Sub Code:KME303

Paper Id: 140323 Roll No: | | | | | | | | | | | | | |

B TECH
(SEM III) THEORY EXAMINATION 2019-20
MATERIALS ENGINEERING

Time: 3 Hours *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q. No.	Questions	Marks	CO
a.	What is unit cell?	2	1
b.	Draw the planes for given miller indices (111) and (101)?	2	1
c.	What is the difference between Ductile and Brittle fractures?	2	2
d.	Differentiate between NDT and destructive testing.	2	2
e.	What is Gibb's phase rule?	2	3
f.	What is Invariant reaction? Write eutectic reaction.	2	3
g.	What is the difference between annealing and normalizing?	2	4
h.	Enlist the quenching medium in descending order of their cooling rate.	2	4
i.	What are the different constituents present in HSS and why?	2	5
j.	What are the uses of copper and aluminum? Enlist them.	2	5

SECTION B

2. Attempt any *three* of the following: **3 x 10 = 30**

Q. No.	Questions	Marks	CO
a.	What are the different types of imperfections present in the crystal? Explain them.	10	1
b.	What is factor of safety and what is its importance? Also explain the Tresca and Von-mises failure theory.	10	2
c.	What is solid solution? What is the difference between interstitial and substitutional solid solutions?	10	3
d.	Why we prefer tempering after hardening? Explain in details.	10	4
e.	What is cast iron? What are the different types of cast iron? Explain them with proper applications.	10	5

SECTION C

3. Attempt any *one* part of the following: **1 x 10 = 10**

Q. No.	Questions	Marks	CO
a.	Define Atomic packing factor and determine the Atomic packing factor for FCC and BCC.	10	1
b.	What is hardness? Explain Brinell and Vickers hardness testing techniques.	10	1

4. Attempt any *one* part of the following: **1 x 10 = 10**

Q. No.	Questions	Marks	CO
a.	Explain the Griffith criteria of brittle fracture.	10	2
b.	What is Fatigue limit? Draw S-N curve and explain its importance.	10	2

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5. Attempt any *one* part of the following: 1 x 10 = 10

Q. No.	Questions	Marks	CO
a.	Draw Fe-C equilibrium diagram? What are the different informations we get from this diagram? Explain.	10	3
b.	What is the difference between Eutectic and Eutectoid phase diagrams? Explain with suitable example.	10	3

6. Attempt any *one* part of the following: 1 x 10 = 10

Q. No.	Questions	Marks	CO
a.	Draw TTT diagram? What are the applications of this diagram? Explain.	10	4
b.	Write short note on: Austempering and Mertempering.	10	4

7. Attempt any *one* part of the following: 1 x 10 = 10

Q. No.	Questions	Marks	CO
a.	What is the purpose behind alloying the steels? What are the different types of steels are available and what are their applications? Explain.	10	4
b.	Write the composition and application of brass and bronze.	10	4