on HRC fuses. (10)

Q.7 a)For which type of transmission lines, power line carrier current protection is used? Also explain the principle of PLCC protection. (10)

b)Explain the working principle of SF6 circuit breakers. (10)

Con. 13689-14.

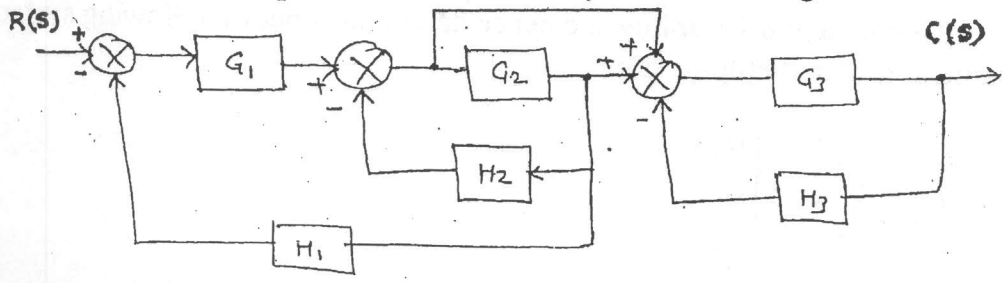
QP Code : MV-18068

(3 Hours) [Total Marks :100

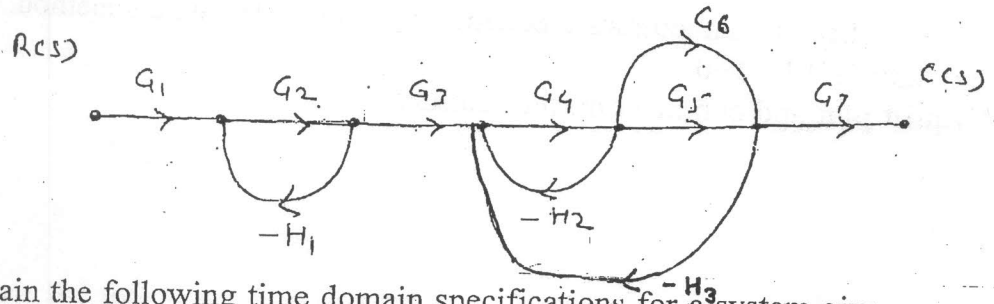
N.B. : (1) Question no. **1** is **compulsory.**
(2) **Attempt** any **four** from remaining **six** questions.
(3) Make suitable assumption wherever it is **necessary.**
(4) **Figures** to the **right** indicates **full** marks.

1. (i) Define the controllability and absorbability using state space analysis. 5
(ii) What do you mean by gain margin, phase margin, gain cross frequency and phase cross- over frequency, in frequency demain. 5
(iii) Derive the equation to obtain transfer function from state space. 5
(iv) How to determine stability using polar plot. 5

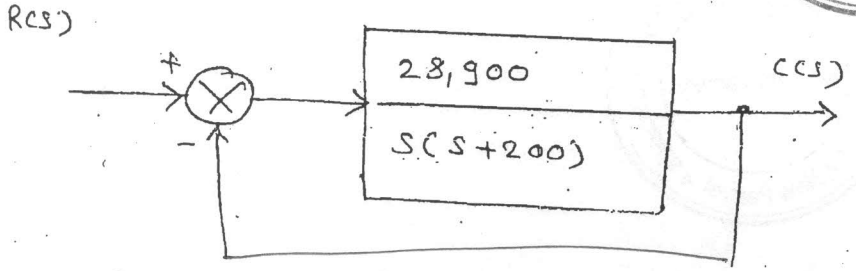
2. (a) Evaluate the close loop transfer function of system from the given block diagram. 10



(b) Use mason's gain formula to find C(s)/R(s) of the system shown. 10



3. (a) Obtain the following time domain specifications for a system given. 10
(i) Damping ration (ξ)
(ii) Natural frequency (w_n)
(iii) Percentage peak overshoot (% Mp)
(iv) Peak time (tp)
(v) Rise time (tr)
(vi) Setting time (ts)



Q3.b) Derive & explain the process to calculate Kp, Kv & Ka from the bode plot.

