

B.E Power Engineering 4th Year 2nd Semester Examination, 2018

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) Write down the different functions of maintenance store department.
- b) Discuss the different factors in boiler, turbine & plant area on which plant thermal efficiency depend.
- c) What is the objective of phosphate dosing in boiler water? What is 'Phosphate Hide Out'?
- d) In the event of total power failure in the plant what are the major operations are to be dealt with?
- e) Describe the various emergencies encountered in boiler and their effects on plant.
- f) Describe the starting procedure of Air Preheater including the line up.

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

b) What are the starting permissives of first ID fan?

c) What are the tripping conditions of an ID Fan?

d) Describe briefly the sequential activities for boiler light-up in cold start-up process

Marks: 3+2+2+8

3. a) What are the major classifications of Boiler tube leakages?

b) Explain the tube leakage due to Hydrogen Embrittlement.

c) What are the operation & maintenance practices are to be adopted to reduce the boiler tube leakage?

Marks: 3+7+5

4. a) Describe briefly the different activities which are carried out in boiler, turbine and generator for the synchronisation of Turbo-Generator Set from initial commissioning.

b) Describe briefly the different activities for Turbine rolling and synchronisation process.

Marks: 7+8

5. a) What is the objective of maintenance management system?

b) What are the different systems adopted for effective maintenance management system?

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

d) Discuss the 'Preventive Maintenance' and 'Predictive Maintenance'.

Marks: 2+3+5+5

B.E POWER ENGINEERING FOURTH YEAR-SECOND SEMESTER EXAMINATION 2018

SUBJECT: POWER PLANT OPERATION AND MAINTENANCE

PART -II

FULL MARKS: 50

(Answer any five questions from the following

All questions carry equal marks.

Use separate answer scripts for each group.)

1. What are the different types of modern exciters being used for alternator excitation? Mentioning their special features. 5+5=10
2. What is automatic generation control? Explain with the help of diagram AVR and ALFC loop. 10
3. a) Deduce static performance of AVR loop and compensation in AVR loop.
b) Draw the block diagram of primary ALFC loop. 5+5=10
4. a) What is the protective relaying? Explain primary and back up protection. Mention the desirable quality of protective relaying. What is sensitivity factor?
b) Find the open loop gain of an AVR loop if the static error does not exceed 2%. 7+3=10
5. A sub grid has total rated capacity of 3000 MW. It encounters a load increase of 40 MW, 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/PU MW. Find
 - a) ALFC loop parameters
 - b) Static frequency drop.
 - c) Transient response of the ALFC loopAssume load frequency dependency is to be linear. 10
6. Write short notes on any two of the followings: 2*5=10
 - 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