D17002166

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

Total Number of Pages : 01 **M.TECH**

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017
MATERIAL SELECTION IN MACHANICAL DESIGN
Branch: MD, Subject Code:MMDPE1054
Time: 3 Hours
Max Marks : 70
The figures in the right hand margin indicate marks.

PART-A

(2X10=20 MARKS)

1. Answer the following questions .

a) What is metal matrix composite?
b) What do you mean by bulk molding compound?
c) Describe the mass bar-chart.
d) Young's modulus for cupper is 124 Gpa and Poisson's ratio is 0.345.What is its shear modulus?
e) What are the advantages of metal matrix composite?
f) State the application of leaf spring and how it is differ from helical spring?
g) What are the advantages of CES software?
h) What do you mean by the fracture toughness?
i) What is a sandwich structure?
j) A heat exchanger has an exchange area of A=0.5 m^2. It passes heat from a fluid at temperature at T1=100^0C to a second fluid at T2=20^0C. the exchange wall is made of copper sheet of thermal conductivity 350W/m.K with thickness 2 mm. How much energy flows from one fluid to the other in one hour?

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

2. a) Discuss mechanical properties of materials with necessary diagrams and graphs. **(5)**
   b) What do you mean by toughness? Differentiate between charpy and izod test. **(5)**
3. a) Give brief description about finishing processes. **(5)**
   b) What are the design requirements for a light pressure vessel? **(5)**
4. a) Describe briefly the failure of a beam and shaft. How would you design a shaft? **(5)**
   b) Do the Case study of flywheel. **(5)**
5. a) What is the use of material property chart? **(2)**
   b) Give brief description about the modulus-density chart, strength-density chart and fracture toughness-modulus chart. **(8)**
6. a) Write the various steps involved in machine design. **(5)**
   b) How do atoms assemble into solid structures? **(5)**
7. a) Discuss different Materials used for springs. **(5)**
   b) What is the significance of Materials in Design? **(5)**
8. Write short notes on
   a) Strength and Density chart **(5)**
   b) Fracture toughness and modulus chart. **(5)**

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