

Assignment # 2

GSA

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Qno 1

Write a note on Malaria.

Malaria:-

Malaria is a life-threatening disease, and is transmitted through the bite of an infected Anopheles mosquito. Infected mosquito carry the Plasmodium parasite, which is transferred into the bloodstream. Plasmodium parasite cause the disease actually.

Causes:

Malaria is transmitted through the following ways:-

(1) Malaria parasites- Infection is caused when an infected mosquito bite a person. There are 4 kinds of ^{malaria} parasites that can infect humans.

(a) Plasmodium vivax

(b) Plasmodium ovale

(c) Plasmodium malariae

(d) Plasmodium falciparum

Plasmodium falciparum causes a severe form of the disease and those who contact this form of malaria have a higher risk of death.

(2) Congenital malaria: An infected mother can also pass it to her baby at birth.

(3) Transmission through blood: Malaria ^{can} also be transmitted by blood, so it can be transmitted through:

(a) An organ transplant

(b) Blood transfusion

(c) Use of shared needles

Signs and Symptoms:-

A malarial infection is generally characterized by recurrent attacks with the following signs and symptoms:

(a) moderate to severe shaking chills

(b) High fever

(c) Sweating

Other symptoms may include headache, vomiting, & ~~nausea~~ diarrhea

Malaria signs and symptoms typically begin within a few weeks after being bitten by an infected mosquito. However, some types of malaria parasites can live dormant

in your body for up to a year.

Diagnosis:

Blood tests can show the presence of parasites and help tailor treatment by determining presence of malaria, type of malaria parasite, and ^{whether} parasite is resistant to certain drugs or not. Moreover, it can also be diagnosed that whether the disease is affecting the vital organs or not.

Some blood tests can take several days to complete, while others can produce results in less than 15 minutes.

Treatment:

The types of drugs and the length of treatment will vary, depending on various factors:-

- (a) type of malaria parasite
- (b) severity of symptoms
- (c) age
- (d) pregnancy.

Medication:

The most common antimalarial drugs include:

- (a) chloroquine

(b) Quinine sulfate

(c) Hydroxychloroquine

(d) Mefloquine

(e) Combination of atovaquone and proguanil

The history of antimalarial medicine has been marked by a constant struggle between evolving drug-resistant parasites and the search for new drug formulations. In many parts of the world, for instance, resistance to chloroquine has rendered the drug ineffective.

Prevention ?

Question 2

Write a note on Dengue.

Dengue:

Dengue is an acute infectious disease that is characterized by headache, severe joint pain, and a rash. It is caused by a single stranded RNA virus of the genus *Flavivirus* (species *dengue virus*) and transmitted by mosquitoes of the genus *Aedes*. It is also known as Breakbone fever, and Dandy fever.

Causes:

The viruses that cause Dengue fever are spread by mosquitoes of the species

Aedes aegypti, and sometimes also by Aedes albopictus. Aedes mosquitoes are usually found in urban and suburban areas as they like to breed in man-made containers like tires, flowerpots and household waterpots. Aedes albopictus mosquitoes have been transported to North America and Europe by Asian products like tires and lucky bamboo. These mosquitoes can survive subfreezing temperatures, which has allowed dengue to spread to cooler climate.

Signs and Symptoms:

Symptoms of dengue fever typically developed between 3 to 14 days after a person is bitten by an infected mosquito.

Classic symptoms include

- (a) Fever
- (b) Headache and pain behind the eyes
- (c) Severe muscle and joint pain (that is why it is called breakbone fever)
- (d) Extreme fatigue
- (e) Rash appearing between the second and fifth fifth day of fever
- (f) tendency to bleed from nose or skin
- (g) Blood stools or heavy menstrual bleeding

(b) nausea and vomiting

(i) Respiratory symptoms such as cough, sore throat, and nasal congestion.

These symptoms usually last for three to seven days, at which point the fever breaks. After fever breaks, people either start to get better or get much worse, developing severe dengue.

