

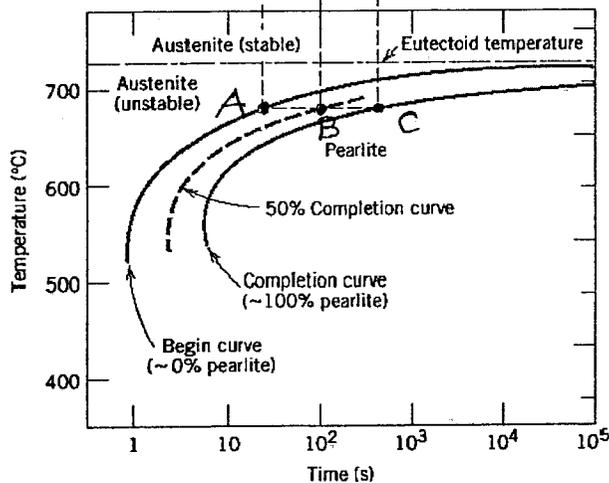
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Indian Institute of Technology Kharagpur
End Autumn Examination 2011-2012
AR22001 Advanced Building Materials & Composites (2nd Yr. B.Arch.)
Time: 3 Hrs. Full Marks: 100

Answer all questions.

- 1 Provide answer in 1-2 words. 15
- In structural members, fatigue is caused by _____ and creep is caused by _____.
 - Brass = mainly Copper + _____ and Bronze = mainly copper + _____.
 - For Iron extraction in Blast furnace, Limestone acts as _____ that helps in forming _____.
 - Floast glass floates on bath of _____ that helps to make the glass _____.
 - For oil based paints, opacity and gloss are provided by _____ and _____ respectively.
 - _____ process makes a metal soft and ductile.
 - Natural tar is made by _____ of pine wood.
 - In pre-tensioning, tendons and concrete are with / without direct contact.
 - Process of making polymers from monomer is called _____.
 - Self-cleaning glass has a coating of _____.

- 2 a. Mention one practical application of TTT diagram. 1+3x3
- b. In the figure is shown TTT diagram for steel. Solid curves shows start and end of Austenite to Pearlite transformations. Dashed curve shows 50% transformation. That means at point A, 100% Austenite is present, at B 50% Austenite and 50% pearlite are present and at point C 100% Pearlite is formed. Referring to the diagram find the answer for the following:



- What you can get by keeping steel above eutectoid temperature for 1 day?
- At lower temperature Austenite to Pearlite transformation rate is faster or slower? Explain.
- After 10 sec of cooling, if 30% conversion is obtained, then what is the corresponding temperature?

- 3 a. Discuss briefly about any five different types of paints. 10+5
- b. For a particular enamel paint sample, it is found that 1 litre paint contains 85 ml of pigment. If CPVC for enamel paints is 6.9%, then predict the performance of given paint sample.
- 4 Pick the most suitable alternative and logically support your choice. (1+2)
x5
- Walls for open to sky cafeteria interior: Plastic paint / Distemper / Emulsions.
 - Dome for naturally ventilated atrium: self-cleaning glass/ soda-lime glass/ laminated glass.
 - Balcony railing: Wrought iron / Cast iron / Steel.
 - Pipes for hot water supply : PEX / Steel / Brass.
 - Lecture hall wall: cork board / wooden panel / metal panel.
- 5 a. Briefly describe manufacturing process of float glass. 5+10
- b. Discuss the working principle of smart glass and self-cleaning glass.
- 6 a. Compare thermoplast and thermosets. 5+10
- b. Mention various uses of plastics and polymers in building construction.
- 7 Write short notes (any three): 5x3
- Thermal bridge
 - CRMB
 - Galvalization
 - Distemper