

Time : 3 Hrs.

D1G  
Surv.& Meas.

Full Marks : 80

Pass Marks : 26

Answer *all* from Group A,  
*any four* from Group B and *any five* from Group C.

xi A l s l Hkj xi B l s fdUgha plj rFkk

xi C l s fdUgha i qp izuka ds mUkj nA

The figures in right hand margin indicate full marks.

ik'oz ds v d i wkk d ds l pd gA

GROUP A

1. Four alternative answers are given to each question. Write down the correct answer for all questions. **1x20=20**

fuEukidR i R; d izu dspkj fodYi fn; sx; sgA l Hkh izuka ds  
l gh mUkj pUdj fy[kA

- (i) If the smallest division of a vernier is longer than the smallest division of its primary scale, the vernier is known as :
- (a) direct vernier (b) double vernier  
(c) simple vernier (d) retrograde vernier.

P.T.O.

vxj ofuz j dk l cl sNkx/k Hkx eq; i kusds l cl sNkx/s

Hkx l scMk gks rks ml ofuz j dks tkuk tkrk g%

(a) l h/kk ofuz j (b) nkjkk ofuz j

(c) l k/kkj .k ofuz j (d) jv/xM ofuz jA

(ii) In the case of geographical maps the scale is usually kept :

(a) 1 cm = 10 cm to 10 m

(b) 1 cm = 50 m to 2 km

(c) 1 cm = 5 km to 160 km

(d) 1 cm = more than 200 km.

Hkxkf yd uD'ks ds fy, ik; % i kus j [kk tkrk g%

(a) 1 l ehE = 10 l ehE l s 10 ehE rd

(b) 1 l ehE = 50 fdEehEehE l s 2 fdEehE rd

(c) 1 l ehE = 5 fdEehE l s 160 fdEehE rd

(d) 1 l ehE = 200 fdEehE l s vf/kdA

(iii) The error due to bad ranging is called :

(a) cumulative error

(b) compensative error

(c) sometimes cumulative and sometimes compensative

(d) insignificant.

[kjc vkj[ku ds dkj.k =fV dgykrh gS%

(a) l ph; =fV

(b) l edkjh =fV

(c) dHk l ph; dHk l edkjh

(d) mi {; =fVA

(iv) As per Indian standard, the length of one link of 30 metre chain should be :

Hkjr; ekud ds vuq kj 30 ehVj yEch tjhc dh ,d fy d dh yEckbz gkuh pkfg, &

(a) 30 cm (b) 20 cm

(c) 40 m (d) 10 cm.

(v) The position of point can be fixed more accurately by :

(a) perpendicular offset (b) optical square

(c) Cross offset (d) Oblique offset.

fdl h fclnqdh l gh fLFkfr LFkfi r djusdsfy, 0; ogkj  
fd; k tkrk gS%

- (a) vfhkyEc vKDI \ (b) idk'kh; xfu; k  
(c) xfu; k ; æ (d) f=; d vKDI \A

(vi) When the length of a chain line along a slope of ' $q$ ' is  
' $l$ ' the correction for slope required is :

' $q$ ' <ky ij tc tjhc js'kk dh yEckbz ' $l$ ' gks rks <ky  
l kks'ku dh ek=kk gkrh gS&

- (a)  $l(1 - \sin q)$  (b)  $l(1 - \tan q)$   
(c)  $l(1 - \cos q)$  (d)  $l(1 - \cos^2 q)$

(vii) The first temporary adjustment of a prismatic  
compass is :

- (a) Levelling  
(b) Focussing of the prism  
(c) Removing of parallax  
(d) Centering.

fdl h fiTe dEi kl dk igyk vLFkfbz l eatu gS%

- (a) ry{k.k  
(b) fiTe dk Qkd l u

- (c) yeu vFkok foLFkki ukhkl nj djuk  
(d) dlnz kA

(viii) The total number of zeroes graduated on  
surveyer's compass is :

fdl h l o{k.k dEi kl ij dgy 'kk; vdr fpàk dh l ; k  
gkrh gS%

- (a) 1 (b) 2  
(c) 3 (d) 4

(ix) What is the whole circle bearing of a quadrant  
bearing N 15° 28' W ?

iwkzfndeku izkkyh eaprfkkk fndeku N 15° 28'W dk  
D; k eku gksk \

- (a) 195° 28' (b) 164° 32'  
(c) 344° 32' (d) 344° 28'.