According to World Health Organization guidelines any of the following symptoms are warning signs that may signal the development of severe dengue often called Dengue Hemorrhagic Fever:

(a) Abdominal pain

(h) Persistent vomiting

(c) Lethargy or restlessness

(d) Mucosal bleeding, such as bleeding gums or nosebleeds

(e) Liver enlargement

(f) Fluid accumulation in the lungs or abdomen

Dengue Hemorrhagic Fever:-

DHF is the most serious form of dengue infection. It is a clinical syndrome characterized by four features
(1) Increased permeability of blood vessels, leading to plasma leakage into the surrounding

- tissues and lack of plasma in bloodstream
- (2) low blood platelet count
 - (3) Fever that lasts for two to seven days
 - (4) tendency toward severe and (hemorrhagic) bleeding

Diagnosis:

Doctors can diagnose dengue infection with a blood test to check for signs of the virus or antibodies to it

Treatment

Like many other viral diseases, the only ^{treatment} option for dengue is symptoms management. Pain relievers that do not make bleeding worse may be taken. Intravenous (IV) fluids may be given to help prevent shock, but frequent blood draws and other assessments must be performed to make sure that the IV fluids are not making the person sicker

Dengue Fever Vaccine:-

The first dengue vaccine, Dengvaxia, was made available in Mexico in December 2015. This live ~~virus~~ vaccine, which covers all four dengue subtypes, is given to people ages 9-45 years as a three-dose series.

Prevention ?

Dengvaxia has been shown to prevent about 50% of dengue cases.

Qno 3

Write a note on Hepatitis.

Hepatitis:-

Hepatitis is an inflammation in the liver that causes damage to the liver.

The liver is the largest organ inside the body. It performs many critical functions including ^{aiding} metabolism, detoxification of blood,

production of bile and storage of glycogen.

These liver processes can be disrupted by hepatitis creating severe health problems throughout the body.

Classification of Hepatitis:

Hepatitis may be acute or chronic depending on its duration, whether it lasts for less than or more than six months.

Acute hepatitis: Acute hepatitis may often resolve on its own or progress to chronic hepatitis.

Chronic hepatitis:- Chronic hepatitis remains a problem ^{for} more than six months. With time, the chronic form may advance to

liver damage, cirrhosis, liver failure, and then finally to liver cancer.

Types of Hepatitis:-

Most hepatitis is caused by viruses. On the basis of types of viruses, Hepatitis can be divided into 5 types known as Hepatitis A, B, C, D, and E. The three most common are hepatitis virus A, B, and C. An infection with any of these three can be fatal. It was reported that:

- ⊙ Hepatitis A affected about 114 million people
- ⊙ Chronic Hepatitis B occurred in about 343 million people
- ⊙ Chronic hepatitis C about 142 million people worldwide in 2015

Causes:

The major causes of hepatitis worldwide are viruses or due to some other causes.

(1) Infectious

(2) Non-infectious

(1) Infectious Causes

Hepatitis A, B, C, D, and E are caused by different types of viruses.

(a) Causes of Hepatitis A: Hepatitis A is caused

by an infection with the Hepatitis A virus. The virus is most commonly transmitted by ingestion of food or water contaminated with fecal matter. It can also spread by eating raw shellfish from sewage-polluted water.

(2) Causes of Hepatitis B: Hepatitis B is caused by the hepatitis B virus. It is spread through direct contact with infectious body fluids such as blood, semen, vaginal secretion. It can also be transmitted by sexual contact, shared ^{contaminated} needles, tattooing, body piercing, and sharing of razor that is contaminated with infected blood. Moreover, infected pregnant women can spread the virus to their babies during childbirth.

Keep the description of the headings brief

(3) Causes of Hepatitis C: Hepatitis C infection is caused by the Hepatitis C virus. It spreads through contaminated blood. It is transmitted through needle sharing especially drug users, blood transfusion, sexual contact.

(4) Causes of Hepatitis D: Hepatitis D infection is caused by the Hepatitis D virus. It is contracted through contact with infected blood. Hepatitis D only occurs in conjunction with hepatitis B.

as the virus only multiplies with the presence of hepatitis B.

