Registration No: | | | | | | | | | | |

Total Number of Pages : 01 **B.Tech**

PCMT4304

6th Semester Back Examination 2017-18

MECHANICAL WORKING AND TESTING OF MATERIALS

BRANCH : METTA, MME

Time : 3 Hours

Max Marks : 70

Q.CODE : C571

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Attempt all parts of a question at a place

Q1 **Answer the following questions :** **(2 x 10)**

a) What is the function of flash gutter?

b) Give application of deep drawing.

c) How are forming processes classified?

d) Determine the engineering strain, true strain, and reduction for a bar which is doubled in length.

e) Differentiate between hot working and cold working process.

f) Define Roll forming

g) Differentiate between buckling and barrelling.

h) Draw the load-time history of an instrumented Charpy test.

i) Draw the creep curve and identify the regions of creep.

j) How Acoustic emissions (AE) signals are generated?

Q2 **a)** Explain the principle of Eddy current testing with suitable diagram. **(5)**

b) With the help of the deformation mechanism map explain the various mechanism of creep. **(5)**

Q3 **a)** Explain the Various forging operations with the help of suitable diagrams. **(5)**

b) Derive the expression for forging a plate in plane stress condition. **(5)**

Q4 **a)** A block of lead 25mmx25mmx150mm is pressed between flat dies to a size 6.25mmx 100mmx 150mm. If the uniaxial flow stress is σ_0= 6.9MPa and μ=0.25 determine the pressure distribution over the 100mm dimension and the total forging load. **(5)**

b) Explain the rolling defects with suitable diagrams. **(5)**

Q5 **a)** Calculate the rolling load if steel sheet is hot rolled 30% from a 40mm thick slab using a 900mm diameter roll. The slab is 760mm wide. Assume μ=0.30. The plane strain flow stress is 140MPa at entrance and 200MPa at the exit from the roll gap due to the increasing velocity. **(5)**

b) Differentiate between direct and indirect extrusion with the help of diagrams. **(5)**

Q6 **a)** Differentiate between high cycle and low cycle fatigue. **(5)**

b) Explain the relationship between hardness and flow curve. **(5)**

Q7 Explain the different metallurgical factors affecting the transition temperature curve. **(10)**

Q8 **Write short answer on any TWO :** **(5 x 2)**

a) Rubber forming

b) Hot extrusion

c) Deep drawing

d) Larson miller parameter