CONTROL WORK

SPATIAL DATA MANAGEMENT

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Surname, name, patronymic:

Group:

Date:

Signature:

A:

Select all correct statements.

1. We use “spatial reference system” and “coordinate reference system” interchangeably
2. Earth ellipsoid – spheroid with polar axis approx. aligned with the rotation axis of the Earth
3. We use terms “ellipsoid” and “spheroid” interchangeably
4. Geoid is an approximation of the Earth’s shape
5. Geographic coordinate system is used for projected data
6. Ellipsoid is defined by the lengths of its axes
7. None of the above

B:

Select all correct statements.

1. Datum contains spheroid orientation
2. Datum can be local or global
3. Datum contains projection information
4. Datum can be vertical or horizontal
5. Datum contains units
6. Datum can be formatted as WKT

C:

Select all correct statements.

1. WGS84 may refer to the coordinate reference system
2. WGS84 may refer to the UTM coordinate system
3. WGS84 may refer to the ellipsoid
4. WGS84 was last revised in 1984
5. WGS84 may refer to the datum

D:

The components of a datum are (check all that apply):

1. Spheroid
2. Spheroid orientation
3. Prime meridian
4. Coordinate reference system
5. Spheroid origin
6. Units

E:

The EPSG code for unprojected, geographical coordinate system is (one correct answer):

1. EPSG:900913
2. EPSG:4356
3. EPSG:32637
4. EPSG:4326
5. EPSG:5776
6. None of the above

F:

Coordinates latitude and longitude in meters are ambiguous unless:
(one correct answer)

1. Projection is specified
2. Units are specified
3. Prime meridian is specified
4. Coordinate reference system is specified
5. Ellipsoid is specified
6. Geographic reference system is specified
7. None of the above

G:

EPSG database contains (choose all that apply):

1. Coordinate systems
2. Prime meridians
3. Units
4. Earth weight
5. Ellipsoids

H:

In what text notations CRS could be represented? Choose all that apply.

1. WKT
2. PROJ.4
3. Shapefile
4. None of the above

I:

Which datum is best suited for GPS navigation? Choose one correct answer.

1. UTM
2. EPSG
3. WGS84
4. WKT

J:

Select all correct statements.

1. UTM WKT does not contain spheroid parameters
2. UTM divides Earth on zones
3. UTM does not distort distances, angles, and areas
4. Landsat 8 scenes are disseminated in UTM projection

K:

What is true about the UTM projection? (check all that apply):

1. UTM projection makes it possible to locate points on the Poles
2. 32N, 32T, 32S are UTM zones
3. Coordinate systems of neighboring UTM zones do not overlap
4. Any point with coordinates (0, 0) is on the Equator
5. A single cylinder with the same alignment relatively to the Earth is used to create a map for any UTM zone
6. The point with coordinates (900 000m, 900 000m) is out of a UTM zone
7. The scale of objects on a map in UTM projection is 1:1 only along the central meridian
8. None of the above

L:

Select projections that are equivalent

1. Equidistant Cylindrical
2. Plate Carrée
3. Equirectangular
4. Geographic

M:

Universal Transverse Mercator is a (one correct answer):

1. Spheroid
2. Datum
3. Projection
4. Coordinate system
5. None of the above

N:

Select the appropriate chain of transformations to obtain spherical latitude and longitude coordinates (lat, lon) from integer indexes (x, y) of a projected raster (one correct answer):

1. (x, y) -> geographic coordinates (x1, x2) -> (lat, lon)
2. (x, y) -> projection coordinates (x1, x2) -> (lat, lon)
3. (x, y) -> world coordinates (x1, x2) -> (lat, lon)

O:

What type of information an attribute of a vector data feature may contain?
Choose all that apply.