⑤ Causes of Hepatitis E: Hepatitis E is a water-borne disease caused by the hepatitis E virus. It spreads mainly through contaminated food and water and is mainly found in areas with poor sanitation.

2- Non-infectious Causes

Non infectious causes are

(a) Excessive alcohol consumption: This type is called as alcoholic hepatitis.

(b) Autoimmune diseases

(c) Certain medications

(d) Toxins.

Symptoms:-

Acute hepatitis may be accompanied by loss of appetite, abdominal pain, pale stool, dark urine, fatigue, fever, nausea, vomiting, jaundice etc.

Chronic hepatitis develops slowly so signs and symptoms may be hard to notice.

Diagnosis:

To make a diagnosis, your doctor may first review the medical history to determine if the patient have any risk factor.

for infectious or non-infectious hepatitis. If hepatitis is suspected, the type and severity may only be diagnosed through a laboratory test. The following test can be used:

① Liver function test:-

It is used to determine how perfectly and efficiently the liver works. This test uses blood samples.

② Other blood tests:-

Other blood tests may be carried out to detect and checked for hepatitis viruses and for antibodies that are found in conditions like autoimmune hepatitis.

③ Liver biopsy:-

In liver biopsy, a small tissue is taken from liver for testing. This helps the doctor in detecting how much inflammation or infection has affected your liver.

④ Abdominal ultrasound:-

An abdominal ultrasound may also be carried out to take a close look at liver and organs around it. This test can reveal liver damage or enlargement, tumor, and fluid in abdomen.

Treatment:

Acute hepatitis A and B, E usually does not need specific treatment as it is short-termed, typically resolves on its own. The initial treatment involves resting, relieving symptoms of nausea, abdominal pain, and vomiting. Moreover, adequate fluids intake is also necessary.

Chronic hepatitis B may be treated with antiviral medications. Acute and chronic hepatitis C may be treated with antiviral medications.

In Autoimmune hepatitis, treatment may include certain medications to suppress the immune system. As they have been seen to be effective in about 80% of people with the condition.

Preventive Measures:-

Preventive measures should be taken to prevent the disease. To prevent hepatitis, vaccination or immunization is highly essential. Vaccination for hepatitis A, B, and D are available. Pregnant women who develop hepatitis E require attention and care. Vaccination for hepatitis E is available only in China.

Good answer. But is lengthy and will affect your time management. So shorten it a bit

Q#4

4. Write a note on Polio.

Polio:-

Poliomyelitis (Polio) is a highly contagious viral disease caused by a virus that attacks the nervous system. Polio is also referred to as polio mostly affects children younger than 5 years old. This age group is more likely to contract the virus than any other group. In its most severe form, it causes nerve injury leading to paralysis, difficulty breathing and sometimes even death.

Global polio eradication initiative:-

In 1988, global polio eradication initiative was taken, as a result of which following regions are now certified polio-free:

- (a) Americas
- (b) Europe
- (c) Western Pacific
- (d) South East Asia

However, despite the worldwide effort to wipe out polio, poliomyelitis still affects children in parts of Asia and Africa.

Patterns of Polio Infections:

Two patterns of

polio infections exist:

- ① Non-paralytic or abortive polio

② Paralytic polio

Non-paralytic polio:- It is a minor illness that doesn't involve the central nervous system and does not eventually lead to paralysis

Paralytic polio:- It is the most serious form involving the central nervous system. This type is rare and affects about 1% of people with the condition. It may either progress to paralysis or not. About 1-5 in a thousand cases of paralytic polio progresses to paralytic disease where the muscle becomes weak, poorly controlled, and finally completely paralyzed

Classification of Paralytic Polio:

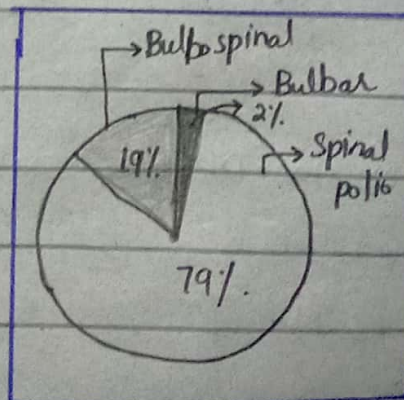
There are three classifications of paralytic polio depending on the site of paralysis

