



BRAINWARE UNIVERSITY
Term End Examination 2020 - 21
Programme – Diploma in Civil Engineering
Course Name – Surveying
Course Code - DCE301
Semester / Year - Semester III

Time allotted : 75 Minutes

Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

1. (Answer any Sixty)

(i) The graduations in prismatic compass i) are inverted ii) are upright iii) run clockwise having 0° at south iv) run clockwise having 0° at north The correct answer is

- | | |
|-------------------|------------------|
| a) (i) and (iii) | b) (i) and (iv) |
| c) (ii) and (iii) | d) (ii) and (iv) |

(ii) The temporary adjustments of a prismatic compass are i) Centering ii) Levelling iii) Focusing the prism The correct order is

- | | |
|---------------------|---------------------|
| a) (i), (iii), (ii) | b) (i), (ii), (iii) |
| c) (ii), (iii), (i) | d) (in), (i), (ii) |

(iii) If altitude bubble is provided both on index frame as well as on telescope of a theodolite, then the instrument is levelled with reference to i) altitude bubble on index frame ii) altitude bubble on index frame if it is to be used as a level iii) altitude bubble on telescope iv) altitude bubble on telescope if it is to be used as a level The correct answer is

- | | |
|---------------|------------------------|
| a) only (i) | b) both (i) and (iv) |
| c) only (iii) | d) both (ii) and (iii) |

(iv) In the cross-section method of indirect contouring, the spacing of cross-sections depends upon i) contour interval ii) scale of plan iii) characteristics of ground The correct answer is

- a) only (i)
- b) (i) and (ii)
- c) (ii) and (iii)
- d) (i), (ii) and (iii)

(v) During chaining along a straight line, the leader of the party has 4 arrows in his hand while the follower has 6. Distance of the follower from the starting point is

- a) 4 chains
- b) 6 chains
- c) 120 m
- d) 180m

(vi) A metallic tape is made of

- a) steel
- b) invar
- c) linen
- d) cloth and wires

(vii) For a well-conditioned triangle, no angle should be less than

- a) 20°
- b) 30°
- c) 45°
- d) 60°

(viii) The angle of intersection of the two plane mirrors of an optical square is

- a) 30°
- b) 45°
- c) 60°
- d) 90°

(ix) The allowable length of an offset depends upon the

- a) degree of accuracy required
- b) method of setting out the perpendiculars and nature of ground
- c) scale of plotting
- d) All of these

(x) The permissible error in chaining for measurement with chain on rough or hilly ground is

- a) 1 in 100
- b) 1 in 250
- c) 1 in 500
- d) 1 in 1000

(xi) The correction for sag is

- a) always additive
- b) always subtractive
- c) always zero
- d) sometimes additive and sometimes subtractive

(xii) Cross staff is an instrument used for

- a) measuring approximate horizontal angles
- b) setting out right angles
- c) measuring bearings of the lines
- d) None of these

(xiii) If the length of a chain is found to be short on testing, it can be adjusted by

- a) straightening the links
- b) removing one or more small circular rings
- c) closing the joints of the rings if opened out
- d) None of these

(xiv) For accurate work, the steel band should always be used in preference to chain because the steel band

- a) is lighter than chain
- b) is easier to handle
- c) is practically inextensible and is not liable to kinks when in use
- d) can be easily repaired in the field

(xv) The length of a chain is measured from

- a) centre of one handle to centre of other handle
- b) outside of one handle to outside of other handle
- c) outside of one handle to inside of other handle
- d) inside of one handle to inside of other handle

(xvi) Select the incorrect statement.

- a) The true meridians at different places are parallel to each other.
- b) The true meridian at any place is not variable.
- c) The true meridians converge to a point in
- d) The maps prepared by national survey

northern and southern hemispheres.

departments of any country are based on true meridians.

