

**Cryptography and Network Security  
(COMPUTER SCIENCE AND ENGINEERING)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
<b><u>UNIT-I</u></b>				
1.	a) Compare and contrast Security Services and Security Mechanisms.	5 M	1	K4
	b) Explain various types of Security Attacks with suitable examples.	5 M	1	K2
<b>(OR)</b>				
2.	a) Show the relationship between security mechanisms and services in terms of matrix.	5 M	1	K2
	b) Apply Caesar Cipher to generate cipher text using $K = 10$ for the following plain text using "DONOT" and Prove decryption to get original plain text using $K = 10$ .	5 M	1	K1
<b><u>UNIT-II</u></b>				
3.	a) Define Conventional Encryption and explain its essential principles.	5 M	2	K1
	b) Compare Symmetric and Asymmetric Encryption with suitable examples.	5 M	2	K4
<b>(OR)</b>				
4.	a) Explain Feistel encryption structure with diagram.	5 M	2	K2
	b) Explain the triple DES in detail.	5 M	2	K2
<b><u>UNIT-III</u></b>				
5.	a) Define Public-Key Cryptography and explain its basic principles.	5M	3	K1
	b) Explain the working of the RSA algorithm with an example.	5M	3	K2
<b>(OR)</b>				
6.	a) Apply RSA algorithm to perform encryption and decryption for the following: $p = 3$ , $q = 11$ , $e = 7$ , $M = 5$ .	5 M	3	K3
	b) Illustrate X.509 public-key certificates with neat diagram.	5 M	3	K2
<b><u>UNIT-IV</u></b>				
7.	a) Define Pretty Good Privacy (PGP) and explain its purpose in email security.	5M	4	K1
	b) Explain the role of RFC 822 in electronic mail message format.	5M	4	K2
<b>(OR)</b>				
8.	a) Describe in detail about five header fields of MIME.	5 M	4	K2
	b) Describe few limitations of SMTP.	5 M	4	K2
<b><u>UNIT-V</u></b>				
9.	a) Define IP Security (IPSec) and explain its importance in secure communications.	5M	5	K1
	b) Explain the structure and purpose of the Encapsulating Security Payload (ESP).	5M	5	K2
<b>(OR)</b>				
10.	a) Describe briefly the Design principles of Firewalls.	5 M	5	K2
	b) Describe the following i) Master Key ii) Session Key iii) Nonce iv) Key Distribution Centre (KDC)	5 M	5	K3
<b><u>UNIT-VI</u></b>				
11.	a) Define Web Security and list key considerations for securing web-based applications.	5 M	6	K1
	b) Describe the architecture of SSL and its main components.	5 M	6	K2
<b>(OR)</b>				
12.	a) Explain the payment process supported in SET.	5 M	6	K2
	b) Describe briefly about the dual signature in detail.	5 M	6	K2

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	<u><b>UNIT-I</b></u>	Marks	CO	Blooms Level
1. a)	Discuss the scope of managerial economics.	5	1	2
b)	Explain the types of elasticity of demand.	5	1	2
	<b>(OR)</b>			
2.	Define demand forecasting. Explore the survey and statistical methods of demand forecasting.	10	1	2
	<u><b>UNIT-II</b></u>			
3. a)	What are Isoquants? Explain the features of isoquants.	5	2	2
b)	Discuss the internal and external economies of scale.	5	2	2
	<b>(OR)</b>			
4. a)	Explain the managerial significance and limitations of break-even analysis.	5	2	2
b)	Differentiate between explicit costs and implicit costs.	5	2	3
	<u><b>UNIT-III</b></u>			
5. a)	Discuss the features of monopolistic competition.	5	3	2
b)	Analyse any two pricing strategies.	5	3	4
	<b>(OR)</b>			
6. a)	Explain the price-output determination in case of monopoly.	5	3	2
b)	Outline the types of competition.	5	3	2
	<u><b>UNIT-IV</b></u>			
7. a)	Explain the Fayol's principles of management.	5	4	2
b)	Analyse the Maslow's theory of human needs.	5	4	4
	<b>(OR)</b>			
8. a)	Elucidate the systems approach to management.	5	4	2
b)	Discuss the functions of management.	5	4	2
	<u><b>UNIT-V</b></u>			
9. a)	Explain the importance of marketing mix.	5	5	2
b)	Discuss the various channels of distribution.	5	5	2
	<b>(OR)</b>			
10. a)	Examine the marketing strategies based on product lifecycle.	5	5	3
b)	Outline the factors influencing the channels of distribution.	5	5	2
	<u><b>UNIT-VI</b></u>			
11. a)	Distinguish between HRD and Personnel Management & Industrial Relations.	5	6	3
b)	Explain the methods of performance appraisal.	5	6	2
	<b>(OR)</b>			
12. a)	Discuss the basic functions of HR manager.	5	6	2
b)	Outline the various sources of recruitment.	5	6	2

