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Author(s)		
Verifiers		Stamp:
Approver		

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1.	PPHRL Lab Staff on duty
2.	Quality Management Record
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Revise before:	After one year of approver/ as per need

Changes in this version compared to previous version:

To be done after revision as per international accreditation guidelines

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1. Scope:

The purpose of this document is to provide guidance on laboratory biosafety and standard operating procedure related to the testing of clinical specimens of patient that meet the case definition of the novel coronavirus (SARS-CoV-2), the disease named COVID-19.

2. Responsibilities:

Sample collection: Front Desk Officers and Home Sampling team

Sample transport: Sample Management Department team

Testing: Lab Technologists of Virology section

Supplies: Inventory Department

Biosafety: Biosafety Manager

Reporting: Lab Coordinator and Lab Manager

Trainings: Resident Virologist and Biosafety Manager

3. Sample collection:

3.1 Precautions:

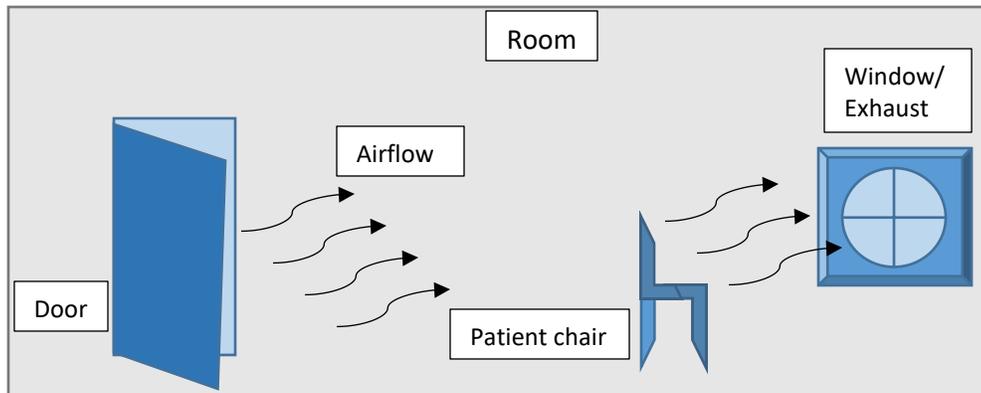
Transmission-based (contact and droplet) precautions must be used when collecting respiratory specimens. These include:

- Perform hand hygiene before donning gown, gloves, eye protection (goggles or face shield) and N95 mask (which should be fit-tested).
- to collect nasopharyngeal or oropharyngeal swabs, stand slightly to the side of the patient to avoid exposure to respiratory secretions in case patient cough or sneeze,
- at completion of procedure, clean the contaminated surfaces with disinfectant, remove PPE and perform hand hygiene,
- do not touch the front of any item of PPE during removal.

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3.2 Sample collection area:

Preferably collect sample in open area (roof, balcony, terrace etc.) or in a ventilated space so that airflow is outside the sample collection area. If collecting the specimens in a room, then let the patient sit near the window/exhaust and stand at side of patient (not between window and patient). After specimen collection close the door and leave the room, which should be left vacant for at least 30 minutes (cleaning can be performed during this time by a person wearing PPE).



