EC6501-DIGITAL COMMUNICATION

TWO MARK QUESTION WITH ANSWER

UNIT I SAMPLING & QUANTIZATION

PART–A

1. Giveanexamplefortimelimitedandtimeunlimitedsignals.[MAY2011]
2. Givetheadvantagesanddisadvantagesofdigitalcommunication[May2011]
3. Whichparameteriscalledfigureofmeritofadigitalcommunicationsystemandwhy? [NOV2010]
4. Whatismeantbydistortionlesstransmission? [NOV2010]
5. DefineBER
6. WhataretheadvantagesofPAM?
7. Whatismeantbybasisset?
8. Whatistheconditionfororthogonal?
9. Definenoiseequivalentbandwidth
10. StateDimensionalitytheorem
11. WhatisGSOP?
12. Writetheexpressionforbandwidthofdigitalsignal.
13. WritetheexpressionforLinearfilterchannel.

1. ExplainhowPWMandPPMsignalsaregenerated.(16) [MAY2011]
2. Classifychannels.Explainthemathematicalmodelofanytwocommunicationchannels(16)[MAY2011]
3. Drawaneatblockdiagramofatypicaldigitalcommunicationsystemandexplainthe functionofthekeysignalprocessingblocks.(16) [NOV2010]
4. Distinguishbetweenbasebandandbandpasssignaling.(6)
5. ExplainBinarysymmetricchannelandGaussianchannelwith theirmathematicalmodels.(10) [NOV2010]
6. DeriveGeometricalrepresentationofsignal.(8)
7. Explaintheprocedureforobtainingfromthebasisset.(8)
8. Explainthemathematicalmodelsofcommunicationchannel
9. ExplaintheconceptofPWMandPAM
10. Obtaintheorthonormalbasisfunctionforthesetofwaveformsusing GSOP

UNIT II WAVEFORM CODING
PART-A

1. Statesamplingtheorem. [MAY2011]
2. Whatisquantizationerror [MAY2011]
3. Whyisprefilteringdonebeforesampling? [NOV2010]
4. Definequantizationnoisepower [NOV2010]
5. Statesamplingtheorem. (MAY/JUN2006/MAY/JUN2007,APR/MAY2008,NOV2008)
6. Whatarethelimitationsofdeltamodulation? (APR/MAY2004,MAY/JUNE2009)
7. hatshouldbethepassbandforantialiasingandsmoothingfiltersusedwithpulsemodulation/demodulationsystems? (NOV/DEC2004)
8. WhycompressorsareusedinPCM? (NOV/DEC2004)
9. Whatistheinterpolatorypropertyforsincfunction? (APR/MAY2005)
10. Drawtheblockdiagramoftransmitterandreceiversectionsof DPCM. (APR/MAY2005,MAY/JUNE2009)
11. Whatdoyouunderstandbythetermaliasing? (NOV/DEC2005)
12. Abandpasssignalhasthe spectralrangethatextendsfrom20kHzto 82kHz.Findtheacceptablerangeofsamplingfrequencyfs. (NOV/DEC2005)
13. WhatistheSNRofPCMsystemifnumberofquantizationlevelsis2^8? (MAY/JUN2006)
14. Statebandpasssamplingtheorem (MAY/JUNE2006)
15. Definequantisationerror. (MAY/JUNE2007,NOV/DEC2008)
16.)
17. Asignalx(t)=5cos(1000Πt)issampledandquantizedusing8bitPCMsystem.Findthesignaltoquantizationnoiseratio (NOV/DEC2007)
18. StatetheprincipleofDPCM (APR/MAY2008)
19. Plotthemagnitudespectrumoftheideallysampledversionofthesignal M(t)=2cos(200Πt)+40sin(290Πt).Assumethatthesamplingrateis1KHz. (APR/MAY2008)
20. Definepulsepositionmodulationschemewithasuitablediagram.
21. DifferentiateNoiseandfading. (NOV/DEC2008)
22. Ananalogsignalisquantizedandtransmittedbyusing a PCMsystem.Ifeachsampleatthereceivingendofthesystemmustbeknowntowithin±0.5%ofthepeaktopeakfullscalevalue.Howmanydigitsmusteachsamplecontain (NOV/DEC2008)
23. Definequantisationnoise. (NOV/DEC2008)
24. Statesamplingtheoremforlowpasssignals. (MAY/JUNE2009)
25. Whatarethedrawbacksofdeltamodulation. (MAY/JUNE2009)

