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## M.Tech. (EE) (2018 Batch) (Sem.–2) DIGITAL PROTECTION OF POWER SYSTEM Subject Code : MTEE-202-18 M.Code : 76101

Time: 3 Hrs.

Max. Marks : 60

## INSTRUCTIONS TO CANDIDATES : 1.Attempt any FIVE questions out of EIGHT questions. 2.Each question carries TWELVE marks.

- Ql. (a) Explain the types of comparators used for static relaying and its duality for different applications.
  - (b) Explain the static Reactance Relay using phase comparator for three zone distance protection scheme.
- Q2. Explain any one finite difference method with respect to power system application.
- Q3. (a) Explain the role of signal conditioner in a data acquisition system. Also explain the functions of various components of the signal conditioner.
  - (b) Find the maximum frequency that can be sampled without using hold circuit for a DSP system with the following specifications: Conversion time of ADC = 5  $\mu$ s and number of bits in the ADC = 16
- Q4. Find the Fourier series expansion up to second harmonic from the following data :

| <i>x</i> : | 0  | $\pi/3$ | 2 π/3 | π  | 4 π /3 | 5π /3 | 2 π |
|------------|----|---------|-------|----|--------|-------|-----|
| f(x):      | 10 | 12      | 15    | 20 | 17     | 11    | 10  |

- Q5. Explain the Mann-Morrison technique of estimating the rms value and phase angle of a signal. State the underlying assumptions.
- Q6. Explain the relation between Least Square Error and Pseudo-Inverse.
- Q7. Explain half cycle data window DFT algorithm. Explain Traveling Wave based Techniques.
- Q8. Explain Digital Differential Protection of Transformers using harmonic filtering algorithms based restraint conditions.

## NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

**1** M-76101