

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: BE101-02

Course Name: INTRODUCTION TO MECHANICAL ENGINEERING SCIENCES

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks.

Marks

- | | | |
|---|---|-----|
| 1 | a) Define entropy. What happens to entropy of an isolated system during irreversible process and reversible process? | (5) |
| | b) An inventor claims to have developed an engine that works between 500 degree Celsius and 30 degree Celsius with an efficiency of 68%. Is this claim true? Justify your answer. | (6) |
| | c) Differentiate between enthalpy and internal energy. | (4) |
| 2 | a) Explain the working of reciprocating air compressor with neat sketch. | (8) |
| | b) Describe the working of reaction type steam turbine. | (7) |
| 3 | a) Discuss the recent space programs of ISRO. | (5) |
| | b) Differentiate between solid propellant rockets and liquid propellant rockets. | (5) |
| | c) Compare SI and CI engines. | (5) |

PART B

Answer any two questions, each carries 15 marks.

- | | | |
|---|---|------|
| 4 | a) Describe the working of vapour compression refrigeration system with line diagram. Also show the processes on P-h and T-S coordinates. | (10) |
| | b) Draw and explain the fuel system of a diesel engine. | (5) |
| 5 | a) With a neat sketch explain the working of window air conditioning system. | (10) |
| | b) Draw a single plate clutch and mark different parts on it. | (5) |
| 6 | a) Explain the working of turboprop engine with line diagram. | (9) |
| | b) Differentiate between comfort air-conditioning with industrial air-conditioning. | (6) |

PART C

Answer any two questions, each carries 20 marks.

- | | | |
|---|--|------|
| 7 | a) Define the following terms associated with crystallography
i. Space lattice ii. Unit cell iii. Coordination number iv. Atomic packing factor. | (10) |
| | b) Discuss the following mechanical properties of the material
i. Ductility ii. Brittleness iii. Hardness iv. Malleability v. Creep | (10) |
| 8 | a) With a neat sketch explain the working of a shaper machine. | (10) |
| | b) Explain arc welding process with schematic diagram. | (10) |
| 9 | a) Illustrate the properties of composites and ceramics with reference to the relevant fields of application. | (10) |
| | b) Draw a neat diagram of a lathe and label its parts. | (10) |
