

B.E./B.TECH. Degree Examination, December 2020

Third Semester

**CE16303 – SURVEYING I**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

**PART A - (8 X 2 = 16 marks)**

1. The type of surveying in which the curvature of the earth taken into account is called
  - a) Geodetic Surveying
  - b) Plane surveying
  - c) Preliminary Surveying
  - d) Topographical Surveying
2. In quadrantal bearing system, bearing of a line varies from
  - a)  $0^{\circ}$  to  $360^{\circ}$
  - b)  $0^{\circ}$  to  $180^{\circ}$
  - c)  $0^{\circ}$ N to  $90^{\circ}$ S
  - d)  $0^{\circ}$ S to  $90^{\circ}$ N
3. During a leveling work along a falling gradient using a dumpy level and a staff of 3m length ,following successive readings were taken:1.785,2.935,0.360,1.320.What will be the correct order of booking these four readings in a level book ?(BS:Back Sight, IS: Intermediate Sight,FS:Fore Sight)
4. If the contour lines are far apart, it indicates \_\_\_\_\_ slope
  - a) Steep
  - b) Gentle
  - c) Uniform
  - d) Undulated
5. Distinguish between plane and geodetic surveying.
6. Change the following whole circle bearing to reduced bearing:  
(a)  $151^{\circ} 20'$  (b)  $332^{\circ} 40'$
7. What do you mean by reduction in leveling? Name the methods.
8. What is the use of mass haul diagram?

**PART B - (4 X16 = 64 marks)**

09. (a) A chain line AB comes across a pond. Two points P and R are selected on the chain line on either side of the pond. A line PQ of 300 m length is set on the one side of the pond and another line PS of length 500 m is run on the opposite side of PQ. It is so aligned the points Q,R and S are on the same straight line .Calculate the approximate length of the pond .If QR and RS are measured as 150m and 250m respectively . ( 16 )

**(OR)**

- (b) A line AB was measured with a steel tape which was exactly 30 m at a temperature of 20<sup>0</sup> C and pull of 10 Kg.The measured length was 1650m.The temperature during measurement was 30<sup>0</sup>C and the pull applied was 15 kg.Find the true length of the line ,if the cross sectioned area of the tape per degree Celsius is 3.5 X 10<sup>-6</sup> and modulus of elasticity of the material of the tape is E=2.1 x 10<sup>6</sup> kg/cm<sup>2</sup> ( 16 )

10. (a) The following bearings were observed in running a closed traverse ( 16 )

Line	Fore Bearing(FB)	Back Bearing (BB)
AB	80 <sup>0</sup> 10'	259 <sup>0</sup> 00'
BC	120 <sup>0</sup> 20'	301 <sup>0</sup> 50'
CD	170 <sup>0</sup> 50'	350 <sup>0</sup> 50'
DE	230 <sup>0</sup> 10'	49 <sup>0</sup> 30'
EA	310 <sup>0</sup> 20'	130 <sup>0</sup> 15'

Mention which stations were affected by local attraction and determine the corrected bearing

**(OR)**

- (b) (i) What is two point problem and explain with neat sketch. ( 8 )  
(ii) Explain the following methods of plane table surveying with neat sketch ( 8 )  
1) Radiation  
2) Intersection
11. (a) The following consecutive readings were taken with the help of a dumpy level ( 16 )  
1.904, 2.653, 3.906, 4.026, 1.964, 1.702, 1.592, 1.261, 2.542, 2.006, 3.145.  
The instrument was shifted after 4<sup>th</sup> and 7<sup>th</sup> readings; the first reading was taken on the staff held on the B.M of R.L 100.00 meters. Rule out a page of field book ,enter the above readings there on .Calculate the R.Ls of the points and apply arithmetical check.

**(OR)**

- (b) The following observations were made in running fly levels from a B.M of R.L 60.65 m. **(16)**

B.S	F.S
0.964	0.948
1.632	1.153
1.105	1.584
0.85	

Five Pegs at 20 m intervals are to be set on a falling gradient of 1 in 100 m from the last position of the instrument. The first peg is to be at R.L 60 m .Workout the staff readings required for setting the pegs and prepare the page of the level book.

12. (a) A railway embankment is 12m wide. The ground is level in a direction transverse to the center line. Calculate the volume contained in a 100m length by trapezoidal rule and prismoidal rule. If the slope is 1.5:1. The center heights at 20 m interval are 3.7 m,2.6 m,4.0 m,3.4 m,2.8 m,3.0 m and 2.2 m. **(16)**

**(OR)**

- (b) What do you mean by contouring ?List out its characteristics and uses with neat sketch. **(16)**