

**664****October 2017***Time – Three hours  
(Maximum Marks: 75)*

- [N.B: (1) Q.No. 8 in PART – A and Q.No. 16 in PART – B are compulsory. Answer any FOUR questions from the remaining in each PART – A and PART – B  
(2) Answer division (a) or division (b) of each question in PART – C.  
(3) Each question carries 2 marks in PART – A, 3 marks in Part – B and 10 marks in PART – C.]*

**PART – A**

1. Define surveying.
2. Define perpendicular offset.
3. Define latitude.
4. What do you mean by base inaccessible?
5. What is total station?
6. Define contour gradient.
7. Mention any two applications of GPS.
8. What are the constants used for tacheometry?

**PART – B**

9. The following are observed for fore bearing of the line. Calculate the respective for back bearings. (i)  $AB=24^{\circ}30'$  (ii)  $CD=268^{\circ}30'$  (iii)  $EF=N12^{\circ}30'E$ .
10. What is parallax in a levelling instrument? How do you eliminate it?
11. What is meant by face left and face right of theodolite? How would you change the face?
12. A transit was setup at a distance of 187m from a temple. The angle of depression to the temple was  $3^{\circ}12'$  and the angle of elevation to its top was  $10^{\circ}2'$ . Find the height of the temple.
13. Write down the applications of total station.
14. Define contour interval and horizontal equivalent.

**[Turn over.....**

- 15. Compare ordinary mapping to GIS.
- 16. What are the applications of GPS in civil engineering?

PART - C

- 17. (a) The following were the bearings observed with a surveyor's compass in closed traverse ABCDE. Calculate the included angles and apply the usual check.

Line	FB	BB
AB	N60° 30'E	S60° 30'W
BC	N33° 45'W	S33° 45'E
CD	S70° 00'W	N70° 00'E
DE	S15° 15'W	N15° 15'W
EA	S50° 30'E	N50° 30'W

(Or)

- (b) The following consecutive readings were taken with a levelling instrument of intervals of 20m. 2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2.855 and 3.630m. The instrument was shifted after the fourth and eight readings. The first reading was taken on a BM of RL 110.200m. Find the RLs of all the points by height of collimation method.

- 18. (a) Find the area of the closed traverse having the following data by the co-ordinate method.

Line	Latitude	Departure
AB	+225.5	+120.5
BC	-245.0	+210.0
CD	-150.5	-110.5
DA	+170.0	-220.0

(Or)

- (b) Determine the RL of the top of the temple from the following observations. The instrument stations and the temple are in the same vertical plane.

Inst. at	Vertical angle	Reading on BM	Remarks.
A	+16° 42'	3.625	RL of BM=1728.785
B	+11° 12'	2.005	Distance AB=30m

- 19. (a) Explain the field procedure of total station to run a traverse.

(Or)

- (b) Determine the distance between the instrument station P and the staff station Q from the following data. Also determine the RL of Q if RL of P is 200.400m. Height of instrument=1.500m, Vertical angle= +4° 30', staff readings=0.645, 1.000, 1.355. Take C=100 and K=0.

- 20. (a) The following offsets were taken from a chain line to a hedge.

Distance(m)	0	30	60	90	120	150	180
Off sets(m)	9.4	10.8	12.5	10.5	14.5	13.0	17.5

Calculate the area by (i) Trapezoidal rule (ii) Simpson's rule.

(Or)

- (b) (i) What are the uses of contour map?  
(ii) Define interpolation and mention the different methods of interpolation.

- 21. (a) (i) Briefly explain the elements of GPS.  
(ii) Explain differential GPS.

(Or)

- (b) (i) Briefly explain the components of GIS.  
(ii) State the applications of LIS.

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