

## GANPAT UNIVERSITY

## B. Tech. Semester: VII (Electrical Engineering)

Regular Examination November – December 2014

Subject-Protection &amp; Switchgear, Code-2EE-702

Time: 3 Hours / As per Scheme

Total Marks: 70

- Instruction: 1 Attempt all questions.  
2 Figures to the right indicate full marks.  
3 Assume suitable data wherever necessary.

## Section - I

- Que. - 1 A Discuss essential qualities of a protective system. 06  
B There are no natural current zeros in Direct Current. Then, how does a D.C. circuit breaker interrupt the current. 06

OR

- Que. - 1 A What is meant by primary protection. Why is back up required? Discuss various types of back up protections used. 06  
B Describe the construction, operating principle and application of vacuum circuit breakers. 06

- Que. - 2 A Discuss classification of over current relays. 05  
B Explain the 3 stepped time distance characteristics of impedance relays. 06

OR

- Que. - 2 A Explain how the directional relays are used to protect parallel feeders and ring main system. 06  
B Explain differential protection used in bus bars. 05

- Que. - 3 A What are incipient faults? What type of protection is used in transformers to cater to such type of faults? 06  
B Define PSM, TMS, over reach, blind spot, unit protection, relay pick-up. 06

## Section - II

- Que. - 4 A What protection is used for the alternator stator inter turn faults. 06  
B Write a short note on carrier aided distance protection. 06

OR

- Que. - 4 A Discuss the block diagram of numerical relays. What are the advantages of numerical relays over conventional relays. 06  
B What are the limitations of simple differential protection of transformers due to which the biased differential protection is used? 06

- Que. - 5 A Explain the phenomenon of current chopping in a circuit breaker. What measures are taken to reduce it? 05  
B What is meant by direct testing of circuit breakers? What tests are carried out under the same. 06

OR

- Que. – 5 A With a neat sketch, describe the working principle of an axial air blast type circuit breaker. Also explain why resistance switching is used in this breaker. 06
- B Plot the V-I characteristic of the arc. Explain the methods of arc extinction. 05
- Que. – 6 A Derive the expression for re-striking voltage and RRRV. 07
- B Discuss the operating principle of SF<sub>6</sub> circuit breaker. What are its advantages over other types of breakers. 05

END OF PAPER

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