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DEPT: CIVIL ENGINEERING

MATRIC: 18/ENG03/006

CONCEPTUALISATION:

A pneumonia of unknown cause detected in Wuhan, China was first reported to the WHO country office in China on 31 December, 2019. The outbreak was declared a public health emergency of international concern on 30 January 2020. On 11 February 2020, WHO announced a name for the new CORONAVIRUS disease: COVID_19

SPECIFICATION

Detection- Covid 19 signs and symptoms may appear two to 14 days after exposure and can include:

- Fever
- Cough
- Shortness of breath or difficulty breathing
- Tiredness
- Aches
- Runny nose
- Sore throat

Display:

- Laboratory testing
- Specimen collection and shipment
- Reporting of cases and test results
- Research toward improved detection of COVID 19 virus

Degree of infection:

- The global death toll climbed above 100,000 globally.
- Over 1.7 million cases in the world globally.
- Recovered of over 300 thousand cases globally.

Store:

Covid 19 causes a Pneumonia, an infection of the lungs which produces pus and fluid and reduces the lungs ability to absorb oxygen. Of the 99 people with severe infection three quarters had pneumonia involving both lungs. Around 14% appeared to have lung damaged caused by the immune system

Transmit Data:

- Washing hands frequently

- Maintain social distancing
- Avoid touching eyes, nose, mouth.
- Practice respiratory hygiene

How to access transmit data

- Newspapers
- Magazines
- T.v
- Internet

Testing and debugging:

There are several ways to test for the corona virus:

- Molecular tests
- Serological test
- Public test

Release and update:

The rate of corona spreading is increasing daily and also the death rate. The increment in the days of lockdown in every countries has helped to reduce the spread of the virus.....

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HARDWARE AND SOFTWARE FEATURES

POC DEVICES

X-RAY DEVICES

BIOSENSOR DETECTOR

Table 2. Specimen collection and storage (adapted from ref 6 and ref 29,30)

Specimen type	Collection materials	Storage temperature until testing in-country laboratory	Recommended temperature for shipment according to expected shipment time
Nasopharyngeal and oropharyngeal swab	Dacron or polyester flocced swabs*	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days
Bronchoalveolar lavage	Sterile container *	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
(Endo)tracheal aspirate, nasopharyngeal or nasal wash/aspirate	Sterile container *	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
Sputum	Sterile container	2-8 °C	2-8 °C if ≤ 2 days -70 °C (dry ice) if > 2 days
Tissue from biopsy or autopsy including from lung	Sterile container with saline or VTM	2-8 °C	2-8 °C if ≤ 24 hours -70 °C (dry ice) if > 24 hours
Serum	Serum separator tubes (adults: collect 3-5 ml whole blood)	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days
Whole blood	Collection tube	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days
Stool	Stool container	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days
Urine	Urine collection container	2-8 °C	2-8 °C if ≤ 5 days -70 °C (dry ice) if > 5 days

* For transport of samples for viral detection, use viral transport medium (VTM) containing antifungal and antibiotic supplements. Avoid repeated freezing and thawing of specimens. If VTM is not available sterile saline may be used in place of VTM (in such case, duration of sample storage at 2-8 °C may be different from what is indicated above).

Aside from specific collection materials indicated in the table also assure other materials and equipment are available: e.g. transport containers and specimen collection bags and packaging, coolers and cold packs or dry ice, sterile blood-drawing equipment (e.g. needles, syringes and tubes), labels and permanent markers, PPE, materials for decontamination of surfaces etc.

Table 1. Specimens to be collected from symptomatic patients and contacts

	Test	Type of sample	Timing
Patient	NAAT	Lower respiratory tract	Collect on presentation.
		- sputum - aspirate - lavage	Possibly repeated sampling to monitor clearance. Further research needed to determine effectiveness and reliability of repeated sampling.
		Upper respiratory tract - nasopharyngeal and - oropharyngeal swabs - nasopharyngeal wash/nasopharyngeal aspirate Consider stools, whole blood, urine, and if diseased, material from autopsy	
Patient	Serology	Serum for serological testing once validated and available	Paired samples are necessary for confirmation with the initial sample collected in the first week of illness and the second ideally collected 2-4 weeks later (optimal timing for convalescent sample needs to be established).
Contact (in health-care centre associated outbreaks or other settings where contacts have symptoms, or where asymptomatic contacts have had high-intensity contact with a COVID-19 case.	NAAT	Nasopharyngeal and oropharyngeal swabs	Within incubation period of last documented contact.
	Serology	Serum for serological testing once validated and available	Baseline serum taken as early as possible within incubation period of contact and convalescent serum taken 2-4 weeks after last contact (optimal timing for convalescent sample needs to be established).