1. Explainauniformquantizationprocess(8). [MAY2011]
2. Writenoteontemporalwaveformcoding(8) [MAY2010]
3. Explainaspectralwaveformencodingprocess(8) [MAY2011]
4. Comparevariousspeechesencodingmethod(8) [MAY2011]
5. Statethenyquistsamplingtheorem.Demonstrateitsvalidityforananalogsignal

havingfouriertransformx(f)whichiszerooutsidetheinterval[Kfm<f<+fm][DEC2010]

6. ExplainindetailthevarioussourcecodinggeneratingwidebandFMwithneatblockdiagram.
7. Whatismeantbycompander?Whatarethetwotypesofcompression?(APR/MAY2004,8MARKS)
8. ExplaintheframeformatandsignalingschemeusedinT1carriersystem.(APR/MAY2004,8MARKS)
9. DrawtheblockdiagramofdifferentialPCMandexplainthefunctionperformedbyeachblock. (NOV/DEC2004,8MARKS)
10. WhatismeantbyslopeoverloaddistortioninDM?Whatistheconditiontobesatisfiedtoavoidthissituation? (NOV/DEC2004,8MARKS)
11. Withneatblockdiagram,explainindetailaboutdeltamodulationandthetypesofquantizationerrorsoccurringinit. (APR/MAY2005,12MARKS)
12. Withnecessarysketchesandexpressions,brieflyexplainaboutflattopsampling.(APR/MAY2005,8MARKS)
13. WithsupportingderivationprovethatifasignalcontainsnofrequencieshigherthanWhertz,itmaybereconstructedfromitssamplesatasequenceofpointsspaced1/2Wsecondsapart. (APR/MAY2005;MAY/JUN2006,8MARKS)
14. DeriveexpressionsforthequantizationnoiseandsignaltonoiseratioinaPCMsystemusinguniformquantizer. (NOV/DEC2005,10MARKS)
15. AsinusoidalsignalistransmittedusingPCM.AnoutputSNRof55.8dBisrequired.Findthenumberofrepresentationlevelsrequiredtoachievethisperformance.(NOV/DEC2005,6MARKS)
16. DerivetheexpressionforSNRinPCMsystemandcompareitwithdeltamodulation.ExplainhowSNRcanbeimprovedinaPCMsystem. (MAY/JUN2006,10MARKS)
17. Showthatpredicationerrorvarianceislessthanthevarianceofthepredicatorinputforpredictioroforder1 (MAY/JUNE20066MARKS)
18. Explaintheprincipleofdeltamodulationandderiveanexpressionforaverageoutputnoisepowerindeltamodulation. (MAY/JUN2006,8MARKS)
19. Explaintheprocessofquantisation,encodinganddecodinginPCM?InwhatwayDPCMisbetterthanPCM? (MAY/JUNE2007)

20. Explainuniformandnonuniformquantisation (4marksKAPR/MAY2008)
21. WritenotesonTDMA (APR/MAY2008)
22. (i)GivetheblockdiagramofdifferentialpulseCodeModulationSchemeandexplaintheprinciplesindetail (APR/MAY20089Marks)
    a. (ii)ObtainanexpressionfortheprocessinggainofaDPCMsystem (APR/MAY20084MARKS)
    b. (iii)SupposeanexestingstandardPCMsystem forvoicesignalisreplacedbyaDPCMofprocessinggain6dB,whilemaintainingthe(SNR)Q/What willbethereductioninthebitrateachievedbyDPCM?(APR/MAY20083MARKS)

23. (i)Forauniformquantizer,discussthewayinwhichthenumberofquantizationlevels(L)
    a. (ii)DiscusstheneedforNonKuniformquantizationosspeechsignal (APR/MAY20082 MARKS)
    b. (iii)Outlinetheprinciplesofcompanderusedforspeechsignal. (APR/MAY20084

MARKS)

c. (iv)GivethebitrateofaDeltamodulatorfedsamplesatarateof40ksamples/sec.(APR/MAY 20082MARKS)
d. (v)HowdoesadaptivedeltamodulationhelpinalleviatingtheproblemsassociatedwithDeltamodulationScheme

