Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70837

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth / Seventh Semester

Mechanical Engineering

ME 6701 – POWER PLANT ENGINEERING

(Common to: Mechanical Engineering (Sandwich) / Electrical and Electronics Engg.)

(Regulations 2013)

(Also common to : PTME 6701 – Power Plant Engineering for B.E. (Part-Time) – Mechanical Engineering / Electrical and Electronics Engineering / Sixth / Second Semester Regulations — 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the need of modern coal based thermal power plants.

2. What are the two most commonly used methods for the burning of coal?

3. What are the applications of Diesel engine power plants?

4. List down the various processes of the Brayton cycle.

5. What is the function of Pressurizer in the PWR?

6. What is CANDU?

7. List the types of conventional energy sources and non-conventional energy sources.

8. What is the function of surge tank in hydroelectric power plant?

9. What is main objective of tariff?

10. Define plant use factor.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the principle of Fluidised bed combustion (FBC) system. State the advantages of FBC system. (13)

Or

(b) Explain the various methods involved in ash handling with neat sketches. (13)

12. (a) Discuss the essential components of the diesel power plant with neat layout. (13)

Or

(b) (i) Derive an expression for the work ratio using Brayton cycle. (7)

(ii) Discuss the working of anyone type of combined cycle power plant. (6)

13. (a) Explain with neat diagram various components of nuclear reactor with layout of power plant. (13)

Or

(b) (i) With neat diagram explain boiler water reactor also mention its advantages and disadvantages. (7)

(ii) Explain nuclear fission and chain reaction. (6)

14. (a) What is Fuel cell? Why Fuel cells employed for power generation? Also discuss the working principle of fuel cell.

Or

(b) Discuss the function of concentrating solar collectors. Also briefly explain how electrical energy is generated in solar power plant using these collectors.

15. (a) Describe the economics in plant selection.

Or

(b) Describe the pollution control methods for coal and nuclear power plants.

PART C — (1 × 15 = 15 marks)

16. (a) What is regeneration? How it improves the thermal efficiency of a simple open cycle gas? (15)

Or

(b) State the classification of hydro-power plants and explain the working hydroelectric power plant with a neat sketch. (15)

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