M. Sc. (Electronics) (Fourth Semester)

EXAMINATION, July, 2022

WIRELESS & MOBILE COMMUNICATION

Time : 1:30 Hours]　　　　　　　　　　　　[*Maximum Marks : 100*

Instructions to the Examinee :

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

2.　The booklet contains 60 questions. Examinee is required to answer any 50 questions in the OMR Answer-Sheet provided and not in the question booklet. If more than 50 questions are attempted by student, then the first attempted 50 questions will be considered for evaluation. 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 60 प्रश्न हैं। परीक्षार्थी को किन्हीं 50 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। यदि छात्र द्वारा 50 से अधिक प्रश्नों को हल किया जाता है तो प्रारम्भिक हल किये हुए 50 उत्तरों को ही मूल्यांकन हेतु सम्मिलित किया जाएगा। 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. SDMA technique employs :

   (A) Smart antenna technology

   (B) Use of spatial locations of mobile units in same cell

   (C) More consumption of battery

   (D) Both (A) and (B)

2. Paging systems were based on :

   (A) Simplex

   (B) Half duplex

   (C) Full duplex

   (D) None of the above

3. Fading is caused due to :

   (A) Multipath propagation

   (B) Obstacles

   (C) Variation in amplitude and phase at receiver

   (D) All of the above

4. EIRP is :

   (A) Effective isotropic radiated power

   (B) A factor of power and gain of transmitter

   (C) Maximum radiated power by transmitter

   (D) None of the above

5. PN sequence at the decoder acts as a locally generated carrier at the receiver and decodes the signal using :

   (A) Correlator

   (B) Adder

   (C) Frequency divider

   (D) PLL

6. The digital modulation technique used in frequency selective channels is :

   (A) BPSK

   (B) ASK

   (C) FSK

   (D) QPSK

7. Working of adaptive equalizer include :

   (A) Training

   (B) Tracking

   (C) Modulation

   (D) Both (A) and (B)

8. The techniques used for small scale multipath measurements are :

   (A) Direct RF pulse system

   (B) Sliding correlator

   (C) Frequency domain

   (D) All of the above

9. In spread spectrum technique, the multiple users are assigned with :

   (A) Same spectrum and same PN code

   (B) Different spectrum and different PN code

   (C) Same spectrum and different PN code

   (D) Different spectrum and same PN code

10. If coherence time of the channel is smaller 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

11. Diversity employs the decision-making at :

    (A) Transmitter

    (B) Receiver

    (C) Transmitter and receiver

    (D) Channel

12. The diversity schemes are based on :

    (A) Time diversity

    (B) Frequency diversity

    (C) Space diversity

    (D) All of the above

13. Advantage of using spread spectrum modulation is/are :

    (A) Interference rejection capability

    (B) Frequency planning is required

    (C) Resistance to multipath fading

    (D) None of the above

14. According to Friis free space equation :

    (A) Received power falls with square of the distance between the transmitter and receiver

    (B) Increases with square of the distance between the transmitter and receiver

    (C) Received power increases with gains of transmitting and receiving antennas

    (D) All of the above

15. Doppler spread refers to :

    (A) Signal fading due to Doppler shift in the channel

    (B) Temporary failure of message transfer

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

    (D) None of the above

16. Traffic intensity is expressed in :

(A) Erlangs/MHz/km^2

(B) Erlangs

(C) λ/sec

(D) dB/sec

17. Increase in co-channel reuse ratio indicates :

(A) Better transmission quality

(B) Low co-channel interference

(C) Both (A) and (B)

(D) None of the above

18. Interference in frequency bands may lead to :

(A) Missed calls

(B) Blocked calls

(C) Cross talk

(D) All of the above

19. Umbrella cell approach :

(A) uses large and small cells.

(B) uses different antenna heights.

(C) is used for high speed users with large coverage area and low speed users with small coverage area.

(D) All of the above

20. When all of the radio channels are in use in a trunking system ?

(A) The user is blocked.

(B) The access to the system is denied.

(C) The queue may be provided.

(D) All of the above

21. In a fixed channel assignment strategy, if all the assigned channels are occupied, the call :

(A) gets transferred to another cell.

(B) gets blocked.

(C) is kept on waiting.

(D) All of the above

22. The interference between the neighboring base stations is avoided by :

(A) Assigning different groups of channels

(B) Using transmitters with different power levels

(C) Using different antennas

(D) All of the above

23. Which two channels are responsible for initiating mobile calls ?

    (A) FCC, RCC

    (B) FCC, RVC

    (C) FVC, RVC

    (D) RCC, FVC

24. Which of the following problem occur due to adjacent channel interference ?

    (A) Cross talk

    (B) Blocked call

    (C) Dropped call

    (D) Near far problem

25. Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places ?

