

NOTICE

Ref. Advt. No. 05/2020

**SYAMA PRASAD MOOKERJEE PORT – KOLKATA
HALDIA DOCK COMPLEX**

(Jawahar Tower Complex, Haldia Township,
Purba Medinipur, West Bengal, Pin – 721607)

**Written Examination for selection of Surveyor (on contract)
under I&CF Division of Haldia Dock Complex**

- Written Test Venue** : Training Institute,
Operational Building, 1st Floor, Chiranjibpur
Haldia Dock Complex,
Dist Purba Medinipur, West Bengal
Pin -721607
- Date of Test** : 19/03/2021
- Reporting Time** : 10:30 hrs.
- Model Question Paper with Answer** : Attached.
- Question Paper** : **Total Marks: 50**
Qualifying Marks: 25
- Question paper Duration** : **120 Mins.**

General Instructions to the candidates:

- Admit card have been issued to the prima-facie eligible candidates both by speed posts and also by email. If the candidate does not receive admit card by post, he/she may also take a print out of the e-mail (soft copy) of the admit card.
- The candidate must bring the admit card with recent passport size photograph affixed in the space provided and the filled in self-declaration at the time of appearing for the written examination. No candidate will be permitted to enter the examination Centre without the admit card with fill up the self-declaration about their Health status.
- The admit card along with affixed passport size photograph will be collected in the examination hall and therefore the candidate is advised to keep one photocopy of the Admit Card for his/ her own reference.
- Candidate must carry at least one photo bearing **IDENTITY PROOF** in original such as Passport, Driving License, Voter Card, Aadhaar Card, Identity Card issued by University / College, Pan Card **along with a self-certified photocopy of the same**, to the examination Centre, failing which, **HE/SHE SHALL NOT BE ALLOWED TO APPEAR FOR THE EXAMINATION.**
- The candidate should reach the examination Centre / Venue at the reporting time. Late comers will not be permitted to appear in the test. **They should bring 2 good quality BLACK/BLUE ball point pen for answering the test questions. Use of Pencils is strictly prohibited for answering questions.**
- Candidature for the test is provisional and subject to fulfilling all the eligibility conditions as indicated in the advertisement. Receipt of Admit card by the candidate is not to be construed as

acceptance of the candidate's eligibility for selection. If, at any stage, it is found that the candidate is ineligible for sitting in the written examination or at any subsequent stage his / her candidature will be rejected.

- Candidates are not allowed to carry any papers, notes, books, calculators, pagers or mobile phone or electronic devices etc., in the examination hall. Any candidate found using or in possession of such unauthorised material or indulging in copying or adopting unfair means, is liable to be summarily disqualified.
- Request for change of centre / venue will not be entertained under any circumstances.
- No Travelling allowance will be reimbursed for appearing in the Written Test.
- Candidates are required to comply with the Government COVID-19 related safety protocols for the examination as prescribed therein. The important COVID-19 safety guidelines are given overleaf.
- Candidates are required to wear Facemask and carry their own water bottle, Hand Sanitizer etc. inside the examination hall.
- Candidates shall be allowed entry only if using Face Mask / Face Cover and the Face Mask / Face Cover has to be worn properly all times inside the examination center. They have to undergo mandatory Thermal Screening and Hand Sanitization before entering into the Examination Centre.
- Candidates shall be permitted to enter the examination Centre only if they are not having any COVID-19 symptoms. HDC reserves the right to allow / disallow entry of candidates subject to COVID-19 Protocol.
- Candidates are required to maintain physical distance when queuing up for entry.
- Bags/Books/Mobiles etc. shall not be allowed in the Examination hall. Designated space would be provided by HDC for keeping such items.
- Spitting in and around is strictly prohibited. Use of spit/saliva for counting /turning question paper/Answer Sheet is also strictly prohibited.
- Sharing of personal belongings / stationary shall not be allowed.
- Candidates are also requested to go through the detailed Government COVID-19 guidelines given below.

The Government guideline on preventive measures to be followed by the candidates while appearing for the written examination to contain spread of Covid-19

1. Generic preventive measures

The generic measures include simple public health measures that are to be followed to reduce the risk of COVID-19. These measures need to be observed by all (candidates and parents) in these places at all times.

These include:

- i. Physical distancing of at least 6 feet to be followed as far as feasible.
- ii. Use of face covers/masks to be made mandatory.
- iii. Practice frequent hand washing with soap (for at least 40-60 seconds) even when hands are not visibly dirty. Use of alcohol-based hand sanitizers (for at least 20 seconds) can be made wherever feasible.

- iv. Respiratory etiquette to be strictly followed. This involves strict practice of covering one's mouth and nose while coughing/sneezing with a tissue/handkerchief/flexed elbow and disposing off used tissues properly.
- v. Self-monitoring of health by all and reporting any illness at the earliest.
- vi. Spitting shall be strictly prohibited.
- vii. Installation & use of Aarogya Setu App shall be advised to all, as far as feasible.

