Roll No. .....

Question Booklet Number

O. M. R. Serial No.

M. Sc. (Electronics) (Fourth Semester)

(NEP) EXAMINATION, 2025-26

WIRELESS AND MOBILE COMMUNICATION

Paper Code							
B	1	4	1	0	0	1	T

Questions Booklet Series
B

Time : 1:30 Hours] [*Maximum Marks : 75*

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.

2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.

3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।

2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।

3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page) **(शेष निर्देश अन्तिम पृष्ठ पर)**

(Only for Rough Work)

1. Spreading of signal in DSSS is done using :

(A) Carrier signal

(B) Noise

(C) Pseudo Noise (PN) sequence

(D) Time slot

2. The interference between the neighbouring base stations is avoided by :

(A) Assigning different group of channels

(B) Using transmitters with different power level

(C) Using different antennas

(D) All of the above

3. The ratio of spread bandwidth to original bandwidth is known as :

(A) Processing gain

(B) Path loss

(C) Doppler shift

(D) Delay spread

4. Space diversity is also known as .....

(A) Antenna diversity

(B) Frequency diversity

(C) Polarization diversity

(D) Time diversity

5. In CDMA, interference between users is minimized by :

(A) Time division

(B) Frequency division

(C) Orthogonal codes

(D) Noise

6. Flat fading channel is also known as :

(A) Amplitude varying

(B) Phase varying

(C) Frequency varying

(D) Wideband channel

7. Sectoring helps to reduce :

(A) Noise

(B) Co-channel interference

(C) Signal strength

(D) Path loss

8. What is the main disadvantage of RF pulse system :

(A) Simplicity

(B) Interference and noise

(C) Not real time

(D) Complexity

9. A group of cells that use complete set of frequencies is called :

(A) Sector

(B) Cluster

(C) Channel

(D) Network

10. What is the set of possible carrier frequencies in FH-SS ?

(A) Hop

(B) Hop set

(C) Symbols

(D) Chips

11. When radio waves hit irregular surfaces whose dimensions are in the order of wavelength, the phenomenon is called :

(A) Reflection

(B) Diffraction

(C) Scattering

(D) Refraction

12. Sectoring is done using :

(A) Omni-directional antenna

(B) Directional antenna

(C) Noise filter

(D) Amplifier

13. Surface roughness are often tested using :

(A) Nyquist criterion

(B) Rayleigh criterion

(C) Lawson criterion

(D) Barkhausen criterion

14. Which of the following memory device stores information such as subscriber's identification number in GSM ?

(A) SIM

(B) Register

(C) Flip flop

(D) SMS

15. Which of the following does not come under subsystem of GSM architecture :

(A) RSS

(B) NSS

(C) OSS

(D) Channel

16. A Bluetooth network is called :

(A) Cell

(B) Cluster

(C) Piconet

(D) Sector

17. Free space propagation model is to predict :

(A) Received signal strength

(B) Transmitted power

(C) Gain of transmitter

(D) Gain of receiver

18. Bluetooth uses :

(A) FDMA

(B) TDMA

(C) Frequency Hopping Spread Spectrum

(D) CDMA

19. A surface is considered rough if protuberance is ..... than critical height.

(A) Equal

(B) Less

(C) Greater

(D) No relation

20. Bluetooth uses how many hopping frequencies ?

(A) 20

(B) 40

(C) 79

(D) 100

21. Doppler shift is directly proportional to :

(A) Height of antenna

(B) Velocity

(C) Power of receiving antenna

(D) Power of transmitter

22. EDGE stands for :

(A) Enhanced Data for GSM Evolution

(B) Extended Data for GSM Environment

(C) Enhanced Digital GSM Evolution

(D) Extended Digital GSM Evolution

23. GPRS is an example of :

(A) Circuit switching

(B) Packet switching

(C) Optical switching

(D) Frequency switching

24. What is the name of a database used mainly that stores information of a subscriber along with eligible services under roaming or another MSC ?