(xvii) If the true bearing of a line AB is $269^{\circ} 30'$, then the azimuth of the line AB is

- a) $0^{\circ} 30'$
- b) $89^{\circ} 30'$
- c) $90^{\circ} 30'$
- d) $269^{\circ} 30'$

(xviii) In the prismatic compass

- a) the magnetic needle moves with the box
- b) the line of the sight does not move with the box
- c) the magnetic needle and graduated circle do not move with the box
- d) the graduated circle is fixed to the box and the magnetic needle always remains in the N-S direction

(xix) In the quadrantal bearing system, a whole circle bearing of $293^{\circ} 30'$ can be expressed as

- a) $W23^{\circ}30'N$
- b) $N66^{\circ}30'W$
- c) $S113^{\circ}30'N$
- d) $N23^{\circ}30'W$

(xx) The prismatic compass and surveyor's compass

- a) give whole circle bearing (WCB) of a line and quadrantal bearing (QB) of a line respectively
- b) both give QB of a line and WCB of a line
- c) both give QB of a line
- d) both give WCB of a line

(xxi) A negative declination shows that the magnetic meridian is to the

- a) eastern side of the true meridian
- b) western side of the true meridian
- c) southern side of the true meridian
- d) None of these

(xxii) If the magnetic bearing of the sun at a place at noon in southern hemisphere is 167° , the magnetic declination at that place is

a) 77° N

b) 23° S

c) 13° E

d) 13° W

(xxiii) Theodolite is an instrument used for

a) tightening the capstan-headed nuts of level tube

b) measurement of horizontal angles only

c) measurement of vertical angles only

d) measurement of both horizontal and vertical angles

(xxiv) Size of a theodolite is specified by

a) the length of telescope

b) the diameter of vertical circle

c) the diameter of lower plate

d) the diameter of upper plate

(xxv) Which of the following is not the function of levelling head ?

a) to support the main part of the instrument

b) to attach the theodolite to the tripod

c) to provide a means for levelling the theodolite

d) None of these

(xxvi) A telescope is said to be inverted if its

a) vertical circle is to its right and the bubble of the telescope is down

b) vertical circle is to its right and the bubble of the telescope is up

c) vertical circle is to its left and the bubble of the telescope is down

d) vertical circle is to its left and the bubble of the telescope is up

(xxvii) The cross hairs in the surveying telescope are placed

a) midway between eye piece and objective lens

b) much closer to the eye-piece than to the objective lens

c) much closer to the objective lens than to the eye piece

d) anywhere between eye-piece and objective lens

(xxviii) For which of the following permanent adjustments of theodolite, the spire test is used ?

- a) adjustment of plate levels
- b) adjustment of line of sight
- c) adjustment of horizontal axis
- d) adjustment of altitude bubble and vertical index frame

(xxix) The adjustment of horizontal cross hair is required particularly when the instrument is used for

- a) levelling
- b) prolonging a straight line
- c) measurement of horizontal angles
- d) All of these

(xxx) Which of the following errors is not eliminated by the method of repetition of horizontal angle measurement ?

- a) error due to eccentricity of verniers
- b) error due to displacement of station signals
- c) error due to wrong adjustment of line of collimation and trunion axis
- d) error due to inaccurate graduation

(xxxii) The error due to eccentricity of inner and outer axes can be eliminated by

- a) reading both verniers and taking the mean of the two
- b) taking both face observations and taking the mean of the two
- c) double sighting
- d) taking mean of several readings distributed over different portions of the graduated circle

(xxxiii) In the double application of principle of reversion, the apparent error is

- a) equal to true error
- b) half the true error
- c) two times the true error
- d) four times the true error

(xxxiiii) Which of the following errors can be eliminated by taking mean of both face observations ?

- a) error due to imperfect graduations
- b) error due to eccentricity of verniers
- c) error due to imperfect adjustment of plate levels
- d) error due to line of collimation not being perpendicular to horizontal axis

(xxxiv) If a tripod settles in the interval that elapses between taking a back sight reading and the following foresight reading, then the elevation of turning point will

- a) increase
- b) decrease
- c) not change
- d) either increase or decrease'

(xxxv) A 'level line' is a

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

(xxxvi) The rise and fall method of levelling provides a complete check on

- a) backsight
- b) intermediate sight
- c) foresight
- d) All of these

(xxxvii) In an internal focussing type of telescope, the lens provided is

- a) concave
- b) convex
- c) plano-convex
- d) plano-concave

(xxxviii) Which of the following errors can be neutralised by setting the level midway between the two stations ?

