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[5352]-518

S.E. (Mech./Automo.) (Second Semester) EXAMINATION, 2018

ENGINEERING METALLURGY

(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

**N.B.** :— (i) Solve Question Nos. Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8.

(ii) Figures to the right indicate full marks.

(iii) Draw neat, labelled sketch wherever necessary.

1. (a) Compare Steel and Cast Iron on the basis of composition, properties and application. [4]
- (b) State whether the following statements are True or False and justify your choice correctly :
  - (1) Retained Austenite is a useful phase.
  - (2) Martensite is a soft phase. [4]
- (c) Differentiate between Tool steel and Plain carbon steel, on the basis of composition, properties, uses, cost and examples. [5]

Or

2. (a) Is etching is essential every time ? Explain with suitable example. [4]
- (b) What is Austenite to Pearlite transformation ? Explain with suitable figure. [4]

P.T.O.

- (c) Explain how Microscopic and Macroscopic examinations are useful in investigations failure analysis in metals. [5]
3. (a) State whether the following statements are True or False and justify your choice correctly. [4]
- (1) Pack carburising is most suitable for large scale of production.
- (2) Tool steel requires preheating before austenitising.
- (b) Define Hardanability, and explain the test with suitable figure. [5]
- (c) What is Spark test ? Where is it applicable ? [4]
- Or*
4. (a) Draw Iron Carbon diagram showing all details, like Temperature, Composition, Phases, Critical lines and reactions. [6]
- (b) Differentiate between the following : [7]
- (1) Austempering and Martempering.
- (2) Annealing and Hardening.
- (On the basis of suitable figure, phases obtained, operating temperature. cooling medium and application.)
5. (a) Classify Cast Irons and explain why they are called as cast irons only ? [4]

(b) What is Malleabilising Heat Treatment ? Explain the test with suitable figure. [4]

(c) Write short note on Quench Cracks in Hardening process. [4]

*Or*

6. (a) What is the importance of TTT diagrams in Heat Treatment processes. [4]

(b) Differentiate between Gray C.I. and Nodular C.I. [4]

(c) What is Sub Zero Treatment and why is it necessary? [4]

7. (a) What is HAZ ? Explain with suitable figure. [5]

(b) State merits and demerits of Non-Ferrous metals over Ferrous metals. [3]

(c) Why Aluminium and Copper metals are known as corrosion resistant. [4]

*Or*

8. (a) What is IS, AISI, SAE and DIN ? Explain in detail. [6]

(b) What is Stellite 21 and Stellite 31 ? What are their advantages and disadvantages ? [6]