2. Entry and Exit to the examination center

- i. Entrances to have mandatory hand hygiene and thermal screening provisions. If any examination functionary/examinee fails to meet the self-declaration criteria, they shall not be allowed entry.
- ii. Only asymptomatic staff and students shall be allowed inside the examination hall.
- iii. In regular course, a symptomatic candidate should be referred to the nearest health center and given an opportunity to undertake the examination through other means or the Universities/Educational Institution shall arrange for taking exam at a later date when the student is declared physically fit. However, if a student is found to be symptomatic, the permission or denial thereof, in such cases shall be granted as per the policy already enunciated on the issue by the Examination Conducting Authorities.
- iv. All staff and students to be allowed entry only if using face cover/masks. The face cover/mask has to be worn at all times inside the examination center by all.
- v. Enough entry & exits gates for students and staff shall be ensured to avoid overcrowding.
- vi. Maintaining physical distancing of a minimum of 6 feet, when queuing up for entry and inside the center as far as feasible.
- vii. Specific markings may be made with sufficient distance to manage the queue and ensure social distancing in the premises.
- viii. Proper crowd management in the examination center as well as outside premises like parking lots, waiting areas — duly following physical distancing norms shall be ensured.
- ix. Bags/books/mobiles should not be allowed in the examination center.
- x. The examinees will be taken to a registration room in batches maintaining adequate physical distancing norms for document verification and recording of attendance. Thereafter they will be escorted in batches to the allotted examination hall.
- xi. Frisking of examinees, if needed, shall be undertaken after thermal screening. Personnel involved in frisking shall wear triple layer medical mask in addition to gloves. Proper hand hygiene shall be maintained by such personnel every time they change their gloves.
- xii. On completion of exam, the candidates should be permitted to move out in an orderly manner.

Model Question Paper with answers

Subject: Surveying
Full marks: 50

Time: 02 Hrs.

Instructions:

- A. Illustrate your answers with neat sketches wherever necessary.
- B. Figures to the right indicate full marks.

Q: 1 Choose the right answer from the followings (any fifteen):

15x1=15 Marks

i) Which of the following methods of contouring is most suitable for a hilly terrain?

- a. Direct method
- b. Cross section method
- c. Square method
- d. Tachometric method

Ans: -d

ii) For a well-conditioned triangle, no angle should be less than:

- a. 20°
- b. 30°
- c. 45°
- d. 60°

Ans: b

iii) Which of the following methods of offsets involves less measurement on the ground?

- a. Method of perpendicular offsets.
- b. Method of oblique offsets.
- c. Method of ties

Ans: -a

iv) The correction for sag is:

- a. Always additive
- b. Always subtractive
- c. Always zero.
- d. Sometimes additive and sometimes subtractive

Ans: b

v) The horizontal angle between true meridian and magnetic meridian is known:

- a. bearing
- b. dip
- c. magnetic bearing
- d. convergence

Ans: c

vi) The method of finding out the difference in elevation between two points for eliminating the effect of curvature and refraction is:

- a. precise levelling
- b. reciprocal levelling
- c. differential levelling
- d. flying levelling.

Ans: b

vii) If whole circle bearing of a line is 120° , its reduced bearing is:

- a. $S20^\circ E$
- b. $S60^\circ E$
- c. $N120^\circ E$
- d. $N 60^\circ E$

Ans: b

The following sights are taken on a "Turning point or change point":

- a. fore sight only
- b. back sight only
- c. fore sight and back sight
- d. fore sight and intermediate sight.

Ans: c

ix) Height of instrument method of levelling is:

- a. more accurate than rise and fall method.
- b. less accurate than rise and fall method.
- c. quicker and less tedious for large number of intermediate sights.
- d. none of the above.

Ans: c

x) The R.L. of the point A which is on the floor is 100m and back sight reading on A is 2.455m. If the fore sight reading on the point B which is on the ceiling is -2.745m, the R.L. of point B:

- a. 94.80m
- b. 99.71m
- c. 100.29m
- d. 105.20m

Ans: d

xi) An imaginary line lying through out the surface of ground and preserving a constant inclination to the horizontal is known as:

- a. contour gradient.
- b. contour line
- c. contour interval
- d. horizontal equivalent.

Ans: a

xii) A series of closely spaced contour lines represents a:

- a. gentle slope.
- b. uniform slope.
- c. steep slope.
- d. plane surface.

Ans: c

xiii) Closed contours, with higher value inwards, represent a:

- a. depression.
- b. hillock.
- c. plane surface.
- d. none of the above.

Ans: b

xiv) If the intercept on a vertical staff is observed as 0.75m from a tacheometer, the horizontal distance between tacheometer and staff station is:

- a. 7.5m
- b. 25m
- c. 50m
- d. 75m

Ans: d

xv) The co- ordinate of a point measured perpendicular to the parallel, is called:

- a. total latitude.
- b. meridian distance.
- c. total departure.
- d. consecutive co- ordinate.

