B.E.(with Credits)-Regular-Semester 2012-Mining Engineering Sem V

MN504 - Mine Surveying-II

P. Pages : 2 **GUG/W/16/3807**

Time : Three Hours * 3 9 9 2 * Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answers wherever necessary with the help of neat sketches.
4. Weightage to the question indicated on its right.

1.
- Compare and contrast between triangulation, traversing and tri literation. **6**
- Explain briefly the various types of signals giving their merits and demerits. **4**
- Write short notes on : **6**
  - Inter visibility of stations.
  - Strength of figure.
  - Satellite station.

OR

2.
- Describe a method of extending a base line. List out the different corrections that may be necessary for the measured length of a base line. **7**
- The three bays of a base line were measured by a steel tape and the following data was collected **6**

No.	Length (m)	Temp. (ºC)	Pull (kg)	Difference of level supports (m)
1	30.084	12	7	0.3
2	29.973	13	7	0.7
3	25.233	17	5	0.7

The 30m tape was standardized at 15ºC under a pull of 4.5 Kg. What are the true length of the bays ? The tape weighs 1 Kg. The unit weight of steel is 8300 kg/m^3 and the coefficient of thermal expansion is 0.000011/ºC and $E = 2.1\times10^4\ kg/mm^2$.

- State and explain various applications of GPS in Mining. **3**

3.
- Discuss the factors which would influence the method that you will adopt to correlate surface and underground workings/surveys. **4**
- Describe in detail how you would orient an underground survey of mine and connect it to surface triangulation when a single shot 1000 m deep is available for correlation. **12**

OR

4.
- State suitability, limitations and explain at length magnetic method of correlates. **8**
- What do you understand by 'diurnal variations'? What precautions will you observe to compensate for the same. **4**
- Determine the true bearing of u/g reference Line CD based on following observations **4**
  - True bearing of surface reference line AB=N 60º 10′00″ E
  - Magnetic bearing of surface ref. Line AB = N 76º 54′30″ E, Time of observation 10.00 AM
  - Magnetic bearing of u/g ref. Line CD = N 89º 17′00″E at 10:45 AM
  - Magnetic bearing of surface ref. line AB = N 76º 57′00″ at 11:35 AM.

5.
- Explain the procedure to locate a point of known coordinate. **4**
- Clarify stope surveying methods and state various purposes of the same. **6**
- State and discuss the method of stope surveying for a steeply inclined orebody worked by overhand stopping. **6**

OR

6.
- Explain the procedure to set direction of advance and gradient for an underground roadway. **4**
- Discuss at length various factors affecting selection of stopping techniques. **4**
- Sketch and briefly discuss the Ray method for transfer of stope faces to the mine plane. **8**

7.
- Define and discuss types of photogrammetric surveying. **2**
- Sketch and explain how will you determine horizontal position of a point from photographic measurement when camera axis is horizontal. **4**
- Explain the procedure to determine Azimuth of a line from photographic measurement. **4**
- The distance from two points on a photographic point to the principal line are 68.24 mm to the left and 58.48 mm to the right. The angle between the points measured with a transit is $44^{o}30'$. Determine the focal length of the lens. **6**

OR

8.
- Enlist essential parts of an Aerial camera and discuss in detail it's working mechanism **6**
- If the scale of a vertical photograph is known, describe the procedure with the help of neat sketch to determine height of the object from Relief Displacement **6**
- A tower TB, 50 m high, appears in a vertical photograph taken at a flight attitude of 2500 m above MSL. The distance of the image of the top of the tower is 6.35 cm. Compute the displacement of the image of the top of the tower with respect to the image of it's bottom. The elevation of the bottom of the tower is 1250 m. **4**

9.
- What is an 'Error' ? State and discuss in detail with examples, various categories of errors. **4**
- State and describe how will you determine probable error in the following cases. **9**
  - Direct observations of equal weight on a single unknown quantity
  - Direct observations of unequal weight on a single unknown quantity
  - Direct observation of weight w.
- Observations for horizontal angles of a triangle give the following results. **3**

  $a = 20^{o}20' \pm 0.2$

  $b = 100^{o}20' \pm 0.1$

  $c = 59^{o}20' \pm 0.2$

  Determine the probable Error of it's summation.

OR

10.
- Derive an expression for determining most probable value of Indirectly observed quantities having unequal weights by using theory of least squares. **8**
- The following are the observed values of three angles of a triangle. Determine their most probable values. **3**

  $A = 75^{o}15'16''$ wt.8

  $B = 45^{o}20'38''$ wt.6

  $C = 56^{o}24'12''$ wt.4
- What are the different types of plan and sections to be maintained in case of Degree III gassy coal mine. Explain ventilation plan. **5**

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