

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII(OLD) • EXAMINATION – WINTER 2016

Subject Code: 170903**Date: 23/11/2016****Subject Name: Power System Protection****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) With a neat sketch, describe the percentage differential protection of an alternator. **07**
 (b) Discuss the protective scheme which protects transformers against faults but does not operate in case of magnetizing inrush current. **07**
- Q.2** (a) Define : Knee point, Aliasing, Incipient fault, Plug setting Multiplier (PSM), Reach of a relay, Burden, Unit protection. **07**
 (b) Distinguish between an earth fault relay and an over current relay. Discuss various methods to energize an earth fault relay. **07**
- OR**
- (b) Explain the impedance relay characteristics on the R-X diagram. Discuss the range setting of 3 impedance relays placed at a particular location. Why is the first zone unit not set to protect 100 % of the line. **07**
- Q.3** (a) Explain with a neat diagram, the over current protection of a 3 phase feeder against phase faults and earth faults. How many phase fault and earth fault relays are used? **07**
 (b) Discuss the essential qualities of a protective relay. **07**
- OR**
- Q.3** (a) Under what circumstances are over current relays having very inverse and extremely inverse characteristics used? **07**
 (b) Explain the differential protective scheme for protection of bus-zone. **07**
- Q.4** (a) What are the limitations of three stepped distance protection? How are they overcome by carrier current protection. **07**
 (b) Discuss carrier aided directional comparison relaying. **07**
- OR**
- Q.4** (a) Discuss area of application of directional over current relays. **07**
 (b) What do you understand by a zone of protection. Discuss various zones of protection for a modern power system. Why do adjacent protective zones overlap? **07**
- Q.5** (a) What are the advantages of numerical relays
 . Discuss the block diagram of a numerical relay. **07**
 (b) Discuss the block diagram of finite impulse response (FIR) filter and Infinite impulse response (IIR) filter. **07**
- OR**
- Q.5** (a) Explain the block schematic diagram of interface for a reactance relay. **07**
 (b) Write a brief note on the type tests carried out on relays. **07**
