

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII EXAMINATION – WINTER 2015**

**Subject Code: 170903****Date: 09/12/2015****Subject Name: Power System Protection****Time: 10:30am to 1:00pm****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) What do you understand by time multiplier setting and plug multiplier setting in an over current relay? Explain with the help of relay characteristic. 7

(B) Why earth fault IDMT Relay is having only two plug positions? 7

Q.2 (A) How IDMT relay is provided with directional feature? 7

(B) Discuss the disc of IDMT relay. 7

**OR**

(B) With neat sketch explain the ring main protection. 7

Q.3 (A) Why  $30^\circ$ ,  $60^\circ$  and  $90^\circ$  connections are used in directional relays. 7

(B) How relay torque is improved in directional earth fault relay? 7

**OR**

Q.3 (A) Why Shortline protection is done by reactance relays and not by impedance relays. 7

(B) Explain under reach and over reach of distance relay. 7

Q.4 (A) Give sketch of biased differential relay characteristics for  
(i) Generator protection.  
(ii) Power transformer protection.  
Show the reason for difference. 7

(B) Explain harmonic restraint by neat diagram. 7

**OR**

Q.4 (A) A 3 phase transformer having line Voltage ratio of 400V/33000V is Connected in star-delta. The CTs on the 400 Volt side have a current ratio of 1000/5. What must be the ratio of CTs on the 33000 V side. 7

(B) In what manner the CTs are connected for biased differential protection of transformer having (i) delta-star connection.  
(ii) star-star connection.

Give reason for the CT Connections employed. 7

- Q.5 (A) Explain with neat sketch the power line carrier current protection. **7**
- (B) How PLCC protection is used to accelerate distance protection. Show with contact diagram of distance relay. **7**

**OR**

- Q.5 (A) What are the advantages of numeric relays? **7**
- (B) How numeric type impedance relay makes impedance measurement of line? **7**