

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**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.*

- |   |   | Marks |
|---|---|-------|
| 1 | a) State Zeroth law of thermodynamics. Explain its significance.  | (5)   |
|   | b) Prove the equivalency of Kelvin Planck and Clausius statements.  | (5)   |
|   | c) Write a short note on thermodynamic work.  | (5)   |
| 2 | a) Compare intensive and extensive properties with examples.  | (5)   |
|   | b) With the help of a neat diagram explain the working of a reaction steam turbine clearly showing the variation of steam pressure and velocity inside the turbine. | (10)  |
| 3 | a) Compare an open cycle and closed cycle gas turbine.  | (5)   |
|   | b) With the help of a neat diagram explain the working of 4 stroke cycle diesel engine.   | (10)  |

**PART B**

*Answer any two questions, each carries 15 marks.*

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|---|--|------|
| 4 | a) Write a short note on the impact of refrigerants on environment.            | (5)  |
|   | b) With neat sketches explain the working of window air conditioning system.   | (10) |
| 5 | a) Derive the expression for the ratio of belt tensions.                       | (10) |
|   | b) Write a short note on the classification of gears.                          | (5)  |
| 6 | a) Explain various desirable properties of refrigerants.                       | (4)  |
|   | b) With a neat sketch explain the working of an internal expanding shoe brake. | (6)  |
|   | c) Write a short note on major components of automobiles.                      | (5)  |

**PART C**

*Answer any two questions, each carries 20 marks.*

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|---|--|-----|
| 7 | a) With the help of a neat diagram explain the thermit welding process.  | (8) |
|   | b) Explain the extrusion process. Compare direct and indirect extrusion process.   | (6) |
|   | c) Write a short note on various casting defects.  | (6) |
| 8 | a) Explain powder metallurgy. Narrate various steps in powder metallurgy.  | (5) |
|   | b) With the help of a diagram mark the parts of a drilling machine. Explain any four operations performed on a drilling machine. | (8) |
|   | c) With neat sketches explain the up milling and down milling process.   | (7) |
| 9 | a) Explain different desirable properties of moulding sand.  | (4) |

- (b) Compare different rolling mills with neat sketches. (8)
- (c) With a neat sketch explain the principal parts of a shaper and discuss major operations performed in a shaper. (8)

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