

Sample Test Paper - I

Course Name : Diploma in Electronics and Video Engineering

Course Code : EV / EQ

Semester : Sixth

Subject Title : Optical Fiber and Mobile Communication

Marks : 25

17669

Time: 1 Hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE

9 Marks

- (a) Draw neat sketch of the following terms and define them with respect to Optical Fiber.
 - (i) Critical angle
 - (ii) Numerical Aperture
 - (iii) Diffraction
- (b) State any six characteristics of fiber optic cable.
- (c) Define mobile base station and mobile control station.
- (d) Draw well labelled block diagram of paging system and give the function of each block.

Q2. Attempt any TWO

8 Marks

- (a) Draw well labelled block diagram of fiber optic communication system. Describe the function of optical source and optical detector.
- (b) State the need of strengthening material in construction of optic fiber cable. Also, draw well labeled structure of optic fiber cable.
- (c) Justify the necessity of frequency synthesizer in mobile unit with diagram.

Q3. Attempt any TWO

8 Marks

- (a) Draw block diagram of control unit with mobile hand set and write its operation.
- (b) List any four losses occur in optical fiber. State the reason for any one loss with essential diagram or waveform.
- (c) Compare LED and LASER optical sources on the basis of :
 - (i) Output power
 - (ii) Bandwidth
 - (iii) Spectral width
 - (iv) Suitable as s source for Fiber type.

Sample Test Paper - II

Course Name : Diploma in Electronics and Video Engineering

Course Code : EV / EQ

Semester : Sixth

Subject Title : Optical Fiber and Mobile Communication

Marks : 25

17669

Time: 1 Hour

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE

9 Marks

- (a) Describe the concept of frequency reuse in cellular communication with the help of neat diagram.
- (b) State any six GSM air interface parameters with their specifications.
- (c) Draw architecture of UMTS and write function of Radio Network Controller.
- (d) Draw regular hexagonal cell geometry showing co-channel and adjacent channel. List methods to reduce co-channel interference.

Q2. Attempt any TWO

8 Marks

- (a) Draw IS-95 architecture and state the function of PLMN and DMH in it.
- (b) State any four features of
 - (i) High speed circuit switched data (HSCSD)
 - (ii) General packet radio switching (GPRS)
- (c) Define hand-off in cellular communication. Describe what happens in
 - (i) Improper hand-off situation
 - (ii) Proper hand-off situation.

Q3. Attempt any TWO

8 Marks

- (a) Describe the working of local multipoint distribution system (LMDS). State any four applications of it.
- (b) State the function of following in GSM architecture.
 - (i) HLR
 - (ii) AC or AUC
 - (iii) EIR
 - (iv) MSC
- (c) State methods of improving coverage and capacity in cellular system. Draw any one method with proper diagram.

Scheme – G

Sample Question Paper

Course Name : Diploma in Electronics and Video Engineering

Course Code : EV / EQ

Semester : Sixth

Subject Title : Optical Fiber and Mobile Communication

Marks : 100

17669

Time: 3 Hours

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. A) Attempt any THREE

12 Marks

- a) Justify with four points, how fiber optic communication system is better than other wired communication system.
- b) Draw the schematic of fiber optic communication system and describe the function optical sensor and detector.
- c) Draw well labelled simplified eye pattern of optical fiber. Define noise margin and timing jitter related to it.
- d) Define mobile base station and mobile control station.

Q1. B) Attempt any ONE

06 Marks

- a) Define the following with well labeled diagram:
 - i) Acceptance angle
 - ii) Critical Angle
 - iii) Numerical Aperture
- b) Draw well labeled block diagram of cordless phone. How it is different from cellular phone.

Q2. Attempt any FOUR

16 Marks

- a) Name the device which is used for fault finding in fiber optic cable. Describe its working principle with neat labelled diagram.
- b) Give reason for the cause of the intermodal dispersion loss in optical fibre. Also describe the effect of intermodal dispersion in optical fibre.
- c) If the call is initiated by Aman from his land line number to his friend Sunita on her mobile handset. How does the call processing takes place on forward and reverse control and voice channel.
- d) Name the method by which the disadvantage of cell sectoring has been removed? Describe the method with neat diagram.

- e) Compute the dispersion per kilometre of length and total dispersion in a 10 km length of step index fibre from the following data:
Refractive index of core = 1.55, $\Delta = 0.026$.

