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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017**

**Course Code: ME100****Course Name: BASICS OF MECHANICAL ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any two questions. Each carries 15 marks.*

- 1 a) Explain the air standard Carnot cycle with neat sketches and derive the expression for efficiency. (10)
- b) 1 kg of air at temperature  $15^{\circ}\text{C}$  and pressure 100 kPa is taken through a Diesel Cycle. The compression ratio is 15 and heat added is 1850 kJ. Calculate the ideal cycle efficiency. (5)
- 2 a) Derive the characteristic gas equation using ideal gas laws. (5)
- b) Explain the working of a 4 stroke SI engine with neat sketches. (10)
- 3 a) Differentiate between open cycle and closed cycle gas turbines with neat sketches. (10)
- b) Explain the working of reciprocating pump with a neat sketch (5)

**PART B***Answer any two questions. Each carries 15 marks.*

- 4 a) Explain the various psychrometric processes involved in air conditioning using psychrometric chart. (8)
- b) Explain the working of a domestic refrigerator with neat sketch. (7)
- 5 a) Explain the impact of refrigerants on the environment. (5)
- b) Explain the gear terminology with neat sketch. (10)
- 6 a) Explain the following: - (10)
  - i) Cone clutch ii) Single plate clutch
- b) What is a chain drive? Explain the roller chain with a neat sketch. (5)

**PART C***Answer any two questions. Each carries 20 marks.*

- 7 a) Explain the following: - (10)
  - i) Hot chamber die-casting ii) Cold chamber die-casting
- b) Briefly explain various forging operations. (10)
- 8 a) Explain various types of electrical resistance welding processes. (10)
- b) Differentiate between up milling and down milling. (10)
- 9 a) Explain the various operations that can be performed on a drilling machine. (10)
- b) Explain any two methods of taper turning with figures. (10)

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