

****MODEL QUESTION PAPER****

FIFTH SEMESTER B.TECH DEGREE EXAMINATION

Branch: MECHANICAL ENGINEERING

13. 506.7 POWDER METALLURGY (MPU)
(2013 Scheme)

3Hrs

100Marks

PART-A

(Answer all questions from part-A and any one from each module in part-B)

1. List the basic steps in Powder Metallurgy.
2. Detail about the mechanism of milling for metal powder production.
3. Enumerate the variables affecting the process of mixing of metal powders.
4. Brief about the major metal powder characteristics.
5. Describe,
 - a) apparent density
 - b) compression ratio
6. Describe rapid sintering methods.
7. Detail about applications of powder rolling.
8. Outline the various post sintering operations adopted in powder metallurgy.
9. Explain powder extrusion process.
10. What are the desirable characteristics of binders? (2x10=20marks)

PART B

Module I

11. Illustrate the different mechanical methods of metal powder production.

(20 marks)

12. Explain the various methods used in determining the following powder particle characteristics:
 - i) Particle size

- ii) Porosity.
- iii) Surface area.
- iv) Particle density. (20 marks)

ModuleII

- 13 Explain the different pressureless powder shaping methods. And enumerate their advantages and disadvantages. (20 marks)
- 14 (a) Discuss about the powder conditioning methods adopted in Powder metallurgy.
(b) Differentiate between the various Mechanical and thermal methods of powder compaction (20 marks)

ModuleIII

- 15 Discuss about sintering furnaces, the atmospheres and the various factors to be considered in their selection. (20 marks)
- 16 Explain the various types of high - temperature compaction processes (20 marks)

ModuleIV

- 17 How do you manufacture the following powder metallurgy components?
a. Porous bearings
b. Electrical contact materials
c. Friction materials
d. Composites (20 marks)
- 18 Paraphrase the application of powder metallurgy products in automobile and power generation industries. (20 marks)