Code No: 137SD **RA**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, February/March - 2022
SWITCH GEAR AND PROTECTION
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) Define the terms restriking voltage and recovery voltage and further derive the expression for restriking voltage.
b) Explain the principle of operation of Air Blast circuit Breaker. [8+7]

2.a) In a short circuit test, with earthed neutral, on a 400 KV three phase circuit – breaker, the power factor of the fault was 0.45, the recovery voltage was 0.9 of full line value, the breaking current was symmetrical and the restriking transient had a natural frequency of 20000 Hz. Estimate the rate of rise of restriking voltage.
b) Explain the working of vacuum circuit Breaker. [7+8]

3.a) Explain the basic requirements of a well-designed protective relaying system.
b) Explain the operating characteristics of an impedance relay on R – X diagram. [7+8]

4.a) Explain the construction, working principle of Induction cup relay.
b) List the advantages and applications of Static relays. [9+6]

5.a) What is a carrier current protection and explain how can this be applied to transmission line protection.
b) Explain the various protection schemes as applied to busbar protection. [7+8]

6. Explain with a neat diagram about the working of Restricted Earth fault protection of Generator [15]

7.a) Explain the working of Reactance earthing with a neat diagram
b) A 33 KV three phase, 50 Hz over head line 50 km long has a capacitance to earth line equal to 0.2μF per Km. Determine the inductance and KVA rating of the arc suppression coil. [8+7]

8.a) Suggest and explain with supporting points for an insulation co – ordination scheme of a 400 KV substation.
b) Explain the working of value type lightning arrestor with the neat sketch. [8+7]

---ooOoo---