Curriculum Scheme: Rev2016
Examination: TE Semester V
Course Code: and Course Name: Digital Communication
Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In probability theories, the events which can never occur together are classified as
Option A:	collectively exclusive events
Option B:	mutually exhaustive events
Option C:	mutually exclusive events
Option D:	collectively exhaustive events
2.	According to Shannon Hartley theorem on channel capacity
Option A:	$C/B = \log_2(1+S/N)$
Option B:	$C/B = \log_2(1+S/N_0)$
Option C:	$C/B = \log_{10}(1+S/N)$
Option D:	$C/B = \log_{10}(1+S/N_0)$
3.	Given below is a parity check matrix of a linear block code. H= 1 1 1 1 1 1 1 1 0 1 1 0 0 1 1 0 0 1 0 1 0 0 0 0 This corresponds to a
Option A:	(6,3) linear block code
Option B:	(6,4) linear block code
Option C:	(6,2) linear block code
Option D:	(2,6) linear block code
4.	A cyclic code can be generated using
Option A:	Generator polynomial
Option B:	Generator matrix
Option C:	Generator polynomial & matrix
Option D:	None of the above
5.	How error detection and correction is done?
Option A:	By passing it through equalizer
Option B:	By passing it through filter
Option C:	By amplifying it
Option D:	By adding redundancy bits
6.	The number of k bit shift over which a single information bit influences the

	encoder output is given by
Option A:	Code rate
Option B:	Constraint length
Option C:	Code length
Option D:	Code weight
7.	The error correcting capability of a code scheme increases as the
Option A:	Number of channel symbols per information bit increases
Option B:	Bandwidth increases
Option C:	Information per bit increases
Option D:	All of the mentioned
8.	Which is called as on-off keying?
Option A:	Amplitude shift keying
Option B:	Uni-polar PAM
Option C:	Amplitude shift keying & Uni-polar PAM
Option D:	FSK
9.	Which statements are false a) Binary phase shift keying is a straightforward modulation scheme that can transfer two bits per symbol. b) Quadrature phase shift keying is more complex but doubles the data rate (or achieves the same data rate with half the bandwidth). c) QPSK has the same Bandwidth as that of BPSK. d) Differential QPSK uses the phase difference between adjacent symbols to avoid problems associated with a lack of phase synchronization between the transmitter and receiver.
Option A:	a, b, c and d
Option B:	b,c and d
Option C:	a and c
Option D:	All of the above
10.	The limit which represents the threshold Eb/N0 value below which reliable communication cannot be maintained is called as
Option A:	Probability limit
Option B:	Error limit
Option C:	Shannon limit
Option D:	Communication limit
11.	The process of converting coded output into electrical pulses or waveforms for transmission is called
Option A:	Line coding
Option B:	Amplitude modulation
Option C:	FSK
Option D:	Filtering
12.	In a uni-polar RZ format,
Option A:	The waveform has zero value for symbol ‘0’
Option B:	The waveform has A volts for symbol ‘0’
Option C:	The waveform has positive and negative values for ‘1’ and ‘0’ symbol

	respectively
Option D:	The waveform has - A volts for symbol ‘0’
13.	Entropy is maximum when
Option A:	Symbols with equal probability
Option B:	Symbols with unequal probability
Option C:	Less no. of symbols
Option D:	More no. of symbols
14.	Relation between probability P_k and Information I_k is
Option A:	$I_k=\log_{10}(1/P_k)$
Option B:	$I_k=\log_2(1/P_k)$
Option C:	$I_k=10\log_2(1/P_k)$
Option D:	$I_k=10\log_{10}(1/P_k)$
15.	For M equally likely messages, the average amount of information H is
Option A:	$H = \log_{10}M$
Option B:	$H = \log_2M$
Option C:	$H = \log_{10}M^2$
Option D:	$H = 2\log_{10}M$
16.	The process of converting coded output into electrical pulses or waveforms for transmission is called
Option A:	Line coding
Option B:	Amplitude modulation
Option C:	FSK
Option D:	Filtering
17.	The polarities in NRZ format use
Option A:	Complete pulse duration
Option B:	Half duration
Option C:	Both positive as well as negative value
Option D:	Each pulse is used for twice the duration
18.	In coherent detection of signals,
Option A:	Local carrier is absent
Option B:	Frequency and phase of the received carrier is same as transmitted carrier
Option C:	The carrier is not in synchronization with modulated carrier
Option D:	Local carrier is present
19.	Which is easier to implement and is preferred?
Option A:	Coherent system
Option B:	Non coherent system
Option C:	Coherent & Non coherent system
Option D:	All of the above
20.	The code in convolution coding is generated using

Option A:	EX-OR logic
Option B:	AND logic
Option C:	OR logic
Option D:	All of the above

Q2	**Solve any Two out of Three** **10 marks each**
A	Explain Line codes and their characteristics.
B	A binary source produces 0's and 1's with probabilities 0.2 and 0.8 respectively. The binary data is then transmitted over a noisy channel. The probability of correct reception of 0 when a 0 is transmitted over the channel is 0.9. Also the probability of reception of a 0 when a 1 has been transmitted is 0.2. Find the probability of receiving a 0 and 1. If a 1 is received, what is the probability that a 0 was transmitted.
C	Explain the working of QPSK system with neat block diagram.

Q3	
A	**Solve any Two** **5 marks each**
i.	What is information and how is it measured.
ii.	Define conditional probability and Bayes rule.
iii.	Define a random process and erogodicity.
B	**Solve any One** **10 marks each**
i.	Compare BASK,BFSK and BPSK techniques
ii.	Write short note on Matched Filter