

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.

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|---|--|-------|
| 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.

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|---|---|-----|
| 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.

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|---|--|-----|
| 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 | |