- a) error due to curvature only
- b) error due to refraction only
- c) error due to both curvature and refraction
- d) None of these

(xxxix) 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 these

(xl) The rise and fall method

- a) is less accurate than height of instrument method
- b) is not suitable for levelling with tilting levels
- c) provides a check on the reduction of intermediate point levels
- d) quicker and less tedious for large number of intermediate sights

(xli) The difference between a level line and a horizontal line is that

- a) level line is a curved line while horizontal line is a straight line
- b) level line is normal to plumb line while horizontal line may not be normal to plumb line at the tangent point to level line
- c) horizontal line is normal to plumb line while level line may not be normal to the plumb line
- d) both are same

(xlii) With the rise of temperature, the sensitivity of a bubble tube

- a) decreases
- b) increases
- c) remains unaffected
- d) None of these

(xliii) Sensitiveness of a level tube is designated by

- a) radius of level tube
- b) length of level tube
- c) length of bubble of level tube
- d) None of these

(xliv) The difference of levels between two stations A and B is to be determined. For best results, the instrument station should be

- a) equidistant from A and B
- b) closer to the higher station
- c) closer to the lower station
- d) as far as possible from the line AB

(xlv) Contour interval is

- a) inversely proportional to the scale of the map
- b) directly proportional to the flatness of ground
- c) larger for accurate works
- d) larger if the time available is more

(xlvi) The suitable contour interval for a map with scale 1 : 10000 is

- a) 2 m
- b) 5m
- c) 10 m
- d) 20 m

(xlvii) Direct method of contouring is

- a) a quick method
- b) adopted for large surveys only
- c) most accurate method
- d) suitable for hilly terrains

(xlviii) Closed contours, with higher value inwards, represent a

- a) depression
- b) hillock
- c) plain surface
- d) none of these

(xlix) The type of surveying which requires least office work is

- a) tacheometry
- b) trigonometrical levelling
- c) plane table surveying
- d) theodolite surveying

(l) . Intersection method of detailed plotting is most suitable for

- a) forests
- b) urban areas
- c) hilly areas
- d) plains

(li) The size of a plane table is

- a) 750 mm x 900 mm
- b) 600 mm x 750 mm
- c) 450 mm x 600 mm
- d) 300 mm x 450 mm

(lii) . The process of determining the locations of the instrument station by drawing resectors from the locations of the known stations is called

- a) radiation
- b) intersection
- c) resection
- d) traversing

(liii) . If in a closed traverse, the sum of the north latitudes is more than the sum of the south latitudes and also the sum of west departures is more than the sum

of the east departures, the bearing of the closing line is in the

- a) NE quadrant
- b) SE quadrant
- c) NW quadrant
- d) SW quadrant

(liv) If the reduced bearing of a line AB is $N60^{\circ}W$ and length is 100 m, then the latitude and departure respectively of the line AB will be

- a) +50 m, +86.6 m
- b) +86.6 m, -50 m
- c) +50m, -86.6 m
- d) +70.7 m,-50 m

(lv) Transit rule of adjusting the consecutive coordinates of a traverse is used where

- a) linear and angular measurements of the traverse are of equal accuracy
- b) angular measurements are more accurate than linear measurements
- c) linear measurements are more accurate than angular measurements
- d) all of these

(lvi) . Which of the following methods of theodolite traversing is suitable for locating the details which are far away from transit stations ?

- a) measuring angle and distance from one transit station
- b) measuring angles to the point from at least two stations
- c) measuring angle at one station and distance from other
- d) measuring distance from two points on traverse line

(lvii) Subtense bar is an instrument used for

- a) levelling
- b) measurement of horizontal distances in plane areas
- c) measurement of horizontal distances in undulated areas
- d) measurement of angles

(lviii) Horizontal distances obtained by tacheometric observations

- a) require slope correction
- b) require tension correction
- c) require slope and tension corrections
- d) do not require slope and tension

corrections

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

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

(lx) . Overturning of vehicles on a curve can be avoided by using

- a) compound curve
- b) vertical curve
- c) reverse curve
- d) transition curve