

## Unit 2 - Week 1

### Course outline

How does an NPTEL online course work?

#### Week 1

● Introduction: Fundamental concepts of quality, inspection and their role in manufacturing

● Need of Inspection: Types and Principles

● Destructive Inspection-I

○ Destructive Inspection-II

● Testing of Composite Materials

○ Quiz : Assignment 1

○ Solution for Assignment 1

#### Week 2

#### Week 3

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## Assignment 1

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-03-04, 23:59 IST.**

1) Which of the following statements is/are correct regarding the inspection process in manufacturing? 1 point

- Inspection is done to minimize the rework and scrap costs in manufacturing.  
 Inspection can be performed at several places in production.  
 High volume items having low cost associated with passing defective items require little inspection.  
 All of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of these.

2) Which of the following is the correct definition of "Quality" given by quality guru named Edward Deming? 1 point

- Quality of a product or service is the fitness of that product or service for meeting its intended use required by the customer.  
 Quality is what the customer says, it is.  
 Quality is conformance to specifications.  
 The totality of features and characteristics of a product or services that bear on its ability to satisfy stated or implied needs of the customers.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Quality is conformance to specifications.

3) As prescribed by Garvin, which of the following dimensions of product quality describes the reputation of a company? 1 point

- Aesthetics  
 Perceived quality  
 Conformance  
 Serviceability

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Perceived quality

4) Which of the following product design guidelines is/are correct as per design for inspection (DFI) methodology? 1 point

- Selection of inspection method and instruments at the design stage.  
 Redesign of a product to reduce the inspection cost component when it is high.  
 Use of modules in product design.  
 All of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of these.

5) In which of the following types, inspection is performed away from the manufacturing process, and there is time delay between processing and inspection? 1 point

- Off-line inspection  
 On-line inspection  
 Combined inspection  
 None of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Off-line inspection

6) Which of the following inspection procedures is not suitable for centralized inspection? 1 point

- Incoming materials inspection  
 Finished product inspection  
 Inspection of heavy products  
 Inspection of high precision parts of delicate products

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Inspection of heavy products

7) \_\_\_\_\_ is the study of physical structure and components of metals, by using microscopy. 1 point

- Corrosion test  
 Metallography test  
 Tensile test  
 None of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Metallography test

8) Ductility can be defined as: 1 point

- measure of the degree of plastic deformation that has been sustained at fracture.  
 percent elongation.  
 percent reduction in area.  
 All of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of these.

9) In \_\_\_\_\_, the sample is dissolved and then the element of interest is precipitated and its mass measured or the element of interest is volatilized and the mass loss is measured. 1 point

- Gravimetry Analysis Method  
 Optical Atomic Spectroscopy  
 Neutron Activation Analysis Method  
 Corrosion Test

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Gravimetry Analysis Method

10) What is the value of initial minor load (preliminary test force) used in Rockwell superficial hardness test? 1 point

- 10 N  
 30 kg  
 3 kg  
 3 N

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
3 kg

11) The hardness specified by 50 HR15N represents: 1 point

- Superficial Rockwell hardness of 50 at 15N scale  
 Brinell hardness of 50 at N scale  
 Rockwell hardness of 15 at N scale  
 Brinell hardness of 50 at 15N scale

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Superficial Rockwell hardness of 50 at 15N scale

12) What does 500 HBW 1/30/20 represent? 1 point

- Brinell hardness of 500 determined with a ball of 1 mm diameter and with a test force of 30 N applied for 20 s.  
 Brinell hardness of 500 determined with a ball of 1 mm diameter and with a test force of 294.2 N applied for 20 s.  
 Brinell hardness of 500 determined with a ball of 1 mm diameter and with a test force of 20 N applied for 20 s.  
 None of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Brinell hardness of 500 determined with a ball of 1 mm diameter and with a test force of 294.2 N applied for 20 s.

13) Which of the following tests/methods is/are used to determine fiber volume fraction in composite materials? 1 point

- Fiber pull-out test  
 Indentation test  
 Acid digestion method  
 All of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Acid digestion method

14) Which of the following statements is/are correct in respect of role of matrix in a composite material? 1 point

- Holds the fibres together.  
 Protects the fibres from environment.  
 Enhances transverse properties of a laminate.  
 All of these.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of these.

15) Which of the following is the correct expression for calculating interfacial strength between fiber and matrix using pull-out test? 1 point

Consider,  $\tau$  = interfacial strength,  $P_{max}$  = maximum pull-out load,  $l$  = embedded length, and  $R$  = fiber radius.

- $\tau = \frac{P_{max}}{\pi \times R \times l}$   
  $\tau = \frac{P_{max}}{2 \times \pi \times R \times l}$   
  $\tau = \frac{2 \times P_{max}}{\pi \times R \times l}$   
  $\tau = \frac{4 \times P_{max}}{\pi \times R \times l}$

No, the answer is incorrect.  
Score: 0

Accepted Answers:

$$\tau = \frac{P_{max}}{2 \times \pi \times R \times l}$$