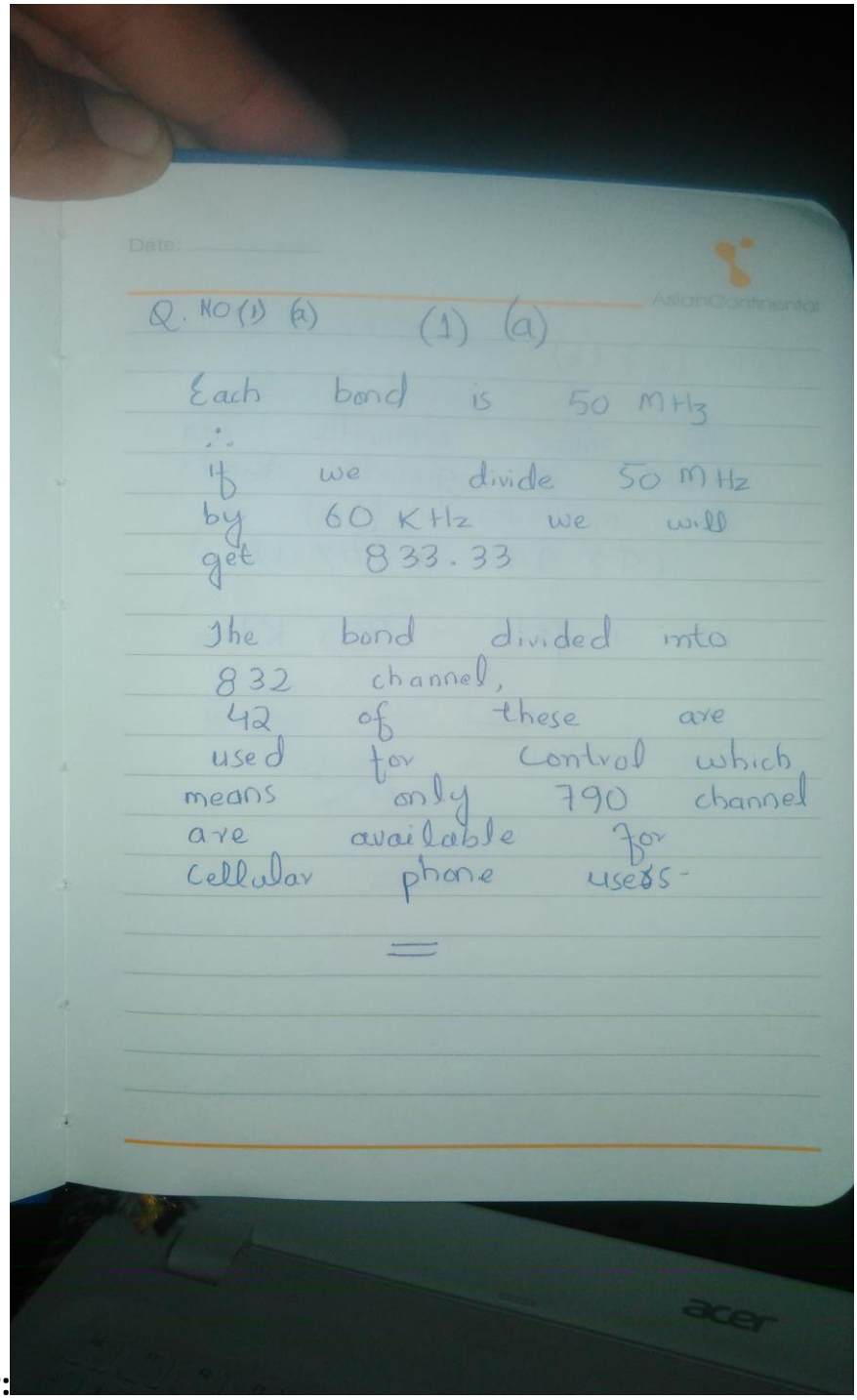
ID 15092

Question 1

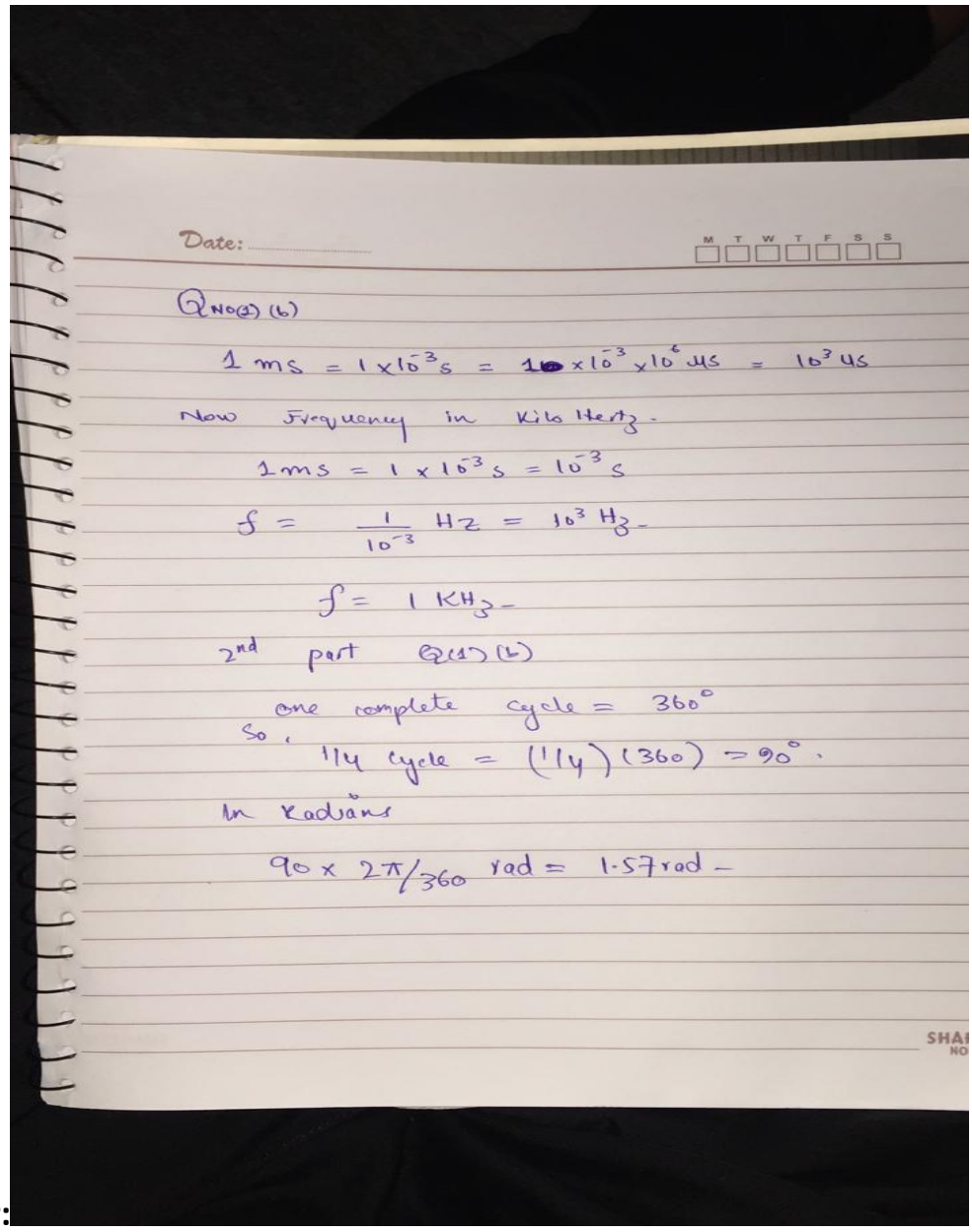
(A)

Answer:



(B)

Answer:



Question 2

(A)

Answer: WDM is a technique in fiber optic transmission that enables the use of multiple light wavelengths (or colors) to send data over the same medium. Two or more colors of light can travel on one fiber and several signals can be transmitted in an optical waveguide at differing wavelengths.