24. ObtainanexpressionfortheprocessinggainofaDPCM (NOV/DEC2007)
25. HowdoesADMallevatesproblemsassociatedwithDM (NOV/DEC2007)
26. Withneatdiagram,explainthedetectionofPWMsignals.(8) (NOV/DEC2007)
27. Explainthetwotypesofquantizationnoiseindeltamodulationsystem.(8)(NOV/DEC2007)
28. Drawtheblockdiagramandexplaintheprocessofa PCMsystemindetail.
i. (NOV/DEC2008K10Marks)
29. ComparetheprinciplesofDeltaandadaptivedeltamodulationsystems.
i. (NOV/DEC2008K6Marks)
30. Ananalogvoltagewaveformhavinganabsolutebandwidthof100Hzandanamplituderangeof–10Vo+10VistobetransmiedoveraPCMsystemwith± 0.1%accuracy(fullscale).
31. Determinetheminimumsamplingrateneeded.(4)
32. Determinethenumberofbitsneededineach PCMword.(4)
33. DeterminetheminimumbitraterequiredinthePCMsignal.(4)
34. Determinetheminimumabsolutechannelbandwidthrequiredfortransmissionofthis PCMsignal.(4) (NOV/DEC2008)
35. (i)DiscusstheprincipleofAdaptiveDeltamodulationindetail. (10)
(ii)Giveanaccountoftheadvantagesandlimitationsof PCM. (6) (MAY/JUNE2009)
36. (i)Describetheconceptofdigitalmultiplexinganddemultiplexing(8)
(ii)ExplainhowPCMisinfluencedbynoisesources. (8) (MAY/JUNE2009)
37. (i)A PCMsystemusesauniformquantizerfollowedbya7bitbinaryencoder.Thebitrateofthesystemisequalto50×10^6bitspersecond.

(1) Whatisthemaximumbandwidthforwhichthesystemoperates
(2) satisfactorily?
(3) Determinetheoutputsignaltoquantizingnoiseratiowhenafull–load
(4) Sinusoidalmodulatingwaveoffrequency1MHzisappliedtotheoutput .(8)

38. Withneatdiagramandnecessaryequations,explaintheconceptofsamplingandreconstructionofsignals.(8)(MAY/JUNE2009)
39. ExplaintheprincipleofDeltamodulationandderiveandexpressionforthermalnoisein deltamodulation.(8)
40. WhatistheneedforcompandinginPCM?Drawthetransfercharacteristicsofacompanding system.(4)
41. Withaneatdiagram,explaintheprincipleofTDMA(4)(MAY/JUNE2009)

UNIT III BASEBAND TRANSMISSION

1. Definehammingdistance. (MAY2011)
2. Whatismeantbytransparencywithrespecttolinecodes (MAY2011)
3. Definehammingdistanceandcalculateitsvaluefortwocodewords11100and11011 (NOV2010)
4. DrawtheNRZandRZcodeforthedigitaldata10110001 (NOV2010)
5. Whatismeantbysyndromeoflinearblockcode? (APR/MAY2004)
6. Howisthesyndromecomputedforblockcodes? (NOV/DEC2004)
7. Drawthediagramofaconvolutionalencoderofrate½withgeneratorpolynomial: $g^{(1)}(D)=1+D+D^2$ and $g^{(2)}(D)=1$. (NOV/DEC2004)
8. WhatdoesmeantbyRScoding? (APR/MAY2005)
9. Whatisconvolutionalcode? (APR/MAY2005;MAY/JUN2006)
10. Explainthefundamentaldifferencebetweenblockcodesandconvolutionalcodes. (NOV/DEC2005,MAY/JUNE2009))
11. Howwillyoudefinecodinggainwithreferencetoerrorcontrolcodes? (NOV/DEC2005)
12. WhatismeantbyBCHcode? (MAY/JUN2006,NOV/DEC2007)
13. Listtheadvantagesofturbocodes. (MAY/JUN2007)
14. Defineminimumdistance. (MAY/JUN2007)
15. GivethespecialfeaturesofTrelliscode (NOV/DEC2007)
16. Definelinearblockcode. (NOV/DEC2007)
17. Whatismeantbyconstraintlengthofconvolutionalcode? (NOV/DEC2007)
18. Write4featuresoflinearblockcodes (APR/MAY2008)
15. DefineHammingdistanceofablockcode. (NOV/DEC2008)
16. ShowthatthecodeC={000,100,011,111}isnotcyclic. (NOV/DEC2008)
17. DefineHammingdistanceandhammingweight (MAY/JUNE2009)18.WhataretheerrordetectionanderrorcorrectioncapabilitiesofHammingCode?(MAY/JUNE 2009)
19. Whatarethefundamentalpropertiesexhibitedbycycliccodes? (MAY/JUNE2009)
20. Defineblockhopping. (MAY/JUNE2009)

