KADI SARVA VISHWAVIDHYALAYA

M. E. Semester: II

Subject Code: EEC **Subject Name: Advanced Power System Protection**

Date: 12/06/2013 **Time: 10:30 to 1:30** **Total Marks: 70**

Instruction:

1. Answer each section in separate Answer sheet.
2. Use of Scientific Calculator is permitted.
3. All questions are **Compulsory.**
4. Indicate **Clearly**, the options you attempt along with its respective question number.
5. Use last page of main supplementary of **rough work.**

Section-I

Q.1. (All Compulsory)

(A) Show basic components of digital relay with suitable diagram. Also explain components of signal conditioning subsystem. **[5]**

(B) Write a short note on sample and hold circuit. **[5]**

(C) Explain Analog to Digital converter. **[5]**

OR

(C) Short note on Digital Relay sub-system with flow chart. **[5]**

Q-2 Answer the following questions.

(A) What is LINKNET? Draw flow chart for relay co-ordination and the flowchart for LINKNET structure **[5]**

(B) Find out primary backup pairs using LINKNET structure for primary relay R_1, R_4 and R_6 for the system shown in figure 1. **[5]**

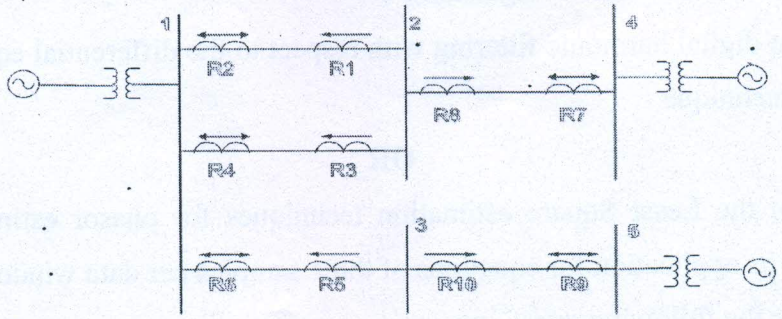

FIGURE -1

OR

(A) Show the generalized flow chart for plug setting determination and for primary/backup relay pair determination. [5]

(B) Find out primary backup pairs using LINKNET structure for primary relay R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 for the system shown in figure 2. [5]

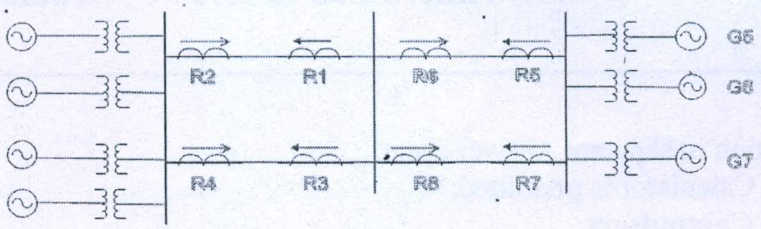

FIGURE 2

Q-3 Answer the following questions.

(A) Write a short note on single short v/s multi short t reclosing relay. [5]

(B) Explain following terms with reference to reclosing relay [5]

a) Instantaneous trip lockout

b) Deionizing time for three pole reclosing

c) Selective reclosing

OR

(A) Explain sampling theorem [5]

(B) What is aliasing error? Also explain the way to remove it. [5]

Section-II

Q-4 (All Compulsory)

(A) Explain the Fourier based full window cycle algorithm with its schematic representation. [5]

(B) Explain with frequency response diagram the concept of Fourier analysis based half cycle window algorithm. [5]

(C) Explain digital harmonic filtering with respect to the differential equation based technique. [5]

OR

(C) Explain the Least Square estimation techniques for phasor estimation. Shows its application for equations of three samples per data window. [5]

Q-5 Answer the following questions.

(A) Explain the precaution for automatic reclosing of circuit breakers. [5]

(B) Explain the external structure of SGR-12 with relevant diagram. [5]

OR

(A) Explain the factors governing the applications of reclosing. [5]

(B) Explain briefly the voltage and angular synchronism check characteristic with respect to reclosing relay. [5]

Q-6 Answer the following questions.

(A) Explain Fourier transform based algorithm. [5]

(B) Explain the main aspects of automatic synchronizing. [5]

OR

(A) Explain the concept of adoptive relaying. [5]

(B) Explain sub-cycle window algorithm. [5]