M. Tech. Electrical Power System (CBCS Pattern) Semester-II

PEPS22 / EP202 - Advanced Power System Protection

P. Pages : 1 **GUG/S/25/11022**

Time : Three Hours * 1 1 5 2 * Max. Marks : 70

Notes :
1. All questions carry equal marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.
5. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
6. Answer **any five** questions.
7. Non programmable calculator is permitted.

1.	a)	Explain the performance and operational characteristics of digital protection.	**7**
	b)	Discuss the basic structure of Digital relay.	**7**
2.	a)	Define Walsh function and explain its fundamental properties.	**7**
	b)	Define the term data window. State the advantages and disadvantages of half cycle.	**7**
3.	a)	Explain the phenomenon of aliasing & principle of multiplexing in digital relay.	**7**
	b)	State the various methods of Analog to digital conversion. Also with the help of block.	**7**
4.	a)	Explain digital line differential protection.	**7**
	b)	Compare digital filters with analog filters and explain any one of the digital filters.	**7**
5.	a)	State and explain Fourier algorithm with suitable example.	**7**
	b)	Draw and explain surge protection circuit for digital relay.	**7**
6.	a)	Discuss giving principle of operation of microprocessor based percentage differential for protection of transformer.	**7**
	b)	Explain block schematic diagram for wave differential scheme.	**7**
7.	a)	Explain how fundamental and second harmonic components are extracted using FIR filter.	**7**
	b)	Discuss integral LSQ fit technique in detail.	**7**
8.	a)	Draw and explain flow chart for digital protection relay.	**7**
	b)	Explain recent developments in the field of digital power system protection.	**7**

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