ANNEXURE – II
SYLLABUS FOR THE EXAMINATION FOR SECOND CLASS MANAGER'S CERTIFICATE OF COMPETENCY
MINE SURVEYING

MINE SURVEYING

Linear measurement: Instruments for measuring distance and ranging, units of measurement in surveying.

EDM: Principles of measurements; types; correction and selection of instrument.

Angular measurement: Prismatic compass; bearing of lines; local attraction; magnetic declination.

Theodolite: Modern micro-optic theodolites; measurement of horizontal and vertical angles; theodolite traversing; traverse calculation; computation of coordinates; adjustment of traverse; temporary and permanent adjustment; Gyrothedolite; principle and determination of Gyro north; determination of true bearing by equal altitude method; tacheometry.

Levelling: Levelling instruments; types of levelling; characteristics and uses of contours; methods of contouring; booking and reduction methods; shaft depth measurement; temporary and permanent adjustment of levels.

Use, care, testing and calibration of instruments.

Controlled surveys: Triangulation; trilateration; application of GPS and Total Station in mine surveying.

Field astronomy: Astronomical terms; determination of true bearing by equal altitude method; Gyro theodolite; principle and determination of Gyro north. Astronomical triangle; conversion of time system and precise determination of azimuth by astronomical methods.

Correlation: Methods of correlation surface and underground including Gyro-Laser combination.

Development: Surveys of flat, moderately and steeply inclined and vertical workings; control of direction and gradient in drifts and roadways traversing along steep working with or without auxiliary telescopes, 3Dlaser profiling of bench walls in opencast working.

Theory of errors and adjustments: Causes and classification of errors; inclines of precision; laws of weight; propagation and adjustment of errors; adjustment of triangulation figures.

National grid: Map projection Cassini Lambert's polyconic and universal transfers Mercator; transformation of coordinates.

Area and volume calculation: Different methods and their limitations; earthwork and building estimation; laying out of rail curves and haul road curves, surface and underground.

Sampling and reserve calculations

Dip, and strike problems: outcrop problems; borehole surveying and calculations.

Types of plans and their preparation, care, storage and preservation: legislation concerning mine plans and sections; duties and responsibilities of surveyors.

Application of computers in mine surveying and preparation of plans.