

KATHMANDU UNIVERSITY  
End Semester Examination  
February/March, 2019

Marks Scored:

Level : B. E.

Year : IV

Exam Roll No. :

Time: 30 mins.

Course : ETEG 429

Semester: I

F. M. : 10

Registration No.:

Date 05 MAR 2019

SECTION "A"

[20 Q × 0.5 = 10 marks]

Choose the most appropriate option.

- Cellular Mobile Communication started in Nepal from year ..... with the launching of GSM Mobile Service.  
a. 2055                      b. 2056                      c. 2057                      d. 2058
- A brief message which is broadcast over entire service area usually in simulcast fashion by base stations at the same time is called .....  
a. broadcast message                      b. simulcast message  
c. page message                      d. handoff message
- Among the following, most disadvantageous multiplexing technique during uneven traffic distribution is.....  
a. TDM                      b. FDM  
c. Hybrid TDM/FDM                      d. CDM
- High powered non-cellular mobile system was characterized with  
a. good coverage, good capacity                      b. limited coverage, limited capacity  
c. good coverage, limited capacity                      d. limited coverage, good capacity
- If 10 MHz of bandwidth is allocated to FDD cellular system that uses 100 KHz channel, the number of channels available per cell when cluster size is 4 equals to  
a. 10                      b. 25                      c. 50                      d. 100
- Situation when handoff is not made properly due to slow decay of signal strength is known as  
a. cell dragging                      b. cell breathing                      c. improper handoff                      d. edge handoff
- When the size of the cell is approximately the same and the BSs transmit the same power, the relation between D and R becomes....., where N is cluster size.  
a.  $D = \sqrt{R3N}$                       b.  $D = 3\sqrt{RN}$                       c.  $D = R\sqrt{3N}$                       d.  $D = \sqrt{3RN}$
- In cellular communication, interference to neighboring cell is reduced by  
a. cell sectoring                      b. cell splitting                      c. antenna tilting                      d. impedance
- GSM transmitter power control has the purpose of limiting the transmitted power of .....  
a. MS                      b. BTS  
c. Neighboring BTS                      d. MSs in neighboring cell

10. In 3G, following access technology is used  
 a. EDGE                      b. HSDPA                      c. WCDMA                      d. OFDMA
11. GERAN stands for.....  
 a. Green Energy Radio Access Network    b. Global Evolution Radio Access Network  
 c. GSM European Radio Access Network    d. GSM EDGE Radio Access Network
12. GSM component that provides encryption parameter is .....  
 a. HLR                      b. VLR                      c. EIR                      d. AUC
13. GPRS is sometimes referred as  
 a. 2G                      b. 2.25G                      c. 2.5G                      d. 2.75G
14. Low mobility 4G users should be able to achieve the speed of  
 a. 1 Mbps                      b. 10 Mbps                      c. 100 Mbps                      d. 1 Gbps
15. Every SIM can be protected by a Personal Identification Number (PIN) which allows .... attempts before the phone is blocked.  
 a. 2                      b. 3                      c. 4                      d. 10
16. ....is the data base of the IMEI numbers of handsets which is not supposed to work on member service providers' network.  
 a. CEIR                      b. EIR                      c. BEIR                      d. GEIR
17. In "Li-Fi", which of the following means is used to provide internet access?  
 a. Radio waves suspended in spectrum    b. Visible spectrum of light  
 c. Infrared waves                      d. Ultra violet wave
18. Bluetooth and Ad-Hoc sensor networks are example of .....generation Ad-Hoc Network.  
 a. 1<sup>st</sup>                      b. 2<sup>nd</sup>                      c. 3<sup>rd</sup>                      d. 4<sup>th</sup>
19. WiMax network refers to broadband wireless network are based on .....standard.  
 a. IEEE 802.11                      b. IEEE 802.15                      c. IEEE 802.16                      d. IEEE 802.21
20. The term IoT was first coined by Kevin Ashton in  
 a. 1999                      b. 2000                      c. 2001                      d. 2002

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F. M. : 40

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SECTION "B"  
[8Q × 5 = 40 marks]

Attempt *ALL* questions.

1. a. On what manner FDD is different than TDD, explain. [2]  
b. In terms of (i) mobility, (ii) coverage, and (iii) special services; compare cordless telephone system with that of cellular mobile communication system. [3]
2. a. Present at least three advantages of using UHF range of spectrum for mobile radio communication. [3]  
b. For cluster size of  $N=12$ , draw and show six co-channel neighbors cell if we assume a cell at the center is using a set of channel represented as "A". [2]
3. a. Briefly explain the following terms: [5]  
i. Handoff  
ii. Umbrella cell concept  
iii. Cell dragging  
iv. Cell breathing  
v. Roaming
4. a. Write advantages and disadvantages of "Dynamic Channel Assignment" technique used in cellular mobile communication. [2]  
b. Assume that Kathmandu University IV year communication engineering students are hosting big event with international concert where thousands of people are expected to gather for evening. In such scenario, if you are telecom engineer, what measures will you recommend if you want to provide voice service with pre-defined Grade of Service (GoS) to the visitors? [3]
5. a. GSM and CDMA are competing wireless technologies with GSM enjoying more market share globally; now present your own view on why the former one is getting much popularity in comparison to later? [3]  
b. What are major functions of AuC and EIR in GSM network? [2]
6. a. List down the roles of RR, MM, and CM, respectively, in Layer 3 of GSM protocol suite. [3]  
b. Why SMS is preferred over voice communication during time of disaster in 2G networks? [2]
7. a. What were the drawbacks of 3G network that lead to the development of 4G networks and then explain how the 4G network addressed those issues? [3]  
b. Compare HSCSD with HSPA technology. [2]
8. a. What do you mean by RNC in UMTS radio access network, write down its function in brief. [3]  
b. Envision the applications, requirements, and developments necessary for successful deployment of IoT in context of Nepal. [2]