1. Assumea(2,1)convolutionalcoderwithconstraintlength6.Drawthetreediagram,statediagram andtrellisdiagramfortheassumedcoder (MAY2011)
2. Findthe(7,4)linearsystematicblockcodewordcorrespondingto1101.Assumeasuitablegenerat ormatrix. (MAY2011)
3. DerivethepowerspectraofpolarcodesandonKoffcodes.Discusstheircharacteristics(16)(MAY20 11)
4. For(6,3)systematiclinearblockcodethecodewordcomprises I_1,I_2,I_3,P_1,P_2,P_3 wherethe3paritybi ts P_1,P_2,P_3 areformedfromtheinformationbitsasfollows:
   a. $P_1=I_1 \oplus I_2$
   b. $P_2=I_1 \oplus I_3$
   c. $P_3=I_2 \oplus I_3$

Findparitycheckmatrix,generatormatrix,allpossiblecodewords,minimumweight

5. minimumdistance,theerrorcorrectinganddetectingcapabilityofthecode.(MAY2010)
6. Explainhowencodingisdonebyconvolutionalcodeswithasuitableexample(MAY2010)
6. Explaintreediagram,trellisdiagramandstatetransitiondiagramofconvolutionalcodes
7. Writethegeneratormatrixandparitycheckmatrixof(7,4)hammingcode.
   i. (APR/MAY2004,6MARKS)
8. Describeadecodingprocedureforlinearblockcode. (APR/MAY2004,6MARKS)
9. Drawtheblockdiagramofrate½convolutionalencoderwithconstraintlength3.Whatisgeneratorpolynomialoftheencoder?Findtheencodedsequenceyouhavedrawn,correspondingtothemessage(10011). (APR/MAY2004,12MARKS)
10. Obtainthetrellisdiagramoftheencoderthatyouhavedrawn. (APR/MAY2005,4MARKS)
11. Drawthediagramofthe½rateconvolutionalencoderwithgeneratorpolynomial:$g^{(1)}(D)=1+D$and$g^{(2)}(D)=1+D+D^2$.Andcomputetheencoderoutputforinputsequence101101.
    i. (NOV/DEC2004,10MARKS)
12. Whatismeantbyfreedistanceofaconvolutionalcode?Howdoesitaffectthenumberoferrorsthatcanbecorrectedandcodinggain? (NOV/DEC2004,6MARKS)
13. Brieflyexplaintheviterbikdecodingalgorithm. (APR/MAY2005;MAY/JUN2005,APR/MAY2008)
14. Describeindetailaboutlinearblockcodes. (APR/MAY2005;MAY/JUN2006,4MARKS)
15. Considerarate½,nonsystematicconvolutionalcodewith,$g^{(1)}=\{1,0,1\}$and$g^{(2)}=\{1,1,1\}$.Determinetheencoderoutputcorrespondingtothedatasequence{1,0,1,0,1}.Ifthefirstandthefourthbitsoftheencodedsequenceareaffectedduringtransmission,demonstratetheerrorcorrectingcapabilityoftheviterbialgorithm. (NOV/DEC2005,16MARKS)
16. A(15,5)linearcycliccodehasageneratorpolynomial,$g(D)=1+D+D^2+D^4+D^5+D^8+D^{10}$Drawtheblockdiagramsofanencoderandsyndromecalculatorforthiscode.Findthecodepolynomialinthesystematicform,forthemessagepolynomial$m(D)=1+D^2+D^4$.Is$y(D)=1+D^4+D^6+D^8+D^{14}$,acodepolynomial?Ifnot,findthesyndromeof$y(D)$.
    i. (NOV/DEC2005,16MARKS)
17. Generatethecodewordsfor(7,4)hammingcode. (MAY/JUN2006,8MARKS)
18. Stateandprovethepropertiesofsyndromedecoding. (APR/MAY2005,6MARKS; MAY/JUN2006,8MARKS)
19. ExplainthefeaturesofRScode. (APR/MAY2004,4MARKS)
20. Explainanyfourcharacteristicsofthefollowingblockcodes(i)BCHcodes(ii)CRCcodes(iii)maximumlengthcodes. (NOV/DEC2004,12MARKS)
21. Findthegeneratorandparitycheckmatrixfor(5,1)repetitioncode.(NOV/DEC2004,4MARKS)
22. Evaluatethesyndromesforallfiveprobablesignalerrorpatternsin(5,1)repetitioncode.(MAY/JUN2006,6MARKS)
23. Letg(x)bethegeneraratorpolynomialofa cycliccodeC.Findaschemeforencodingthedatasequence($d_0,d_1,d_2,\ldots.d_{kK1}$)intoan(n,k)systematiccodeC. (MAY/JUNE,2007/16MARKS)

