1048

Code : 15CE21T

Register Number | | | | | | | |

II Semester Diploma Examination, Nov./Dec. 2017

SURVEYING – I

Time : 3 Hours] **[Max. Marks : 100**

Note : (i) Answer any **six** questions from Section – I. Each carries **5** marks.
(ii) Answer any **seven** full questions from Section – II. Each carries **10** marks.

SECTION – I

1. Define the principle of chain surveying. Explain the well conditioned triangle and ill conditioned triangle. **5**

2. With a neat sketch, explain the process of stepping in chaining. **5**

3. Define the following : **5**
   (i) Meridian
   (ii) Fore Bearing
   (iii) Magnetic Declination
   (iv) Magnetic Bearing and
   (v) Centring

4. Write the comparison between prismatic compass and surveyor's compass. **5**

5. Define the following : **5**
   (i) Bench mark
   (ii) Back sight
   (iii) Change point
   (iv) Line of collimation and
   (v) Axis of bubble tube

6. Compare, collimation system with rise and fall system of reduction of levels. **5**

7. Briefly explain the temporary adjustments of the dumpy level. **5**

8. List the errors in levelling. **5**

9. Write any five characteristics of contour lines with figures. **5**

[Turn over

SECTION – II

10. (a) Explain the cumulative and compensating errors in chaining. 4

(b) Plot the following cross-staff survey of a field and calculate its area in hectares. All measurements are in metre. 6

	75	D
	60	75 E
C 60	45	
	30	90 F
B 50	20	
	10	
	0	A

11. (a) Give the conventional symbols for the following : 4

(i) Railway single line bridge

(ii) Embankment

(iii) Wall with gate

(iv) Pond

(b) Explain in detail with neat sketch, the reciprocal ranging. 6

12. (a) Convert the following R.B. to W.C.B. and W.C.B. to R.B. : 4

(i) 339° 15'

(ii) N 49° 10' W

(iii) 192° 30'

(iv) S 65° 10' E

(b) Write the comparison between R.B. system and W.C.B. system. 6

13. The following F.B. and B.B. were taken in traversing with a prismatic compass in a place where local attraction was suspected :

Line	F.B.	B.B.
AB	192° 45'	12° 00'
BC	28° 00'	208° 45'
CD	6° 30'	186° 30'
DE	228° 30'	46° 15'
EA	314° 15'	136° 30'

(i) At what station do you suspect local attraction ?

(ii) Determine the corrected bearings of the lines. 10

14. The following staff readings were taken with a 4 m leveling staff @ 30 m interval on a continuously sloping ground :
0.450, 0.780, 1.150, 1.950, 0.850, 1.750, 2.250, 2.800, 3.500, 1.250, 2.450, 3.250 and 3.785 m
The first reading was taken on a B.M. of R.L. 150.500 m. Rule out a page of level book and calculate R.L. of the stations by rise and fall method and apply the usual check. **10**

15. During the fly levelling operation the following observations were made :
B.S. : 0.650, 2.155, 1.405, 2.655, 2.435
F.S. : 2.455, 1.305, 0.555, 2.405
The first B.S. was taken on a B.M. of R.L. 50.50 m. From the last B.S. it is required to set four pegs each at a distance of 30 m on a falling gradient of 1 in 150. Calculate the R.L. of these pegs. Apply the check. **10**

16. (a) Define the following : **5**
    (i) Grade contour
    (ii) Contour line
    (iii) Contour interval
    (iv) Horizontal equivalent
    (v) Grade stake
    (b) List any five uses of contour maps. **5**

17. Four sight rails are to be erected @ four points A, B, C and D 60 m apart in a straight line. The invert level of the sewer @ D is 86.48 m. The sewer is on a gradient of 1 in 120 rising from D to A. Surface pegs are driven @ A, B, C and D and their recued levels are : 90.03, 89.85, 88.92 and 88.46 respectively. The height of the sight rail @ D is 1.62 m. Find the suitable length of the boning rod and the heights of the sight rails above the surface pegs @ A, B and C. **10**

18. (a) Write the formulae for trapezoidal rule and Prismoidal rule with notations, to determine the volume of earth work. **4**
    (b) The area within the contour lines @ the site of a reservoir and the face of the proposed dam are as follows :

Contour in 'm'	area in sq.m.
450	270
452	10,440
454	75,600
456	1,44,000
458	2,70,000
460	4,14,500
462	4,60,800
464	5,86,800
466	6,39,900

Compute the volume of water between 450 to 466 contours by Prismoidal Rule. **6**

19. A road @ a constant R.L. of 180.00 runs North to South. The East to West is level. The surface level along the centre line of the road area as follows :

Chainage	R.L. in 'M'
0 m	183.50
30 m	182.45
60 m	182.15
90 m	181.55
120 m	180.95
150 m	182.05
180 m	180.80

Compute the volume of cutting given that the width @ formation level is 8 m and side slopes $1\frac{1}{2}$ to 1 by trapezoidal rule. **10**