(A) HLR

(B) VLR

(C) AuC

(D) EIR

25. Antenna efficiency is given by the ratio of ..... .

(A) Losses

(B) Physical aperture to effective aperture

(C) Signal power to noise power

(D) Effective aperture to physical aperture

26. The DECT system is based on :

(A) TCP

(B) IP

(C) OSI

(D) AMPS

27. In a DSSS system, the chip rate is 10 Mbps and the data rate is 100 kbps. Calculate the processing gain.

(A) 100

(B) 200

(C) 50

(D) 80

28. Which of the following layers consists of paging channel and control channel ?

(A) Physical layer

(B) Network layer

(C) Data link layer

(D) MAC layer

29. Channel sounding is used to :

(A) Increase noise

(B) Measure wireless channel characteristics

(C) Increase bandwidth

(D) Reduce frequency

30. Sweep frequency sounding technique uses :

(A) Multiple antennas

(B) Frequency variation

(C) Time slots

(D) Coding

31. For which type of connection WPA security is used ?

(A) Ethernet

(B) Bluetooth

(C) Wi-Fi

(D) Infrared

32. IEEE 802.11 defines basic service set as building block of a wireless :

(A) LAN

(B) WAN

(C) MAN

(D) ALOHA

33. Parameter that is normally achieved through a trailer added to end of frame is :

(A) Flow control

(B) Access control

(C) Error control

(D) None of the above

34. Which of the following specifies WLAN security standard ?

(A) IEEE 802.11

(B) IEEE 802.11g

(C) IEEE 802.11b

(D) IEEE 802.1li

35. US digital cellular system based on CDMA was standardized as :

(A) IS-95

(B) IS-53

(C) IS-12

(D) IS-59

36. What was the security algorithm defined for IEEE 802.11 ?

(A) WEP

(B) RSN

(C) WPA

(D) SSL

37. The smallest beam of a satellite antenna radiation pattern is :

(A) Zone beam

(B) Hemispheric beam

(C) Spot beam

(D) Global beam

38. The specification of a protocol, along with the chosen key length is known as :

(A) Cipher suite
(B) System suite
(C) Key set
(D) Service set

39. Several protocols for upper layers in bluetooth use :

(A) UDP
(B) HSP
(C) ITC
(D) L2CAP

40. Which is a link layer protocol ?

(A) ARP
(B) TCP
(C) UDP
(D) HTTP

41. Small scale variations of a mobile radio signal are directly related to :

(A) Impulse response of mobile radio channel
(B) Impulse response of base station
(C) Frequency response of antenna
(D) Frequency response of base station

42. Determine the number of cells in cluster when i = 2, j = 1.

(A) 7

(B) 12

(C) 28

(D) 35

43. If reuse distance D = 6 km cell radius R = 1 km. Find cluster size N.

(A) 4

(B) 7

(C) 12

(D) 5

44. What will be coherence bandwidth if approximate delay spread is 2 μsec.

(A) 125 kHz

(B) 250 kHz

(C) 60 kHz

(D) 500 kHz

45. For multipath power profile of a wireless channel, power measurement was (–20 dB, –10 dB, 0 dB, –10 dB) at (5 μsec, 10 μsec, 15 usec, 20 μsec) correspondingly. What will be mean delay ?