4. (a) Obtain the state space representation in phase variable from and draw a state model for given system. 10

$$\frac{C(s)}{R(s)} = \frac{s^2+9s+4}{s^3+17s^2+40s+24}$$

(b) Sketch the root locus of unity feedback system nearing G(s) H(s) given. 10

Also determine the value of K for $\xi = 0.5$ $G(s)H(s) = \frac{k}{s(s+4)(s+10)}$

5. (a) Draw the bode plot and find Gm, Pm, w_{gc},w_{pc} abo determine and comment the stability. 10

$$G(s)H(s) = \frac{100}{s(s+36)(s+100)}$$

(b) Define controllability and oservability and hence determine whether following system is controllable and observable or not. 10

$$x = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -10 & -17 & -18 \end{bmatrix} x + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u$$

$$y = [4 \quad 1 \quad 0]x$$

6. (a) Determine the stability of charactoristics equation by routh`s Hurwitz`s method. 10
$f(s)=2s^5 + 3s^4+2s^3+3s^2+2s+1=0$

(b) Draw the Nyquist plot and comment on the stability 10

$$G(s) = \frac{20}{s(s-2)(s+4)}$$

7. Write short notes on any **Two**. 20
   (1) AC/DC servo motor.
   (2) Proportional, Derivative and Integral controllers.
   (3) co-relation between time domain and fequency domain analysis.

Con. 9614-14.

TE - Electrical 05/6/14
Sem VI (Rev)
Project Management

QP Code : MV-18242

Duration:3 Hours Total Marks assigned to the paper:100

Instructions to the institutes: Normal distribution tables to be provided to the students

Instructions to the candidates:

N.B.:-1)Q.no 1 is compulsory.

2)Answer any four from the remaining questions.

Q.no.1.

A)Which phase of the project is more crucial for project completion and justify why? (5)

B)Explain the importance of risk management in projects (5)

C)Project Manager need not be a technical person. Justify the statement (5)

D)Explain the PBP method of financial analysis. (5)

Q.No.2.

A)Explain the techniques of time management in projects (10)

b) What are the elements of project planning (10)

Q.No.3.

Tendering Process

A)Explain the different steps involved in crashing with an example. (10)

B)Explain the NPV method of project evaluation with an example. (10)

Q.No.4.

A) Why material planning is important and explain how it is done (10)

B)Explain market & demand feasibility in detail. (10)

Q.No.5

Draw the PERT network. Identify the critical path and find the probability of completion of project within 40 days (10)

[TURN OVER

Activity	Predecessor	Time Estimates in days		
		3	4	5
A	-	3	7	10
B	A	4	7	12
C	B	2	5	13
D	A	3	5	9
E	D	1	8	21
F	A	7	7	7
G	F	1	10	10
H	C,E	10	20	25
I	G	15	7	12
J	K,I,J KIH	2	15	20
K	A	10		

B)Explain the need, Technique, advantages, disadvantages of crashing activity in projects (10)

Q.No.6.

A) Explain the importance and techniques of Logistics management. (10)
(10)

B) How the resources are allocated in projects? (10)

Q.NO.7.

A) Write the Maslow's Hierarchy of motivation. (10)

B) Explain the term team co-ordination and its effect on success of project (10)

TE- EE-Sem VI (Rev)

EM-III

20/05/2014

Q P Code :MV-18115

(3 Hours) **[Total Marks : 100**

N.B. : (1) Questions **No. 1** is **compulsory.**
(2) **Answer** any **four** out of remaining questions.
(3) **Assume** suitable data if **necessary.**
(4) **Figure** to the **right** indicates **marks.**

1. (a) What is the effect of using a short pitched coil? **5**
   (b) The O.C.C. of an alternator is a curve and the S.C.C. is a straight line. Explain. **5**
   (c) Which is greater, X_d or X_q? Why? **5**
   (d) Two alternators are connected in parallel and is supplying a local load. What will happen if only excitation of one alternator is increased? **5**

2. (a) A 3Φ, 16 pole, star connected salient pole alternator has 144 slots with 10 conductors per slot. The alternator is run at 375 rpm. The terminal voltage of the generator is found to be 2.657 kV. Determine the frequency of the induced emf and the flux per pole. **10**
   (b) Explain the phasor diagrams of synchronous machine in generating mode and motoring mode with neat diagrams. **10**

3. (a) Explain the significance of synchronizing power. Derive the equation of synchronizing power and synchronizing torque. **10**
   (b) Two alternators A & B operate in parallel and supply a load of 10 MW at 0.8 p.f. lagging. By adjusting steam supply of A, its power output is adjusted to 6000 kW and by changing its excitation, its p.f. if adjusted to 0.92 lag. Find the p.f. of alternator B? **10**

4. (a) Explain how to measure X_d and X_q of a salient pole synchronous machine. **10**
   (b) Explain in detail with diagrams the potier method of predetermining the voltage regulation of alternators. How it is superior to EMF & MMF method? **10**

