



# 22214

11819

**3 Hours / 70 Marks**

Seat No.

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- Instructions :**
- (1) *All questions are **compulsory**.*
  - (2) *Illustrate your answers with neat sketches **wherever** necessary.*
  - (3) *Figures to the **right** indicate **full** marks.*
  - (4) *Assume suitable data, if **necessary**.*
  - (5) *Preferably, write the answers in sequential order.*

**Marks**

**1. Attempt any five of the following :**

**10**

- a) Define wet steam and dry steam.
- b) Define boiler mountings with two examples.
- c) Explain the functions of following parts in I.C. engine :
  - i) Piston
  - ii) Cylinder.
- d) It is observed that in device, feed water heated by utilising the heat in exhaust flue gases before it leaving through the chimney in steam power plant, sketch and identify the device.
- e) Define brake power and brake thermal efficiency.
- f) List the applications of refrigeration system.
- g) Define Ton of refrigeration.

**2. Attempt any three of the following :**

**12**

- a) Explain working of impulse steam turbine with neat sketch.
- b) Sketch the layout of steam power plant and –
  - i) Label the components
  - ii) Describe the function of any two major components.
- c) State the need of compounding of steam turbines and give its types.
- d) State the effect of pollution on environment due to steam power plants.

**P.T.O.**



3. Attempt **any three** of the following :

12

- a) Suggest the remedies in following situations for diesel engine
  - i) Piston seizure
  - ii) Engine overheating
  - iii) Low power developed
  - iv) Smokey exhaust of diesel engine.
- b) List any four pollutants in exhaust gases of I.C. engine with their effects on environment.
- c) Explain working of closed cycle gas turbine with neat sketch.
- d) A dam is constructed to provide a high head of water
  - i) Name the relevant turbine that used to generate power
  - ii) Sketch the turbine you suggest.

4. Attempt **any three** of the following :

12

- a) Explain working of centrifugal compressor with sketch.
- b) Suggest the suitable compressor with justification for following applications
  - i) Automobile washing centre
  - ii) Gas turbine.
- c) State different applications of compressed air (min-4 applications).
- d) In a diesel engine, heat is supplied at a rate of 13.43 kW. Engine produces brake power at a rate of 2.83 kW. Estimate brake thermal efficiency.
- e) Two sets strike the bucket of Pelton wheel which develops 15000 kW. The discharge is  $6 \text{ m}^3/\text{sec}$ . If the net head on turbine is 350 m. Find overall efficiency of turbine.

5. Attempt **any two** of the following :

12

- a) Describe the functions in refrigeration system
  - i) OLP
  - ii) Thermostat
  - iii) Defrost heater.
- b) Explain working of simple vapour compression system with neat sketch of its layout.
- c) It is observed that when refrigerator is switched on, the compressor does not start. Mention the possible causes with remedies.

6. Attempt **any two** of the following :

12

- a) Draw neat sketch of window air conditioner and explain its working.
  - b) Explain the working of Babcock and Wilcox boiler with neat labelled sketch.
  - c) Explain working of single acting reciprocating pump with neat sketch.
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