(A) 5.65

(B) 14.91

(C) 2.32

(D) None of the above

46. GOS is typically given as a likelihood that ..... .

(A) a call is in progress

(B) a channels are busy

(C) a call is blocked

(D) a channel is free

47. Discretization of multipath delay axis of impulse response into equal time delay segments is called :

(A) Excess delay bins

(B) Delay bins

(C) Discrete bins

(D) Digital bins

48. In a microcell zone concept, when a mobile travels from one zone to another within the cell, it retains the same :

(A) Power level

(B) Base station

(C) Channel

(D) Receiver

49. Spread spectrum sounding provides :

(A) Low resolution

(B) High time resolution

(C) No fading

(D) Constant delay

50. Channel impulse response is obtained using :

(A) Pulse sounding

(B) Noise

(C) Frequency reuse

(D) Sectoring

51. Which of the following is a 4G technology ?

(A) GSM

(B) CDMA2000

(C) LTE

(D) GPRS

52. Bluetooth operates in which band ?

(A) 700 MHz

(B) 2.4 GHz

(C) 3.5 GHz

(D) 5 MHz

53. The maximum transceivers handled by BSS are :

(A) 4

(B) 8

(C) 16

(D) 32

54. Which multiple access technique is used in 2G GSM networks ?

(A) CDMA

(B) FDMA

(C) TDMA

(D) OFDMA

55. Edge excited hexagonal system has :

(A) Directional antenna

(B) Yagi uda antenna

(C) Omnidirectional antenna

(D) None of the above

56. The advantage of using frequency reuse is :

(A) Increased capacity

(B) Limited spectrum is required

(C) Both (A) and (B)

(D) None of the above

57. In a dynamic channel assignment strategy :

(A) Each cell is assigned a predefined set of frequencies

(B) The call is served by unused channels of cell

(C) The call get blocked if all the channels are occupied

(D) None of the above

58. Which duplexing technique is used in LTE ?

(A) FDD only

(B) TDD only

(C) Both FDD and TDD

(D) Neither FDD nor TDD

59. In the GSM network GPRS is a part present in :

(A) BTS

(B) BSS

(C) NSS

(D) HLR

60. Which of the following is NOT a propagation impairment ?

(A) Fading

(B) Interference

(C) Noise

(D) Multiplexing

61. Direct RF pulse system helps in calculating :

(A) Impulse response in frequency domain

(B) Impulse response in phase domain

(C) Power delay profile

(D) None of the above

62. DECT stands for :

(A) Digital European Cordless Telex

(B) Digitized Emergency Cellular Telephone

(C) Digital European Cordless Telephone

(D) Digital European Cellular Telephone

63. TMSI stands for :

(A) Temporary Mobile Service Industry

(B) Temporary Mobile Subscriber Identity

(C) Temporary Mobile Subscription Identification

(D) Temporary Mobile Service Identification

64. Which parameter determines the coverage area of a cell ?

(A) Antenna height and transmit power

(B) SIM card type

(C) Mobile brand

(D) Battery capacity

65. The 2G GSM technology uses a carrier separation of :

(A) 200 kHz

(B) 30 kHz

(C) 12 kHz

(D) 1.02 MHz

66. The main purpose of power control in CDMA systems is to :

(A) Increase interference

(B) Solve near-far problem

(C) Reduce bandwidth

(D) Increase cluster size

67. MAHO stands for :

(A) MSC assisted handoff
(B) Mobile assisted handoff
(C) Machine assisted handoff
(D) Man assisted handoff

68. The paging channel in GSM is used to :

(A) Send SMS
(B) Alert a mobile station of an incoming call
(C) Transfer voice data
(D) Authenticate users

69. Which protocol is used for mobility management in IP-based mobile networks ?

(A) HTTP
(B) FTP
(C) Mobile IP
(D) SMTP

70. Interference on voice channel causes :

(A) Crosstalk
(B) Blocked calls
(C) Queuing
(D) Missed calls

71. What is the cluster size for CDMA ?

(A) 10
(B) 100
(C) 1
(D) 7

72. In cellular systems, frequency reuse factor (N) is used to :

(A) Increase transmission power
(B) Determine cluster size
(C) Reduce antenna height
(D) Eliminate fading

73. Mobile assisted handoff MAHO provides :

(A) MSC need not to monitor the signal
(B) Faster handoff
(C) Suitability for handoff
(D) All of above

74. Which method of cellular network assists in minimizing the cochannel interference with angle of degree ?

(A) Cell splitting
(B) Cell sectoring
(C) Cell segmentation
(D) None of the above

75. The Doppler shift in mobile communication is caused by :

(A) Multipath fading
(B) Movement of transmitter or receiver
(C) High bandwidth
(D) Noise

