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BME-060

01981

DIPLOMA IN MECHANICAL ENGINEERING (DME)

Term-End Examination

December, 2013

BME-060 : MACHINE DESIGN

Time : 2 hours *Maximum Marks : 70*

Note : *Question 1 is **compulsory**. Attempt **FIVE** questions from remaining questions. Use of scientific calculator and Machine Design Data Book **allowed**.*

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1. Select the most appropriate alternative and write the alternative in your answer book. **10x2=20**

(a) A fatigue load is :
- (i) suddenly applied
- (ii) slowly applied
- (iii) changing with time
- (iv) a shock load

(b) Identify among the following materials the anisotropic one.
- (i) wood (ii) steel
- (iii) copper (iv) aluminium

(c) Bulk modulus is :
- (i) stress/strain
- (ii) strain/stress
- (iii) volumetric stress/volumetric strain
- (iv) none of these

(d) In fatigue test stressed specimen should survive the following no.of cycles.
- (i) 10^5 (ii) 10^7
- (iii) 10^6 (iv) 10^8

(e) The important characteristic of composite is :
   (i) constituents are in solution
   (ii) undergo no chemical reaction or get into solution
   (iii) chemically reacting constituents
   (iv) none of the above true

(f) Addition of chromium to steel imparts :
   (i) increased hardness
   (ii) increased wear resistance
   (iii) improved high temperature oxidation resistance
   (iv) All the above

(g) Addition of the following enhances fatigue strength of steel.
   (i) carbon (ii) vanadium
   (iii) lead (iv) cobalt

(h) Babbits are used for making :
   (i) bearings
   (ii) rolled sections
   (iii) tubes and pipes
   (iv) plates and sheets

(i) Case hardening is done on :
   (i) high carbon steel
   (ii) alloy steel
   (iii) low carbon steel
   (iv) aluminium

(j) Having the same weight and material, the torque transmitted by a hollow shaft compared to a solid shaft is :
   (i) more (ii) less
   (iii) equal (iv) unpredictable

2. How a tensile, compressive and shear stresses observed in structural joints ? Explain with suitable sketches. **10**

3. Explain using sketches how single shear and double shear can occur in rivetted joints. Give the relevant expressions for shear strength. **10**

4. Describe in detail the steps involved in designing a screw. **10**

5. What do you understand by multistart thread ? Define lead and the pitch and give relation between them. If two threads are having same pitch but one is single start and other is three start, which one will advance more and how much if screw is turned through one full rotation in the nut. **10**

6. Sketch a flange coupling and mention how strength of bolts and thickness of flange can be calculated. **10**

7. How will you calculate load on a shaft if it supports a pulley or when it supports a gear. **10**