

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 | (6) |
| i) WBT ii) Relative humidity iii) Dew point temperature | |
| 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: | (6) |
| i) Casting ii) Forging iii) Rolling | |
| 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: | (5) |
| i) Forging ii) Extrusion iii) Turning iv) Milling v) Drilling | |
