

R16

Code No: 136EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year II Semester Examinations, May - 2019****SWITCH GEAR AND PROTECTION****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is the value of Resistance connected across the contacts of CB in Resistance switching so, that no oscillations will occur and why Resistance switching is employed? [2]
- b) Define restriking voltage. [3]
- c) What are the objectives of protection system? [2]
- d) What is universal torque Equation and express the terms in it? [3]
- e) What is three zone distance relay protection? [2]
- f) Write a short note on Buchholtz Relay protection used in transformer. [3]
- g) What are the advantages of neutral grounding? [2]
- h) What is solid grounding? What are its advantages? [3]
- i) What is BIL? [2]
- j) What are the requirements of a good lightning arrester? [3]

PART - B**(50 Marks)**

- 2.a) Explain in detail about SF6 circuit breaker with a neat circuit diagram.
 - b) For a 132 V system, the reactance and the capacitance up to the location of CB is 3ohms and 0.015 micro farad, respectively. Find i)The frequency transient oscillation ii) Maximum value of the restriking voltage iii)Maximum value of RRRV. [5+5]
- OR**
- 3.a) Describe with the aid of neat sketch the working of a air blast circuit breaker.
 - b) Explain the phenomenon of current chopping and its effect on circuit interruption. Why is it more common in an air blast circuit breaker than in oil circuit breaker? [5+5]
- 4.a) What is an impedance relay? Discuss its principle of operation. What is the merit of this relay for transmission line protection?
 - b) What are the various types of over current relays? Discuss their area of applications. [5+5]
- OR**
- 5.a) Explain the characteristics of distance relays.
 - b) Explain the requirement of primary and back up protection in any equipment. [5+5]

- 6.a) Explain the construction and principle of operation of a Translay relay applied to a line.
b) Explain and draw the schematic diagram of the carrier current protection scheme of lines. [5+5]

OR

- 7.a) Explain about Percentage Differential Protection of Transformers.
b) Explain about the Differential Protection of Bus bars. [5+5]

8. Explain the different methods of neutral grounding. [10]

OR

- 9.a) Explain about Arcing Grounds and Grounding Practices.
b) What are the effects of Ungrounded Neutral on system performance? [5+5]

- 10.a) Explain and sketch neat diagram of valve type lightning arrester.
b) Enumerate the basic concepts of insulation coordination. [5+5]

OR

- 11.a) Discuss the causes of over voltages in a power system.
b) Compare valve type and ZnO oxide lightning arresters. [5+5]

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