B.E. Mining Engineering Fifth Semester

# MN504 - Mine Surveying-II

P. Pages : 2 **GUG/W/18/1654**

Time : Three Hours * 1 3 0 3 * Max. Marks : 80

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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. Marks are indicated to the right.

**1.** a) What is meant by 'Triangulation'? In what way does it differ from traversing? **8**

b) Give tabular classification of triangulation system along with their general specification. **4**

c) An observer standing on the deck of a ship just sees a light house top with his eye at a height of 8m. The top of the lighthouse is 60m above mean sea level. Find the distance of the observer from the lighthouse. **4**

**OR**

**2.** a) Sketch and explain Jaderin's method using flexible apparatus for measuring length of a base line. **8**

b) Write down components of GPS. Give application of GPS in mining. **8**

**3.** a) Define correlation survey and give detailed classification of correlation survey. **4**

b) Sketch and discuss in brief 'Weissbach Quadrilateral' method of correlation stating suitability condition, instruments needed, steps, merits and demerits. **12**

**OR**

**4.** a) Write down most modern method of correlation survey in a mine with vertical shaft. **3**

b) Discuss in detail, alignment/co-planning method of correlation with applicability, steps, merits and demerits. **13**

**5.** a) Sketch and explain the method for the following development survey. **8**
- Setting a point of known Co-ordinate.
- Setting up directions and gradient for underground roadway/drivage.

b) Sketch and briefly discuss a method for transfer of stope faces to the mine plan. **8**

**OR**

**6.** a) Give classification of stope surveying method and state the various purpose of the same. **6**

b) Sketch and explain the essential components and working of a stereometer. **10**

**7.** a) Derive an expression for horizontal and vertical angle in case of a terrestrial photograph. **8**

b) Three points A, B and C were photographed and their co-ordinates with respect to the lines joining the collimation marks on the photograph are – **8**

| Point | X | Y |
|---|---|---|
| a | –30.24mm | +21.43mm |
| b | +8.56mm | –16.38mm |
| c | +48.26mm | +36.72mm |

The focal length of lens is 120.80mm Determine the azimuths of the lines OB and OC, if that of OA is 350º30'. The axis of camera was level at the time of the exposure at station O.

**OR**

**8.** a) Sketch and describe an "Aerial camera" along with essential parts. **8**

b) How do you estimate the scale of a photograph if all the points are having same elevations? **4**

c) A camera having focal length of 20cm is used to take a vertical photograph to a terrain having an average elevation of 1500 meters. What is the height above sea level at which aircraft must fly in order to get scale of 1:8000? **4**

**9.** a) Define the term "Error"? Explain types of error. **6**

b) Included angle of a triangle are given as follows. **10**

$< A = 73^{o}\,41'10"$ , $wt = 1$

$< B = 46^{o}\,43'35"$ , $wt = 2$

$< C = 59^{o}\,32'20"$ , $wt = 3$

Find MPV of A, B and C by least square method.

**OR**

**10.** a) Define the term 'Probable error"? Given the radius of circle as 22m with PE of $\pm 0.22$. What will be probable error of its circumference? **6**

b) Enlist various plans to be maintained for U/g colliery. **4**

c) State various statutory requirements for mine plan and section. **6**

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