'I' Scheme

Sample Question Paper

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Electrical Substation Practices
Max. Marks : 70 **Time: 3 Hrs.**

22633

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Sub-questions in a main question carry equal marks.
(5) Assume suitable data if necessary.
(6) Preferably, write the answers in sequential order.

Q.1 Attempt any Five of the following. (10 Marks)

a) Classify substations based on voltage level.
b) State the need of pole mounted distribution substation.
c) Illustrate the function of isolator switch.
d) List out any four protective devices needed in 132/33 kV substation.
e) List the material used to enhance earthing resistance in rocky land.
f) State the need of gas insulated sub station
g) List any two advantages of GIS substation.

Q.2 Attempt any Three of the following. (12 Marks)

a) With neat diagram explain the working of configured grid substation.
b) Describe the construction and working of swing out (Drop out) fuse.
c) Explain the precautions taken while carrying out maintenance of capacitor bank in substation.
d) Explain working and need of capacitor voltage transformer with neat sketch.

Q.3 Attempt any Three of the following. (12 Marks)

a) List out personal protective equipments (PPEs) used while entering the substation with their respective application
b) Draw neat labeled single line diagram of pole mounted substation, state the function of protective devices used for protection.
c) Summarize the activities to be carried out for maintenance of oil circuit breaker.
d) Distinguish between system earthing and equipments earthing.

Q.4) Attempt any Three of the following. (12 Marks)

a) Explain the methods of improving earth resistance.
b) Difference between conventional earthing and chemical earthing.
c) Describe the procedure to perform voltage break down test of transformer oil.
d) List the precautions taken while carrying out preventive maintenance of GIS.
e) Define partial discharge and explain its effect on performance of GIS

Q.5) Attempt any Two of the following. **(12 Marks)**

a) Determine the ratings of LA, CT, PT, DO fuse and circuit breaker (with Justifications) for mounting of 500kVA, 11/0.4kV plinth mounted substation.

b) Illustrate the procedure to carry out preventive maintenance of 33/ 11 kV air break circuit breaker.

c) With neat diagram explain the working and advantages of power line carrier communication.

Q.6) Attempt any Two of the following. **(12 Marks)**

a) i) Differentiate between mat earthing and plate earthing
ii) list the merits of mast protection.

b) Describe the causes of hot spot formation in transformer and state the methods of identification.

c) Elaborate the causes of fire in gas insulated substation and list firefighting equipments mainly used based on the reason of fire.

'I' Scheme

Progressive Test– I Sample Question Paper

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Electrical Substation Practices
Max. Marks : 20 **Time: 1 Hour**

22633

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Sub-questions in a main question carry equal marks.
(5) Assume suitable data if necessary.
(6) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **(08 Marks)**

a. State the typical earth resistance values of 11, 33,132 and 400 kV substation.
b. Define tower footing resistance of steel structure and write its significance in protection.
c. State any four causes of electrical fire due to electrical reasons in substation.
d. List the switching sequence followed to shut down and charge a HT line.
e. Explain four properties of material used for main and auxiliary bus.
f. Explain the need of substation transformer.

Q.2 Attempt any THREE. **(12 Marks)**

a. Describe the procedure followed to undertake breakdown maintenance of dry type power transformer.
b. Draw labelled single line diagram of 33kV substation.
c. Describe the procedure to measure insulation resistance as per IS for pole mounted substation.
d. Demonstrate the safety rules to be followed to minimize the risk of electrical hazards in substation.
e. Illustrate the activities under preventive maintenance of oil cooled transformer.

'I' Scheme

Progressive Test– II Sample Question Paper

Program Name : Electrical Engineering Program Group
Program Code : EE/EP/EU
Semester : Sixth
Course Title : Electrical Substation Practices
Max. Marks : 20 **Time: 1 Hour**

22633

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Sub-questions in a main question carry equal marks.
(5) Assume suitable data if necessary.
(6) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **(08 Marks)**

a. Explain the meaning of 220/132/33 kV nomenclature used to represent substation.
b. State the difference between earthing and grounding.
c. Describe the function and need of wave trap in substation.
d. State any four properties of SF6 gas as an electrical insulating medium.
e. List the precaution taken while carrying out routine maintenance of batteries in substation.
f. State the operational difference between air break switch and isolator switch

Q.2 Attempt any THREE. **(12 Marks)**

a. Describe the procedure to monitor, record and locate hot spot in 132kV substation.
b. Define the following terms and their importance with regards to safety.
   i. Step potential
   ii. Touch potential
   iii. Mesh potential and
   iv. Transferred potential.
c. Draw single line diagram of 132 kV GIS substation and write any two advantages of GIS over conventional substation.
d. Describe the working of UHF (Ultra high frequency) method of identifying the location of partial discharge.
e. Differentiate between gas insulated and conventional air insulated substation

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