## Dr. Babasaheb Ambedkar Technological University, Lonere End Semester Examination (Dec 2017)

I Sem B. Tech.

## Sub: Basic Mechanical Engineering

INSTRUTIONS:

1) Attempt any FIVE questions.
2) Necessary data are given in the respective questions. If such data is not given, it means that the knowledge of that data is a part of the examination.
3) Make suitable assumptions if necessary and state them clearly giving reasons.
4) Use of necessary charts and tables are permitted.

Q. 1(a) Write name of the specialization of Mechanical Engineering of the following applications/activities they belong (1X4)

Sr. No	Example/ Activity	Specialization
	Taper Turning	
2	Working of an Engine	
3	Working of steering of a car	
4	Temperature measurement by a thermocouple	

(b) Attempt Any TWO

- (i) State Zeroth law of thermodynamics and PMM-1. (4)
- (ii) A domestic refrigerator is loaded with food and the door closed. During a certain period the machine consumes I kWh of energy and internal energy of the system drops by 5000 kJ. Find the net heat transfer for the system. (4)
- (iii) If the thermal efficiency of a thermal power plant is 30% and heat rejected at the rate of 1 Mj/sec find the rate of work done. (4)
- Q. 2 (a) Define and illustrate with simple sketch (ANY THREE). Bore, TDC, BDC, Clearance Volume, Stroke length. (6)
  - (b) The cubic capacity of a four stroke SI engine is 245 cubic centimetre. The compression ratio is 10. Find the clearance volume and bore and stroke if bore to stroke ratio is 0.9.(6)
- Q. 3 (a) Draw the neat labelled diagram of a Gas power plant and briefly explain its working.

(6)

- (b) Explain the function of the following in the automobile transmission; Clutch, Propeller shaft, Universal Joint. (6)
- Q. 4 (a) Define the following terms with suitable example. (6) (a) Factor of safety (b) Mechanisms (c) Fasteners
  - (b) Define the following: Toughness, Malleability, Ductility. (6)
- Q. 5 (a) Draw the labelled diagram of Belt and chin drives. How they are different from each other. (6)
  - (b) Draw the neat labelled diagram of a vertical drilling machine illustrating its standard specifications. (6)
- Q. 6 (a) Classify the different type of the materials used in engineering applications and write two applications and two characteristics of each. (7)
  - (b) Do as directed

(5)

- (i) The factor of safety is always
  (a) Less than 1 (b) greater than 1 (c) equal to 1
- (ii) A machine is combination of one/many mechanisms.
- (iii) Bronze is an example of pure metal/alloy.
- (iv) In the high temperature applications such as furnace lining the most preferred material is (a) metal (b) ceramics (c) polymers
- (v) Fasteners are used in case of permanent joint/temporary joints

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