

# 17413

**16172**

**2 Hours / 50 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

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

**9 × 2 = 18**

- (a) State the applications of compressed air in industry.
- (b) State the classification of pumps.
- (c) Define compressor capacity and swept volume.
- (d) List the methods of energy saving in air compressor.
- (e) Define the term boiler efficiency.
- (f) Define suction head and delivery head of centrifugal pump.
- (g) State two provisions under Boiler Act for remedial measure.
- (h) Define break power and indicated power.
- (i) What is the purpose of Morse test ? Name other methods.
- (j) Write down the function of foot valve.
- (k) State the sources of heat losses in boiler.

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

**4 × 4 = 16**

- (a) Draw the labelled sketch of Cochran boiler.
- (b) Explain the process of priming of a centrifugal pump.

[ 1 of 2 ]

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- (c) What is staging ? What are the advantages of multistage compression ?
- (d) Differentiate between two stroke engine and four stroke engine.
- (e) State two points of differences between impulse turbine and reaction turbine.  
Also state two applications of each.
- (f) State any four faults in working of centrifugal pump and suggest remedial action for the same.

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

**4 × 4 = 16**

- (a) Write the possible causes and remedies for following in case of IC engine :
  - (i) Bearing wear
  - (ii) Irregular discharge
  - (iii) Suction problem
  - (iv) Excessive vibration
- (b) During the test on single cylinder oil engine, working on four stroke cycle and fitted with a rope brake, the following readings are taken :
  - Spring balance reading – 30 N
  - Length of Indicator diagram – 60 mm
  - Effective diameter of brake wheel – 630 mm
  - Dead load on brake – 200 N
  - Area of Indicator diagram = 420 mm<sup>2</sup>
  - Spring scale – 1.1 bar/mm
  - Diameter of cylinder – 100 mm
  - Stroke – 150 mm

Calculate brake power and indicated power, if speed of the engine is 430 rpm.

- (c) State and draw different types of casing used in centrifugal pump.
  - (d) Explain superheater and preheater in super critical boilers.
  - (e) State the four stages of compressed air preparation.
  - (f) Differentiate between fire tube and water tube boilers.
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