

D

D1802

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, APRIL 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) | Give the two statements of second law of thermodynamics and show their equivalence. | (6) |
| | b) | Explain the working of a reaction steam turbine with a neat sketch. | (5) |
| | c) | Write a short note about the qualitative ideas on entropy. | (4) |
| 2 | a) | State the zeroth law of thermodynamics. What is its physical significance? | (4) |
| | b) | Distinguish between the terms heat engine, heat pump and refrigerator. | (5) |
| | c) | Explain the working of a four stroke CI engine with suitable sketches. | (6) |
| 3 | a) | Mention any four milestones in Indian space program. | (4) |
| | b) | Explain the working of gas turbines. | (5) |
| | c) | Explain the following: | (6) |
| | | i) Principle of increase of entropy ii) Irreversibility iii) Available energy | |

PART B

Answer any two questions, each carries 15 marks.

- | | | | |
|---|----|---|-----|
| 4 | a) | List any six applications of refrigeration. | (6) |
| | b) | Explain the working of a split air conditioning system with a suitable sketch. | (5) |
| | c) | Mention the names any four vehicle manufactures in India along with their popular makes | (4) |
| 5 | a) | Explain the following terms with respect to psychrometry
i) WBT ii) Relative humidity iii) Dew point temperature | (6) |
| | b) | List the major components of an automobile. Also explain their individual functions. | (9) |
| 6 | a) | How do we use refrigeration for the purpose of food preservation? | (4) |
| | b) | Explain any three different types of jet engines mentioning their applications. | (6) |
| | c) | Write a short note about aerodynamics. | (5) |

PART C

Answer any two questions, each carries 20 marks.

- | | | | |
|---|----|--|-----|
| 7 | a) | Explain about the mechanical properties of common engineering materials. | (7) |
| | b) | What are CNC machines? What are their applications? | (7) |
| | c) | Differentiate between following manufacturing methods:
i) Casting ii) Forging iii) Rolling | (6) |
| 8 | a) | What are alloys? List any five alloys with their composition. | (6) |
| | b) | Distinguish between BCC, FCC and HCP crystal structures. | (6) |
| | c) | How do soldering process differ from brazing? | (4) |
| | d) | What is grinding process in machining? | (4) |
| 9 | a) | Explain any four methods for testing engineering materials. | (8) |
| | b) | What is a welding process? Explain any three welding techniques. | (7) |
| | c) | Give few examples for the typical products produced by the following processes:
i) Forging ii) Extrusion iii) Turning iv) Milling v) Drilling | (5) |