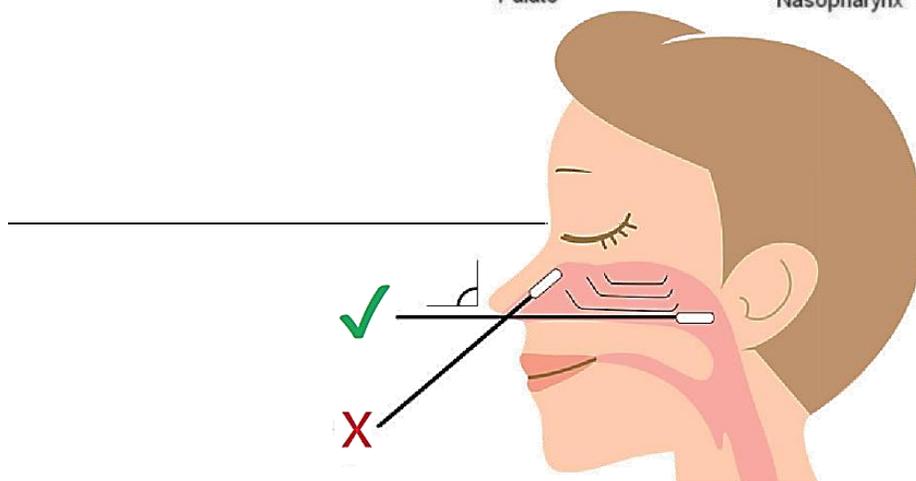
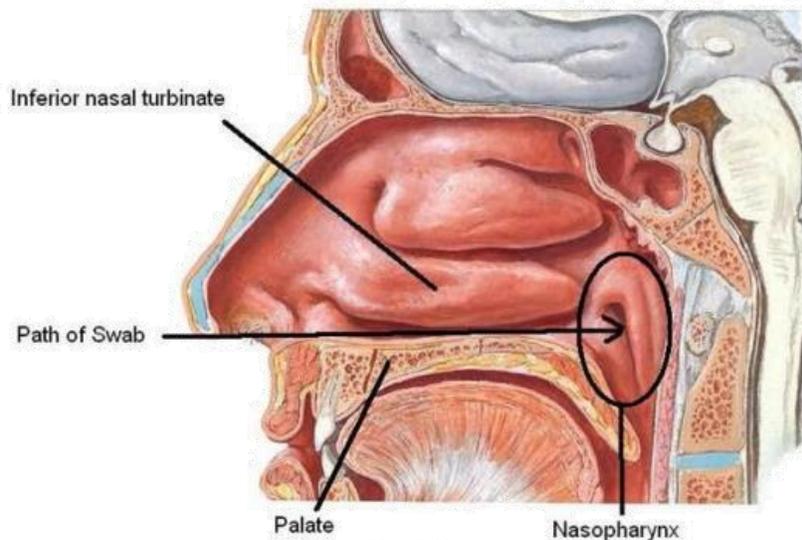
3.3 Sample collection procedure:

For initial diagnostic testing for COVID-19, CDC recommends collecting and testing an upper respiratory nasopharyngeal swab (NP). Collection of oropharyngeal swabs (OP) is a lower priority and if collected should be combined in the same tube as the NP. Place swabs immediately into sterile tubes containing 2-3 ml of viral transport media.

a) Nasopharyngeal swab (NOT nasal swab):

