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**Reg. No. :**

**Question Paper Code: 46064**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Sixeth Semester

Instrumentation and Control Engineering

14UIC903- POWER PLANT INSTRUMENTATION

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The common sources of energy are

(a) Solar, wind and biomass (b) Wood, animal wastes and agriculture wastes

(c) None of the above (d) Fossil fuels, hydropower and nuclear energy

2.  Solar thermal power generation can be achieved by

(a)Using focusing collector or heliostates (b) Using flat plate collectors

(c) Using a solar pond (d) Any of the above system

3. In thermal power plant the dust of flue gas is trapped by

(a) Precipitator (b) Economizer (c) Super heater (d) Air preheater

4. With the increase in \_\_\_\_\_\_ the efficiency obeys the law of diminishing returns

(a) Volume (b) Temperature (c) Pressure (d) Flow

5. The pH value of the water used in boiler is\_\_\_\_\_\_\_

(a) Unity (b) 7 (c) Slightly more than seven (d) Slightly less than seven

6.  In coal preparation plant, magnetic separators are used to remove

(a) Dust     (b)  Clinkers (c)  Iron particles      (d)  Sand

7. Deaerative heating is done to

(a) Heat the water (b) Heat the air in the water

(c) Remove dissolved gases in the water (d) None of the above

8. For industrial process heating the best quality of steam is \_\_\_\_\_\_\_

(a) Dry saturated (b) Superheated steam

(c) Wet steam (d) High pressure steam

9. In a shell and tube heat exchanger, the vapour steam\_\_\_\_

(a) Is flown in the tube (b) Contained on the shell side

(c) Generally, not used for heat exchanger (d) None of the above

10. Radial vibration measurement measures\_\_\_\_\_

(a) Unbalanced masses (b) Oil whirl

(c) Cracked shafts (d) All of the mentioned

PART - B (5 x 2 = 10 Marks)

11. What is cogeneration?

12. What do you mean by shrinking effect of boiler drum level?

13. Name any two instruments to find CO in flue gas?

14. What are the effects of feed water pressure variation in drum level control?

15. How to control the shell temperature?

PART - C (5 x 16 = 80 Marks)

16. (a) Draw the block diagram of a thermal power plant and explain the process. (16)

Or

(b) (i) Draw an Instrumentation diagram of a Boiler and explain. (8)

(ii) Describe a Solar power plant. (8)

17. (a) With neat diagrams explain a method for the measurement of Current. State the

advantages and disadvantages. (16)

Or

(b) (i) Describe a method for measuring Boiler Drum Level. (8)

(ii) Describe a method for measuring Steam flow. (8)

18. (a) (i) Survey the methods of dissolved oxygen analysis. (4)

(ii) With neat diagrams, explain the operation of pollution monitoring

instruments. (12)

Or

(b) Draw the diagram of a Gas chromatograph and explain the separation process. (16)

19. (a) (i) With neat diagrams explain three element method for the control of drum level

(10)

(ii) Define Ratio Control .Suggest an application in control of boilers. (6)

Or

(b) Explain the interlock operation in industrial boilers. (16)

20. (a) (i) Illustrate the basic control schemes expected in a turbine lubrication system. (8)

(ii) Describe the function of steam pressure for steam turbines. (8)

Or

(b) (i) With a neat sketch explain the method of speed measurement of a steam turbine

using non-contact type transducer. (10)

(ii) How are the vibration of a steam turbine monitired and control? (6)