24. Givethedetailsofimplementationofcyclicencoderanddecoderbasedonlinearfeedbackshiftregisters (NOV/DEC2007)

25. Discuss the convolutionaldecoderalgorithm indetail for the encoder ofconstraint length3andcoderate½. (NOV/DEC2007)

26. Provethattheminimumdistanceofalinearblockcodeisequaltotheminimumweightofanynonzeroword inthecode (APR/MAY2008)

27. Explain theconceptand design procedure of Viterbi decodingalgorithm fora blockcode.(NOV/DEC2008)

28. A1/3rateconvolutionalcodehasthefollowinggenerators:a.

    g_1=[10 0];g_2=[101]and g_3=[11 1]

    b. (1)Drawtheencodercircuitcorrespondingtothiscode. (2.5)

    c. (2)Drawthestatetransitiondiagramforthiscode (2.5)

    d. (3)Drawthestatediagramforthiscode. (2.5)

    e. (4)DrawtheTrellisdiagramforthiscode. (2.5)

    f. (5)ThiscodeisusedfortransmissionoveraAWGNchannelwithharddecisiondecoding.Theoutputofthedemodulationdetectoris(101001011110111…).UsingviterbiKdecodingalgorithm,findthetransmittedsequence.(NOV/DEC2008)

29. (i)theparitycheckmatrixofaparticular(7,4)linearblockcodeisgivenby

$$H=\begin{matrix}1&1&1&0&1&0&0\\1&1&0&1&0&1&0\\1&0&1&1&0&0&1\end{matrix}$$

Findthegeneratormatrix. (6)

(ii)Explainindetailthecodinganddecodingoflinearblockcodes(10)(MAY/JUNE2009)

30.(i)Fortheconvolutionalcodershowinfigure,drawthestatediagramandhencethetrellisdiagram.Theinputsequenceis11010100.(8)

(ii)Whatarecalledcycliccodes?Explainwithmeritsanddemerits.(8)(MAY/JUNE2009)

26.(i)Withnecessarypolynomialofa(7,4)cycliccodeis $g(x)=1+x+x^3$.Generateasystematiccodewordforthemessagevector M=1011. (8)

31.(ii)Stateandproveanytwopropertiesofsyndromedecoding.(8)(MAY/JUNE2009)

27.(i)Thehsubmatrixofa(7,4)systematiclinearblockcodeisgivenby

1. Whatisamatchedfilter? (MAY2011)
2. Give2applicationforeyepattern? (MAY2011)
3. Whatistheneedforademodulatorincaseofbasebandsignalingwhenthereceivedarealreadypul selikewaveforms (NOV2010)
4. HowdoespulseshapingreduceISI
5. Whatdoesthetermequalizationreferto?Explainhowitiscarriedoutbyusingtransversalfilters? (NOV2010)
6. HowiseyepatternobtainedontheCRO? (APR/MAY2004)
7. Whatistheconditionforzerointersymbolinterference? (APR/MAY2004)
8. Howisthetransferfunctionofmatchedfilterrelatedtothespectrumoftheinputsignal?9.(APR/M AY2004)
10. ATDM signalwithbittimeof0.5μsistobetransmittedusinga channelwithraisedcosinerollofffactorof0.5.Whatisthebandwidthrequired? (NOV/DEC2004)
11. Fromtheeyepattern,how isthebesttimeforsamplingdetermined?
12.(NOV/DEC2004,NOV/DEC2007)
13. Whyintersymbolinterferencetakesplaceinachannel? (APR/MAY2005)
14. Whatismeantby"pseudoternarysignaling"? (APR/MAY2005)
15. Whatisthepurposeofusinganeyepattern? (NOV/DEC2005,APR/MAY2008)
16. Whydoyouneedadaptiveequalizationinaswitchedtelephonenetwork?(NOV/DEC2005)
17. Drawanillustrativefiguretoshowtheoperationofacorrelationreceiver.(NOV/DEC2005)
18. Whatisanidealnyquistchannel? (MAY/JUN2006)
19. Whatistheneedforequalization? (MAY/JUNE2007)
20. GivetheNyquistcriterionforzeroISI. (NOV/DEC2007)
21. Whatismeantbyintersymbolinterference? (MAY/JUN2006,APR/MAY2008)
22. 15.Whydowerequireequalizationforacommunicationsystem? (NOV/DEC2008)
23. 16.Listtheapplicationsofmatchedfilters. (NOV/DEC2008)
24. 17.WhatdoyoumeanbyMKaryorthogonalsignals? (NOV/DEC2008)
25. 17.Whatismeantbymatchedfilter? (MAY/JUNE2009)
26. 18.Howdowegeteyepattern?Whatdoyouinferfromthis? (MAY/JUNE2009)
27. 19.Drawthefunctionalmodelofpassbanddatatransmission. (MAY/JUNE2009)