(x) If the magnetic bearing of a line is 60° 20' and  
declination is 2° 50' E at a place, the true  
bearing of the line will be :

- (a) 57° 30' (b) 63° 10'  
(c) 62° 70' (d) None of these.

; fn , d LFkku i j fdI h j s[kk ds p[cdh; fndeku dk  
 eku 60° 20' rFkk p[cdh; fndi kr 2° 50' E gks rks ml  
 j s[kk dk fndeku gksxk %

- (a) 57° 30' (b) 63° 10'  
 (c) 62° 70' (d) buea l s dkbZ ughA

(xi) The working edge of an alidade is known as :

- (a) ebonite edge (b) fiducial edge  
 (c) straight edge (d) graduated edge.

, syhMM dk dk; Zdkjh fl jk dgykrk gS%

- (a) , cksukbV fl jk (b) <kyw/kkj  
 (c) l h/k eki h (d) v'k[dr fl jkA

(xii) The two point of three point problems are  
 methods of :

- (a) orientation (b) resection  
 (c) traversing (d) both (a) and (b).

fj}&fclnq; k f=&fclnq l eL; k fof/k gksrh gS%

- (a) fndLFkki u (b) fLFkfr fu/kkj .k  
 (c) Vbfl x (d) (a) , oa(b) nksukA

(xiii) Accurate centering of a plane table is done by:

- (a) spirit level (b) plumbing fork  
 (c) alidade (d) ranging rod.

lyu Vcy dk l gh d[æ.k bul sfd; k tkrk gS%

- (a) i.k.k l y (b) l kggy dkvk  
 (c) , syMM (d) vkj s[ku nMA

(xiv) Reading of metric levelling staff can be measured  
 accurately :

efV'd ry s[k.k xt l s 'kq) rk l s i kB; kd fd; k tk  
 l drk gS%

- (a) 0.005 (b) 0.001 m  
 (c) 0.01 m (d) 0.1 m.

(xv) A 'level' line is a :

- (a) horizontal line  
 (b) line parallel to the mean spheriodal surface of  
 earth  
 (c) line passing through the centre of cross hairs  
 and centre of eye piece  
 (d) line passing through the objective lens and the  
 eye piece of a dumpy or tilting level.

dkbz^ryjs[kk\* gS%

- (a) {kSrt j[kk  
 (b) ekè; xksykhk Hkñe l rg ds l ekukarj j[kk  
 (c) uf=dk v[š Øñ rlrqdsdñæka l sfudyusokyh j[kk  
 (d) MEi h ; k ur yoy dh uf=dk v[š vfñkn" ; d yñ  
 l sfudyusokyh j[kkA

(xvi) The rise & fall method of levelling provides a complete check on :

- (a) back sight (b) intermediate sight  
 (c) foresight (d) all of the above.

p<ko&mrkj fof/k ea x.kuk ij i wkz fu; æ.k l s j[kk  
 tkrk gS%

- (a) i'pkoykdu (b) eè; koykdu  
 (c) vxtodykdu (d) mijkDr ea l HkhA

(xvii) Closed contours with higher value inward, represent a :

- (a) hill (b) flat  
 (c) lake (d) valley.

vlnj dh v[š vf/kdeku j[kuskysutñhd&utñhd l ekñ;  
 i nf' kñr djrs gS%

- (a) igkMñ (b) pi Vh Hkñe  
 (c) >hy (d) ?kkVhA

(xviii) The size of a theodolite is specified by :

- (a) the length of telescope  
 (b) the diametre of vertical circle  
 (c) the diametre of lower plate  
 (d) the diametre of upper plate.

