BE-203

B.E. I & II Semester

Examination, December 2012

Basic Mechanical Engineering

(Grading System)

Time : Three Hours

Maximum Marks : 70

Note: Solve one question from each unit.

Unit - I

1. a) Draw the stress-strain curve for a ductile metal and point out its salient features. 7

b) Explain the following reactions in relation to iron-carbon equilibrium diagram. 7

i) Eutectic reaction ii) Eutectoid reaction iii) Peritectic reaction.

Or

a) Give the broad classification of engineering materials. 7

b) Define the following mechanical properties of an engineering material: 7

i) Hardness

i i ) Toughness

i i i ) Fatigue

Unit - II

3. a) Explain the construction and use of a combination set. 7

b) Discuss the different sources of error's in the act of taking measurement. 7

Or

4. a) Sketch a micrometer and explain its working. 7

b) Explain the construction and working principle of a lathe machine with neat sketch. 7

Unit- III

5. a) Establish the Bernoulli's theorem from the Euler equation of motion through a stream tube.7

b) Enumerate important characteristics of 7

i) Limar flow

ii) Tufbulent flow

Or

6. a) Explain working principle of fluid coupling. 7

b) A pipe 300 meters long has a slope of I in 100 and tapers from lm diameter at the high end to 0.5m at the low end. Quantity of water flowing is 5400 liters per minute. If the pressure at the high end is 70KPa, find the pressure at the low end. 7 http://www.rgpvonline.com

Unit - IV

7. a) Explain with neat sketch vapour compression refrigeration system also draw P-V and T-S diagrams. 7

b) Find enthalpy of steam at 10 bar in TN lowing conditions.

i) Dry and saturated

ii) Wet having dryness fraction 0.95

iii) Superheated to a degree of superheat = 50°C. 7

Or

8. a) Give classification of boilers on different basis.7

b) A coal fired boiler plant consumes 400kg of coal per hour. The boiler evaporates 3200kg of water at 44.5°C into superheated steam at a pressure of 12 bar and 274.5°C. If the calorific value of fuel is 32,760kJ/kg of Coal, detennine:

i) Equivalent evaporation

ii) Thermal efficiency of boiler. 7

Unit - V

9. a) With the help of theoretical P-V diagram explain working of four stroke petrol engine. 7

b) Explain camot cycle and find expression for efficiency. 7

Or

10. a) With the help of theoretical P-V diagram explain working of single acting steam engine. 7

b) Differentiate between SI and CI engines. 7