1. Derivetheexpressionforbiterrorprobabilityduetoamatchedfilter(16)(MAY2011)
2. DiscussonsignaldesignforISIillumination(16)(MAY2011)
3. DefineamatchedfilterandcompareitsfunctioningwithacorrelatOr(10)(NOV2010)
4. ExplainhowamatchedfiltercanmaximizeSNRforagiventransmittedsymbol(6)
5. Whatdoesthetermequalizationreferto?Explainhowitiscarriedoutbyusingtransversalfilters? (NOV2010)
6. Sketchthetimeresponseandfrequencyresponseofsignalwithraisedcosinepulsespectrum.

(APR/MAY2004,8MARKS)

7. Whyisprecodingusedwithduobinarysignalingscheme?Drawtheblockdiagramofprecoderandexplainitso peration. (APR/MAY2004,8MARKS)
8. DrawtheblockdiagramofanadaptivefilterandexplaintheLMSalgorithm.(APR/MAY2004,10MARKS)
9. Explainhoweyepatternisusedtostudytheperformanceofadatatransmissionsystem. (APR/MAY2004,6MARKS)
10. Whatismeantbytheidealnyquistchannel?Whatareitsmeritsandlimitations? (NOV/DEC2004,8MARKS)
11. Drawtheblockdiagramoftheduobinarysignalingschemeandderivetheoverallfrequencyresponseofthiss cheme. (NOV/DEC2004,NOV/DEC2007)
12. Derivetheequationfortheimpulseresponsecoefficientsofthezeroforcingequalizer. (NOV/DEC2004,8MARKS)
13. Explainwhyadaptiveequalizersarerequiredfortelephonechannel(NOV/DEC2004,4MARKS)
14. Withneatsketches,explaintheduobinarysignalingscheme.(APR/MAY2005,10MARKS;MAY/J UN2006,8MARKS)
15. Obtainanexpressionfornyquistcriterionfordistortionlessbasebandtransmissionforzerointersym bolinterference. (APR/MAY2005,6MARKS)
16. Writebrieflyabouteyepatternandadaptiveequalizationfordatatransmission.(APR/M AY2005,10MARKS;MAY/JUN2006,8MARKS)
17. Whatyouunderstandbyintersymbolinterference(ISI)?Discussindetailthenyquistcriterionforminimizi ng(ISI).Explainthedifficultiesinimplementingitinapracticalsystem. (NOV/DEC2005,16MARKS)
18. Discussthemeritsanddemeritsofduobinarysignaling. (NOV/DEC2005,6MARKS)
19. Thebinarydata(011100101)areappliedtotheinputofaduobinaryencoder.Constructtheduobinaryencod eroutputandthecorrespondingreceiveroutput,withoutprecoder.Supposeduetoerrorduringtransmissi on,thelevelproducedby3rd digitisreducedtozero,constructthenewreceiveroutput. (NOV/DEC2006,10MARKS)
20. Discusson(i)Adaptiveequalization
    i. (ii)BasebandbinaryPAMsystem.
    (MAY/JUNE2007)
21. CompareBasebandbinaryPAMsystemwithBFSK. (NOV/DEC2007)
22. Derivetheexpressionforprobabilityoferrorformatchedfilter.(8) (NOV/DEC2007)
23. Drawtheblockdiaramofadaptiveequalisationandexplain.(8) (NOV/DEC2007)
24. ExplainNyquistsolutionstoavoidISI. (APR/MAY2008)
25. Designa3KtapequalizertoreduceISIduetoPr(t). (APR/MAY2008)
26. Abasebandbinarydigitalcommunicationsystemtransmitsdataat1kbps.ThePSDofnoiseis10^{K7}W/Hza ndthereceivedsignalamplitudeis20mV.
27. Findtheerrorprobabilityforbipolarrectangularsignaling.
28. Ifthebitrateis10kbpstowhatvaluemustAbeadjustedinorderoattainthesameerrorprobabilityasi npart(a).
29. Whatistherequiredchannelbandwidthincase(b).
30. Ifnotmorethana5kHzchannelisavailable,Whatshouldbethe valueofAsothatthedatarateismaximizedandtheerrorprobabilityissameasinpart(a).