    (A) Splitting

    (B) Sectoring

    (C) Microcell zoning

    (D) None of the above

26. What is the dimension of object as compared to wavelength of propagating wave when reflection occurs ?

    (A) Small

    (B) Same

    (C) Very small

    (D) Large

27. Which of the following is not a practical path loss estimation technique ?

    (A) Hata model

    (B) Log normal shadowing

    (C) Log distance path loss model

    (D) None of the above

28. What is the main disadvantage of RF pulse system ?

    (A) Simplicity

    (B) Interference and noise

    (C) Not real time

    (D) Complexity

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

    (A) R. M. S. delay spread

    (B) Doppler spread

    (C) Excess delay

    (D) Bandwidth

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

    (A) Hop

    (B) Hop set

    (C) Symbols

    (D) Chips

31. Half duplex communication system has :

    (A) Communication in single direction

    (B) Communication in both the directions

    (C) Communication in single directions at a time

    (D) All of the above

32. The process of transferring mobile station from one base station to other :

    (A) MSC

    (B) roamer

    (C) handoff

    (D) None of the above

33. 2G standard support :

    (A) Limited internet browsing

    (B) Short messaging service

    (C) Both (A) and (B)

    (D) None of the above

34. Commonly used method for 3G is :

    (A) TDMA

    (B) FDMA

    (C) TDD

    (D) FDD

35. Centre excited hexagonal system has :

    (A) Directional antenna

    (B) Yagi-Uda antenna

    (C) Omnidirectional antenna

    (D) None of the above

36. 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

37. In a fixed channel assignment strategy :

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

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

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

    (D) All of the above

38. The power delay profile helps in determining :

    (A) excess delay

    (B) mean delay

    (C) r. m. s. delay spread

    (D) All of the above

39. Coherence bandwidth is :

 (A) Channel that passes all spectral components with equal gain

 (B) Bandwidth of modulated signal

 (C) Channel that passes all spectral components with linear phase

 (D) Both (A) and (B)

40. The received signal from multipath channel is expressed as :

 (A) Convolution of transmitted signal and impulse response

 (B) Addition of transmitted signal and impulse response

 (C) Substraction of transmitted signal and impulse response

 (D) None of the above

41. 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

42. DECT stands for :

 (A) Digital European Cordless Telex

 (B) Digitized Emergency Cellular Telephone

 (C) Digital European Cordless Telephone

 (D) Digital European Cellular Telephone

43. MIN stands for :

 (A) Mobile identification number

 (B) Mobile internet network

 (C) Mobility in network

 (D) Mobile integral network

44. PCN is :

 (A) Wireless concept of making calls

 (B) Receiving calls

 (C) Irrespective of user location

 (D) All of the above

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

 (A) 200 kHz

 (B) 30 kHz

 (C) 12 kHz

 (D) 1.02 MHz

46. The shape of cell for maximum coverage is :

(A) Circular

(B) Hexagonal

(C) Oval

(D) Triangular

47. The strategies acquired for channel assignment are :

(A) Static

(B) Dynamic

(C) Regular

(D) Both (A) and (B)

48. Delay in handoff caused due to :

(A) Weak signal condition

(B) High traffic condition

(C) Unavailability of channel

(D) All of the above

49. While handoff, termination of cell can be avoided by :

(A) Providing guard channel

(B) Queuing of handoffs

(C) Both (A) and (B)

(D) None of the above

50. GSM is an example of :

(A) Wideband TDMA

(B) Narrowband TDMA

(C) FDMA

(D) CDMA

51. Global positioning system uses :

(A) TDMA

(B) FDMA

(C) CDMA

(D) SDMA

52. Dwell time is the time for :

(A) A cell within the cell

(B) Handoff

(C) Waiting for channel allocation

(D) None of the above

53. Mobile Assisted Handoff (MAHO) provides :

(A) MSC need not to monitor the signal

(B) Faster handoff

(C) Suitability for handoff

(D) All of the above

54. When all of the channels are is use in trunking system ?

(A) Call will be blocked.

(B) Access to system is denied.

(C) A queue may be provided.

(D) All of the above

55. Co-channel reuse ratio depends on :

(A) Radius of the cell

(B) Reuse distance

(C) Frequency allocation of nearest cell

(D) Both (A) and (B)

56. Brewster angle is the angle at which :

(A) No reflection occurs at the first medium

(B) Reflection coefficient is zero

(C) The wave get refracted in the direction of source

(D) Both (A) and (B)

57. When a wave falls on a perfect conductor :

(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

58. The technique used to improve capacity :

(A) Splitting

(B) Sectoring

(C) Microcell zoning

(D) All of the above

59. Interference in cellular system caused by :

(A) Two base stations operating in same frequency band

(B) Two calls progresses in nearby mobile stations

(C) Leakage of non-cellular service in cellular frequency band

(D) All of the above

60. Packet radio refers to :

(A) Multiple users on single channel

(B) Single user on multiple bands

(C) Multiple users on multiple channels in different time slots

(D) None of the above

(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 most correct/appropriate answer and mark the same in the OMR Answer-Sheet as per the direction :

Example :

Question :

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

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 ny 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 एक सबसे सही अथवा सबसे उपयुक्त उत्तर छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

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

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।