SOLUTION OF MECHANICS MATERIAL BY BEER 5TH EDITION

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Questions and Answers on Solution of Mechanics of Materials by Beer 5th Edition

Q1. Determine the normal stress in the bar shown in Fig. 2.24.

A1: The normal stress in the bar is given by:

? = P/A = 100 kN / 100 mm² = 1 MPa

Q2. Calculate the shear stress in a circular shaft subjected to a torque of 500 N-m and has a diameter of 50 mm.

A2: The shear stress in the shaft is given by:

? = T / (?d^3/16) = 500 N-m / [?(0.05 m)^3/16] = 40.6 MPa

Q3. Determine the bending stress in a beam subjected to a concentrated load of 2000 N at its mid-span, with a length of 2 m and a rectangular cross-section of width 50 mm and height 100 mm.

A3: The bending stress in the beam is given by:

? = (Mc) / I = [(2000 N)(1 m)](50 mm x 100 mm^2 / 12) = 16.67 MPa (tensile)

Q4. Calculate the deflection of a cantilever beam with a length of 1 m, a cross-sectional area of 50 mm x 100 mm, and an elastic modulus of 200 GPa, subjected to a concentrated load of 1000 N at its free end.

A4: The deflection of the beam is given by:

? = (PL^3) / (3EI) = [(1000 N)(1 m)^3] / [3(200 GPa)(50 mm x 100 mm^2)] = 0.00167 m = 1.67 mm

Q5. Determine the critical buckling load of a column with a length of 2 m, a cross-sectional area of 100 mm x 100 mm, and an elastic modulus of 200 GPa.

A5: The critical buckling load is given by:

Pcr = (?^2EI) / L^2 = [(?^2)(200 GPa)(100 mm x 100 mm^2)] / (2 m)^2 = 15.71 kN

Willem J. M. Levelt: A Pioneer in Psycholinguistics

Willem J. M. Levelt is an esteemed professor at the Max Planck Institute for Psycholinguistics (MPI) in Nijmegen, the Netherlands. His groundbreaking work in psycholinguistics has made significant contributions to our understanding of language production and comprehension.

What is Psychoglinguistics?

Psycholinguistics is the scientific study of the mental processes involved in language use. It investigates how we produce and comprehend language, including the cognitive and neurological mechanisms underlying these processes.

Levelt's Contribution to Language Production

Levelt's research on language production has revolutionized our understanding of how we formulate and utter speech. His "speech production model" proposes that language production involves three distinct stages: conceptualization, planning, and articulation. Each stage engages different cognitive processes and brain regions.

Levelt's Model of Language Comprehension

Levelt has also extensively studied language comprehension. His "lexical access model" posits that word recognition involves two stages: a prelexical stage, where the sensory input is analyzed, and a lexical stage, where words are identified and retrieved from memory.

Levelt's Impact on Psycholinguistics

Levelt's groundbreaking research has had a profound impact on psycholinguistics. His models have served as frameworks for numerous subsequent studies and have guided our understanding of language processing. He has also fostered collaborations between psychologists, linguists, and computer scientists, advancing the field of cognitive science.

Continuing Legacy

Willem J. M. Levelt remains an influential figure in psycholinguistics. His work continues to inspire researchers and contribute to our knowledge of how we use language. Through his research, teaching, and mentorship, he has shaped the field and left an enduring legacy in the study of human cognition.

TCS Placement Papers: Tata Consultancy Services Sample Questions and Answers

TCS (Tata Consultancy Services) is one of the leading global IT services, consulting, and business solutions companies. Every year, TCS conducts placement drives to recruit fresh graduates from various engineering colleges.

Section 1: Verbal Reasoning

- **Question:** Identify the antonym of "prolific".

- **Answer:** Sterile

- **Question:** Choose the correct preposition to complete the sentence: "The book was placed __ the table."

- **Answer:** On

Section 2: Quantitative Aptitude

- **Question:** Find the value of x in the equation: 2x + 5 = 13

- **Answer:** 4

- **Question:** A train travels 200 kilometers in 4 hours. What is its average speed?

- **Answer:** 50 kilometers per hour

Section 3: Logical Reasoning

- **Question:** Which of the following statements is true based on the syllogism below?
  - Premise 1: All dogs are animals.
  - Premise 2: Some animals are cats.

- **Answer:** Some cats are dogs.

Section 4: Programming

- **Question:** Write a Java program to reverse a string.

- **Answer:**

```java
public class ReverseString {

  public static void main(String[] args) {
      String str = "TCS Placement Papers";
      String reversedStr = "";

      for (int i = str.length() - 1; i >= 0; --i) {
          reversedStr += str.charAt(i);
      }
```

```java
            System.out.println("Original string: " + str);
            System.out.println("Reversed string: " + reversedStr);
        }
    }
```

Section 5: General Knowledge

- **Question:** Who is the CEO of TCS?

- **Answer:** Rajesh Gopinathan

- **Question:** What is the full form of GST?

- **Answer:** Goods and Services Tax

The Walking Dead Comic: An Unforgettable Post-Apocalyptic Tale

What is The Walking Dead comic about?

The Walking Dead comic, created by Robert Kirkman, Tony Moore, and Charlie Adlard, follows the story of Rick Grimes, a sheriff who awakens from a coma to find the world overrun by flesh-eating walkers. As he navigates this new reality, he encounters a group of survivors who struggle to maintain humanity amidst the chaos.

What makes The Walking Dead comic so popular?

The Walking Dead comic has gained a massive following due to its gripping storyline, complex characters, and unflinching depiction of human nature. It explores the depths of human desperation, morality, and resilience in a world where society has collapsed.

Where can I read The Walking Dead comic online?

You can read The Walking Dead comic online on various platforms, including:

- **Image Comics Website:** https://imagecomics.com/comics/series/the-walking-dead
- **ComiXology:** https://www.comixology.com/The-Walking-Dead/comics-series/137
- **Marvel Unlimited:** https://www.marvel.com/comics/series/32549/walking_dead_the_2003

What are the major themes of The Walking Dead comic?

The Walking Dead comic explores numerous themes, including:

- The fragility of humanity in the face of adversity.
- The importance of community and cooperation for survival.
- The ethical dilemmas faced in a post-apocalyptic world.
- The power of hope and resilience in the darkest of times.

Will The Walking Dead comic continue?

The Walking Dead comic is currently ongoing, with new issues released monthly. Kirkman has stated that he plans to continue the series indefinitely, as long as the story remains compelling and fresh.

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