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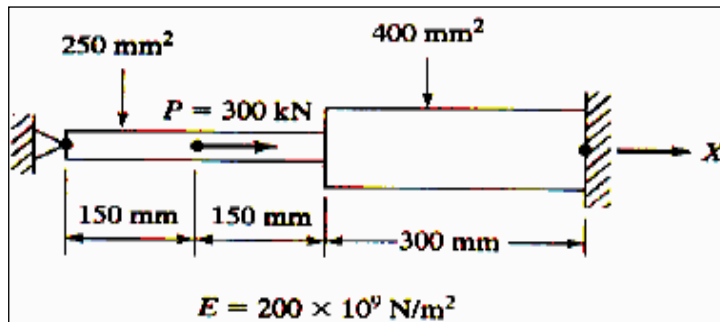
All parts of the Question must be answered at one place

**UNIT-I**

- |      |   | Marks | CO  | Blooms Level |
|------|---|-------|-----|--------------|
| 1.   | Derive D Matrix and deduce plane strain condition from it<br>(OR)   | 10M   | CO1 | L3           |
| 2 a) | A displacement field is imposed on a FE element as<br>$u = 1+3x+4x^3+6xy^2$ ; $v = xy - 7x^2$ , Write down the expressions for $\epsilon_{xx}$ , $\epsilon_{yy}$ , and $\epsilon_{xy}$ , and find the values of three strain components at point (0,0). | 6M    | CO1 | L3           |
| b)   | In a plane strain problem we have, $\sigma_x = 20000$ psi, $\sigma_y = -10000$ psi, $E = 3 \times 10^7$ psi, and $\nu = 0.3$ . Determine the value of the stress $\sigma_z$ .   | 4M    | CO1 | L2           |

**UNIT-II**

- |    |  |     |     |    |
|----|--|-----|-----|----|
| 3. | Find the Deflections and stresses in the structure shown in Fig. | 10M | CO2 | L4 |
|----|--|-----|-----|----|

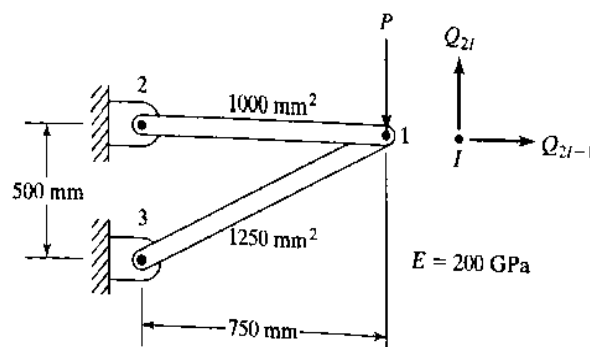


(OR)

- |      |   |    |     |    |
|------|---|----|-----|----|
| 4 a) | Derive the shape functions and element strain displacement matrix for a 1D bar element. | 5M | CO2 | L3 |
| b)   | Starting from the first principles, derive the stiffness matrix for a 1D bar element.   | 5M | CO2 | L3 |

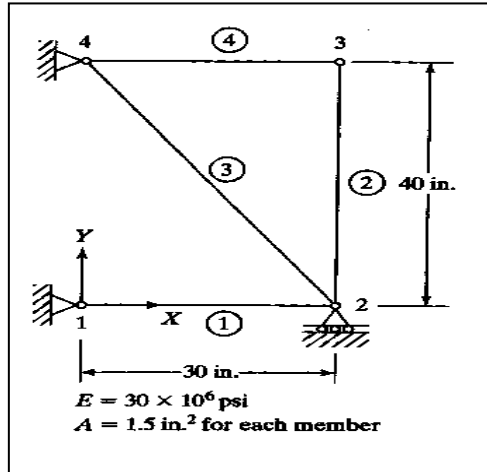
**UNIT-III**

- |    |  |     |     |    |
|----|--|-----|-----|----|
| 5. | For the pin jointed configuration shown below determine the stiffness values $K_{11}$ , $K_{12}$ , $K_{22}$ of the global stiffness matrix | 10M | CO3 | L4 |
|----|--|-----|-----|----|



