



C09-M-404

3504

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2014

DME—FOURTH SEMESTER EXAMINATION

ENGINEERING MATERIALS

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

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. What are the advantages of non-destructive tests?
2. What is the effect of grain size on mechanical properties?
3. What are the functions of coke in iron and steel making?
4. Calculate the percentage of cementite and pearlite in 1.2% carbon steel.
5. What is steel? Distinguish between Hypoeutectoid and Hyper-eutectoid steels.
6. What is meant by case-hardening? What are various case-hardening processes?
7. Differentiate between Annealing and Normalising.
8. State the composition, properties and uses of admiral bras.
9. Write down the composition, properties and uses of nickel alloy of constantan.
10. Define (a) flow ability, (b) green strength and (c) sintering ability.

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PART—B

10×5=50

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

- 11.** Explain with a neat sketch how single-shear and double-shear tests are conducted.
- 12.** How are space lattices mainly classified? Explain each with sketches.
- 13.** Describe the process of making steel by open-hearth process with a neat sketch.
- 14.** (a) Draw and describe the cooling curve for pure metal.
(b) Define solid solution. Distinguish between substitutional and interstitial solid solutions.
- 15.** Name the important heat treatment processes of steel. Explain any two of them with neat sketches.
- 16.** Write down the composition, properties and applications of—
(a) gray cast iron;
(b) white cast iron.
- 17.** (a) List out different methods of compacting metal powders and explain any two of them.
(b) State the advantages and limitations of powder metallurgy.
- 18.** (a) State the applications of engineering materials used in—
(i) various mechanical processes;
(ii) various industries.
(b) What is alloy steel? What is the purpose of alloying elements in steel? Write any four advantages of alloy steels.

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