17508

16172

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory*.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FOUR of the following: **16**

a) State the causes of faults in power system.

b) Draw and explain important characteristic of high rupturing capacity fuse.

c) A circuit breaker is rated at 2 kA, 1000 MVA, 33 kV, 3 Sec, 3-phase. Determine breaking capacity, making capacity, short time rating of the breaker.

d) Explain the fundamental requirements of protector relaying.

e) State any four advantages of static overcurrent relay.

f) List out all possible faults which may occur on an alternator.

Marks

2. Attempt any FOUR of the following: **16**

a) State stepwise procedure for symmetrical fault calculations.

b) Compare Fuse and MCCB on:

(i) size

(ii) cost

(iii) reliability

(iv) safety

c) With neat diagram explain working of directional overcurrent relay.

d) Draw neat diagram of Buchholz relay and explain working in brief.

e) What is the meaning of insulation co-ordination? Give example.

3. a) Attempt any THREE of the following: **12**

(i) What is reactor? Classify the reactors on the basis of their location.

(ii) Distinguish between circuit breaker and isolator.

(iii) Define the following:

1) Relay time

2) Fault clearing time

3) Reset

4) Pick-up value

(iv) Describe operation of static overcurrent relay with block diagram.

b) **Attempt any ONE of the following:** **6**

(i) Explain operation of microprocessor based relay with neat diagram.

(ii) With a neat labelled diagram explain working of SF_6 circuit breaker.

Marks

4. Attempt any FOUR of the following: **16**

a) Describe with neat diagram how balanced earth fault protection is applied to small size generators.

b) A 3-phase transformer of 220 V/22 kV line volts is connected in λ/Δ. The protective transformer on 220 V side have current ratio of 400/5. What should be the C.T. ratio on 22 kV side?

c) Draw a neat sketch of single phasing preventor.

d) State the disadvantages of pilot wire protection.

e) What is arcing ground phenomenon? How is it minimised?

5. a) Attempt any THREE of the following: **12**

(i) Draw neat sketch of percentage differential protection of a transformer.

(ii) Explain with neat sketch negative phase sequence protection of an alternator.

(iii) State the faults that occur on 3-phase induction motors.

(iv) Describe Merz-price voltage balance protection scheme.

b) **Attempt any ONE of the following:** **6**

(i) Give comparison between equipment earthing and neutral earthing.

(ii) Explain time graded over current protection of transmission line.

6. Attempt any FOUR of the following: **16**

a) Describe the 'fault bus protection scheme' of bus-bar.

b) How will you provide protection to motor against short circuit?

c) Write working of attracted armature type relay with neat diagram.

d) Explain low resistance arc extinction method in circuit breaker. State its limitations.

e) State the types of lightning arrestors. Explain the working of any one type.

f) State the various causes of overvoltages in the electrical systems.