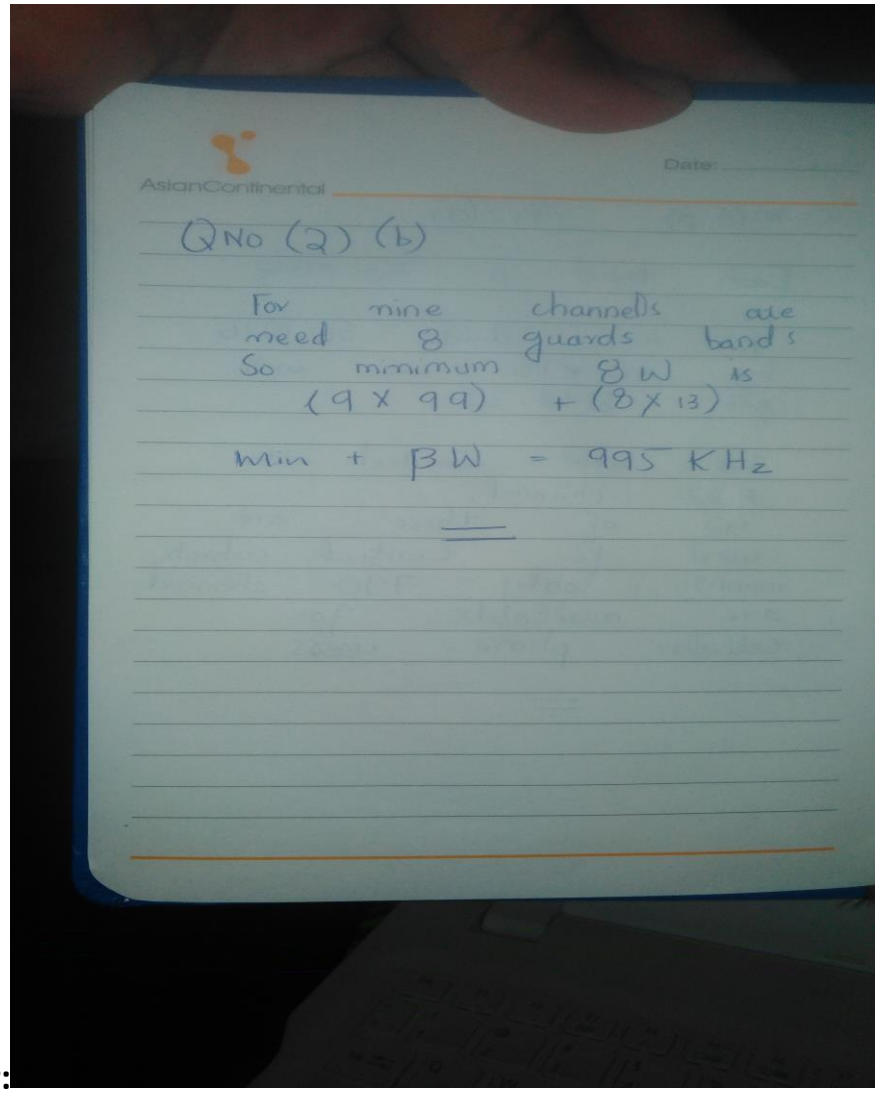
Early fiber optic transmission systems put information onto strands of glass through simple pulses of light. A light was flashed on and off to represent digital ones and zeros. The actual light could be of almost any wavelength—from roughly 670 nanometers to 1550 nanometers.

Application:

1) **Can utilize higher capacity ,Better utilization of bandwidth.**
2) **AM and FM radio broad casting.**
3) **Some concept of tv broadcasting and first generation cellphone.**
4) **Use light signal transmitted through fiber optic channel.**
5) **Link is sectioned by time rather than frequency**

(B)

