

SUBJECT A 2 : SURVEYING

1. Survey practice:

- 1.1 Co-ordinate system in South Africa (briefly)
 - Physical properties of the earth
 - Gauss conform map projection
 - Local co-ordinate systems
- 1.2 Horizontal, vertical and inclined planes
- 1.3 Units of measurement in surveying, tape corrections
- 1.4 Plotting co-ordinated points on a plan and obtaining information from plans
- 1.5 Join calculations
- 1.6 Survey instruments and their use: (General understanding of survey)
 - Theodolite tapes and accessories
 - Level
 - Clinometer rule
 - New instruments and electronic innovations (GPS)
- 1.7 Survey calculations:
 - Traverse calculations
 - Surface triangulations
 - Resection, intersection
 - Curves
- 1.8 Levelling and calculation of elevations
- 1.9 Measuring of underground excavations
- 1.10 Tacheometry
- 1.11 Planimeter
- 1.12 Surveying maths
 - Triangles
 - Areas
 - Surface areas
 - Angles
 - Distances and volumes of triangular structures
 - Solution of triangles
 - Areas and perimeters of plane figures
 - Areas bounded by irregular lines
 - Perpendicular offsets at irregular intervals
 - Trapezoidal rule
 - Simpson's rule
 - Volumes and surface areas -
 - Circle circular sector
 - Circular segment
 - Circular cylinder
 - Frustum of pyramid or cone
 - Ellipse
 - Rectangle

- Square
- Parallelogram
- Quadrilateral
- Trapezium rhombus
- Regular polygon
- Cyclic quadrilateral
- Wedge
- Sphere
- Prismoidal formula
- Prisms
- Subdivision of land
- Underground traverse calculation
- Major and Minor dips
 - Calculation of dip and strike from 3 points
 - Calculation of true width of reef bodies from boreholes
 - Calculations involving lines of intersection between reef and fault planes

1.13 Surveying drawings of plans and sections:

Topographical - underground and surface workings - production planning and recording – rescue plans - ventilation - geological. (Emphasis on gold for metal option, emphasis on coal for coal options).