- (1) Spinal polio: polio leads to paralysis in spinal cord
- (2) bulbar polio: paralysis in the brainstem
- (3) bulbospinal polio: paralysis in both the spinal cord and brainstem

79% of paralytic polio cases results from spinal polio, about 2%

of paralytic cases are caused by bulbar polio, and about

19% cases results from bulbospinal cases



It is possible for polio to return even after recovery. This can occur 15 to 40 years after, and it is referred to as post-polio syndrome.

Causes:

Poliomyelitis is caused by polio virus. This virus is highly contagious and can be transmitted mainly from person-to-person through infected fecal matter entering the mouth, or less commonly through contaminated food & water. It multiplies in the intestine from where it can invade the nervous system and can cause paralysis. It is so contagious that anyone who is living with an infected person can catch it too.

Malnutrition, skeletal muscle injury due to injection of vaccine, immune deficiency, being young and pregnancy can make an individual susceptible to polio virus.

Symptoms

Symptoms of non-paralytic poliomyelitis:-

Too lengthy paragraphs

Symptoms

of non-paralytic poliomyelitis are:

- | | |
|----------------|--------------|
| (a) Fatigue | (d) Headache |
| (b) Meningitis | (e) Vomiting |
| (c) Neck pain | (f) Fever |

(g) Back pain

(i) Abdominal pain

(h) irritability

(j) Pain in the arms.

Symptoms of Paralytic Polio:-

Initial signs and symptoms such as fever and headache often mimic those of non-paralytic. After a week, more severe symptoms will appear such

- (a) loss of reflexes
- (b) severe muscle aches or weakness
- (c) loose and floppy limbs
- (d) sudden paralysis which may be temporary or permanent
- (e) deformed limbs, especially in the Hips, Ankles, & Feet

Symptoms of post-polio syndrom:-

In post-polio syndrom, following symptoms are shown:

- (a) muscle pain that gets worse
- (b) fatigue
- (c) muscle wasting, also referred to as muscle atrophy
- (d) Breathing or swallowing problems
- (e) Sleep disorder such sleep apnea
- (f) decreased tolerance of cold temperature

Diagnosis:

The doctor makes a diagnosis by looking at symptoms. The doctor will perform a physical examination and look for neck and back stiffness, abnormal reflexes, or difficulty lifting the head while lying flat. A confirmation made by taking a sample of throat secretions, stool, and cerebrospinal fluid.

Treatment:

No cure exists for polio, the aim of treatment is on increasing the comfort, speeding recovery, and preventing complications. The most supportive treatment includes:

- (a) bed rest
- (b) pain killers
- (c) portable ventilators to help with breathing
- (d) physical therapy to prevent loss of muscle function and deformity
- (e) heating pads or warm towel to ease muscle aches

Lengthy answer

The best way to prevent the polio is to get vaccinated. According to the Centre for Disease Control and Prevention (presented by), children should get one dose at 2 months, 4 months, 6-18 months, and a booster dose between 4-6 years.

Question no 5

Write a note on Typhoid.

Typhoid Fever:-

Typhoid fever is an illness caused by bacter Salmonella Typhi (S-Typhi). It infects the small intestine and causes high fever, stomach pain, and other symptoms. It is also called as Enteric fever.

Paratyphoid fever is similar to Typhoid fever and have mild symptoms. It is caused by Salmonella Paratyphi (S-Paratyphi).

S-Typhi and S-Paratyphi are different than the Salmonella bacteria that causes salmonellosis, a common type of food poisoning.

Typhoid is most common in rural areas of developing countries where there isn't modern sanitation. Countries in South and Southeast Asia, Central and South America, Africa and the Caribbean are most affected by typhoid. It's estimated that 11-21 million people of the world get typhoid each year.

