



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

First Semester, B.E. - Semester End Examination; Dec - 2017/Jan - 2018

Elements of Mechanical Engineering

(Common to All Branches)

Time: 3 hrs

Max. Marks: 100

*Note: i) Answer FIVE full questions, selecting ONE full question from each unit
ii) Assume suitably missing data if any.*

UNIT - I

- 1 a. With a neat sketch, explain working principle's of Parson's steam turbine. 10
- b. Discuss the following with relates to steam :
- (i) Dryness fraction (ii) Enthalpy (iii) Internal energy
- (iv) Specific volume (v) Latent heat of evaporation. 10
- 2 a. With a neat sketch, explain the working of closed cycle gas turbine and two applications of it. 10
- b. Differentiate between the fire tube and water tube boilers. 6
- c. List out the advantages of super heated steam. 4

UNIT - II

- 3 a. Explain following terms :
- (i) Indicated power (ii) Brake power
- (iii) Thermal efficiency (iv) Mean effective pressure. 8
- b. With a neat sketch, explain working of 2-stroke petrol engine and how 2-stroke is different from 4-stroke engine? 12
- 4 a. A 4-stroke IC engine has a piston dia of 150 mm, stroke length 210 mm, speed of the engine is 500 rpm. Mean effective pressure 0.786 MPa and measured tensions at tight side and slack side are 700 N and 400 N respectively, with radius of pulley 0.5 m in belt dynamometer. 10
- Find;
- (i) IP (ii) BP (iii) η_{mech} .
- b. Explain working of 4-stroke diesel engine with the help of pressure-volume diagram. 10

UNIT - III

- 5 a. Differentiate the followings :
- (i) Positive displacement pump and Roto dynamic pump
- (ii) Single acting and double acting pump. 10
- b. Explain the working principle of vapour absorption refrigeration system. 10
- 6 a. List out the properties of good refrigerant. 6
- b. Discuss different types of refrigerant used in refrigerator. 4
- c. With a neat sketch, explain working principle of centrifugal pump. 10

UNIT - IV

- 7 a. Define tapering and discuss the different types of tapering methods adopted in lathe machine. 10
b. With a neat sketch, explain working principle of column-knee type horizontal milling machine. 10
- 8 a. With a neat sketch, explain followings :
(i) Reaming (ii) Tapping. 6
b. Write a sketch of twist drill and label the parts. 6
c. Describe the working principle of centreless grinding machine. 8

UNIT - V

- 9 a. With a neat sketch, explain gas welding technique. 10
b. List out the applications of Brazing process. 4
c. A shaft running at 100 rpm is to drive a parallel shaft at 150 rpm. The pulley on the driving shaft is 35 cm in diameter. Find the diameter of the driven pulley. Calculate the linear velocity of the belt and also the velocity ratio. 6
- 10 a. Differentiate Fusion and Plastic welding process. 6
b. Describe an expression for length of cross belt drive. 8
c. With a neat sketch, explain Iron soldering method. 6

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