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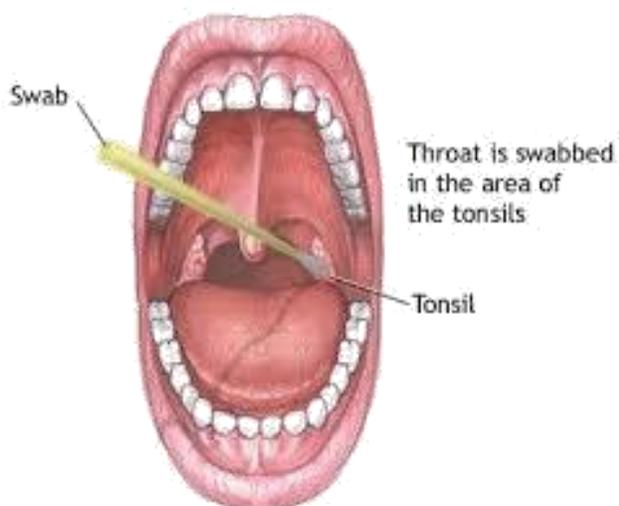
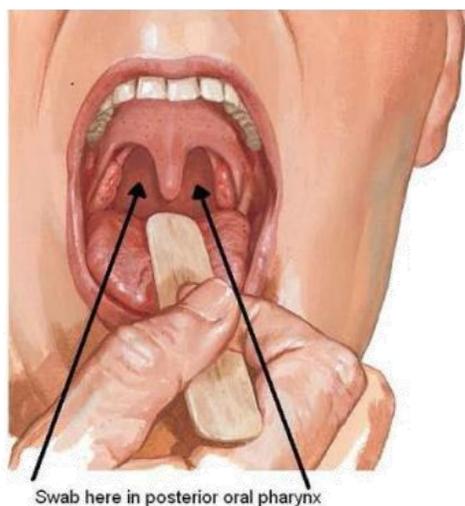
- Blow nose and look for any obstruction. (In case of obstruction, take oropharyngeal swab)
- Hold swab between your thumb and forefinger with the shaft resting on your middle finger.
- Patient tilts head back, and you place your hand on the patient's forehead.
- Insert swab into nostril, gently rotating inward until resistance is met.
- Rotate the swab 2-3 times and leave the swab for 4-5 seconds so that the material is absorbed.
- Withdraw the swab, remove hand from patient forehead, and place swab in vial with transport medium.
- Break off the end of broken swab so cap will close.
- Dispose of broken tip into sharps container.
- Tighten cap.



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b) Oropharyngeal swab (e.g., throat swab):

- Hold swab between your thumb and forefinger with the shaft resting on your middle finger.
- Have the patient open their mouth.
- Rotate the swab 2-3 times.
- Withdraw the swab and place in vial with transport medium.
- Break off the end of broken swab so cap will close.
- Dispose of broken tip into sharps container.
- Tighten cap.



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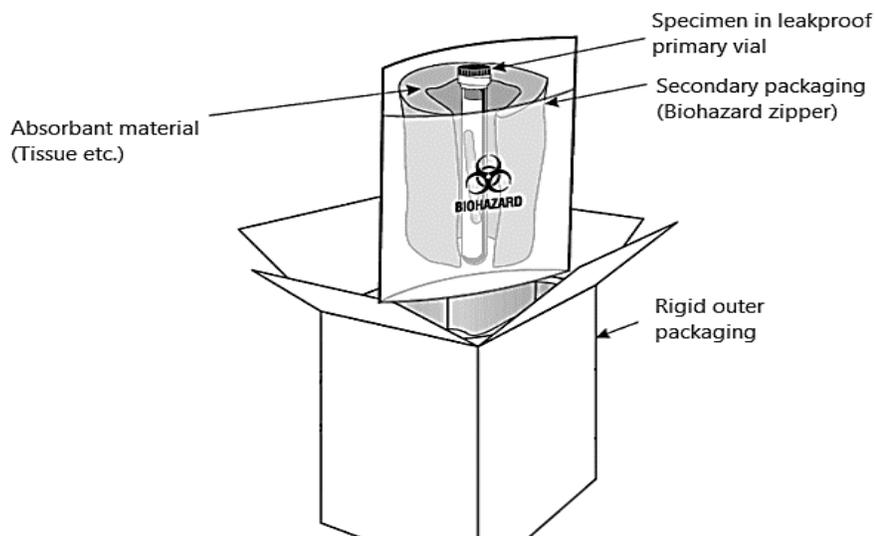
c) Lower respiratory tract specimen:

For patients for whom it is clinically indicated (e.g., those receiving invasive mechanical ventilation), a **lower respiratory tract aspirate or bronchoalveolar lavage** sample can be tested as a lower respiratory tract specimen.

4. Sample transport:

Store specimens at 2-8°C and ship overnight.

All vials should be placed in a secondary container to minimize the potential for breakage or a spill. Specimens surface should be decontaminated before transport.



