

Reg No.: _____

Name: _____

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

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks.

Marks

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|---|----|--|------|
| 1 | a) | 5 kg of gas contained in a cylinder is fitted with a piston. 150 kJ of heat is transferred to the gas and simultaneously the piston is forced to compress the gas with an expenditure of work equivalent to 100 kJ. Determine the change in specific internal energy of the gas. | (5) |
| | b) | Derive an expression for the efficiency of a Carnot cycle. | (10) |
| 2 | a) | Explain the term CRDI. | (5) |
| | b) | With a neat sketch explain the working of a centrifugal pump. | (10) |
| 3 | a) | Explain the working of a reaction hydraulic turbine with a neat sketch. | (7) |
| | b) | With a neat sketch explain the working of a 2 stroke petrol engine. | (8) |

PART B

Answer any two questions, each carries 15 marks.

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| 4 | a) | Explain desirable properties required for refrigerants. | (5) |
| | b) | With a neat sketch explain the working of a Vapour Compression Refrigeration system. | (10) |
| 5 | a) | Derive an expression for the ratio of belt tensions. | (10) |
| | b) | Explain the working of a window air conditioner with a neat sketch. | (5) |
| 6 | a) | Explain the major components of an automobile. | (5) |
| | b) | Derive an expression for the length of an open belt drive. | (10) |

PART C

Answer any two questions, each carries 20 marks.

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| 7 | a) | Explain the function of runner and riser in sand casting. | (5) |
| | b) | List out the properties of moulding sand used in sand casting. | (10) |
| | c) | Explain different casting defects. | (5) |
| 8 | a) | With a neat diagram explain the main parts a lathe. Explain any four operations that can be carried out on a lathe. | (12) |
| | b) | Compare up milling and down milling processes with neat diagrams. | (8) |
| 9 | a) | State various advantages of CNC machines over conventional machines. | (5) |
| | b) | Differentiate between soldering and brazing. | (5) |
| | c) | Explain powder metallurgy. What are the different steps involved in powder metallurgy process? | (10) |