Signs and Symptoms:

Typhoid fever gets its name from a high fever that can last for weeks if left untreated. It often gets

Lengthy paragraphs

progressively worse over a few days. Other symptoms of typhoid fever include:

- (a) Headache
- (b) Chills
- (c) loss of appetite
- (d) stomach pain
- (e) Cough
- (f) muscle aches
- (g) Nausea
- (h) Vomiting
- (i) Diarrhea or constipation
- (j) "Rose spots" rash, or faint pink spots, usually on ^{the} chest or stomach.

Causes:

It is caused by the bacterium *S. Typhi*. It lives in the gut of infected people and can contaminate food and water. Infection can spread if

- someone with typhoid touches something to be eaten without washing their hands ^{that is}
- water with fecal contamination gets into drinking water

Diagnosis:

Diagnosis is made by examining the physical symptoms and ^{by conducting} tests on samples of body fluids. Samples of body fluids and tissues are taken to check for the signs of Typhoid, which include:

- (a) blood
- (b) Stool

(c) urine

(d) bone marrow.

Treatment:

Typhoid is a bacterial disease and is treated with antibiotics. Antibiotics include:

- (1) Ciprofloxacin, levofloxacin, or ofloxacin
- (2) Ceftriaxone, cefotaxime or cefixime
- (3) Azithromycin
- (4) Carbapenems

In severe case, treatment is done by giving steroids like dexamethazone.

Prevention:

The best way to reduce the risk of typhoid fever is to get vaccinated. Avoid eating or drinking things that could be contaminated with *S. Typhi*. Wash your hands with soap and water before and after preparing food or eating and after going to the bathroom.

Vaccines for Preventing Typhoid Fever

There are

two vaccines for typhoid fever.

- ① Oral vaccine:- The oral vaccine for typhoid is four pills that is taken every other day. As of December 2020, it is no longer available from the manufacturer.

(2) Injectable vaccine (shot):- It is a single shot. Children over 2 years old can get the typhoid vaccine shot. In order to stay protected, its booster shot must be gotten.

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Date: 3-12-23

Assignment #3

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Hajra Sarfraz (Batch #59)

Topic:- GIS and its Components

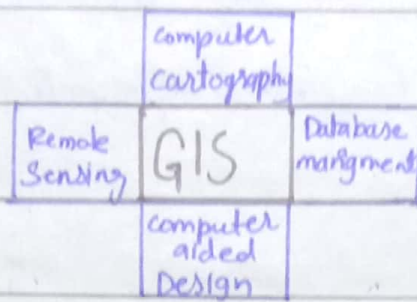
GIS:-

GIS stands for ^G geographic Information System. It can be defined as:

A GIS is a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information; that is, data identified according to location.

It helps to analyze things that exist and events that happen on Earth. GIS can show many different kinds of data on one map, such as streets, buildings, and vegetation. This enables people to more easily see, analyze, and analyze patterns and relations.

GIS is an integrating technology which makes it possible to map, model, query, and analyze large quantities of data all held together in a single database.



Components of GIS:- A working GIS integrates 5 components:-

- (a) Hardware
- (b) Software
- (c) Data
- (d) Methods
- (e) People

① **Hardware:-** Any device (a computer, a smartphone, a tablet, a laptop, a printer, a scanner etc) that stores large GIS database, GIS software, and applications can be referred to as the hardware. Typically, these are GIS workstations with powerful processing capacity, huge monitors, high-speed connectivity, and ample disk space for data storage.

② **Software:-** Any program, software package or application that enables a GIS user to perform GIS function is called the software prog component. GIS programs, database management systems, and Graphical user

interface (GUI) apps enable users to manipulate, store, query, and analyse spatial and non-spatial data and information.

③ Data:- Any spatial or non-spatial information stored digitally in computers or servers can be referred to GIS data. Such data is gathered using data collection technologies such as geospatial remote sensors and stored in a digital format for GIS users. While this process can be done in-house, some organisations prefer liaising with third-party commercial data providers or vendors for their data needs. A GIS solution helps users make sense of the data collected, and then organise it, analyse it, and use data visualisation tools to present it in the form of a map, graph, or other informative graphics.

