Roll No. | | | | | | | | | | |

B.E. (Full time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

Materials Science and Engineering

IV Semester

ML 8404 POWDER METALLURGY

(Regulation 2012)

Time: 3 Hours Answer ALL Questions Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the metallurgical advantages of powder metallurgy?
2. How do you produce sponge iron powders?
3. What are the various types sampling techniques used for sampling of metal powders?
4. How do you determine angle of response with respect to flow characteristics of metal powders?
5. How is powder compaction techniques classified?
6. What are the major defects in die pressing?
7. What is spark sintering?
8. What do you mean by infiltration in powder metallurgy process?
9. What are the important characteristics of cermets?
10. What do you understand by dispersion strengthened materials?

Part – B (5 x 16 = 80 marks)

11. i) What are the main objectives of the mechanical methods of powder production by milling are grinding? (2 Marks)
    ii) Explain the mechanism of milling in the production of metal powder. (6 Marks)
    ii) Describe the principle of operation of milling/grinding equipments used in the production of metal powders. (8 Marks)

12. a) i) What do you understand by blending and mixing of metal powders? (4 Marks)
    ii) Discuss the effect of powder lubrication on the green properties of pressed sponge iron powder. (8 Marks)
    iii) What are the objectives of heat treatment usually carried out before mixing or blending of metal powders? (4 Marks)

    (OR)

    b) i) Explain the principle of sedimentation analysis method of particle sizing.(8 Marks)
    ii) Describe the turbidimetric method of determining particle size distribution in a powder sample. (8 Marks)

13. a) i) How do you determine the green strength of metal powder compacts? (6 Marks)
ii) How the properties of sintered compact is determined. (6 Marks)
iii) What are the factors influencing the compressibility of metal powders? (4 Marks)

(OR)

b) i) Describe powder rolling compaction of metal powders. (4 marks)
ii) Discuss briefly the steps in powder rolling. (12 Marks)

14. a) i) Discuss briefly the various types of sintering. (10 Marks)
ii) Explain the structure and property changes during sintering. (6 Marks)

(OR)

b) i) Describe the principle and stages of liquid phase sintering technique. (10 Marks)
ii) Explain the mechanism of liquid phase sintering. (6 Marks)

15. a) Describe the major techniques used for the production of porous filters produced by powder metallurgy.

(OR)

b) Discuss briefly the various steps in the production of sintered carbides.