1. Cacti photo
2. Date of birth
3. Regular expression
4. WiFi Address
5. Weight

P:

Given:

```
PROJCS["GDA94 / MGA zone 55",
 GEOGCS["GDA94",
  DATUM["Geocentric Datum of Australia 1994",
   SPHEROID["GRS 1980", 6378137.0, 298.257222101, AUTHORITY["EPSG","7019"]],
   TOWGS84[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0],
   AUTHORITY["EPSG","6283"]],
  PRIMEM["Greenwich", 0.0, AUTHORITY["EPSG","8901"]],
  UNIT["degree", 0.017453292519943295],
  AXIS["Geodetic latitude", NORTH],
  AXIS["Geodetic longitude", EAST],
  AUTHORITY["EPSG","4283"]],
 PROJECTION["Transverse_Mercator", AUTHORITY["EPSG","9807"]],
 PARAMETER["central_meridian", 147.0],
 PARAMETER["latitude_of_origin", 0.0],
 PARAMETER["scale_factor", 0.9996],
 PARAMETER["false_easting", 500000.0],
 PARAMETER["false_northing", 10000000.0],
 UNIT["m", 1.0],
 AXIS["Easting", EAST],
 AXIS["Northing", NORTH],
 AUTHORITY["EPSG","28355"]]
```

What does EPSG:4283 correspond to?

1. Projected coordinate system
2. Datum
3. Projection
4. Geographic coordinate system
5. Unit
6. Coordinate reference system
7. None of the above

Q:

Select all WKT expressions that are correct and represent valid geometries.

1. POLYGON ((10 10, 10 5, 15 5, 12 5, 10 10))
2. MULTILINESTRING ((26 24, 30 70, 60 70, 60 40, 96 34), (70 20, 40 20, 41 55, 90 60))
3. MULTIPOLYGON ((23 32, 50 68, 93 60, 72 18, 23 32), (83 98, 87 134, 188 125, 134 67, 83 98))
4. None of the above

R:

Select all WKT expressions that are correct and represent valid geometries.

1. POLYGON ((50 100, 150 100, 150 50, 50 50, 50 100),
   (70 70, 130 70, 130 50, 70 50, 70 70))
2. GEOMETRYCOLLECTION (POLYGON ((50 100, 150 100, 150 50, 50 50, 50 100)),
   POLYGON ((70 70, 130 70, 130 50, 70 50, 70 70)))
3. MULTIPOLYGON (((50 100, 150 100, 150 50, 50 50, 50 100)),
   ((70 70, 130 70, 130 50, 70 50, 70 70)))
4. None of the above

S:

Select all WKT expressions that are correct and represent valid geometries.

1. MULTIPOINT (1 2, 12 13, -1 -2)
2. POLYGON ((10 10, 15 20, 25 20, 30 9, 19 4))
3. MULTIPOINT ((-6.6 7.6), (-2.55 9.45), (-4 5), (-5.8 4.5), (-3.95 7.45), (1.65 7.5), (3.15 7.35))
4. POLYGON NULL
5. LINESTRING (25 15, 30 15, 30 10, 20 10, 20 20, 35 20, 35 5, 15 5,
   15 25, 40 25, 40 0, 10 0, 10 30, 50 30)
6. None of the above

T:

Select all WKT expressions that are correct and represent valid geometries.

1. MULTILINESTRING ((50 100, 50 0), (0 60, 100 60))
2. POLYGON ((20 30, 60 30, 60 10, 20 10, 20 30),
   (25 25, 35 25, 35 15, 25 15, 25 25),
   (40 25, 55 25, 55 20, 40 20, 40 25))
3. MULTIPOLYGON (((50 100, 100 100, 100 50, 50 50, 50 100),
   (70 90, 100 90, 100 60, 70 60, 70 90)),
   ((80 80, 90 80, 90 70, 80 70, 80 80)))
4. GEOMETRYCOLLECTION (
   POLYGON ((50 100, 103 65, 104 18, 32 41, 50 100)),
   LINESTRING (33 115, 110 120, 135 61, 130 0, 0 0, 33 115),
   POINT (70 60))
5. MULTILINESTRING ((50 100, 200 100), (200 100, 300 100))
6. MULTIPOLYGON (((50 50, 100 100, 210 100, 250 50, 50 50)),
   ((100 100, 210 100, 210 50, 100 50, 100 100)))
7. None of the above

U:

Select all WKT expressions that are correct and represent valid geometries.

