



B.Tech VII Semester Supplementary Examinations, April 2024

POWER SYSTEM PROTECTION
(Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 27.04.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)

- 1 In which type of fault, zero sequence currents do not exist?
- 2 What is the main problem of the circuit breaker?
- 3 Define plug-setting multiplier.
- 4 Why directional relay is necessary for parallel feeder?
- 5 What are the main safety devices available with transformer?
- 6 Why busbar protection is needed?
- 7 What is meant by digital protection?
- 8 What happens if the sampling frequency is less than the Nyquist limit?
- 9 What do you mean by power swing?
- 10 What are the components of WAMS?

Part-B

Answer All the following questions. (5X10M=50Marks)

- 11 What are the different types of protection schemes in power system? [10]
OR
- 12 With neat Diagram, explain the construction and operation of Non-Directional and Directional over current relay. [10]
- 13 If the rated current (pick up current) of a relay is 3A, and the time dial setting is 1.
 - (i) How long does it take the relay to trip if the supply C.T is rated at 400:5 A, and the fault current is 480A? The type of the OC relay is CO-8.
 - (ii) Solve using the standard curve equation and compare the results. [10]OR
- 14 Protection of parallel feeders: [5+5]
 - (i) With non-directional relays.
 - (ii) With directional relays.
- 15 Explain with a neat circuit diagram the differential protection scheme used to protect star/delta transformers. [10]

OR

- 16 Discuss and compare briefly various bus-bar arrangement in a power system. [10]
- 17 A. What do you mean by Fourier analysis? Explain. [5]
B. A 12-bit ADC has conversion time of 10 microseconds. What is the maximum frequency that can be acquired without using a sample and hold unit? [5]

OR

- 18 State the salient features of microprocessor-based protection relay. Draw block diagram of microprocessor based over current relay. [10]
- 19 A. How df/dt Relay Can Prevent total Power Outage? [5]
B. Explain the Operating principle and setting of df/dt Relay. [5]
- 20 What is PMU? Explain its working with the help of block diagram. [10]