(NOV/DEC2008)

31. ExplainonCorrelativelevelcodingandadaptiveequalizationofbasebandtransmission. (NOV/DEC2008)
32. (i)WhatisknownasISI?DiscussthecauseforISI.AlsoexplainNyquistcriteriafordistortionless
33. Transmissin.(10)
34. (ii)WriteanoteonBasebandMKaryPAMtransmission(6) (MAY/JUNE2009)
35. 24.(i)describeDuobinaryencoding.Alsodiscusshowerrorpropagationiseliminated.(10)
36. (ii)Explainthetwooperationmodesofadaptiveequalizers(6) (MAY/JUNE2009)

25. (i)AbinaryPAMwaveistobetransmittedoveralowpasschannelwithan
    i. absolutelymaximumbandwidthof75KHz.Thebitdurationin10msec.Find
    ii. araisedcosinespectrumthatsatisfiestheserequirements.(6)
37. (ii)Withneatsketches,explainthemodifiedduobinarysignalingscheme(10)(MAY/JUNE2009)
26. (i)Writebrieflyabouteyepatternandadaptiveequalizationfordatatransmission(10)
38. (ii)Comparethepowerspectraofdifferentbinaryformats.(MAY/JUNE2009)

1. DrawthePSKwaveformfor011011 (MAY2011)
2. Whatisanoncoherentdetectionsystem (MAY2011)
3. DefineQAManddrawitsconstellationdiagram (NOV2010)
4. Abinaryshiftkeyingsystememploys2signallingfrequenciesf1andf2.thelowerfrequencyis1200hzandsignalingrateis500baudcalculatef2 (NOV2010)
5. Inminimumshiftkeyingwhatistherelationbetweenthesignalfrequenciesandbitrate?(APR/MAY 2004)
6. Writetheexpressionforbiterrorrateforcoherentbinary FSK. (NOV/DEC2004)
7. Bringoutthedifferencebetweencoherentandnon Kcoherentbinarymodulationschemes.(APR/MAY2005)
8. WhatistheerrorprobabilityofMSKandDPSK? (APR/MAY2005)
9. HighlightthemajordifferencebetweenQPSKsignalandaMSKsignal. (NOV/DEC2005)
10. ComparetheprobabilityoferrorofPSKwiththatofFSK. (MAY/JUN2006,NOV/DEC2007)
11. StatethedifferencebetweencoherentandnonKcoherentbinarymodulationtechniques.
    i. (MAY/JUN2006)
12. Whatdoyouunderstandbycontinuousphasefrequencyshiftkeying? (MAY/JUN2007)
13. Givethesignalspacerepresentation ofQPSK (NOV/DEC2007)
14. Whatisamatchedfilter? (APR/MAY2008)
15. Whatistheneedforsynchronization? (APR/MAY2008)
16. Whatissignalconstellationdiagram? (NOV/DEC2008)
17. StateShannon'stheoremonchannelcapacity. (NOV/DEC2008)
18. Whatissignalconstellationdiagram? (NOV/DEC2008)
19. Differentiatecoherentandnon-coherentdetection. (NOV/DEC2008)

PART-B

1. Derivethebiterrorprobabilityduetocoherent ASK, PSK & FSK systems. Comparethe
2. Performance (MAY2011)
3. Discuss QPSK Signalling
4. Discussbiterrorprobabilityduetoqpskreceiver. CompareitwithPSKreceiver(MAY2011)
5. Distinguishcoherentandnoncoherentscheme (NOV2010)
6. DiscussNoncoherentdetectionmethodofBFSKSignalling (NOV2010)

