

**M. TECH.-II (ELECTRICAL -POWER SYSTEM) (CBCS – 2015
COURSE) : WINTER - 2017
SUBJECT : DIGITAL PROTECTION OF POWER SYSTEM**

Day : **Tuesday**
Date : **28/11/2017**

Time : **11.00 AM TO 02.00 PM**
Max. Marks : 60

W-2017-2821

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Answers to both the sections should be written in **SEPARATE** answer book.

SECTION – I

Q.1 Explain the function of circuit breaker and protective relaying. List their types. **(10)**
Also, explain any power system circuit is divided into different protection zones?
Explain with neat sketch.

OR

Draw and explain the basic Architecture of modern digital relay. Also mention its advantages.

Q.2 What is a static relay? Name different components used in a typical static relaying scheme. State in the order of importance, the advantages and disadvantages of static relaying scheme. **(10)**

OR

Explain what you understand by complex β -plane and complex α -plane? Why it is preferred to plot the relay threshold characteristics on these planes?

Q.3 Explore the following terms in relation with signal conditioning subsystems – **(i)** **(10)**
Transducers **(ii)** Surge protection circuits **(iii)** Analog filtering **(iv)** Analog multiplexers.

OR

Explain the term **(i)** Digital filters Signal Aliasing Error **(ii)** Sample and hold circuit.

SECTION – II

Q.4 Explain the theory and basic principle of digital protection of a transmission line. **(10)**
Also, discuss with the help of neat diagram, the hardware and software of the digital protection scheme using distance relays.

OR

What is the function of filters in digital protection scheme? Discuss analog and digital filters along with their merits and limitations?

Q.5 Explain the theory and principle of operating of percentage differential relaying scheme using static components for the protection of Δ -Y connected transformer showing CT connections. **(10)**

OR

What is inter-turn fault in the synchronous machine? Why unit protection scheme fails during inter turn fault? Also explain the hardware and software scheme of the relay.

Q.6 Explain the following terms **(i)** Artificial Neutral Networks (ANN) **(ii)** Fuzzy **(10)**
systems **(iii)** Export system **(iv)** Genetic Algorithm.

OR

Explain the basic structure of fuzzy relay with neat sketch. Also explain the fuzzy logic approach for fault clearing.

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