1.Consider a system with amplitude response and phase shift as shown in fig A and the following two input:

a. $x_1 = \cos(10\pi t) + \cos(12\pi t)$

b. $x2 = \cos(26\pi t) + \cos(34\pi t)$

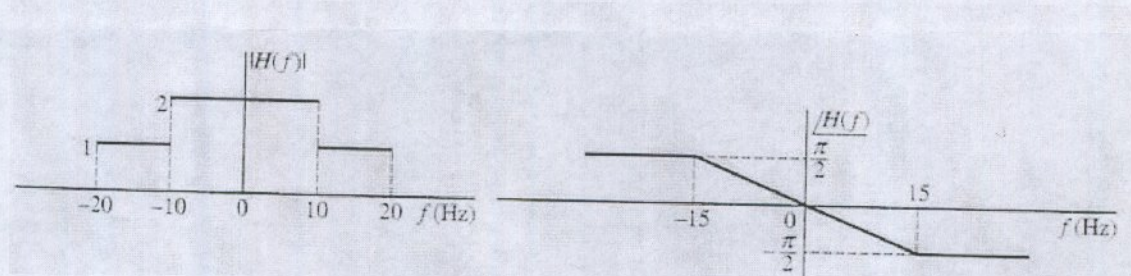.Find the output signal with amplitude and phase.(20%)

Fig.A

2.A Binary data transmission channel ,the probability of sending Binary one and Binary zero are 0.8 and 0.2 respectly . the probability of sending a 1 and receiving a 1 P(1r/1s) or sending a1 is 0.8 while sending a zero and receiving a zero is also 0.8. Find

　　a.　the probability that sending a 1 while receiving a zero P(0r/1s)　　(5%)

　　b.　the probability that sending a zero while receiving a 1 P(1r/1s)　　(5%)

　　c.　the probability that a 1 is received with a 1 was sent　 P(1s/1r)　　(5%)

　　d.　the probability that a zero is received with a zero was sent　 P(0s/0r) (5%
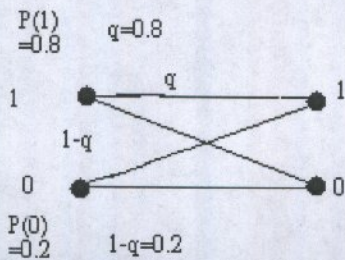
3.Compare the error probability and bandwidth efficiency between MPSK and MFSK.(20%)

4.A rate 1/3 convolutional encode is shown in Fig.B

a.Draw the state diagram.(10%)

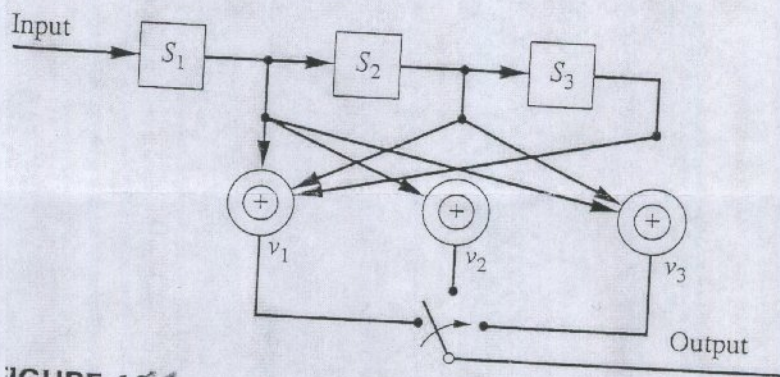b.if the input sequence are 1101, encode the output sequence.(10%)

Fig.B

5.Give a brief describe for the following topics

a. sampling Theorm (4%)

b. multi-path interference (4%)

c. delta modulation (4%)

d.quadrature-amplitude-shift keying(4%)

e.Geostational satellite (4%)