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Reg. No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, JULY 2016

ME100 BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer ALL questions. Each question carries 3 marks

1. "Entropy of the universe is increasing". Comment.
2. Write any three differences between fire tube and water tube boilers?
3. Differentiate between comfort and industrial air conditioning.
4. Bring out the concept of hybrid vehicles.
5. Give examples of three alloys and state their applications.
6. Differentiate between soldering and brazing.
7. List the applications of milling machine.
8. List any six machining operations that are performed on a lathe.

PART B

Answer any 8 Questions (2 QUESTIONS FROM EACH MODULE)
Each question carries 6 marks

MODULE I

9. State the first law of thermodynamics for a process and cycle. Bring out the limitations
10. Sketch a Brayton cycle and explain.
11. A Carnot cycle works with adiabatic compression ratio of 5 and isothermal expansion ratio 2. The volume of air at the beginning of isothermal expansion is 0.3 m3. If the maximum temperature and pressure is limited to 550 K and 21 bar, determine (a) minimum temperature in the cycle, (b) thermal efficiency of the cycle, (c) pressure at all salient points. Take $\gamma = 1.4$.

MODULE II

12. Differentiate between fan, blowers and compressors.
13. Discuss the working of a four stroke SI engine.
14. With a neat sketch explain the working of centrifugal pump.

MODULE III

15. Explain the working of vapour compression refrigeration system.

16. Explain about the different refrigerants used and their impacts on the environment
17. With the help of psychrometric chart explain various psychrometric processes.

MODULE IV

18. Discuss on CRDI and MPFI technology.
19. How can you arrange gears for transmitting power from one shaft to another?
20. Illustrate the working single plate clutch.

PART C

Answer any 4 questions (ANY 2 QUESTIONS FROM EACH MODULE)
Each question carries 7 marks

MODULE V

21. Write short notes on (i) Forging (ii) Rolling
22. Which manufacturing process uses mould to produce desired parts? And list out all possible defects during this process.
23. What is powder metallurgy? What are the basic steps of powder metallurgy?

MODULE VI

24. Describe a milling machine.
25. Explain the merits of CNC machine over conventional machine.
26. Shaper is used to produce flat surfaces, explain the principal parts assist to produce flat surfaces?

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