5. Personnel Protective Equipment (PPEs):

a) Lab coats:

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- Laboratory coats must be used in laboratories to prevent personal clothing from getting splashed or contaminated by biological agents.
- Laboratory coats must have long sleeves, preferably with elasticised or fitted cuffs and must be worn closed.
- Sleeves should never be rolled up.
- Coats must be long enough to cover the knees, but not trail on the floor.
- The fabric of the laboratory coat should be splash resistant and overlap to provide a solid front. Laboratory coats must only be worn in designated areas.
- When not in use, they should be stored appropriately; they should not be hung on top of other laboratory coats, or in lockers or hooks with personal items.

b) Gloves:

- Disposable gloves must be worn for all procedures that may involve contact with potentially infectious materials.
- Gloves should always be inspected before use to check they are intact.
- They must not be disinfected or reused as exposure to disinfectants and prolonged wear will reduce the integrity of the glove and decrease protection to the user.

c) N95 mask:

Respiratory protection is needed, especially when procedures that may create aerosols and droplets will be performed, for example:

- centrifugation,
- handling leaking samples
- procedures that can cause splashes
- loading and unloading of sealed centrifuge cups,
- vigorous shaking or mixing,
- opening of containers of infectious materials whose internal pressure may be different from the ambient pressure).

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Use a cleanable face shield over an N95 respirator to reduce surface contamination

d) Face shield/Googles:

Safety glasses, safety goggles, face shields (visors) or other protective devices must be worn whenever it is necessary to protect the eyes and face from splashes. Eye protection can be reused, but must be regularly cleaned after every use.

6. Donning and Doffing:

When putting on (donning) PPEs, start from clean to dirty while during putting off (doffing) PPEs, move from dirty to clean.

Putting on PPE:

Put on in the following order:

1. Gown.
2. N95 mask.
3. Eye protection, i.e. goggles or face shield.
4. Disposable gloves.

Removal of PPE:

PPE should be removed in an order that minimises the potential for cross-contamination. Before leaving the side room gloves, gown and eye protection should be removed (in that order, where worn) and disposed of as infectious waste. After leaving the area, the respirator can be removed and disposed of as clinical waste. Guidance on the order of removal of PPE is as follows:



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1. Gloves:

Gloves Removal Technique

1. Form an "L" with your thumb and index finger of your left hand. Give five with your right hand.

2. Using your "L", grasp the cuff at the wrist and pinch the glove.

3. Make a scoop with middle finger of your left hand.

4. Pull the end of the glove over the thumb over the top of your fingers forming a "beak."

5. Hold your left hand palm-side up in front of you. Using your "beak" grasp the top of the cuff of the glove and pull the glove down and away from you while turning it inside out.

6. Using the index finger of your left (ungloved) hand, complete the glove removal of the beaked hand by running your finger down the center of the palm. Avoid touching the cuff of your lab coat.

Note: Never reuse disposable gloves. Wash your hands after removing gloves.

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2. Gown

- Unfasten or break ties.
- Pull gown away from the neck and shoulders, touching the inside of the gown only.
- Turn the gown inside out, fold or roll into a bundle and discard.



3. Eye protection

To remove, handle by headband or earpieces and discard appropriately. Reusable eye protection (e.g., goggles) must be cleaned and disinfected.

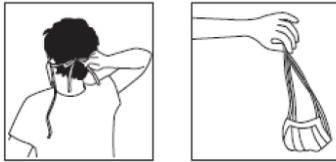


4. Mask

- Don't touch the outside and inside of mask.
- Use same mask by same person and if needed store in a paper bag with appropriate name and date of use.
- To minimize potential cross-contamination, store respirators so that they do not touch each other and the person using the respirator is clearly identified.

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- Discard N95 mask if contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.
- Discard N95 mask that is obviously damaged or becomes hard to breathe through.
- Perform hand hygiene with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator (if necessary, for comfort or to maintain fit).



5. Wash hands

Clean hands thoroughly immediately after removing all PPE.

