Ref. No. Ex/PE/T/421/2017(Old)

B. E.Power Engineering 4th Year 2nd Semester Examination, 2017(Old)

Power Plant Operation and Maintenance

Time: 3 hrs. Full Marks: 100

Use separate Answer Scripts for each part

Part-I (Marks: 50)

Answer Question No. 1 and any two from the rest

1. Answer the following questions briefly (any four) Marks: 4 X 5=20

   a) Discuss the necessity of plant inventory codification system and method used for the codification of any item.

   b) What is the silica carry over in thermal power plant? Discuss the method to control silica in boiler water and steam.

   c) Discuss the Operation & Maintenance philosophy you will adopt in thermal power plant.

   d) What are the major operations to be carried out in the event of total power failure in the plant by the Boiler & Turbine desk engineer?

   e) What are the parameters monitored during turbine rolling and after synchronization?

   f) What is the objective of 'Predictive Maintenance' and what are the different methodologies adopted in predictive Maintenance?

2. a) What are the different systems you will line up for start up of first Pulverizer?

   b) What are the starting permissives of first Mill?

   c) What are the tripping conditions of the Mill?

   Marks: 10+3+2

3. a) What are the major causes of tube failure in a high pressure boiler?

   b) Describe the tube leakage due to long term overheating and hydrogen embrittlement.

   c) What are the remedial measures adopted to reduce the boiler tube leakage due to overheating?

   Marks: 4+8+3

4. a) Describe briefly the different sequential steps for the light-up of the boiler from initial condition.

   b) What are the different tripping conditions of a boiler? Marks: 10+5

5. a) What are the different systems adopted for effective maintenance management system?

   b) Discuss the methodology used in the issuing of "Permit to Work" (PTW system) to any equipment for maintenance purpose.

   c) Write down the different functions of maintenance store department

   Marks: 4+6+5

B.E. POWER ENGINEERING FOURTH YEAR SECOND SEMESTER EXAM 2017 (OLD)

SUBJECT: - POWER PLANT OPERATION & MAINTENANCE

PART-II **FULLMARKS-50**

ANSWER ANY FIVE QUESTIONS FROM THE FOLLOWING ALL QUESTIONS CARRY EQUAL MARKS.

USE SEPERATE ANSWER SCRIPTS FOR EACH GROUP.

2.1 What is Automatic Generation Control, explain with the help of diagram AVR and ALFC loop. 5+5=10

2.2 What are the different types of Modern Exciters being used for Alternator excitation mentioning their special features. 10

2.3a) what is protective relaying, Explain primary and back up protection. Mention the desirable qualities of protective relaying. What is Sensitivity Factor.

2.3b) Find the Open loop gain of an AVR loop if the static error does not exceed 2% 7+3=10

2.4a) Deduce Static performance of AVR loop and compensation in AVR loop

2.4b) Draw the block diagram of primary ALFC loop . 5+5=10

2.5 A sub grid has total rated Capacity of 3000MW. It encounters a load increase of 40MW When the normal operating load is 2000 MW. Assume inertia constant (H) to be 5 sec. and regulation of the generators in the system as 3 HZ/P.U. MW. Find

a) ALFC loop parameters

b) Static frequency drop

c) Transient response of the ALFC loop.

Assume load frequency dependency to be linear. 10

2.6. Write Short Notes on any two of the following:-

a) Economic Operation of energy generating system.

b) Constraint in economic operation of power system.

c) Basic connection of Trip circuit.

d) Voltage balance differential relay.