④ Methods:- An integral part of the GIS framework is the various techniques used to turn into digestible and actionable information for easy interpretation. This

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may include algorithms, statistics, formulas and models that are predefined and unique to each business.

⑤ People: Anyone who uses a GIS falls under this category. This refers to the GIS professionals using dedicated GIS solutions or the general public accessing a digital map.

It is the professionals who keep innovating and pushing the limits of what is possible in the GIS landscape in order to serve their business and general users better.

GIS is used in almost every major industry and generates employment opportunities for a wide range of professionals.

Working of GIS:

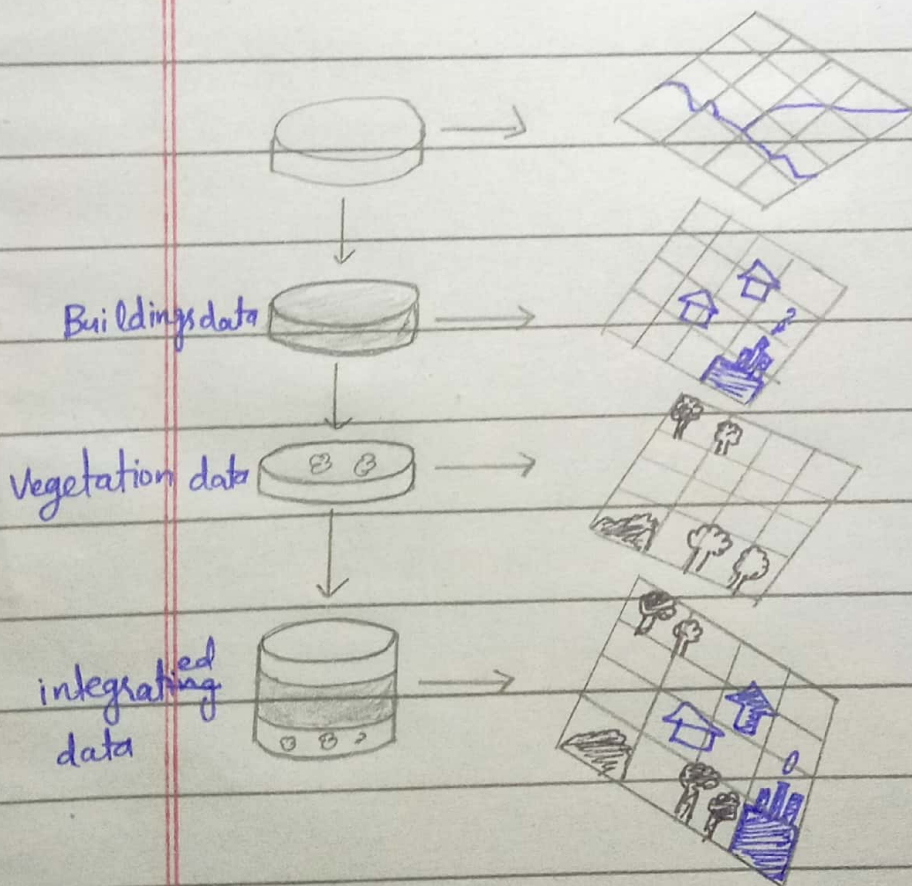
A GIS stores information about the world as a collection of thematic layers that can be tied together by geography.

It allows us to arrange information about a given region as a set of maps displaying information about one characteristic of the region. These maps are called layers.

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Each layer ^{is} has been carefully overlaid on the others so that every location is precisely matched to its corresponding locations on all other maps. Once these maps are registered within a common locational reference system, information displayed on the different layers can be compared and analyzed in combination.



Applications of GIS:- There are huge ranges of applications of GIS, which generally set out to fill the ^{ful} Five Ms of GIS: mapping, measurement, monitoring, modelling, and

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and management. Uses of GIS range from
indigenous people, communities, research
institutions, environmental scientists, health
organisations, land use planners, businesses,
and government agencies at all levels.