7. Hand Hygiene:

Hand hygiene should be performed before and after all patient contact, contact with potentially infectious material, and before putting on and after removing PPE, including gloves. Hand hygiene after removing PPE is particularly important to remove any pathogens that might have been transferred to bare hands during the removal process. Alcohol based hand rub should only be used on visibly clean hands. Clean the hands frequently (preferably after every two hours).



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How to Handwash?

ہاتھ دھونے کا طریقہ

Wash hands when visibly soiled!
otherwise, use handrub

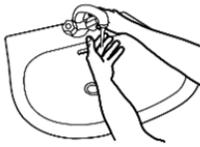
اگر ہاتھوں پر مٹی لگی ہے یا ہاتھ دیکھنے میں گندے ہیں تو پانی اور صابن کا استعمال کریں
دوسری صورت میں (Hand Sanitizer) استعمال کر سکتے ہیں

 Duration of the entire procedure: 40-60 seconds

طریقہ کار کا مکمل دورانیہ 40-60 سیکنڈ

0

Wet hands
with water



ہاتھوں کو پانی سے گیلا کریں

1

Apply enough soap
to cover all hand
surfaces



صابن کو ہاتھ کی ہتھیلی میں ڈالیں

2

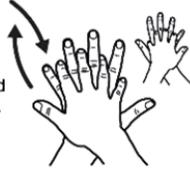
Rub hands
palm to palm



دونوں ہاتھوں کی ہتھیلیاں ملیں

3

Right palm over left
dorsum with interlaced
fingers and vice versa



دائیں ہاتھ کی ہتھیلی کو بائیں ہاتھ کے اوپر سے اور بائیں
ہاتھ کی ہتھیلی کو دائیں ہاتھ کے اوپر سے انگلیوں کے درمیان
میں ملیں

4

Palm to palm with
fingers interlaced



دونوں ہاتھوں کی ہتھیلیوں کو جوڑ کر اور انگلیوں کو ملا کر ملیں

5

Backs of fingers
to opposing
palms with fingers
interlocked



انگلیوں کی پشت کو مخالف ہاتھ کی ہتھیلی سے ملیں

6

Rotational rubbing of left
thumb clasped in right
palm and vice versa



بائیں ہاتھ کے انگوٹھے کو دائیں ہاتھ میں لے کر ملیں
اور یہی عمل دوسرے ہاتھ سے دہرائیں

7

Rotational rubbing,
backwards and forwards
with clasped fingers of
right hand in left palm
and vice versa



دونوں ہاتھوں کی انگلیوں کو ہتھیلیوں سے ملیں

8

Rinse hand
with water



پانی کے ساتھ ہاتھوں کو دھوئیں

9

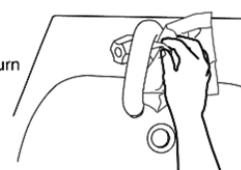
Dry hands thoroughly
with a single use towel



ٹشو پیپر کے ساتھ ہاتھوں کو خشک کریں

10

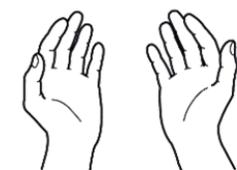
Use towel to turn
off faucet



تل کو بند کرنے کے لیے ٹشو پیپر کا استعمال کریں

11

Your hands are
now safe



خشک ہونے پر آپ کے ہاتھ محفوظ ہیں

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8. Surface cleaning and disinfection:

Any surface or material known to be, or potentially be, contaminated by biological agents during laboratory operations must be correctly disinfected to control infectious risks.

2019-nCoV may likely susceptible to disinfectants with proven activity against enveloped viruses, including:

- sodium hypochlorite (bleach) 0.5% for general surface disinfection,
- 70% ethanol,
- 0.5% hydrogen peroxide.



