BME-060

DIPLOMA IN MECHANICAL ENGINEERING (DME)

Term-End Examination

⊐⊐⨽ᗁᗁ   **December, 2016**

BME-060 : MACHINE DESIGN

Time : 2 hours   *Maximum Marks : 70*

*Note : Answer **five** questions in all. Question no. **1** is **compulsory**. Use of scientific calculator is permitted.*

1.   Choose the correct answer.   *7×2=14*

   (a)   The carbon percentage in Cast Iron is

      (i)   0 – 1%

      (ii)   4 – 5%

      (iii)   2 – 4%

      (iv)   5 – 6%

   (b)   The temperature at which the new grains are formed in the metal is called

      (i)   lower critical temperature

      (ii)   upper critical temperature

      (iii)   eutectic temperature

      (iv)   recrystallisation temperature

(c) Chromium and Vanadium materials are purposely added in spring steel to increase its

    (i) hardness

    (ii) toughness

    (iii) stiffness

    (iv) brittleness

(d) Annealing process reduces

    (i) ductility

    (ii) stiffness

    (iii) toughness

    (iv) hardness

(e) Nickel content in "Monel Metal" is

    (i) 35%

    (ii) 45%

    (iii) 55%

    (iv) 65%

(f) Creep is the progressive deformation with time under a constant

    (i) pressure

    (ii) temperature

    (iii) stress

    (iv) strain

(g) The factor of safety is defined as

(i) $f_s = \dfrac{\text{Allowable stress}}{\text{Failure stress}}$

(ii) $f_s = \dfrac{\text{Failure stress}}{\text{Allowable stress}}$

(iii) $f_s = \dfrac{\text{Working load}}{\text{Failure load}}$

(iv) $f_s = \dfrac{\text{Stress}}{\text{Strain}}$

2. Explain about different properties of engineering materials. *14*

3. Define machine design. What are the steps involved in the design of machine element ? *14*

4. Explain the terminology of Screw Threads with neat diagram. *14*

5. What is a Key ? Explain the different types of keys with diagrams. *14*

6. What is the function of Transmission Shaft ? What types of stresses are induced in shafts ? How are shafts designed when subjected to twisting moment only ? *14*

7. A propeller shaft is required to transmit 45 kW power at 500 rpm. It is a hollow shaft having an inside diameter 0·6 times of the outside diameter. It is made of plain carbon steel and the permissible stress is 84 N/mm^2. Calculate the inside and outside diameters of the shaft. *14*