

KATHMANDU UNIVERSITY
End semester Examination
May/June 2022

Marks Obtained:

Level : B. E.

Course : ETEG 301

Year : III

Semester : II

Exam. Roll No. :

Time: 30 Minutes.

F.M. : 10

Registration No.:

Date :

SECTION "A"

[20Q. \times 0.5= 10 marks]

Encircle the appropriate option.

- _____ to avoid interference in case of simultaneous transmission of many radio wave signals through free space.
 - Each radio communications uses different power level
 - Each radio communications uses a different carrier frequency
 - Each radio transmitter uses a different modulation method
 - Each radio transmitter uses directional antenna for transmission
- If the carrier signal frequency (f_c) is 1000 kHz and the message signal frequency (f_m) is 2 kHz, how many frequencies are present in the Amplitude Modulated signal?
 - 1
 - 2
 - 3
 - 4
- A carrier signal $S_C(t) = A \cos(\omega_c t + \theta)$ after modulation it becomes $S_C(t) = A \cos[\omega_c t + \theta(t)]$. It is a case of _____.
 - frequency modulation
 - amplitude modulation
 - phase modulation
 - angle modulation
- _____ multiplexing used in T1 digital data transmission system.
 - Frequency division
 - Binary division
 - Pulse division
 - Time division
- The baud rate of binary shift keying (eg. BFSK, BASK and BPSK) is _____.
 - always equal to the bit rate
 - equal to twice the bandwidth of an ideal channel
 - not equal to the signaling rate
 - equal to half bandwidth of ideal channel
- The rate at which information can be carried through a communication channel depends on _____.
 - carrier frequency
 - bandwidth
 - transmission loss
 - message frequency
- Which type of network topology is best suited for large businesses, which must carefully control and coordinate the operation of distributed branch outlets?
 - Ring
 - Non Hierarchical
 - Hierarchical
 - Star
- Third Generation Mobile (3G) support _____ technology.
 - AMPS
 - EDGE
 - LTE
 - TACS

9. Half-wave dipole antenna is also known as?
 - a. High power Dipole
 - b. Hertz antenna
 - c. Radiator antenna
 - d. Omni antenna
10. Shape of the radiation pattern of an isotropic antenna looks like _____.
 - a. spherical
 - b. dough-nut
 - c. elliptical
 - d. hyperbolic
11. In terms of the size of the network the correct order (ascending) is _____.
 - a. PAN, MAN, LAN, WAN
 - b. LAN, MAN, WAN, PAN
 - c. PAN, LAN, MAN, WAN
 - d. LAN, PAN, MAN, WAN
12. What is the functional role of an antenna in receiving mode?
 - a. Radiator
 - b. Converter
 - c. Sensor
 - d. Inverter
13. In which of the following mode of propagation the waves are guided along the surface of the earth?
 - a. Ground Wave
 - b. Sky Wave
 - c. Line of Sight Wave
 - d. Space Wave
14. The distance between Radar and target is called?
 - a. Pulse Repetition Frequency
 - b. Range
 - c. Minimum Range
 - d. Maximum Unambiguous Range
15. The resolution of pulsed radar can be improved by _____.
 - a. increasing pulse width
 - b. decreasing pulse width
 - c. increasing the pulse amplitude
 - d. decreasing the pulse repetition frequency
16. Higher pulse repetition frequency (P.R.F.) in radar will _____.
 - a. increase the range of the radar
 - b. make weak signal discernible
 - c. improve the signal to noise ratio of the system
 - d. make large size target detection impossible
17. The satellite, which is used as a relay to extend communication distance is known as _____.
 - a. Relay Satellites
 - b. Communication Satellites
 - c. Repeater Satellites
 - d. Geosynchronous Satellites
18. A satellite beam that covers almost 40% of the earth's surface is known as _____.
 - a. Zone beam
 - b. Hemispheric beam
 - c. Spot beam
 - d. Global beam
19. In an optical fiber, the fiber core _____ the cladding.
 - a. is denser than
 - b. has the same density as
 - c. is less dense than
 - d. is another name for
20. In optical fibers, bandwidth is limited by _____.
 - a. mode
 - b. dispersion
 - c. frequency
 - d. refractive index of cladding

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F. M. : 40

SECTION "B"

Attempt *ANY FOUR* questions.

Missing data may be suitably assumed. Each symbol carries their usual meaning.

1.
 - a. Compare Amplitude Modulation and Frequency Modulation technique. [2]
 - b. What are the advantage and fundamental limitation of digital communication system? [3]
 - c. Explain the working principle of Global Navigation Satellite System. [5]
2.
 - a. What is the difference between Narrow Band FM and Wide Band FM? How are they generated? [4]
 - b. Explain the frame format of T1 and E1 Digital Transmission system. [3]
 - c. Explain the performance parameters of optical link. [3]
3.
 - a. What are the important properties of antenna? Explain the characteristic of Microstrip (patch) antenna and Helical antenna. [2+1]
 - b. Explain Star topology and its significance for the computer networking. [2]
 - c. What do you mean by SS7 signaling explain its functions. [5]
4.
 - a. In which condition ground wave and sky wave propagation are used explain with suitable example. [3]
 - b. Compare ZigBee and WiFi functional architecture. Express your view when to select ZigBee instead of WiFi with suitable example? [2+3]
 - c. Find the round trip delay time for communication system which uses geostationary satellite. [2]
5.
 - a. Explain the frequency reuse concept of cellular communication system. [3]
 - b. How can we enhance the range resolution of radar? Find the range resolution of radar system having 180ns pulse width. [2+2]
 - c. A fiber of 200 m length has $P_{in(max)} = 20\mu w$ and $P_{in(min)} = 15\mu w$ and $P_{out} = 11\mu w$. Find the minimum and maximum loss in dB/km. [3]