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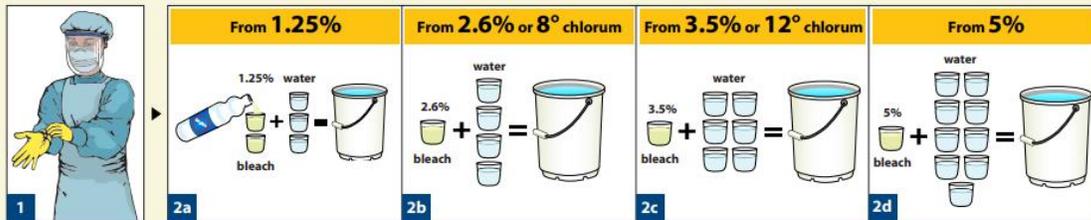
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How to Make Strong (0.5%) Chlorine Solution from Liquid Bleach

Use strong (0.5%) chlorine solution to clean and disinfect surfaces, objects, and body fluid spills.

Make new strong (0.5%) chlorine solution every day. Throw away any leftover solution from the day before.



1
Make sure you are wearing **extended PPE**.

2a
Pour 2 parts liquid bleach and 3 parts water into a bucket. Repeat until full.

2b
Pour 1 part liquid bleach and 4 parts water into a bucket. Repeat until full.

2c
Pour 1 part liquid bleach and 6 parts water into a bucket. Repeat until full.

2d
Pour 1 part liquid bleach and 9 parts water into a bucket. Repeat until full.



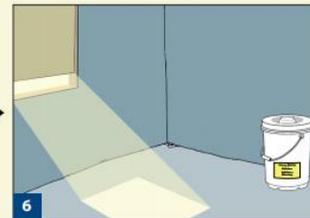
3
Stir well for 10 seconds.



4
Label bucket "Strong (0.5%) Chlorine Solution - Cleaning."



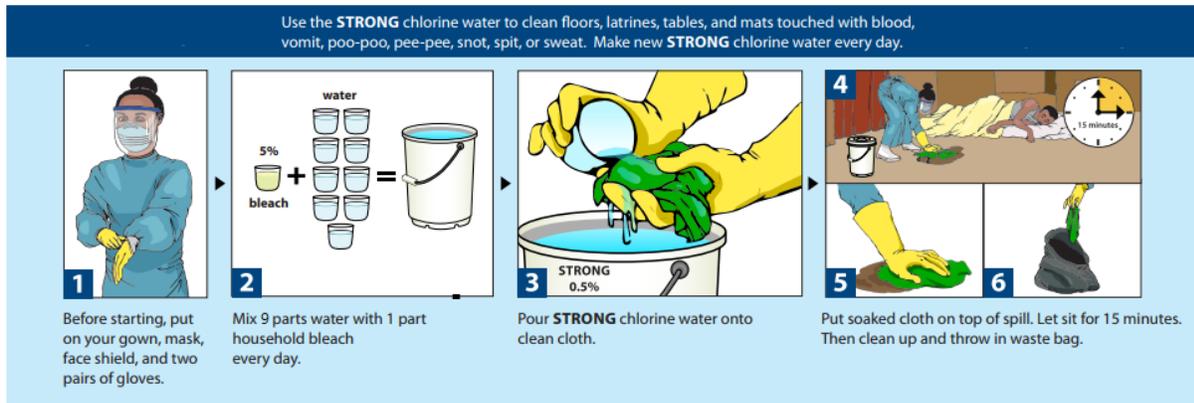
5
Cover bucket with lid.



6
Store in shade. Do not store in direct sunlight.



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9. Waste Management:

Handle laboratory waste from testing suspected or confirmed COVID-19 patient specimens as all other biohazardous waste in the laboratory. Currently, there is no evidence to suggest that this laboratory waste needs additional packaging or disinfection procedures.

10. References:

- CDC- Recommended Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings
<https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>
- CDC - Information for Healthcare Professionals
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html>
- WHO - Technical Guidance - Coronavirus disease (COVID-19)
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>

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- COVID-19: Disinfection and decontamination protocols – Primary & Secondary Healthcare Department, Govt. of the Punjab (issued on 10 March 2020)