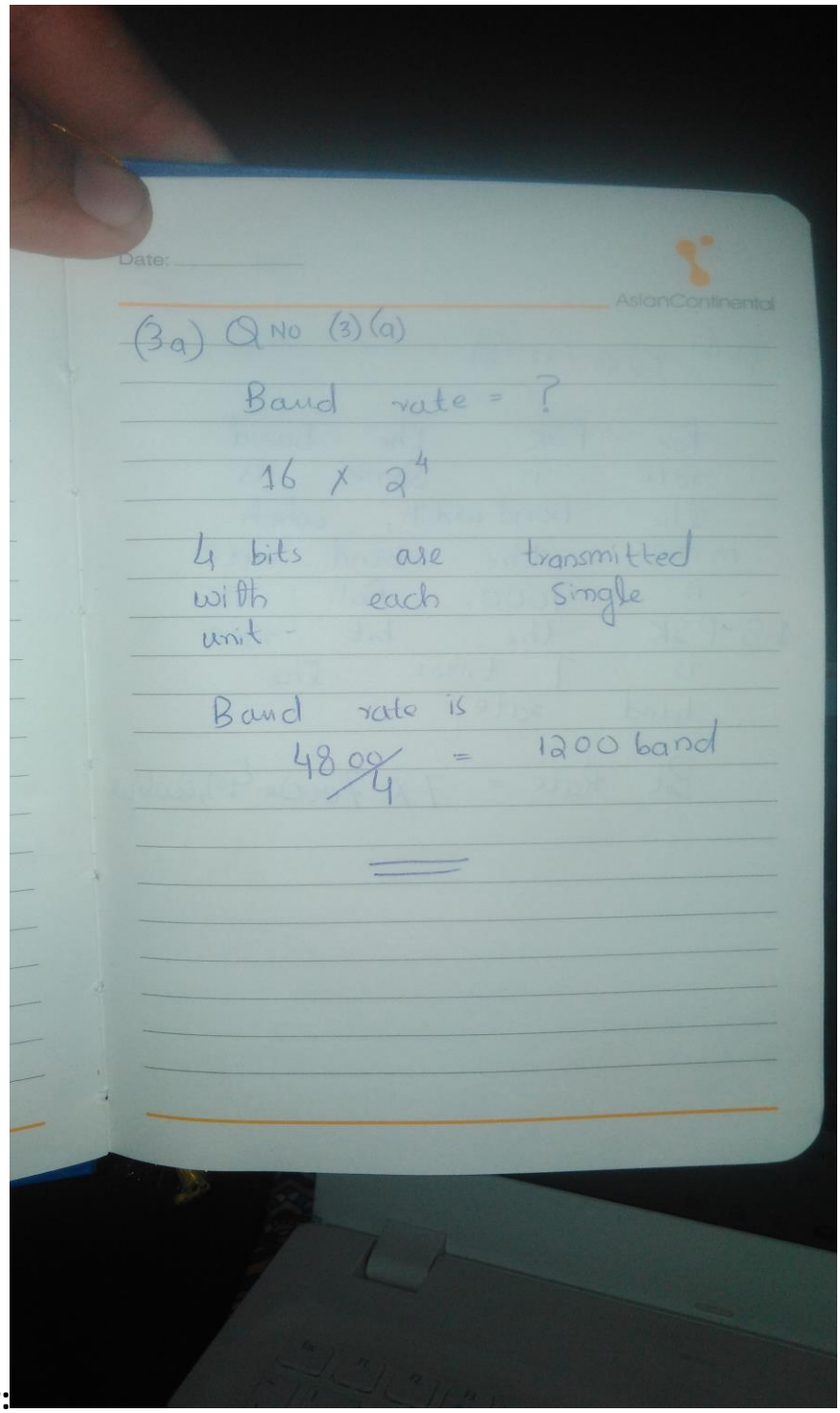
Answer:



