Reg. No:..............................   Name: ....

APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH. DEGREE(HONS.) EXAMINATION December 2019
Course code:08EC7211(A)
Course Name: SIGNAL COMPRESSION THEORY AND METHODS

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

Answer all six questions.

Modules 1 to 6:Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	What is Kraft inequality?	3

Answer b or c

b	Discuss the following codes (i) Prefix-code (ii) fixed length (iii) variable length code (iv) optimal codes	6
c	Elucidate on the major compression schemes with focus on the examples.	6

Q.no.	Module 2	Marks
2.a	a Enumerate the conditions for optimality of Huffman codes.	3

Answer b or c

b	Using Adaptive Huffmann coding algorithm, compress the sequence"PPSQQRR", with all steps in the tree structure	6
c	Explain burrows wheeler transform with an example.	6

Q.no.	Module 3	Marks
3.a	What are the properties of rate distortion function?	3

Answer b or c

b	State and prove converse of rate distortion theorem	6
c	Calculate the value of R(D) for a source alphabet $\{0, 1\}$ with $P(0) = p$.	6

Q.no.	Module 4	Marks
4.a	What is the one word for the process of representing a large—possibly infinite—set of values with a much smaller set. Enumerate the types of it.	3

Answer b or c

b	Which type of quantization operates on blocks of data? Discuss in detail about the technique.	6
c	What is vector quantization? Describe the LBG algorithm used in VQ	6

Q.no.	Module 5	Marks
5.a	Describe Walsh -Hadamard transform	4

Answer b or c

b	Illustrate with example the concept of wavelet transform and the sub band labelling scheme for a three level 2D-wavelet transform	8
c	Differentiate between (i) Lapped orthogonal transform (ii) Lapped Nonorthogonal transform	8

Q.no.	Module 6	Marks
6.a	Write down the principle behind Audio compression	4

Answer b or c

b	Discuss detail about Set partitioning in hierarchical trees (SPHIT) with image compression standard.	8
c	With a neat diagram, explain H.261 video coding algorithm	8