Ans: a

xvi) If the radius of a simple curve is 600m, the maximum length of the chord for calculating offsets, is taken:

- a. 10m
- b. 15m
- c. 30m

Ans: c [Explanation: Length = $r/20 = 600/20 = 30$] if the radius of a simple curve is R, the length of the chord for calculating offsets by the method of chord produced, should not exceed R/20.

xvii) Surveys which are carried out to depict mountains, rivers, bodies, wooded areas and other cultural details, are known as:

- cadastral surveys.
- city surveys.
- topographical surveys.
- plane surveys.

Ans: c

xvii) The reduced bearing of line is N87°W, its whole circle bearing is:

- 87°
- 273°
- 93°
- 3°

Ans: b

xix) Local attraction in compass surveying may exist due to :

- incorrect levelling of the magnetic needle
- loss of magnetism of the needle
- friction of the needle at the pivot
- presence of magnetic substances near the instrument.

Ans: d

xx) Select the correct statement.

- A contour is not necessarily a closed curve.
- A contour represents a ridge line if the concave side of lower value contour lines towards the higher value contour.
- Two contours of different elevations do not cross each other except in case of an overhanging cliff.
- All of the above statements are correct.

Ans: c

Q.2. Answer the following questions:

(1+2+2) = 5 Marks

a) What do you know by elevation?

Ans: The elevation of a point is its vertical distance above or below the datum. It is also known as the reduced level.

b) Define the line of collimation and Bench mark.

Ans: The line of collimation is the line joining the intersection of the cross hairs to the optical centre of the object glass and its continuation.

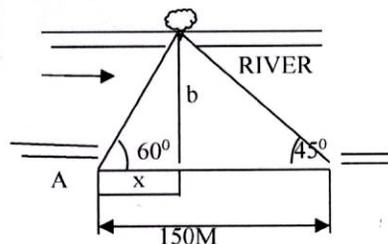
A bench mark (B.M) is a fixed reference point of known elevation.

c) How many kinds of Bench marks are there? Name them.

Ans: There are four kinds of bench marks, such as (i) G.T.S., (ii) permanent, (iii) temporary and (iv) arbitrary bench mark.

Q.3) A and B are two points 150m apart on the nearer bank of a river, which flows east and west. The bearings of the tree on the other bank of a river as observe from A and B are N30°E and N45°W. Find the width of the river with neat sketch. (10 Marks)

Ans: -



Let b be the width of the river and x the distance from A to the foot of the perpendicular from the tree to AB.

Then $b/x = \tan 60^\circ = \sqrt{3}$ or $b = \sqrt{3}x$.

$b/(150-x) = \tan 45^\circ = 1$ or $b = 150-x$.

So, $\sqrt{3} \times x = 150-x$ or $(\sqrt{3} + 1) x = 150$.

Whence $x = 150/2.732 = 54.9$ and $b = 150 - 54.9 \tan 60^\circ = 95.1$ m.

Also, $b = 150 - x = 150 - 54.9 = 95.1$ m.

4) The following consecutive readings were taken with an auto level
 3.865, 3.345, 2.930, 1.955, 0.855, 3.795, 2.640, 1.540, 1.935, 0.865, 0.665.
 The level was shifted after the fifth and the eighth readings. The first reading taken of the Bench mark of R.L 7.450.
 Calculate the reduced level of the change points, and the difference of level between the first and last points.
 (10 Marks)

Ans: -

station	Readings			H.I	Reduced level	Remarks
	Back sight	Inter sight	Fore sight			
1	3.865			11.315	7.450	B.M
2		3.345			7.970	
3		2.930			8.385	
4		1.955			9.360	
5	3.795		0.855	14.255	10.460	C.P - 1
6		2.640			11.615	
7	1.935		1.540	14.650	12.715	C.P - 2
8		0.865			13.785	
9			0.665		13.985	
				Diff. of 1 st & last R.L = + 6.535		

Q. 5) The following perpendicular offsets were taken at 10 m intervals from a survey line to an irregular boundary line: ---
 3.82, 4.37, 6.82, 5.26, 7.59, 8.90, 9.52, 8.42, and 6.43m.

Calculate the area in sq metres enclosed between the survey line, the irregular boundary line and the first and last offsets by the application of Simpson's rule.
 (10 marks)

Ans: - $\Delta = \frac{10}{3}[(3.82 + 6.43) + 4 \times (4.37 + 5.26 + 8.90 + 8.42) + 2 \times (6.82 + 7.59 + 9.52)]$
 $= \frac{10}{3}[10.25 + (4 \times 26.95) + (2 \times 23.93)]$
 $= \frac{10}{3}[10.25 + 107.8 + 47.86]$
 $= \frac{10}{3} \times 165.91$
 $= 553.03 \text{ sqm.}$