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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 (10)
- i. Space lattice ii. Unit cell iii. Coordination number iv. Atomic packing factor.
- b) Discuss the following mechanical properties of the material (10)
- i. Ductility ii. Brittleness iii. Hardness iv. Malleability v. Creep
- 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)
