

13009-MET-034



C09-MET-405

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BOARD DIPLOMA EXAMINATION, (C-09)  
APRIL/MAY-2015  
DMET—FOURTH SEMESTER EXAMINATION  
MATERIAL TESTING

Time : 3 hours |

| Total Marks : 80

PART—A

3×10=30

**Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed **five** simple sentences.

1. Define stress and strain. 1½×2=3
2. Draw the stress-strain curve for ductile and brittle materials. 1½×2=3
3. What is the importance of hardness test? 3
4. What are the different indenters and loads used for various materials in BH testing? 3
5. Define fracture. 3
6. Define notch sensitivity and notch toughness. 1½×2=3
7. State the importance of the fatigue test. 3
8. Define creep. 3
9. State the need of nondestructive test. 3
10. State the principle of radiography. 3

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- ⑪. (a) Explain the salient features of the stress-strain curve. 6  
(b) Convert the engineering strain to the true strain. 4
- ⑫. (a) Explain the principle and operation of Rockwell hardness test. 3+5  
(b) State the conversion of Rockwell hardness to Brinell hardness number. 2
- ⑬. (a) Define torsion, twisting movement and angle of twist. 6  
(b) State the industrial application of torsion. 4
- ⑭. (a) Explain Griffith theory of brittle fracture. 7  
(b) State the equation for theoretical cohesive strength. 3
- ⑮. (a) Explain the operation of Charpy impact test with a neat sketch. 6+1  
(b) What is transition temperature? 3
- ⑯. (a) Explain different cycles of stress applicable to fatigue. 6  
(b) State the effect of temperature on fatigue properties. 4
- ⑰. What is creep? Explain the stages of creep curve with a neat sketch. 3+6+1
- ⑱. (a) Explain the test procedure for ultrasonic test with a neat sketch. 6+1  
(b) Name three piezoelectric crystals. → quartz, 3  
tanzanite,  
barium,  
titamate

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