

Government College of Engineering, Aurangabad

(An Autonomous Institute of Government of Maharashtra)

F. E. (All) Examination

End Semester Examination Dec 2016

ME 1001: BASICS OF MECHANICAL ENGINEERING

Time: Three Hours

17 DEC 2016

Max. Marks: 60

"Verify the Course Code and check whether you have got the correct question paper"

N.B:-

1. All questions are compulsory
2. Figures to the right indicate full marks
3. Assume suitable data if necessary and state it clearly
4. Use of non-programmable calculator is allowed

Q1. Attempt any two (2 x 6) (12)

- i) Enlist four methods of temperature measurement. Explain working of alcohol in glass thermometer.
- ii) A vertical column of composite fluids consist of 30 cm of Hg, 60 cm of water and 70 cm of oil (Specific gravity 0.7). The upper surface of column is exposed to 1.0 bar pressure. Determine pressure at (i) the base of the column (ii) water – mercury interface and (iii) oil-water interface in KPa?
- iii) Differentiate among flow work, displacement work, paddle wheel work and shaft work.

Q2. 110 liters of air at 10 bar and 300° C expands in a reciprocating machines according to law $PV^{1.3} = \text{Constant}$ and does 40 KJ of work. Determine (a) Final Pressure (b) Heat transfer (c) change in internal energy. (12)

OR

Heat added at constant volume to a close system is 168.7 KJ. The system then rejects heat 177 KJ while 40 KJ of work is done on it at constant pressure. If the system now restores to the initial condition by a process in which heat is not transferred; determine the work done by the system during this process. What is internal energy at the two states with respect to the initial state? Show for the cycle net work transfer is equal to net heat transfer.

Q3. Attempt any two (2 x 6) (12)

- (i) Explain working of four stork petrol engine?
- (ii) Differentiate renewable and non renewable energy with two example of each
- (iii) Explain working of steam power plant using block diagram.

Q4. Attempt any two (2 x 6) (12)

- (i) Explain working of brakes with neat diagram.
- (ii) Explain chain and sprocket drive for power transmission. Where it is preferred over other drives?
- (iii) Explain working of gears, classification of gears, velocity ratio.

Q5. Write short notes on any two (2 x 6) (12)

- (i) Turning (ii) forging
- (iii) Engineering Applications of ferrous materials