Fks kñMksykbV dk v[kdkj fufnZV fd; k tkrk gS%

- (a) nijchu yEckbz l s  
 (b) ÅèokZkj oÙk ds0; kl l s  
 (c) fupyh lyV ds0; kl l s  
 (d) Åijh lyV ds0; kl l s

(xix) The cross hairs in surveying telescope are placed :

- (a) midway between eye piece and objective lens  
 (b) much closer to the eye piece than objective lens

- (c) much closer to the objective lens than to the eye piece
- (d) anywhere between eye piece and objective lens.

l o{k.k njichu eaØw rlrqyxk; s tkrsgs%

- (a) uf=dk vkj vfhkn"; d yd dsee; ea
- (b) vfhkn"; d yd dh vi{kk uf=dk dsvf/kd l ehi
- (c) uf=dk dh vi{kk vfhkn"; d yd ds l ehi
- (d) uf=dk vkj vfhkn"; d yd dsee; fd l h Hkh LFkku  
ijA

(xx) The straight tangent line on longitudinal curve of centre of level tube is called :

- (a) horizontal axis (b) trunion axis
- (c) stadia line (d) axis of bubble tube.

i.k.kl y dsdbæ ij vurns; loØ ij Li'kz; k l jy js{kk  
dgykrh gs%

- (a) {kfrt v{k (b) Vfu; u v{k
- (c) LVSM; k js{kk (d) i.k.kl y v{kA

**GROUP B**

2. Answer *any four* of the following questions : **5x4=20**

fuEu ea l s *fdlgha plj* i l uka ds mUkj na%

- (a) Explain the principle of the construction of a diagonal scale.  
fod.kz i sekus dh cukoV dsfl ) kur dk o.ku djA
- (b) Explain how a chain is tested and adjusted.  
crk, jfd , d psu dksds stkp tkrk gs, oal eatu fd; k  
tkrk gA
- (c) What points to be kept in mind in fixing the main survey station in the field ?  
e[; l o{k.k LVs ku {ks= eafu/kkzjr djrs l e; fdu&fdu  
ckrka dk e; ku j [kk tkrk gs\
- (d) In an old survey made when the magnetic declination was  $3^{\circ} 38' E$ , the magnetic bearing of a line AB was  $N 65^{\circ} 12' E$ . If the present magnetic declination in the same locality is  $2^{\circ} 26' W$ , find the true bearing and the present magnetic bearing of AB.

**P.T.O.**

tc ijkkuk l odf; k x; k ml l e; AB dk pfc dh;  
 fndeku N65°12'E rFkk pfc dh; fndi kr 3° 38'E FkkA  
 oUkzku eaml h txg dk pfc dh; fndi kr 2° 26'W gsrks  
 AB dk pfc dh; fndeku , oa; FkkFkZ fndeku crk, A

- (e) Why orientation of plane table is done in plane table surveying? Explain the method of orientation by back sighting.

lyu Vcy l otk. k ealyu Vcy dk fndEFkki u D; kadjrs  
 g\ i 'pkoykdu }kjk fndEFkki u dh fof/k l e>k, A

- (f) What do you mean by contour interval? In what factors it depends?

l ekp j[kkurj l svki D; k l e>rg\ ; g fdu crka i j  
 fuHkj djrk g\

### GROUP C

Answer *any five* of the following questions : **8x5=40**

fuEu ea l s **fdlgha i kp** iz uka ds mUkj na %

3. Define survey. Explain in detail the classification of survey.

l otk. k dh i fjHkk"kk fy [kA l otk. k ds foHkku oxhdj .k dk  
 foLrkj l so. ku djA

4. (a) Chaining and ranging is not possible due to obstacles of a building on chain line. Explain with a neat sketch how can you tackle this obstacle.

pu j[kk ij , d Hkou dh ck/kk vk tkus ds dkj .k u rks  
 vkj[ku vkj u gh pfuax l Hko gA bl ck/kk dks i kj djus  
 dk mi k; fp= l fgr crk, A

- (b) A chain line PQR crosses a river, Q & R being on the near and distant banks respectively. A line QM of length 80 m is set out at right angles to the chain line at Q. If the bearings of QM and MR are 287° 15' and 62° 15' respectively, find the width of the river.

