

CS/B.Tech/PWE/SEM-8/PWE-801/2013

2013

**THERMAL POWER PLANT OPERATION
AND MAINTENANCE**

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) If saturated steam at a pressure of 20 kg/cm² (a) is reduced to 10 kg/cm² (a) through a pressure reducing valve, the steam will
- a) condense
 - b) remain saturated
 - c) get superheated
 - d) be a mixture of 50% steam and 50% condensate.
- ii) The amount of theoretical air required for complete combustion of one ton of coal as compared to that required for one ton of fuel oil is
- a) higher b) lower
 - c) equal d) none of these.
- iii) A rise in conductivity of boiler feed water indicates
- a) drop in the contamination of feed water
 - b) greater purity of feed water
 - c) rise in the contamination of feed water
 - d) it has got no relation with the contamination of

feed water.

iv) Which of the following best indicates the overall efficiency of a combined cycle thermal power plant ?

a) 33% b) 42%

c) 55% d) 60%.

v) High % of carbon monoxide presence in the flue gas of boiler is an indicator of

a) high excess air

b) complete combustion

c) good control of pollutants

d) low excess air.

vi) The purpose of venting air from steam systems is because air is a/an

a) insulator b) good conductor

c) inert substance d) dilutant.

vii) The type of firing used for a pulverized coal fired boiler is

a) over-firing

b) tangential firing

c) vertical firing

d) mixed firing of effective heat transfer.

viii) Which of the following heat recovery equipment works on a refrigeration cycle ?

a) Thermocompressor b) Heat wheel

c) Heat pump d) Heat pipe.

ix) In a fluid coupling, connecting an induction motor and a fan

a) motor speed can be changed by the fluid coupling

b) fan speed can be changed by the fluid coupling

c) both motor and fan speed can be changed by the fluid coupling

- d) none of these is possible.
- x) The fan characteristic curve is a plot of
 - a) static pressure vs flow
 - b) dynamic pressure vs flow
 - c) total pressure vs flow
 - d) suction pressure vs flow.
- xi) Centrifugal compressors are most efficient when they are operating at
 - a) 50% load b) full load
 - c) 75% load d) all load conditions.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain the role of ST, GT, UAT (transformers) in power plant.
3. Differentiate between cold, hot and warm start-up.
4. Discuss on functioning of HP/LP bypass system.
5. What are the pre-checks of mill operation ? Draw the flow path line up from bunker to furnace.
6. Write the logics of BMS/FSSS.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Describe boiler light-up procedure including pre-checks.
b) Write the safety precautions to be taken during isolation of equipment. 10 + 5
8. a) Write the steps for turbine rolling and synchronization.
b) What is the difference between planned and forced shutdown. 10 + 5
9. a) Write the performance parameters to be monitored in case of coal mill, condenser, regenerative feed heaters in

a power plant.

b) Write the procedures of boiler hydro test. 10 + 5

10. a) Write five boiler and five turbine emergencies.

b) How will you carry out furnace air tightness test ?

10 + 5

11. a) Describe preventive and conditioned based maintenance system adopted in power plant.

b) What are the chemical dosings associated with feed water, condensate and at drum. 10 + 5

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