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Reg. No.:_____ Name: _____

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2016

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each question carries 3 marks

1. "No engine can be made to work on Carnot cycle" Justify the statement.
2. What will happen, when diesel fuel is accidentally filled to a petrol car?
3. You are appointed as an engineer in a refrigerator manufacturing company and are assigned by a task of selecting the refrigerant. While selecting the refrigerant point out the desirable properties you consider?
4. Carburetor engines are now being replaced by MPFI engines. Comment.
5. List out the different processes involved in powder metallurgy in the correct order.
6. List out any six important properties of moulding sand.
7. Identify the main operations which can be performed by a Lathe.
8. What is the principle of operation of a planer?

(8 x 3 = 24 Marks)

PART B

Answer any 2 complete questions each having 6 marks

9. Draw the P-V and T-S diagram of a Carnot cycle and explain the processes.
10. In a constant volume 'Otto cycle', the pressure at the end of compression is 15 times that at the start, the temperature of air at the beginning of compression is 38 ^{O}C and maximum temperature attained in the cycle is 1950 ^{O}C. Determine (i) Compression ratio (ii) Thermal efficiency of cycle (iii)Work done per kg of air. Take γ for air =1.4
11. Explain the principle of increase of entropy.

Answer any 2 complete questions each having 6 marks

12. With the help of a neat sketch explain the working of a reciprocating compressor.
13. Compare the working of two stroke and four stroke internal combustion engines.

14. How is steam produced in a fire tube boiler? Explain with a neat figure.

Answer any 2 complete questions each having 6 marks

15. Write a short note on impact of refrigerants on environment.
16. Demonstrate the working of a vapour compression refrigeration system with the help of a neat sketch.
17. Distinguish between window air conditioner and split air conditioner.

Answer any 2 complete questions each having 6 marks

18. Explain the working of a cone clutch in an automobile.
19. Sketch different types of gear trains and explain.
20. Explain the different types of brakes.

PART C

Answer any 2 complete questions each having 7 marks

21. Discuss the various properties of engineering materials.
22. In a certain fabrication industry, they want to join two dissimilar metal pipes, which method should they follow? Justify.
23. Differentiate between welding, brazing and soldering.

Answer any 2 complete questions each having 7 marks

24. Draw the neat sketch of a lathe and explain its principle parts.
25. Explain the working principle of a shaping machine.
26. With a neat sketch, explain a drilling machine.