

## Multiple Choice Questions:

1. Sharp break in dislocation line that is in slip plane \_\_\_\_\_.  
(a) Jog (b) Kink (c) Either jog or kink (d) None
2. Minimum number of slip systems that must be operative during plastic deformation  
(a) 3 (b) 4 (c) 5 (d) 6
3. Following strengthening mechanism applies to multi-phase material  
(a) Grain size reduction (b) Dispersion hardening  
(c) Solid solution strengthening (d) Strain hardening
4. If ASTM grain size number is 1, approximate grain diameter (in mm)  
(a) 0.1 (b) 0.2 (c) 0.25 (d) 10
5. If volume fraction of spherical shaped second phase particles is 50% with radius of 3  $\mu\text{m}$ , interspacing of particles is (in  $\mu\text{m}$ )  
(a) 1 (b) 2 (c) 3 (d) 4
6. Characteristic shape of Martensite platelets  
(a) Disc (b) Lenticular (c) Cylindrical (d) Spheroids
7. Recrystallization temperature of pure materials \_\_\_\_\_ (in terms of homologous temperature)  
(a) 0.1 (b) 0.2 (c) 0.3 (d) 0.4
8. Example for strengthening mechanism in single-phase material  
(a) Strain hardening (b) Precipitation hardening  
(c) Fiber strengthening (d) Dispersion strengthening
9. Higher the degree of deformation, recrystallization temperature is  
(a) Higher (b) Lower (c) No effect (d) Either higher or lower
10. Recrystallization rate varies in the following manner with temperature  
(a) Linearly increasing (b) Linearly decreasing  
(c) Exponential (d) Logarithmic
11. Methods to retard grain growth  
(a) Solute drag (b) Pinning action of particles (c) Both (d) None
12. Driving force for recrystallization process  
(a) Stored energy of cold work (b) Grain boundary energy  
(c) Both (d) Stacking-fault energy
13. Driving force for grain growth process  
(a) Stored energy of cold work (b) Grain boundary energy  
(c) Both (d) Stacking-fault energy
14. Fine grain size, usually, can not be obtained during the following process  
(a) Slow cooling (b) increasing nucleation rate (c) retarding grain growth (d) fast cooling
15. Hardness during over-aging  
(a) Decreases (b) Increases (c) Constant (d) Decreases abruptly
16. Decrease in free energy during recrystallization is attributed to  
(a) Excess point defects (b) Excess dislocations  
(c) Grain boundaries (d) All
17. Decrease in free energy during recovery is attributed to  
(a) Excess point defects (b) Excess dislocations  
(c) Grain boundaries (d) All

**Answers:**

1. b
2. c
3. b
4. c
5. d
6. b
7. c
8. a
9. b
10. c
11. c
12. a
13. b
14. a
15. a
16. b
17. a