

Reg No.: _____

Name: _____

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

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|---|--|-------|
| 1 | a) State and explain second law of thermodynamics. | (5) |
| | b) Derive the expression for the efficiency of a Carnot cycle. | (10) |
| 2 | a) Compare intensive and extensive properties with examples. | (5) |
| | b) With the help of a neat diagram explain the working of an impulse steam turbine clearly showing the variation of steam pressure and velocity. | (10) |
| 3 | a) With a neat diagram explain the working of a Cochran boiler. | (10) |
| | b) Compare an open cycle and closed cycle gas turbine. | (5) |

PART B

Answer any two questions, each carries 15 marks.

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| 4 | a) Define the following terms: (i) absolute humidity (ii) relative humidity (iii) DBT (iv) WBT and (v) Sensible heat. | (5) |
| | b) With neat sketches explain the working of vapour compression refrigeration system. | (10) |
| 5 | a) With a neat sketch explain the working of a domestic refrigerator. | (10) |
| | b) With a neat sketch explain an epicyclic gear train. | (5) |
| 6 | a) With a neat sketch explain the working of a single plate clutch. | (10) |
| | b) Two mating spur gears have 60 and 40 teeth. Their common module is 5 mm. Determine centre to centre distance between the gear axes. | (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 arc welding process. | (8) |
| | b) Explain the extrusion process. Compare direct and indirect extrusion process. | (6) |
| | c) Explain important mechanical properties of materials. | (6) |
| 8 | a) Explain forging process. With suitable diagrams discuss any four forging operations. | (8) |
| | b) With the help of a flow diagram explain the principle of numerical control machine. | (8) |
| | c) Explain any four operations performed on a lathe. | (4) |
| 9 | a) Explain various casting defects. | (8) |
| | (b) Explain the steps involved in powder metallurgy process. | (6) |
| | (c) Compare up milling and down milling process. | (6) |
