

B. Tech. 2nd Semester Examination, May-2011

**BASICS OF MECHANICAL ENGINEERING**

**Paper - ME-101-F**

*Time allowed : 3 hours]*

*[Maximum marks :100*

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*Note : Question No. 1 is compulsory. Each question carries equal marks. Students have to attempt five questions in total.*

1. Write short notes on following :
  - (a) Zeroth law of thermodynamics.
  - (b) Coefficient of performance.
  - (c) Hook's law of poisson ratio.
  - (d) Introduction to manufacturing systems      20
2. (a) Describe the lathe machine tool with neat and clean diagram in detail.      14
- (b) Explain the concept of Internal Energy.      6
3.  $0.5 \text{ m}^3$  of wet steam at 1 bar and 15 percent dryness fraction is enclosed between a cylinder and a piston resting on stop. The atmospheric pressure and the

weight of piston are such that a pressure of 4 bar is required to lift the piston. The steam is heated until the piston reaches the upper stop where the volume is  $0.60 \text{ m}^3$ . Heating is continued further until water exists as saturated vapour. Show the processes on T-v plane and determine 20

- (i) Final pressure
  - (ii) Overall heat transfer
4. (a) Differentiate between the Francis and Kaplan turbines. 10
- (b) Explain the construction details and working of pelton turbine. 10
5. Explain the simple refrigeration vapour compression cycle in detail. 20
6. (a) Describe briefly various type of Gears. 10
- (b) Enumerate the means by which power can be transmitted from one shaft to another. 10
7. (a) Explain the stress-strain diagram for mild steel. 10

- (b) Derive the relationship of the elastic constants. 10
8. Classify and explain the NC system. 20
9. (a) Explain the components of NC system. 10
- (b) Differentiate between the NC and CNC system. 10