

# **MODEL QUESTION PAPER**

**DSA1/DSC1/DSE4/DSM1**

## **III Semester DIPLOMA Examination, August 2011 ENGINEERING MECHANICS**

Time: 3 Hours

Max. Marks: 75

### **GROUP A : Answer any three questions.**

- Q.1 Define Brittleness and Ductility. Give two examples each.
- Q.2 Mention the applications of spur gears.
- Q.3 Explain the term radius of Gyration and derive the moment of inertia of a circular section about its centroidal axis.
- Q.4 State the merits & demerits of V-belts over flat belts.
- Q.5 What is torque diagram? Derive the relation for second moment of inertia for thin walled cylinder.

### **GROUP B : Answer any three questions.**

- Q.6 Explain the term flexural rigidity.
- Q.7 What are the different methods of power transmission?
- Q.8 Define slope and deflection of beams and write a note on shifting of gears.
- Q.9 Explain in detail, Belt drives and various types of belts used in power transmission.
- Q.10 Explain with neat sketches the various types of gears used for transmission of motion.

### **GROUP C : All Questions are Compulsory.**

#### **Q.11 Fill in the blanks**

- (i) Linear strain is defined as the ratio of the change in \_\_\_\_\_ to \_\_\_\_\_.
- (ii) The strain produced by shear stress is known as \_\_\_\_\_.
- (iii) The \_\_\_\_\_ is drawn to represent the variation of shear force along the beam.
- (iv) A spring is \_\_\_\_\_ object to store mechanical energy.
- (v) Moment of an area about a point mean the product of the \_\_\_\_\_ and its \_\_\_\_\_ distance from the point.

#### **Q.12 Multiple choice question.**

- (i) The property of a material to withstand a sudden impact or shock is called \_\_\_\_.
- (a) Hardness (b) Ductility
- (c) Toughness (d) Elasticity of the material

- (ii) \_\_\_\_\_ means a lamina where particles within equal areas of the lamina are of equal weight.  
 (a) Centroid of lamina (b) Uniform lamina  
 (c) Centroid of triangular lamina (d) None of the above
- (iii) The ratio of the velocity of the driven pulley to the velocity of the driving pulley in case of belt drive is known as \_\_\_\_\_.  
 (a) Belt friction (b) Velocity ratio  
 (c) Belt wear (d) Tension ratio
- (iv) The BMD consists of \_\_\_\_\_ for uniformly varying load.  
 (a) Inclined lines (b) Parabolic curve  
 (c) Cubic curve (d) Higher Degree curve
- (v) Young's Modulus is given by \_\_\_\_\_.  
 (a) Stress / Strain (b) Strain / Stress  
 (c) Load / area (d) Area / load

### Q.13 True or false

- (i) A material which does not break in to pieces under a tensile lode or impact load is called as brittle material.
- (ii) The BMD should be a cubic curve for distributed loading.
- (iii) Stress is equal to the force divided by area.
- (iv) Static friction is the friction force that acts between surfaces at rest.
- (v) Backlash is the error in motion that occurs when gears changes direction.

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