Total No. of Questions : 10]

PE3785

SEAT No. :

[Total No. of Pages : 4

[6582]-232

S.E. (Civil Engineering)

PCC-202-CVL : SURVEYING

(2024 Pattern) (Semester - III)

Time : 2½Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Use of scientific calculator is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) Define the following terms: **[3]**

i) Whole Circle Bearing

ii) Dip of needle

iii) True Meridian

b) Explain Segments and advantages of Space Based Positioning System. **[5]**

c) The following are the observed bearing of the lines of a traverse ABCDEA with a compass in a place where local attraction was suspected. **[6]**

Side	F.B.	B.B.
AB	191°45'	13°00'
BC	39°30'	222°30'
CD	22°15'	200°30'
DE	242°45'	62°45'
EA	330°15'	147°45'

Find the correct bearing of the lines.

OR

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P.T.O.

Q2) a) Define the following terms: **[3]**

i) Quadrantal Bearing

ii) Magnetic Declination

iii) True Bearing

b) What is Orientation in Plane Table Surveying? Enlist different orientation methods and explain any one in detail. **[5]**

c) A closed traverse is conducted with five stations A, B, C, D and E taken in anticlockwise order, in the form of a regular pentagon. If the FB of AB is 30° 0'. Find the FBs of the other lines. **[6]**

Q3) a) Define the following terms: **[3]**

i) Height of Instrument

ii) Reduced Level

iii) Fly Levelling

b) Describe the two-peg method of permanent adjustment of a dumpy level with a neat sketch. **[4]**

c) The following notes refer to an operation involving reciprocal levelling **[7]**

Instrument Station	Staff readings on		Remark
	A	B	
A	1.850	3.150	Distance AB=600 m
B	1.550	3.000	RL of B=450.500 m

Find:

i) True R.L. of point A

ii) The Combined correction for curvature and refraction

iii) Collimation error

iv) Whether the line of collimation is inclined upwards or downwards.

OR

Q4) a) Define the following terms: **[3]**

i) Collimation Plane

ii) Bench Mark

iii) Datum Surface

b) Write a short note on: **[4]**

i) Profile Levelling

ii) Longitudinal Levelling

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c) The following levels were observed during levelling on a continuously sloping ground at a common interval of 30m. **[7]**

0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380,

2.055, 2.855, 3.455, 0.585, 1.075, 1.850, 2.755, 3.845 (on B).

The RL of A was 400 m. Tabulate the given readings and apply the usual checks. Determine the Gradient of AB.

Q5) a) Define the following terms: **[3]**

i) Transiting

ii) Latitude

iii) Swinging of Telescope

b) Explain with sketch method of measuring horizontal angle by repetition method. **[5]**

c) The record of a closed traverse is given below, **[6]**

Line	Length (m)	Bearing
AB	100.500	N 30°30' E
BC	?	S 45°00' E
CD	75.000	S 40°30' W
DE	50.500	S 60°00' W
EA	?	N 40°15' W

Calculate the lengths of BC and EA.

OR

Q6) a) Define the following terms: **[3]**

i) Departure

ii) Telescope Normal

iii) Independent Coordinate

b) Enlist fundamental axes of a theodolite & relation between them when theodolite is in perfect adjustment. **[5]**

c) A traverse is run to set out a line MQ = 1900 m at right angles to a given line MN. The lengths and bearings observed are as follows: **[6]**

Line	Length (m)	Bearings
MN	-	360°00'
MO	850	120°00'
OP	1000	86°30'
PQ	?	?

Calculate the lengths and bearing of the line PQ.

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Q7) a) State characteristics of contours. **[6]**

b) A tacheometer with analytic lens having the value of constant 100 was used and the following observations were made on staff held vertically. **[8]**

Inst. Station	H.I. (m)	Vertical Angle	Staff at	Staff Reading
P	1.5	+2°40'	M	1.25, 1.93, 2.56
	1.5	– 4°40'	Q	1.45, 1.85, 2.30

RL of station M is 100.00 m. Calculate the RL of P &Q, distance PQ and gradient of PQ line.

OR

Q8) a) Explain the procedure of determination of height of the building using Total Station. (by using REM function) **[6]**

b) The following observations were made using a tacheometer fitted with an analytic lens, multiplying constant being 100. **[8]**

Inst. Station	H.I (m)	Staff Station	Vertical Angle	Staff Reading
M	1.8	A	+4°30'	1.155, 1.755, 2.355
	1.8	B	+10°15'	1.250, 2.000, 2.750

RL of M = 150 m. Find RL of point A and B also find distance AB.

Q9) a) State different types of curves. Explain compound curve with sketch. **[6]**

b) Two tangents AB and BC meet at chainage of 1350 m. The angle of deflection is 30°. Tabulate the necessary data to layout the curve of 250 m radius by Rankine's method of deflection angle. Take peg interval as 20 m and Least Count 20". **[8]**

OR

*Q10)*a) What is the Transition Curve? State the various types of transition curves with the help of a neat sketch. Explain briefly its necessity. **[6]**

b) Two tangents AB and BC meet at a chainage of 1125 m, the Intersection angle being 150°. Calculate all data required to set out curve of radius 200 m by the method of offsets from the chord produced, taking a peg interval of 20 m. **[8]**

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