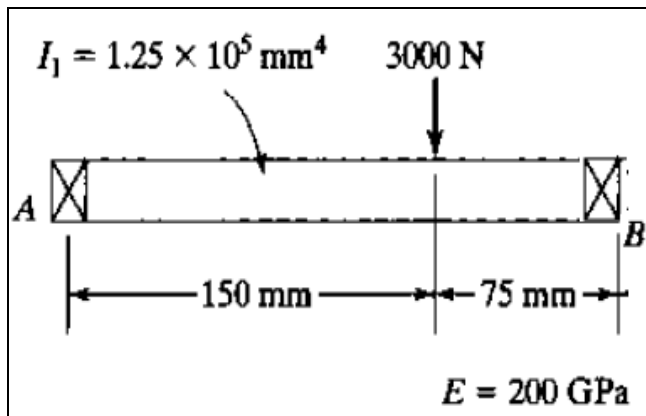
(OR)

- 6 For the truss shown in figure below, a horizontal load of 10M CO3 L4  
4000lb is applied in x direction at node 2.
- Write down the element stiffness matrix  $\mathbf{k}$  for each element
  - Assemble the  $\mathbf{K}$  matrix.
  - Using the elimination approach, solve for  $\mathbf{Q}$ .



#### UNIT-IV

7. Find the deflection at the load and the slopes at the ends of the steel shaft shown in figure below. Consider the shaft to be fixed at its ends. 10M CO4 L4

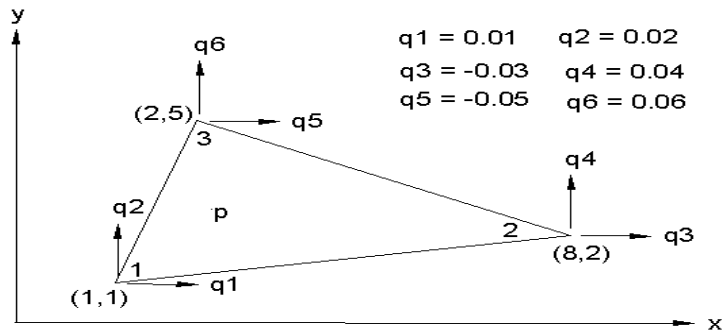


(OR)

- 8 Derive the Hermite shape functions for a two noded 2D 10M CO4 L3  
beam element.

### UNIT-V

9. a) For the point located inside the triangular element, if  $P(x, y) = (2.8, 3.5)$  then evaluate shape functions  $N_1, N_2, N_3$  and prove that these shape functions are valid for area coordinates.



- b) Evaluate the following integral  $\int_{-1}^1 (5x^2 + 3x + 7) dx$ , using direct integration and Gaussian Quadrature 2x2 rule. Comment on which Gaussian formula is better and why?

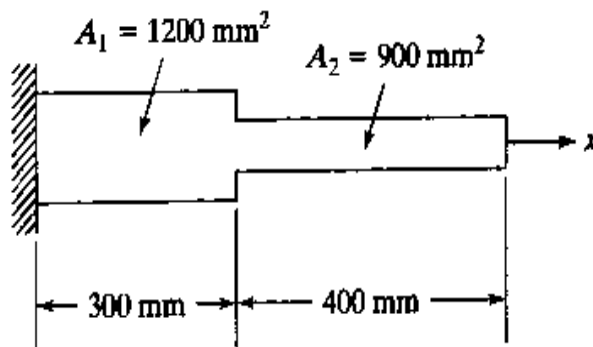
(OR)

10. Derive the stiffness and force matrices of CST Element.

### UNIT-VI

11. Consider the axial vibration of the steel bar shown below

- Develop the global stiffness and mass matrices
- By hand calculations, Determine the lowest frequency and mode shape



Steel bar

(OR)

- Derive the consistent mass matrix for 1 D bar element.
- Describe the properties of eigen values and eigen vectors.