Q3. Attempt any TWO

16 Marks

- a) Describe briefly the following types of losses in fiber optic cable :
i) Absorption losses ii) Scattering losses
- b) i) List different parts of mobile handset. Also give four features of mobile handset.
ii) Give the significance of logic unit and control unit in mobile handset.
- c) i) Draw the frequency reuse pattern with cluster size 7 and 12.
iii) Determine the frequency reuse ratio for a cell radius of 0.8 km separated from the nearest co-channel cell by a distance of 6.4km.

Q4. A) Attempt any THREE

12 Marks

- a) Define co-channel interference. How does co-channel interference becomes a serious concern in the design of cellular mobile system?
- b) Compare GSM system with IS-95 CDMA system with respect to Hand-off, data rate, channel bandwidth, access method.
- c) With neat sketch explain the working principle of PIN photo diode.
- d) Draw schematic of LASER and describe it's working principle with transition process involved in LASER process.

Q4. B) Attempt any ONE

06 Marks

- a) Draw GSM protocol model and illustrate the function of networking layer.
- b) Elaborate compatibility requirements of IMT2000 with other existing systems.

Q5. Attempt any TWO

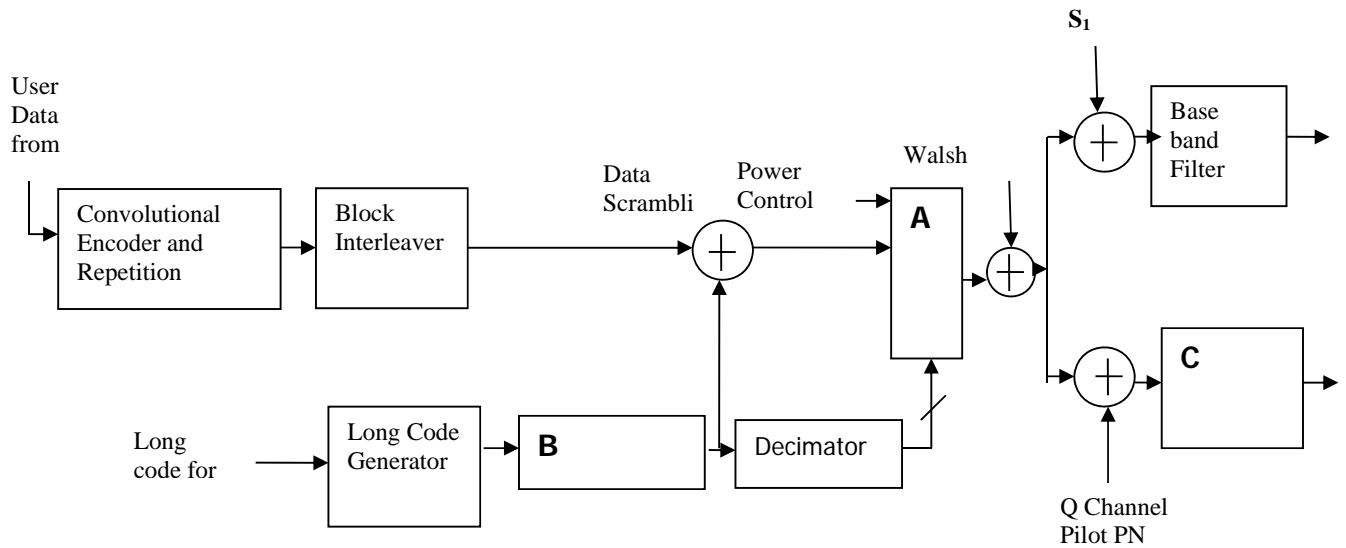
16 Marks

- a) Describe any eight attributes of 3G WCDMA cellular system.
- b) Compare WCDMA with CDMA2000 on the basis of following parameters:
i) Multiple access technique ii) chip rate iii) modulation scheme
iv) frame length v) pilot structure vi) Spreading modulation
vii) scrambling codes viii) channelization code
- c) Justify, why Hands-off implemented on voice channel not on control channel? Illustrate two peculiar situations where hand-offs are necessary but cannot be made.

Q6. Attempt any FOUR

(16 Marks)

- a) Differentiate tele-services and data services in IS-95 system.
- b) Identify the given diagram; Give the name of A,B,C and S_1 . Write the function block B and C.



- c) Define EDGE technology related to GSM system.
- d) State any 4 GSM radio parameters with specifications.
- e) Describe briefly the parameters of connector for connecting optical fiber cables.

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