

Roll No .....

## BE-203

**B.E. I & II Semester** Examination, June 2013

### Basic Mechanical Engineering

*Time : Three Hours*

<http://www.rgpvonline.com/> *Maximum Marks : 70*

**Note:** Attempt five questions selecting one from each unit. All questions carry equal marks.

#### Unit - I

1. a) Explain the stress-strain diagram of mild steel with the help of a neat sketch.  
b) Define following properties of engineering materials :  
i) Hardness                      ii) Ductility  
iii) Fatigue                      iv) Modulus of elasticity
2. a) Describe composition of grey cast iron and its properties and application in engineering field.  
b) What are alloy steel? Why alloying is done. Explain

OR

#### Unit - II

3. a) What is the use of micrometer? Explain its working.  
b) Explain the use of sine bar.

OR

4. a) Write short notes on slip gages.  
b) With the help of a simple sketch, explain different components of Lathe machine.

#### Unit - III

5. a) What is Bernoulli's theorem for incompressible fluid. How is it used to measure flow in a pipe.  
b) How hydraulic pumps are classified. Explain.

OR

6. a) Differentiate between viscous and non-viscous flow.  
b) Explain the working of a fluid coupling.

#### Unit - IV

7. a) State and explain second law of thermo dynamics.  
b) Explain the working of a vapour compression refrigeration system with the help of a neat diagram.

OR

8. Steam at 18 bar and dryness fraction 0.9 is heated at constant pressure until it becomes dry and saturated. Find the increase in volume, heat supplied and work done per kg of steam. Further if volume of steam is kept constant, find how much heat be extracted to reduce the pressure of steam to 14 bar.

#### Unit - V

9. a) What is steam engine? Explain its actual working with the help of actual indicator diagram.  
b) Compare the working of petrol and diesel engines.

OR

10. a) With the help of P-V diagram. Explain the working of a four stroke diesel engine.  
b) An engine working on otto cycle is supplied with air at 0.1 MPa and 35°C. The compression ratio is 8. Heat supplied is 2100 kJ/kg. Calculate the maximum pressure and temperature of the cycle, cycle efficiency and mean effective pressure.