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4250

**BOARD DIPLOMA EXAMINATION, (C-14)
MARCH /APRIL-2019
DME – THIRD SEMESTER EXAMINATION
MATERIALS SCIENCE**

Time: 3 hours

Max. Marks: 80

PART-A**10x3=30M**

Instructions: 1) Answer **all** questions.
2) Each question carries **three** marks.
3) Answers should be brief and straight to the point and shall not exceed five simple Sentences.

- 1) Briefly explain about non-destructive testing of materials?
- 2) State the effect of grain size on mechanical properties.
- 3) Define slag? Mention its usage. (2+1)
- 4) Write down any three differences between ferrite and Cementite.
- 5) Distinguish between hypo eutectoid and hyper utectoid steels.
- 6) Hardening should never be a final heat treatment for steel. Briefly comment on it.
- 7) List out any six methods of heat treatment of steel.
- 8) Classify plain carbon steels based on carbon content.
- 9) Name any three alloying elements that form carbides.
- 10) Mention any six methods of compacting the metal powders.

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PART-B

5x10=50M

Instructions: 1) Answer any **five** questions.
2) Each question carries **ten** marks.
3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11) Explain the Rock well hardness test and compare B-scale with C-scale.
- 12) a) Define the term recrystallisation. 3
b) Describe the solidification of pure metal with a neat sketch. 7
- 13) Explain the sequence of operations for the production of steel from iron ore.
- 14) (a) Sketch the iron - carbon equilibrium diagram and mark the salient points.
b) Define Solid solution. 8+2
- 15) Draw T.T.T. diagram for an eutectoid steel and label different fields and lines. 10
- 16) Discuss the influence of the following elements on the properties of cast iron.
(i) Silicon (ii) Manganese (iii) Sulphur (iv) phosphorus.
- 17) (a) Define the following
(i) Fatigue (ii) Toughness (iii) Creep 6
(b) State the properties and uses of Muntz metal. 4
- 18) a) List out the characteristics of metal powder. 4
b) Explain the isostatic moulding. 6

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