

11. (a) What is firewall ? Explain the design issues involved in it. 7
- (b) Write a short note on antivirus techniques. 6

**OR**

12. (a) Define the following :
- (i) intruder
- (ii) viruses
- (iii) worms. 6
- (b) Write in brief on secure electronic payment system. 7

**Faculty of Engineering & Technology**  
**Seventh Semester B.E. (EC/ET) (C.B.S.) Examination**  
**ELECTIVE-I : DATA COMPRESSION AND**  
**ENCRYPTION**

Time—Three Hours]

[Maximum Marks—80

**INSTRUCTIONS TO CANDIDATES**

- (1) All questions carry marks as indicated.
- (2) Solve Question No. **1 OR** Questions No. **2**.
- (3) Solve Question No. **3 OR** Questions No. **4**.
- (4) Solve Question No. **5 OR** Questions No. **6**.
- (5) Solve Question No. **7 OR** Questions No. **8**.
- (6) Solve Question No. **9 OR** Questions No. **10**.
- (7) Solve Question No. **11 OR** Questions No. **12**.
- (8) Assume suitable data wherever necessary.
- (9) Illustrate your answers wherever necessary with the help of neat sketches.
- (10) Use of non-programmable calculator is permitted.

1. (a) Explain the steps of Shannon Fano Coding. Given  $A = (abcde)$ ;  $P(a) = \{0.2, 0.2, 0.4, 0.1, 0.1\}$ , calculate its average length, entropy of the source and efficiency. 7
- (b) What are the dictionary based compression schemes ? Explain LZ77 with suitable example. 7

**OR**

2. (a) Consider source with alphabets  $A = \{a_1, a_2, a_3\}$  with probability model  $\{0.2, 0.6, 0.2\}$  respectively. Perform arithmetic coding and generate a decimal tag for the sequence :  $a_1 a_3 a_2 a_1$ . 7
- (b) Define the following terms :
- (i) Compression ratio
  - (ii) Compression rate
  - (iii) Distortion
  - (iv) Fidelity and quality. 7
3. (a) Write a short note on digital audio. 6
- (b) Explain DPCM and ADPCM techniques used in Audio Compression. 7

**OR**

4. (a) Describe the format of  $\mu$ -law encoder and decoder specified by G.711. Find out the codeword for-656 input sample using  $\mu$ -law encoder. 7

- (b) Explain audio encoder and decoder used in MPEG. 6

5. (a) Explain video encoder and decoder using JPEG. 7
- (b) Write a short note on Video Compression. 7

**OR**

6. (a) Explain different 2-dimensional image transform. 7
- (b) Describe the features of video compression as compared to image compression. Explain MPEG industry standard for video compression. 7
7. (a) Explain different types of Security attacks. 7
- (b) Write a short note on steganography. 6

**OR**

8. (a) Explain simplified DES, with all its steps. 7
- (b) Write short note on Triple DES. 6
9. (a) State and explain Chinese remain theorem and its significance. 7
- (b) Explain RSA algorithm giving a simple example of it. 6

**OR**

10. (a) What do you mean by Elliptic curve cryptography ? Explain. 7
- (b) Write a short note on digital signature. 6