76. Far field region is also known as :

(A) Near Far region

(B) Fraunhofer region

(C) Erleng region

(D) Fresnel region

77. When a wave falls on a perfect dielectric :

(A) Wave is partially reflected and perfectly refracted

(B) All energy is reflected back without loss of energy

(C) Part of energy get absorbed

(D) None of the above

78. The signal-to-noise ratio (SNR) is measured in :

(A) Watts

(B) Hertz

(C) Decibel (db)

(D) Seconds

79. Calculate the brewster angle for permittivity of 4.

(A) 56.26

(B) 46.26

(C) 36.26

(D) 26.26

80. Knife edge diffraction model is used when signal encounters :

(A) Smooth surface

(B) Sharp obstacle

(C) Flat terrain

(D) Rain

81. Why the shape of cell is not a circle ?

(A) Omni directionality

(B) Small area

(C) Gaps are left

(D) Complex design

82. In free space model, if distance between T_X and R_X is doubled, path loss becomes :

(A) Same

(B) Half

(C) Four times

(D) One fourth

83. Capacity of a cellular system is directly proportional to :

(A) Number of cells

(B) Number of times cell is replicated

(C) Number of base stations

(D) Number of users

84. Which model is best suited for urban cellular environment ?

(A) Free space model
(B) Knife edge
(C) Log normal shadowing
(D) Vacuum model

85. Path loss exponent (n) in urban area is approximately :

(A) 1
(B) 2
(C) 3 to 5
(D) 10

86. Fresnel zone clearance is important to reduce :

(A) Reflection loss
(B) Diffraction loss
(C) Thermal loss
(D) Atmospheric loss

87. Working of Adaptive Equalizer include :

(A) Training
(B) Tracking
(C) Modulation
(D) Both (A) and (B)

88. Which of the following is not a channel parameter ?

(A) Bandwidth
(B) Coherence time
(C) Rms delay spread
(D) Doppler spread

89. Flat fading channel is also known as :

(A) Amplitude varying channel
(B) Wideband channel
(C) Phase varying channel
(D) Frequency varying channel

90. If coherence time of the channel is more than the symbol period of the transmitted signal, it is :

(A) Fast fading
(B) Slow fading
(C) Frequency selective fading
(D) Frequency non selective fading

91. Rapid fluctuations of signal strength over short time duration is called :

(A) Slow fading
(B) Fast fading
(C) Shadowing
(D) Interference

92. Time dispersion in multipath channel leads to :

(A) Frequency modulation
(B) Inter Symbol Interference (ISI)
(C) Phase shift
(D) Noise

93. Level crossing rate is a function of :

(A) Transmitted power

(B) Power density of receiver

(C) Mobile speed

(D) None of the above

94. Fast fading occurs when :

(A) Doppler spread is small

(B) Doppler spread is large

(C) Delay spread is zero

(D) Frequency is constant

95. Doppler shift refers to :

(A) Change in received signal frequency

(B) Temporary failure of message transfer

(C) Large coherence time of the channel as compared to the delay constraints

(D) None of the above

96. The rapid fluctuations due to small scale fading affect the..... design

(A) Transmitter

(B) Receiver

(C) MSC

(D) BSC

97. A mobile user is moving with a speed of 60 km/hr towards the base station. If the carrier frequency is 900 MHz, calculate the maximum Doppler shift.

(A) 50.5 Hz

(B) 56.5 Hz

(C) 24.5 Hz

(D) 70.5 Hz

98. The signal bandwidth of a communication system is 100 kHz and the coherence bandwidth is 200 kHz. Determine the type of fading.

(A) Flat Fading

(B) Fast Fading

(C) Slow Fading

(D) Frequency Selective Fading

99. Why spread spectrum technique is inefficient for a single user ?

(A) Large transmission bandwidth

(B) Small transmission bandwidth

(C) Fixed transmission bandwidth

(D) Fixed null bandwidth

100. In CDMA, multiple users share the same :

(A) Frequency band

(B) Time slot

(C) Code

(D) Both frequency and time simultaneously

(Only for Rough Work)

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

Q. 1 (A) ● (C) (D)
Q. 2 (A) (B) ● (D)
Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. : On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)
प्रश्न 2 (A) (B) ● (D)
प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण : प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।