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B.E. / B.Tech. (Full Time) END SEMESTER EXAMINATIONS, APRIL / MAY 2019
MATERIALS SCIENCE AND ENGINEERING BRANCH
FOURTH SEMESTER – (REGULATIONS 2012)
ML 8404 – POWDER METALLURGY

Time : 3 hrs

Max Mark: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. What are the factors that affect the powder production in atomization process?.
2. What are the advantages of Powder Metallurgy when compared to the other conventional forming processes?
3. Write down the difference between apparent and tap density of metal powders?
4. How are powders produced by thermal decomposition? Give example.
5. What is the role of lubricants in powder compaction?
6. What are the advantages of die compaction over other compaction methods?
7. What are the finishing operations that can be performed on a sintered powder compact?
8. What is the need for preheating during sintering of a green compact?
9. What are dispersion strengthened materials? Give two examples.
10. Write any two applications of powder metallurgy components in aircraft industries.

Part – B (5 x 16 = 80 Marks)

11. a. Discuss in detail the different methods of sampling in Powder Metallurgy.
12. a. Discuss in detail the mechanism of water and gas atomization process of powder production.

(OR)

- b. (i) Describe the process of determination of flow rate and the green strength of a compact. (8)
- (ii) How will you determine the permeability of a powder bed in powder metallurgy? Explain the process. (8)

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13. a. (i) Enumerate the various Pressure less compaction techniques? (4)
(ii). Describe the cold isostatic pressing of powders with a neat diagram. (12)

(OR)

- b. Write short notes on the following
(i) Double ended die compaction
(ii) Slurry casting

14. a. Explain the mechanisms of different stages of sintering.

(OR)

- b. Draw a schematic diagram representing the different stages of sintering and explain them in detail.

15. a. How are dispersion strengthened materials manufactured? Describe in detail.

(OR)

- b. Explain the process of manufacture of the following materials.
(i) Oxide based ceramics
(ii) Self lubricating materials

