

2.16 30312 ROCK MECHANICS & SRATA CONTROL

UNIT-1 INTRODUCTION:

Definition of rock mechanics – scope of Rock mechanics Application of Rock mechanics to mining field.

UNIT-2 GROUND FORCES, STRESS ANALYSIS, STRESS DISTRIBUTION IN UNDERGROUND:

Various forces acting on block – types of Stress – Relation between vertical and lateral stresses – Stress field – Hydrostatic and Litho static stage of rock. Induced stresses due to Mining – Stress distribution around narrow and wide openings – Instruments used for measurement of stress – Stress distribution around road way.

UNIT-3 PROPERTIES OF ROCKS, ROCK INDICES, CLASSIFICATION OF ROCKS AND THEIR FAILURE:

Rock properties – Physical Mechanical, properties of rocks – compressive strength – Tensile strength shear strength – strength indices of rocks – point load strength index protodyolous strength index – porosity – Anisotropy – methods determining shear strength. Definition of Rock man, Moh's scale of Hardening – classification of rock stability – theories of rock failure – Bumps– rock burst – theories of Bumps and rock bursts – Causes – Preventive measures.

UNIT-4 STRATA AND GROUND MOVEMENTS:

Strata conditions before and after mining operations – Theories of mechanics of Strata behaviour– Strata pressure in and around Bord and pillar and long wall workings.

5.0 SUBSIDENCE

Definition of various terms – Angle of draw positive or negative, factors influencing angle of draw– factors affecting subsidence – damages – Protective measures – Subsidence measurements– Subsidence Survey methods – Objectives. Surface Movements and Deformation during Longwall Mining.

UNIT-6 STRATA CONTROL:

Supports – Necessity – Materials used – Classification of supporting Systems – Applicability's of various types of supports – Size, Shape of supports – Principle of roof bolting, stitching – Merits and demerits of bolting – Rigid and Yielding props – constructional details of Friction, Hydraulic props – Method of setting various supports at different situations – Fore pollary safari supporting– Junction Supports – Clearance of Heavy roof Collapse – Systematic Supporting – withdrawal of supports.

Reference books:

1. Rock Mechanics: Richard E. Goodman.
2. Rock mechanics and strata control : V.P.Varma
3. Mining technology: D.J.Deshmukh & R.T.DeshmukVol 1, 2, 3