21718

2 Hours / 50 Marks Seat No. | | | | | | | | |

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) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any NINE of the following : 18

(a) List any four advantages of Supercritical Boiler.

(b) Differentiate between Fire Tube Boiler and Water Tube Boiler. (Any two points)

(c) Define the terms related to I.C. engine :

(i) Compression ratio

(ii) Expansion ratio

(d) State the application of rotary compressor.

(e) What is priming ? State its purpose.

(f) State the function of nozzles used in steam turbine.

(g) What is principle of operation of steam turbine ?

(h) Define FAD (Free Air Delivered).

(i) State four applications of compressed air in industry.

(j) Compare between Centrifugal & Reciprocating pump. (Any four points)

(k) Draw the sketch of volute casing & volute casing with guide blade of centrifugal pump.

2. Attempt any FOUR of the following : **16**

(a) Explain the function of following in I.C. engine :

(i) Piston

(ii) Crank

(iii) Piston ring

(iv) Cylinder

(b) State any four method's of energy saving in air-compressor.

(c) Sketch & explain construction of Benson Boiler.

(d) State the classification of pumps.

(e) Enlist different power losses in steam turbine.

(f) State the possible causes & remedies for :

(i) Compressor will not start.

(ii) Excessive noise in operation.

3. Attempt any FOUR of the following : **16**

(a) Derive an expression for power required to drive a double acting reciprocating pump.

(b) With neat sketch explain working of vane type rotary compressor.

(c) State any four provisions under boiler act for remedial measures.

(d) Define the following terms :

(i) Indicated power

(ii) Brake power

(iii) Friction power

(iv) Mechanical efficiency

(e) Select the pump in following cases :

(i) Domestic water lifting

(ii) Bore wells

(iii) Service Station of Automobile

(iv) Irrigation

(f) During the test on single cylinder oil engine working on four stroke cycle & be fitted with rope brake the following reading are taken :

- Effective dia of Brake wheel = 631 mm
- Spring balance reading = 31 N
- Speed = 455 r.p.m.
- Dead load on brake = 202 N
- Area of indicator diagram = 422 mm^2
- Length of indicator diagram = 62 mm
- Spring scale = 1.2 bar/mm
- Diameter of cylinder = 100 mm
- Stroke = 151 mm

Calculate Brake Power & Indicated Power.
