

Code No: 137SD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, July/August - 2022

SWITCH GEAR AND PROTECTION

(Electrical and Electronics Engineering)

Time: 3 Hours

Max.Marks:75

Answer any five questions

All questions carry equal marks

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- 1.a) Explain the phenomenon of current chopping and its effect on circuit interruption
b) In a 132 kV system, the inductance and capacitance up to the location of the circuit breaker are 0.4 H and 0.015 μ F respectively. Determine
i) Maximum value of the restriking voltage across the contacts of the circuit breaker
ii) Frequency of transient oscillation and
iii) Maximum value of RRRV. [9+6]
- 2.a) Discuss the operation, advantages and applications of SF6 circuit breaker.
b) Enumerate various types of ratings of a circuit breaker. Discuss symmetrical and asymmetrical breaking capacity, making capacity and short-time current rating. [8+7]
- 3.a) Discuss the construction and principle of operation of Induction Disc relay.
b) What is an impedance relay? Discuss its principle of operation. Show its characteristics on R-X diagram. [7+8]
- 4.a) Explain the operating principle and characteristics of MHO and Offset MHO relay.
b) What are the advantages of static relays over electromagnetic relays? [9+6]
- 5.a) What is carrier current protection? For what voltage range is it used for protection of transmission lines? What are its merits and demerits?
b) With a neat sketch, discuss the differential scheme for busbar protection. [8+7]
- 6.a) Explain briefly about stator fault protection in 3- ϕ generator.
b) A three phase, 11 kV/ 33 kV, Y- Δ connected power transformer is protected by differential protection. The C-Ts on the LV side have a current ratio of 400/5. What must be the ratio of C-Ts on the HV side How the C-Ts on both the sides of the transformer are connected?[8+7]
- 7.a) What are the different types of grounding? Explain the reactance grounding.
b) Discuss the effects of ungrounded neutral on system performance. [8+7]
- 8.a) What are the causes of over voltages arising on a power system? Why is it necessary to protect the lines and the equipment of the system against over voltages?
b) Explain the working of valve type lightning arrester. [8+7]

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