7. Whatdoyouunderstandbycoherentdetection? (APR/MAY2004,2MARKS)
8. Discussthemethodofbitsynchronization. (APR/MAY2004,6MARKS)
9. Drawtheblockdiagramof QPSK transmitterandcoherentQPSKreceiverandexplaintheiroperation. (APR/MAY2004,10MARKS;MAY/JUN2006,NOV/DEC2007)
10. ComparetheBERofcoherentPSK,coherentQPSKandcoherentFSK. (APR/MAY2004,6MARKS)
11. Drawtheblockdiagramof MSK transmitterandexplainthefunctionofeachblock.(N OV/DEC2004,8MARKS)
12. ExplainhowMSKsignalisobtainedfromCPSKsignal? (NOV/DEC2004,8MARKS)
13. Withnecessaryequationsandsignalspacediagram,obtaintheprobabilityoferrorforcoherentbinaryFS Ksystems. (APR/MAY2005,12MARKS)
14. Drawtheblockdiagramofa QPSK receiverandexplainitsworking.(APR/MAY2005,4MARKS)
15. Withneatblockdiagram,explainbrieflyhowsymbolsynchronizationisachieved?(APR/MAY2005,8MARKS)
16. Discussbrieflyaboutminimumshiftkeyingforacpsksignal.(APR/MAY2005;MAY/JUN2006,8MARKS)
17. ExplainBPSKsignaltransmissionandcoherentBPSKreceptionwithsuitablediagrams. Deriveanexpressio nfortheprobabilityofsymbolerrorforthescheme. (NOV/DEC2005,16MARKS)
18. Withnecessaryequationsandsignalspacediagram,explainbrieflyaboutFSKsystem.(MAY/J UN2006,NOV/DEC2007,APR/MAY2008)
19. Obtainprobabilityoferrorintermsof E_b/N_0 forQPSK. (MAY/JUN2006,APR/MAY2008)
20. Drawtheblockdiagramof MSK transmitterandexplainthefunctionofeachblockwiththeconstellationdi agram. (MAY/JUNE,2007/16MARKS)
21. Whataretheadvantagesanddisadvantagesof MSK ascomparedtoQPSKsystem?(6)(NOV /DEC2007)
22. (1)Explaincarriersynchronizationin QPSK signal.(6)
23. (ii)Explainthedetectionofbinary FSK signalwithblockdiagram.(7)
24. (iii)ExplainbinaryPSKsignalwithgeometricalrepresentation.(3) (NOV/DEC2007)
25. Explaintheworkingofcarriersynchronizationsystem (APR/MAY2008)
26. Drawtheblockdiagramsof MSK transmitterandreceiverandexplainthefunctionsofeachblock. Drawtheco nstellationdiagram. Deriveprobabilityoferror. (NOV/DEC2008)
27. Binarydataaretransmittedoveramicrowavelinkattherateof1Mbpsandthe PSD ofthenoiseatthereceiverin putis 10^{K10} W/Hz. Foreachofthefollowingpairs,determinewhichonerequiresmorepowerthantheother. Det erminetheextraaveragesignalpowerrequiredbythemorepowerconsumingschemesothatanaverageprobabilityoferrorof 10^{K4} isalwaysmaintained.
28. CoherentPSKandDPSK. (4)
29. CoherentFSKandnonKcoherentFSK.(4)

30. CoherentPSKandQPSK. (4)
31. CoherentFSKandcoherentMSK.(4) (NOV/DEC2008)
32. Explainthegeneration,detection,signalspacediagram,biterrorprobabilityandpowerspectraofQPSK.(16) (MAY/JUNE2009)
33. (i)Enumerateoncarrierandsymbolsynchronization(10)
34. (ii)ComparetheDigitalmodulationtechniquesintermsofbiterrorrateandbandwidthefficiency. (6) (MAY/JUNE2009)
35. (i)AnRSKsystemtransmitsbinarydataattherateof2.5×10^6bitspersecond.During
36. thecourseofthetransmission,whiteGaussiannoiseofzeromeanandpower
37. spectraldensity10^{K20}wattsperhertzinaddedtothesignal.Intheabsenceofnoise,
38. theamplitudeofthereceivedsinusoidalwaveofdigit1or0is1microvolt.
39. Determinetheaverageprobabilityofsymbolerror,assumingcoherentdetection.(8)
40. (ii)DiscussbrieflyaboutMinimumShiftKeyingforaCPFSKsignal.(8)(MAY/JUNE2009)
41. Withnecessaryequationsandsignalspacediagram,obtaintheprobabilityoferrorforcoherent binaryPSKsystem.