5. (a) Explain excitation circles and power circles. **10**
   (b) The full load current of a 3.3kV, star connected synchronous motor is 160 A at 0.8 p.f. lagging. The resistance and synchronous reactance of the motor are 0.8 Ω and 5.5 Ω per phase respectively. Calculate the excitation emf, torque angle, efficiency and shaft output of the motor. Assume the mechanical stray load loss to be 30 kW. **10**

TURN OVER

6. (a) "Synchronous motor is not self-starting" Why? Explain any two starting methods? 10

(b) A 3Φ star connected synchronous generator supplies a load current of 9A at 0.9 p.f. lagging at 440 V per phase. Find the load angles and the components of armature current I_d and I_q if $X_d = 9\Omega$ & $X_q = 5\Omega$. Neglect armature resistance. Calculate the voltage regulation of the alternator? 10

7. Write short notes on (any **two**) 20

(a) Stepper motor construction

(b) Hunting of synchronous motor

(c) Switched reluctance motor.

TE- EE [sem- VI (Rev)]

Signal Processing

26/5/14

QP Code : MV-18161

(3 Hours) [Total Marks : 100

N. B. : (1) Question No. 1 compulsory.
(2) Attempt any four from remaining questions.

1. (a) Write properties of DFT. 20
(b) Find linear convolution using circular convolution of $x_1(n) = \{1,-2,2,3\}$ and $x_2(n) = \{2,1,1\}$.
(c) Draw and explain of architecture of DSP processor.
(d) Find x(n) considering all possible region of convergence.

$$x(2)=\frac{10z}{(z-1)(z-2)}$$

2. (a) Determine whether the system is static, causal, time invariant, linear and stable. 10
(i) $y(t) = x(t+1) + x(t^2)$
(ii) $y(t) = x(t-5) - x(2-t)$ — (minus)
(b) Find the z - transform of the following sequence :- 10
(i) $x(n) = u(n-6) - u(n-10)$
(ii) $x(n)=\left[\left(\frac{1}{2}\right)^n-\left(\frac{1}{4}\right)^n\right]u(n)$

3. (a) Consider the following linear constant coefficient difference equation. 10

$$y(n)-\frac{3}{4}y(n-1)+\frac{1}{8}y(n-2)=2x(n-1)$$

Determine y(n), when $x(n) = \delta(n)$
(b) Find the DFT of a sequence $x(n) = \{1,1,0,0\}$ and the IDFT of $Y(k) = \{1,0,1,0\}$. 10

4. (a) Derive radix 2, DIT FFT algorithm and show complete butterfly diagram. 10
(b) Find the DFT of $x(n) = \{1,2,3,4\}$ using DIT-FFT. 10

5. (a) Sketch the signal :- 10
(i) $x(t) = 2u(t) - u(t-2) + u(t-4) - r(t-6) + r(t-8)$
(ii) $x(t) = 2r(t) - 2r(t-1) - 2u(t-3)$
(b) Obtain the magnitude and phase response of following system by analytical and geometric method :- 10

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

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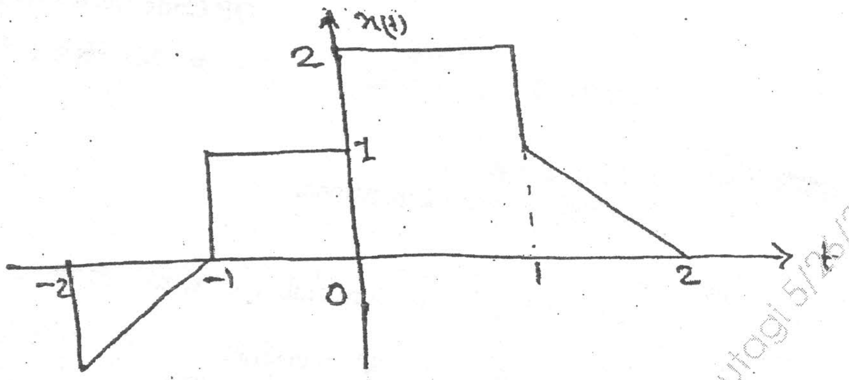
Con. 11766-14.

6. (a) A continuous time signal x(t) :- 10



Sketch the following signals :- (i) x(t-1), (ii) x(2-t), (iii) x(2t+1)

(b) Find x(n) :- 10

$$x(z)=\frac{3-\frac{5}{6}z^{-1}}{\left(1-\frac{1}{4}z^{-1}\right)\left(1-\frac{1}{3}z^{-1}\right)}$$

If :-

(i) $ROC\,|z|>\frac{1}{3}$

(ii) $ROC\,\frac{1}{4}<|z|<\frac{1}{3}$

7. Write short notes on :- 20
   (a) DSP Processor.
   (b) Properties of z-transform.
