

# MODEL QUESTION PAPER

Time: 3 Hrs

Max Marks : 100

Note: (i) Answer all the ten questions in part - A. Each question carries three marks.

(ii) Answer either sub division (A) or sub division (B) of each question in part - B. Each question carries fourteen marks.

## PART – A (10 x 3 = 30 Marks)

1. What are the advantages of superheated steam?
2. What is a boiler mounting? Give examples.
3. Classify steam engines.
4. What are the energy losses in steam turbine.
5. Mention the types of rotary compressors.
6. State the differences between air craft and industrial gas turbines.
7. Distinguish between a refrigerator and heat pump.
8. What are the factors to be considered in Air-conditioning?
9. State the pollutants from power plant.
10. Give examples of fertile and fissile fuels.

## PART – B (5 x 14 = 70 Marks)

Note: Answer all questions by choosing either A or B

11. (A) (i) Describe the working of BHEL boiler with neat sketch.

(14)



M.Q.2

(B) (i) Explain spring loaded safety valve with neat sketch. (7)

(ii) The following observations refer to a boiler trial. Mean temperature of feed water  $28^{\circ}\text{C}$ . Water evaporated per hour 48000 kg. Boiler pressure 14 bar abs. Quality of steam 90% dry. Coal burnt per hour 4800 kg. Calorific value of coal 34, 000 KJ/kg. Calculate

(i) equivalent evaporation

(ii) boiler efficiency

(iii) Factor of evaporation (7)

12. (A) (i) Explain the working principle of a single cylinder double acting reciprocating steam engine with a neat sketch. (8)

(ii) Explain the working principle of evaporative condenser with neat sketch. (8)

(OR)

(B) (i) Describe with line sketch the velocity compounding in a steam turbine. (7)

(ii) Explain the working principle of down flow surface condenser with neat sketch. (7)

13. (A) (i) Explain the working of turbo Jet engine. State its advantages and disadvantages. (7)

(ii) A single stage single acting reciprocating air compressor has a cylinder diameter of 100mm and stroke of 150mm. It receives air at 0.95 bar and  $27^{\circ}\text{C}$  and delivers it at 5.7 bar. If the compression follows the law  $PV^{1.2} = C$  and clearance is 5% of the stroke volume, determine



the power required to drive the compressor, if it runs at 350 rpm. (7)

(OR)

(B) (i) Explain the working of an axial flow compressor with neat sketch. (7)

(ii) Explain the working of an open cycle gas turbine with regenerator with a line diagram. (7)

14. (A) (i) Explain with line diagram the working of vapour absorption refrigeration system. (8)

(ii) A refrigerating plant is required to produce 2.5 tonnes of ice per day at  $-4^{\circ}\text{C}$  from water at  $20^{\circ}\text{C}$ . If the temperature range in the compressor is between  $25^{\circ}\text{C}$  and  $-6^{\circ}\text{C}$ , calculate the power required to drive the compressor. Take specific heat of ice  $2.1 \text{ KJ/kgK}$ ; specific heat of water  $4.2 \text{ KJ/kgK}$ ; latent heat of ice  $336 \text{ KJ/kg}$ .

(OR)

(B) (i) Describe the working of central air conditioning system with a neat sketch. (8)

(ii) Define (i) DBT (ii) Specific humidity  
(iii) relative humidity (6)

15. (A) (i) Discuss the layout of thermal power plant in detail. (14)

(OR)

(B) (i) Explain the working of CANDU Type reactor with neat sketch. (8)

(ii) Discuss the working of cyclone separator with a neat diagram. (6)