6.11.2023 A020520 TE-II (5 SEM)

Register No.: [ ]

356

October 2023

Time – Three hours
(Maximum Marks: 100)

[N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.]

PART – A

1. What do you mean by degree of superheat?
2. Define: throttling process.
3. Distinguish between fire tube and water tube boiler.
4. Write the working of air pre-heater.
5. What is the function of cyclone separator?
6. What are the sources of air in condenser?
7. Define radioactivity.
8. List out the classification of reactors.
9. Write the working of open cycle gas turbine.
10. List the types of rocket engine.

PART – B

11. (a) Steam at a pressure of 8.5bar and 0.95 dry is expanded adiabatically to a pressure of 1.5bar. Find the final condition of steam and heat drop by using steam tables.

(Or)

(b) A closed vessel of $0.6m^3$ capacity contains dry saturated steam at 3.6 bar. The vessel is cooled until the pressure is reduced to 2 bar. Calculate (i) The mass of steam in the vessel. (ii) The final dryness fraction of steam and (iii) The amount of heat transferred.

[Turn over.....

12. (a) Draw a neat sketch of a BHEL high pressure boiler and explain its working.

(Or)

(b) A boiler generates 750 kg of steam per hour at 11 bar absolute with 40^0C super heat. The boiler burns 100 kg of coal having calorific value of 29,300 kJ/kg. The feed water temperature is 45^0C and specific heat of super heated steam is 2.09 kJ/kgK. Calculate (i) The factor of evaporation (ii) The equivalent evaporation (iii) Boiler efficiency (iv) Boiler power.

13. (a) (i) Explain the working of a simple impulse turbine, with a neat sketch. (10)

(ii) Compare the difference between impulse and reaction turbine. (4)

(Or)

(b) Explain the working of thermal power plant with a layout diagram and write its merits and demerits.

14. (a) Explain the boiling water reactor with a neat sketch.

(Or)

(b) Explain the working of diesel power plant with a layout.

15. (a) Explain the working of gas turbine plant with inter cooler, regenerator and reheater and state its effects.

(Or)

(b) A single acting reciprocating air compressor has a piston diameter 120 mm and stroke 150 mm and runs at 300 rpm. Air is drawn at 0.9 bar pressure and is delivered at 8 bar pressure. The law of compression is $pv^{1.3}$ = constant. Determine the power required to drive the compressor. Assume the volumetric efficiency = 80% and the mechanical efficiency = 90%. Also find the mass of airdelivered per minute, if the intake temperature is 25^0C.
