Hall Ticket Number:

Code No. : 22516

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. (ECE: CBCS) II-Semester Main Examinations, June-2018

(Communication Engineering & Signal Processing)

Data Compression Methods

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Differentiate between lossy and lossless compression.
2. List the various models to estimate the entropy of the source.
3. Define average mutual information.
4. Give the equation for general form of distortion.
5. Define discrete sine transform.
6. List any two applications of DCT.
7. Define Gabor transform.
8. Define down sampling.
9. Define temporal masking.
10. What is the use of de blocking filter mode?

Part-B (5 × 8 = 40 Marks)

11. a) A source emits letters from an alphabet $A = \{a_1, a_2, a_3, a_4, a_5\}$ with probabilities of $P(a_1) = 0.15$, $P(a_2) = 0.04$, $P(a_3) = 0.26$, $P(a_4) = 0.05$ and $P(a_5) = 0.50$. Find the Huffman code for this source. [5]

    b) Define composite source model. [3]

12. a) Explain how midtread quantizer is used in data compression, using neat diagrams. [4]

    b) Draw the block diagram and explain the vector quantization procedure in detail. [4]

13. a) Discuss the properties of DCT. [4]

    b) Write short notes on Walsh Hadamard transform. [4]

14. a) Draw the block diagram and explain in detail the sub-band coding system. [4]

    b) Explain the decomposition of an input sequence into multiple bands by recursively using a two band split. [4]

15. a) Draw a block diagram and explain the video coding. [4]

    b) Writ short notes on H.264 standards. [4]

16. a) What are the various measures of performance in lossy compression? [4]

    b) Explain the rate distortion function for the Gaussian source. [4]

17. Answer any ***two*** of the following:

    a) Discuss the properties of K L Transform. [4]

    b) Explain the importance of Nyquist theorem in sub-band coding. [4]

    c) Explain Psychoacoustic model in compression standards. [4]