

CLASS: BTECH  
BRANCH: CSE/IT/ECE/EEE

SEMESTER : I  
SESSION : MO/18

TIME: 3.00 HOURS

SUBJECT: ME101 BASIC OF MECHANICAL ENGINEERING

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

- Q.1(a) A steel bar 35 mm x 35 mm in section and 100 mm in length is acted upon by a tensile load of 180 kN along its longitudinal axis and 400 kN and 300 kN along the axes of the lateral surfaces. Determine [5]  
(i) change in the dimensions of the bar  
(ii) change in the volume  
(iii) longitudinal axial load acting alone to produce the same longitudinal strain as in (i).  
 $E = 205 \text{ GPa}$ , Poisson's ratio = 0.3

- Q.1(b) Detect the forces in the member BC and CD of the truss given figure 1. [5]

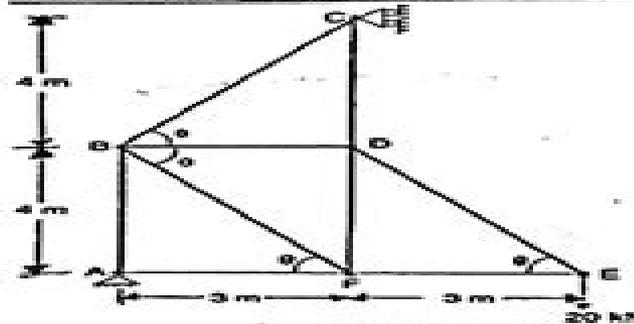


Figure 1

- Q.2(a) A high speed car is moving with a speed of 100 m/s. The resistance to motion of the vehicle is mainly due to aerodynamics drag, which for this speed can be approximated as  $0.2V^2 \text{ N}$ , with  $V$  is in m/s. If the vehicle has a mass of 4000 kg, estimate what distance will it move before its speed reduced to 70 m/s? [5]
- Q.2(b) The position vector of two bodies A and B are defined in fixed XY frame by  $r_A = -4.5t^2\mathbf{i} - 1.5t^2\mathbf{j}$ ,  $r_B = -6t^2\mathbf{i} + 2.25t^2\mathbf{j}$ , where  $r_A$  and  $r_B$  in meters and  $t$  is in sec. Determine  $V_{BA}$  and  $a_{BA}$  after 3 seconds in terms of  $\mathbf{i}$  and  $\mathbf{j}$ . [5]
- Q.3(a) Formulate an expression for the centrifugal tension in a flat belt drive in terms of mass of the belt per unit length 'm' and velocity of the belt 'V'. [5]
- Q.3(b) Detect the natural frequency of the system shown in figure 2 below.  $k = 2 \times 10^5 \text{ N/m}$ ,  $m = 20 \text{ kg}$ . [5]



Figure 2

# Diploma First Sem Mechanical Engineering Question Paper

**Glick, Danny, Cohen, Anat, Chang, Chi**

## **Diploma First Sem Mechanical Engineering Question Paper:**

*Joint Volumes of Papers Presented to the Legislative Council and Legislative Assembly New South Wales.*  
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Courses is a cutting edge research publication that examines current theoretical frameworks research projects and empirical studies related to the design implementation and evaluation of early warning systems and targeted interventions and discusses their implications for policy and practice Moreover this book will review common challenges of early warning systems and dashboard design and will explore design principles and data visualization tools to make data more understandable and therefore more actionable Highlighting a range of topics such as curriculum design game based learning and learning support it is ideal for academicians policymakers administrators researchers education professionals instructional designers data analysts and students

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Mines, Miners and Mining Interests of the United States in 1882 ,1882     **Locomotive Engineering** ,1893

*Transactions - North East Coast Institution of Engineers and Shipbuilders* North East Coast Institution of Engineers and Shipbuilders,1927 List of members in each volume     *Minutes and Votes and Proceedings of the Parliament, with Papers Presented to Both Houses* Western Australia. Parliament,1929     *Surveyor and Municipal and County Engineer* ,1910

**Gas World** ,1922     **Sessional Papers - Legislature of the Province of Ontario** Ontario. Legislative Assembly,1891

## Unveiling the Magic of Words: A Review of "**Diploma First Sem Mechanical Engineering Question Paper**"

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### **Table of Contents Diploma First Sem Mechanical Engineering Question Paper**

1. Understanding the eBook Diploma First Sem Mechanical Engineering Question Paper
  - The Rise of Digital Reading Diploma First Sem Mechanical Engineering Question Paper
  - Advantages of eBooks Over Traditional Books
2. Identifying Diploma First Sem Mechanical Engineering Question Paper
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Diploma First Sem Mechanical Engineering Question Paper
  - User-Friendly Interface
4. Exploring eBook Recommendations from Diploma First Sem Mechanical Engineering Question Paper
  - Personalized Recommendations
  - Diploma First Sem Mechanical Engineering Question Paper User Reviews and Ratings

- Diploma First Sem Mechanical Engineering Question Paper and Bestseller Lists
- 5. Accessing Diploma First Sem Mechanical Engineering Question Paper Free and Paid eBooks
  - Diploma First Sem Mechanical Engineering Question Paper Public Domain eBooks
  - Diploma First Sem Mechanical Engineering Question Paper eBook Subscription Services
  - Diploma First Sem Mechanical Engineering Question Paper Budget-Friendly Options
- 6. Navigating Diploma First Sem Mechanical Engineering Question Paper eBook Formats
  - ePub, PDF, MOBI, and More
  - Diploma First Sem Mechanical Engineering Question Paper Compatibility with Devices
  - Diploma First Sem Mechanical Engineering Question Paper Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Diploma First Sem Mechanical Engineering Question Paper
  - Highlighting and Note-Taking Diploma First Sem Mechanical Engineering Question Paper
  - Interactive Elements Diploma First Sem Mechanical Engineering Question Paper
- 8. Staying Engaged with Diploma First Sem Mechanical Engineering Question Paper
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Diploma First Sem Mechanical Engineering Question Paper
- 9. Balancing eBooks and Physical Books Diploma First Sem Mechanical Engineering Question Paper
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Diploma First Sem Mechanical Engineering Question Paper
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Diploma First Sem Mechanical Engineering Question Paper
  - Setting Reading Goals Diploma First Sem Mechanical Engineering Question Paper
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Diploma First Sem Mechanical Engineering Question Paper
  - Fact-Checking eBook Content of Diploma First Sem Mechanical Engineering Question Paper
  - Distinguishing Credible Sources

13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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