

COLLEGE OF ENGINEERING, PUNE

Computer Engineering and IT Department

Class- T.Y. (Computer Engineering)

Exam: End-Sem

Year -- 2012 13

Time: 180 Minutes

Subject: [CT-302]- Data Communication and Networking

Marks: 50

Instructions :-

1. All questions are compulsory.
2. Uses of any electronics devices (except Non-programmable calculator) are strictly prohibited.
3. Use Black or Blue color pen only.

Q.1	<p>Multiple choice questions. (One mark will be deducted for each incorrect answers)</p> <p>i) The highest data rate is provided by the transmission medium. A) Coaxial cable B) Microwave C) Optical fiber D) Twisted pairs</p> <p>ii) An effective way to prevent attenuation is A) Adding repeaters or amplifiers to a circuit B) Shorting a circuit C) Adding repeaters or amplifiers to a circuit D) Shielding wires</p> <p>iii) The loss of power a signal suffers as it travels from the transmitting computer to a receiving computer is: A) Echo B) Jitter C) Spiking D) Attenuation</p> <p>iv) Rank the following transmission media according to their channel capacity from the highest to the lowest. A) Optical Fibre, Coaxial Cable, Twisted Pair. B) Optical Fibre, Twisted Pair, Coaxial cable. C) Twisted Pair, Coaxial Cable, Optical Fibre. D) Coaxial cable, Optical fibre, Twisted Pair. E) None of the above</p> <p>v) Which organization has authority over interstate and international commerce in the communications field? A) ITU-T B) IEEE C) FCC D) ISOC</p> <p>vi) A _____ sine wave is not useful in data communications; we need to send a _____ signal. A. composite; single-frequency B. single-frequency; composite C. single-frequency; double-frequency D. none of the above</p> <p>vii) According to Nyquist's theorem, the maximum transmission rate (in bps) on a noiseless channel for a given bandwidth is: A) Half the bandwidth B. Equal to the highest signal frequency C) Twice highest signal frequency D. Twice the bandwidth E) None of the above</p> <p>viii) The key requirement/s for a routing function in packet-switching networks is/are: A) Efficiency B) Correctness, Simplicity and Fairness C) Optimality, Robustness and Stability D) All of the above E) None of the above</p> <p>ix) Which of the following sequences best describes the establishment, communication and termination of a communication session using a packet switched network? A) Setup, Data transfer, Disconnect B) Data Transfer, Disconnect C) Dial, Data Transfer, Disconnect D) Dial, Setup, Data Transfer E) None of the above</p>	10
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		x) In TDM, the transmission rate of the multiplexed path is usually _____ the sum of the transmission rates of the signal sources A) greater than B) less than C) equal to D) not related to	
Q.2	a	Draw and Explain the packet switching technique and circuit switching technique, also list three advantages of packet switching technique compared to circuit switching technique.	5
	b	Define the following terms in the context of message delivery over a network, and link utilization. i. Propagation delay. ii. Transmission time. iii. Node delay.	5
Q.3		In relation to modulation and data encoding: i) Define the term modulation. ii) Given a bit string, 001110101, show via a diagram how it can be encoded on to a sine wave analog signal using Amplitude Shift Keying (ASK). iii) Define and discuss in detail, using an example to illustrate each, the following transmission modes: a) Simplex b)Half-Duplex c)Full-Duplex iv) Define the following characteristics in relation to the simple sine wave model for an analog signal: a) Amplitude b)Frequency c) Phase	10
Q.4		What is TSI and its role in a time-division switching? Also, define blocking in a switched network. We need a three-stage space-division switch with $N = 100$. We use 10 crossbars at the first and third stages and 4 crossbars at the middle stage. a. Draw the configuration diagram. b. Calculate the total number of crosspoints. c. Find the possible number of simultaneous connections. d. Find the possible number of simultaneous connections if we use one single crossbar (100×100). e. Find the blocking factor, the ratio of the number of connections in c and in d.	10
Q.5	a	Explain in detail Telephone networks and its components	5
	b	Write a note on Modem	5