3504

C09-M-404

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BOARD DIPLOMA EXAMINATION, (C-09)
OCTOBER/NOVEMBER-2018
DME - FOURTH SEMESTER EXAMINATION

ENGINEERING MATERIALS

Time : 3 Hours] [Total Marks: 80

PART-A

3X10=30

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

1. State the principle of Piezo electric effect.
2. Sketch the following crystal structures: (a) Simple cube (b) B.C.C. (c) F.C.C.
3. What is the role of limestone in iron and steel making?
4. State the properties of following structures: (a) Ferrite (b) Pearlite
5. Calculate the percentage of cementite and pearlite in 1.2% carbon steel.
6. Write a short notes on carbonitriding process.
7. State any three purposes of heat treatment for steels.
8. State any three properties and uses of magnesium and its alloys.
9. State the properties and application of copper.
10. List the sequence of operation involved in powder metallurgy.

PART-B

10X5=50

Instructions :

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

11. Explain Rockwell hardness test compare the B-scale with C-scale.
12. Explain the phenomenon of dendritic crystallization. Describe the solidification of a pure metal.
13. (a) Describe briefly the construction features of open hearth process with a neat sketch

    (b) Distinguish between acidic and basic Bessemer process.
14. (a) Sketch the iron carbon equilibrium diagram and label all the salient points on it.

    (b) Explain Eutectic, Eutectoid and peritectic reaction in iron carbon diagram.
15. Explain the following heat treatment processes
    a. Normalizing
    b. Annealing
    c. Hardening
    d. Tempering
16. (a) State the influence of silicon, sulphur, manganese, nickel and phosphorous on the properties of cast iron

    (b) State any five differences between gray cast iron and white cast iron.
17. (a) List out the different methods of compacting metal powders and explain any two of them

    (b) State the advantages and limitations of powder metallurgy
18. (a) Classify engineering materials with detailed flow chart

    (b) State the composition, properties and uses of Hadfield's Manganese steel and nickel steel.

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