M.A. Semester II (2019-2021)

CC-9 (Practical)

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MERCATOR'S PROJECTION

(Alternative Method)

Mercator's projection is a cylindrical group or orthomorphic projection. It needs the following calculation for construction. The Mercator projection maps all lines with constant bearing to straight lines. The space between meridians are equal parallel lines. The latitude parallels are straight lines that are farther and farther apart as their distance from the Equator increases.

i. The distance between two longitude on the equator (x) =Rr

x= Distance between the meridians

R= Radius of the earth

R= Interval of the meridians

ii. The distance between two latitudes on the equator

Y= R 2.3026 log10 tan (45º* 10/2)

y= Distance of two parallels

R= Reduced radius of the Earth

(log10 value is fixed and is written as 2.3026)

Question: Construct the map of the world on Mercator's Projection at interval of 10° and R.R. is 1.5".

Answer:

R.R -1.5 in.

Interval - 10°

Length of the equator - 2πr

= 2× 3.14×1.5”

= 9.428”

Distance of meridian along the equator = R ƛ

=1.5”×10°

=1.5”×0.17453

=0.2618”

Distance of parallels from equator -

For 10° = 1.5” ×2.3026×log tan (45° + 10/2)

= 1.5×2.3026 log tan 50°

= 0.2632”

For 20° = 1.5” ×2.3026×log tan (45° + 20/2)

= 3.4539×0.1577

= 0.5346”

For 30° = 1.5” ×2.3026×log tan (45° + 30/2)

= 1.5” ×2.3026×0.23856

=0.8240”

For 40° = 1.5” ×2.3026 × log tan (45° + 40/2)

=1.5” × 2.3026 × 0.3313

=1.144”

For 50° = 1.5” × 2.3026 × log tan (45° + 50/2)

=3.4539 × 0.43893

=1.5160”

For 60° = 1.5” × 2.3026 × log tan (45° + 60/2)

=3.4539 × 0.57195

=1.975”

For 70° = 3.4539 × log tan (45° + 70/2)

=3.4539 × 0.7538

=2.6013”

For 80° = 3.4539 × log tan (45° + 80/2)

=3.4539 ×1.05805

=3.654”

Distance of Parallel from Equator

Latitudes	Distance from Equator
0°	0.087 × R
10°	0.175×R
15°	0.265×R
20°	0.356 × R
25°	0.450 × R
30°	0.549 × R
35°	0.652 × R
40°	0.763 × R
45°	0.880 × R
50°	1.011 × R
55°	1.153 × R
60°	1.317 × R
65°	1.505 × R
70°	1.736 × R
75°	2.435 × R
80°	3.132 × R

THE WORLD
ON
MERCATOR'S PROJECTION

R·R - 1·5"