

SUBJECT CODE NO:- P-44
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(MECH/PROD) Examination MAY/JUNE-2016
Metallurgy & Materials
(Revised)

[Time: Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B 1) Solve any three questions from each section.

Section A

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| Q.1 | a) What are the crystal structures into which the metal crystallize? Explain them with the help of neat sketches. | 07 |
| | b) Describe the various imperfections in crystals and their effects on properties. | 07 |
| Q.2 | a) What is LEVER rule? Describe its importance with suitable example. | 07 |
| | b) Draw the phase diagram for two metals A & B which are completely soluble in liquid state but are immiscible in each other in solid state. Explain it. | 06 |
| Q.3 | a) Draw iron-iron carbide diagram and label it completely. | 07 |
| | b) What is tempering? Describe the stages of tempering. | 06 |
| Q.4 | a) What is pack carburizing? What are its advantages and limitations? | 07 |
| | b) Distinguish between i) full annealing ii) process annealing. | 06 |
| Q.5 | a) What is martensite? Why it is very hard? | 05 |
| | b) Write a note on “Patenting”. | 04 |
| | c) Explain the term “Solid solution strengthening”. | 04 |

Section-B

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| Q.6 | a) What are stainless steels? Explain the types of stainless steels and their characteristics. | 08 |
| | b) Why alloying elements are added to steel? List the various types of alloy steels. | 06 |
| Q.7 | a) Describe the solidification of white cast iron. Explain why white cast iron is extremely hard and brittle. | 07 |
| | b) Explain the steps involved in the production of malleable cast iron. | 06 |
| Q.8 | a) Explain why copper is a suitable material for automobile radiators? Classify copper alloys. | 07 |
| | b) Describe the classification of aluminum alloys. Enlist min. six applications of aluminum alloys. | 06 |
| Q.9 | a) What are fibers reinforced composites? Describe its properties and applications. | 07 |
| | b) Cite the general difference in strengthening mechanism between large particle and dispersion strengthened particle reinforced composites. | 06 |
| Q.10 | a) Classify tool steels and explain its applications. | 05 |
| | b) Write a note on “Emergence of Nano Technology” | 04 |
| | c) Write a note on “Phosphor Bronze”. | 04 |