ALGORITHM AND FLOW CHART

Start

Read A,B,C

A-patients air sample

B-patients temperature sample

C-patients RNA

Determining stages

Read D,E,F

D-stored patient air sample of the virus

E-stored patient temperature sample of the virus

F- stored patient RNA sample of the virus

If A=D

Print positive

Else

Print Negative

If B=E

Print positive

Else

Print Negative

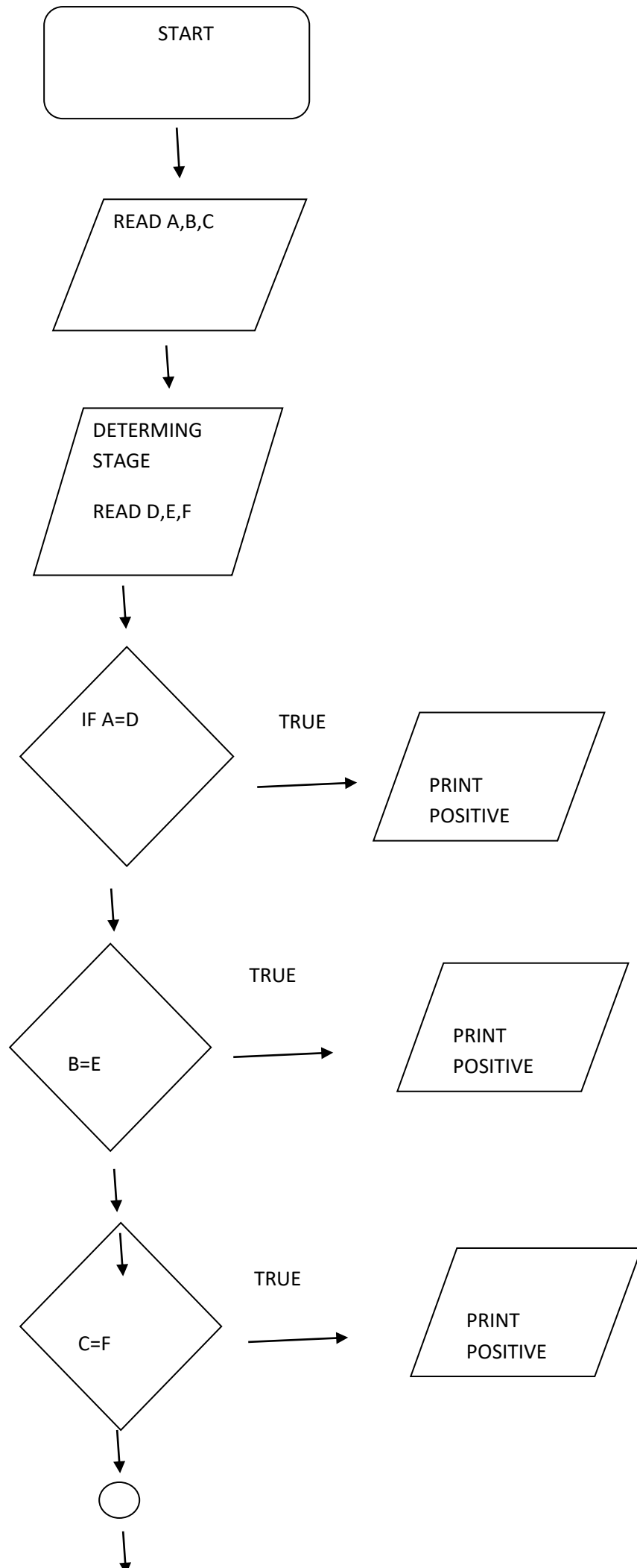
If C=F

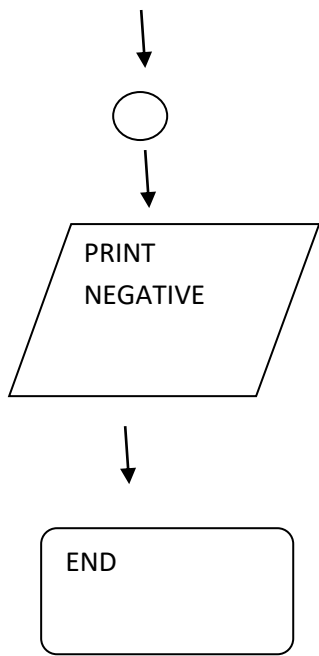
Print positive

Else

Print negative

End





COVID-19 LIVE INFO DATABASE(CLI)