Question 3

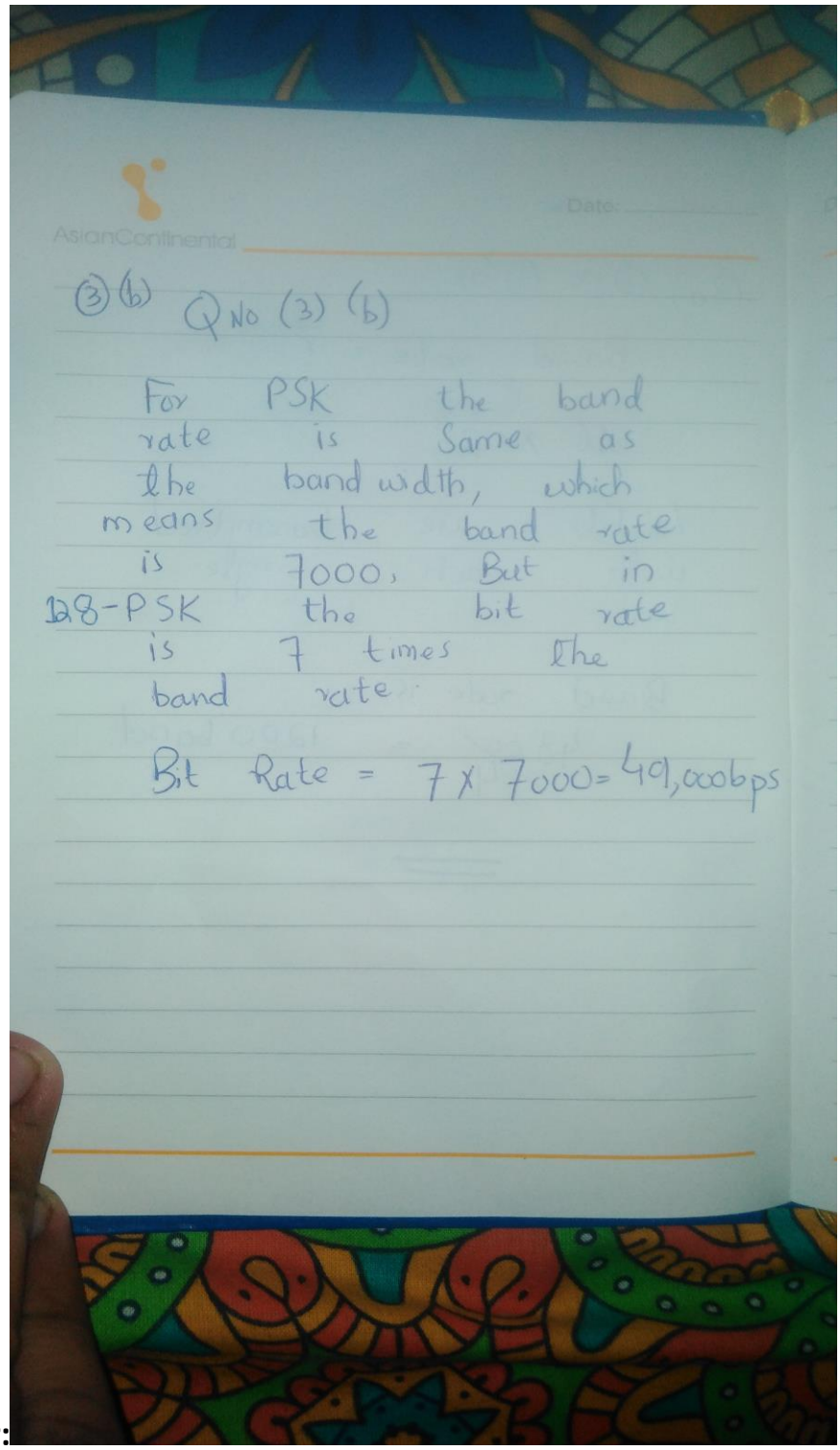
(A)

Answer:


Date:
AsianContinental
(3a) Q No (3)(a)
Baud rate = ?
16 x 2^4
4 bits are transmitted with each single unit.
Baud rate is
4800/4 = 1200 band

(B)

Answer:



Question 4

Answer: Method for wireless propagation

1) **Ground –radio waves travel through lowest portion of atmosphere, hugging the earth**
2) **Sky- Higher frequency radio waves radiate upward into ionosphere and then reflect bath to the earth .**
3) **Line of sight –high frequency signal transmitted in straight line directly from antenna to antenna .**

Wireless transmission waves

1) **Radio waves**
2) **Microwave**
3) **Infrared**

Radio wave

1) **Frequency range 3khz to 1Ghz**
2) **Omni directional**
3) **Susceptible to interference by other antenna using same frequency.**
4) **Ideal for long distance broadcasting.**
5) **Application are AM and Fm radio**

Microwaves

1) **Frequency between 1and 300 Ghz**
2) **Unidirectional**
3) **Narrow focus option sending and receiving antenna to be aliged.**

Infrared

1) **frequency between 300 GHz and 400Thz**
2) **shirt range communication**
3) **high frequency cannot penetrate walls**
4) **advantage prevent interference between system in adjacent room**
5) **disadvantages cannot be use for long range communication.**

We can use Nyquist formula

26500=2*20000*log Zl

Log 2 L=6.65L=26.265=98 levels

Question 5

Answer: Shannon capacity needs nyquist rate to complete the calculation of capacity with the given band width.

Nyquist rate tell you in order to reconstruct a based band signal with the bandwidth W form from sampling,you need to sample the signal at 2W rate. A good instuition is to think about a sine wave. this theory is appling to a signal without noise. ON the contrary,Shannon,s capacity theorem need to specify noise distribution under Gaussian noise,

[math] C=\dfrc {1}{2}log2({1+\dfrc{p}{n})] [\math] bit per sample where [math] p[\math] N[/math] are the power of signal and noise repectively .

Combine with Nyquist rate and calculate the noise power properly ,you get channel capacity bandwidth [math] w[/math] to be

[math] c= wlog-2({1+\draf{p}{N-OW}} [/math] bits per second where [math] N-O{/math] is 2 times of Gaussian noise spectral density

Bit rate =?

Bit rate =2*30008log (two) 4

Bit rate= 12000bps.