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

(An Autonomous Institution affiliated to VTU, Belagavi)

I/II Sem, B.E. - Semester End Examination; May/June - 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) Missing data if any suitably assumed.

UNIT - I

1 a. What is steam boiler? List any four applications of steam boiler. 6

b. Explain the following terms :

i) Enthalpy 4

ii) Dryness fraction.

c. With neat sketches, explain formation of steam at constant pressure with T-H diagram. 10

2 a. With a neat sketch, explain open cycle gas turbine. 10

b. With the help of pressure-velocity graph, sketch and explain the working of reaction turbine. 10

UNIT - II

3 a. With neat sketch, explain the working principle of 4-stroke diesel engine with P-V diagram. 12

b. Differentiate between a 4-stroke and 2-stroke IC engine with atleast 8 different parameters. 8

4 a. With neat sketches, Explain the working principle of 2-stroke petrol engine. 10

b. The average piston speed of a 4-stroke, petrol engine having a piston dia of 150 mm is 3.5 m/s. The mean effective pressure acting on the piston is 0.786 MPa. Determine the power developed inside the engine cylinder. 10

UNIT - III

5 a. With a neat sketch, explain the parts of centrifugal pump and its application. 10

b. Explain the working of single acting and double acting reciprocating pumps. 10

6 a. With a neat sketch, explain vapour absorption refrigeration system. 10

b. With a neat sketch, explain the working of a room air conditioner. 10

UNIT - IV

7 a. Draw a neat sketch of center lathe and label the parts. 8

b. Sketch and explain the following :

i) Up-milling ii) Down milling

iii) Slot milling iv) Angular milling 12

8 a. With a neat sketch, explain Radial drilling machine. 10

b. With a neat sketch, explain cylindrical grinding machine. 10

Cont…2

UNIT - V

9 a. Distinguish between Soldering, Brazing and Welding. 10

b. With neat sketches, explain the different types of flames used in gas welding and specify their applications. 10

10 a. With simple labelled sketches, explain the different types of belt drives. 10

b. A prime mover running at 240 rpm drives a DC generator by a belt drive. The diameter of the pulley on the output shaft of the prime mover is 160 cm and that of the generator shaft is 60 cm. Determine the speed of the generator shaft in the following cases :

i) Neglecting thickness of belt

ii) Considering belt thickness, the thickness of belt is 6 mm

iii) Considering thickness of belt and slip of 3%

iv) Velocity of belt considering the belt thickness 10

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