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**Question Paper Code : 70524**

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019  
Second Semester  
CAD/CAM  
ED5252 – MECHANICAL BEHAVIOR OF MATERIALS  
(Common to : M.E. Computer Aided Design/M.E. Engineering Design)  
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is meant by super plasticity ?
2. What do you understand by Work hardening ?.
3. Distinguish between fail safe and safe life designs.
4. Define crack growth ratio.
5. What are the factors motivating in selection of materials ?
6. Suggest any two materials suitable for brake pad. justify your selection.
7. What do you understand by Dual phase steels.
8. Define Shape Memory Alloys.
9. What is polymerization ?
10. Compare silicates and silica.

PART – B

(5×13=65 Marks)

11. a) List the different strengthening mechanisms. Explain any two of them.

(OR)

- b) Define Griffith's theory of brittle fracture. Derive an expression for fracture stress.

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12. a) Explain the procedure of failure analysis with an example.

(OR)

b) Discuss the mechanisms of Crack initiation and propagation of fatigue crack.

13. a) What are the factors that influence the material selection for creep deformation ?  
Enlist the characteristics of materials for high temperature applications.

(OR)

b) Suggest a suitable material with appropriate Justification for the following applications

i) Landing gear of aircraft.

ii) Cylinder block for passenger car,

iii) Frame structures. (4+4+5)

14. a) Explain the composition, characteristics and application of

i) Maraging steel,

ii) TRIP steel and

iii) HSLA steel. (4+4+5)

(OR)

b) Discuss about

i) Nano structured materials and

ii) Metallic glasses. (6+7)

15. a) Explain any one technique for

i) Fiber and

ii) Foam. (6+7)

(OR)

b) Discuss the characteristics and applications of any three structural ceramics.

PART - C

(1×15=15 Marks)

16. a) Explain the strengthening mechanisms that are prominent in aluminium alloy.

(OR)

b) Discuss the role of Computer in material selections, what are the metallurgical factors to be considered while selecting a material for marine applications.