, d pu j[kk PQR , d unh dks i kj djrh gA Q vkj] R,  
 , d unh dsbl i kj vkj , d unh dsml i kj gA , d j[kk  
 QM, ftl dh yEckbz 80 ehVj g\$ dks Q ij yEcor-  
 vkj[ kr fd; k tkrk gA vxj QM vkj MR dk fndeku  
 Øe'k% 287°15' rFkk 62° 15' gks rks unh dh pksMkbl  
 fudkyA

5. A square plot of land has been measured with the help of a steel tape whose length at 15° and 5 kg pull is 30 m. At the

time of measurement the temperature was 22°C and the pull applied was 8 kg. Also there was no sag in the tape. If the area of land was found to be 62500 m<sup>2</sup> then find the correct area of land. The cross-sectional area of the tape is 0.04 cm<sup>2</sup>, value of modulus of elasticity of steel is 2 x 10<sup>6</sup> kg/cm<sup>2</sup> and the co-efficient of linear expansion per °C temperature is 30x10<sup>-7</sup>.

, d oxkdkj tehu dh eki , d , d s bLi kr ds Qhrs l s dh xbz g\$ ftI dh yEckbz 15°C rFkk 5 fdxt d"lk ij 30 ehVj g\$ tehu uki usds l e; Qhrs ij 8 fdxt dk d"lk yxk; k x; k rFkk rki Øe dk eku 22°C Fkk , oa Qhrs ea dkbz >ky ugha FkkA ; fn tehu dk {k=Qy 62500 oxhVj ik; k x; k rks tehu dk okLrfod {k=Qy fudkyA Qhrs dh vkMh dkV dk {k=Qy 0.04 oxZ l ehE g\$ bLi kr dh iR; kLFkk eki kad dk eku 2x10<sup>6</sup> Kg / cm<sup>2</sup> rFkk j\$ [kd i l kj xqkkad 30x10<sup>-7</sup> ifr °C g\$

6. What is meant by a closing error in a closed traverse ?

How would you adjust it graphically ?

cln pØe ea l eki u =V dk D; k vFlz gkrk g\$ \

vki bl dk l eatu vkj\$ [ku }kjk d\$ sdj\$ \

7. Name the different equipments used in plane table survey.

Explain the intersection method with a neat sketch.

i Vy l o\$ k. k ea dke vkuokys fofHku mi dj. kka ds uke crk, A l kQ fp= cukdj varjNnu fof/k dk o.ku djA

8. The following readings were taken on a staff by a level. If the R.L. of the last point is 100.00 m, then find out the R.L. of the other points. The position of level is changed at the second, fifth and eighth reading. Apply the check also.

0.675; 1.230; 0.750; 2.565; 2.225;

1.935; 1.835; 3.220; 3.115; 2.875

, d ycy ; = }kjk LVkQ ij fuEufyf [kr i kB; kad fy; sx; sg\$ ; fn vkf [kjh fclnq dk R.L. 100.00 m g\$ rks ckdh ds l Hkh fclnqka ds R.L. Kkr djA yoy dh fLFkr ni j\$ i kpoa rFkk vkBoa i kB; kad ds ckn cnyh xbz g\$ tkp Hkh djA

0.675; 1.230; 0.750; 2.565; 2.225;

1.935; 1.835; 3.220; 3.115; 2.875



9. (a) Describe the 'Height of Instrument' method of computing the levels.

ry dh x.kuk djusdsfy, ^mi dj.k&mPprk i ) fr\* dk  
o.ku djA

- (b) Write in brief, any four characteristic of contour line.

I {k si ea l ekPp j s [kkvka d s fdUgha pkj y {k. kka dks fy [kaA

10. What is the meaning of face left and face right observation of theodolite ?

How would you measure a horizontal angle with theodolite ?

Fks k&ksykbV dsck; k; Qyd vksj nk; k; Qyd i {ksk dk D; k vFkZ  
gS \ Fks k&ksykbV }kjk vki {k&rt dksk fdl rjg uki &ks \