1. LINESTRING (50 100, 100 100, 100 50, 50 50, 100 50, 100 100, 50 100)
2. POLYGON ((110 150, 160 60, 60 30, 30 110))
3. MULTILINESTRING ((100 100, 150 100), (100 100, 100 50), (100 50, 150 50),
   (150 50, 150 100))
4. None of the above

V:

What operations on geometries are not set-oriented? Choose all that apply.

1. Complement
2. Union
3. Line simplification
4. Validation
5. Intersection
6. Difference
7. Affine Transform
8. Buffer
9. Reprojection
10. None of the above

W:

What is the resulting geometry type of the Buffer operation with parameter 1 on the MULTIPOINT ((30 70), (50 70), (40 80), (40 60))? Select one correct answer.

1. MULTIPOLYGON
2. POLYGON
3. MULTIPOINT
4. GEOMETRYCOLLECTION
5. None of the above

X:

What is the result of the operation? Select one correct answer.

A = POLYGON ((40 90, 70 90, 70 60, 40 60, 40 90))
B = LINESTRING (40 90, 70 90, 70 60, 40 60, 40 90)
Operation: A – B

1. POLYGON ((40 90, 70 90, 70 60, 40 60, 40 90))
2. LINESTRING (40 90, 70 90, 70 60, 40 60, 40 90)
3. GEOMETRYCOLLECTION(POLYGON ((40 90, 70 90, 70 60, 40 60, 40 90)),
   LINESTRING (40 90, 70 90, 70 60, 40 60, 40 90))
4. Empty geometry
5. None of the above

Y:

What is the resulting geometry type of the Buffer operation with parameter 10 on the MULTIPOINT ((30 70), (50 70), (40 80), (40 60))? Select one correct answer.

1. GEOMETRYCOLLECTION
2. POLYGON
3. MULTIPOLYGON
4. MULTIPOINT
5. None of the above

Z:

What is the resulting geometry type of the Buffer operation with parameter 10 on the POLYGON ((50 100, 100 100, 100 50, 50 50, 50 100))? Select one correct answer.

1. MULTIPOLYGON
2. POLYGON
3. MULTIPOINT
4. GEOMETRYCOLLECTION
5. None of the above

AA:

What is the resulting geometry type of the Buffer operation with parameter 10 on the MULTILINESTRING ((30 70, 70 70), (50 90, 50 50))? Select one correct answer.

1. MULTIPOLYGON
2. POLYGON
3. MULTIPOINT
4. GEOMETRYCOLLECTION
5. None of the above

AB:

What is the resulting geometry type of the Buffer operation with parameter 5 on the GEOMETRYCOLLECTION (LINESTRING (30 70, 30 50),
POINT (50 60), POLYGON ((70 65, 81 65, 81 55, 70 55, 70 65)))? Select one correct answer.

1. MULTIPOLYGON
2. POLYGON
3. MULTIPOINT
4. GEOMETRYCOLLECTION
5. None of the above

AC:

What is the result of the operation? Select one correct answer.

A = POINT (250 350)
B = POINT (250 350)
Operation: A – B

1. POINT NULL
2. POINT (250 350)
3. MULTIPOINT ((250 350))
4. POINT (0 0)
5. None of the above

AD:

What is the result of the operation? Select one correct answer.

A = LINESTRING (20 60, 50 100, 80 60, 50 30, 20 60)
B = LINESTRING (20 60, 80 60)
Operation: A – B

1. LINESTRING NULL
2. MULTILINESTRING ((20 60, 50 100, 80 60), (80 60, 50 30, 20 60))
3. LINESTRING (20 60, 50 100, 80 60, 50 30, 20 60)
4. LINESTRING (20 60, 80 60)
5. None of the above

Both are correct

AE:

In what topological relationship are objects A and B given the following Egenhofer matrix? Choose one correct answer.

	I(B)	B(B)	E(B)
I(A)	T	*	T
B(A)	*	*	*
E(A)	T	*	*

1. A Overlaps B
2. A CoveredBy B
3. A Equals B
4. A Touches B
5. A Disjoint B
6. A Covers B
7. A Contains B
8. A Within B
9. None of the above

AF:

If object A touches object B, what are possible Egenhofer matrices? Choose all that apply.

1.

	I(B)	B(B)	E(B)
I(A)	F	*	*
B(A)	T	*	*
E(A)	*	*	*

2.

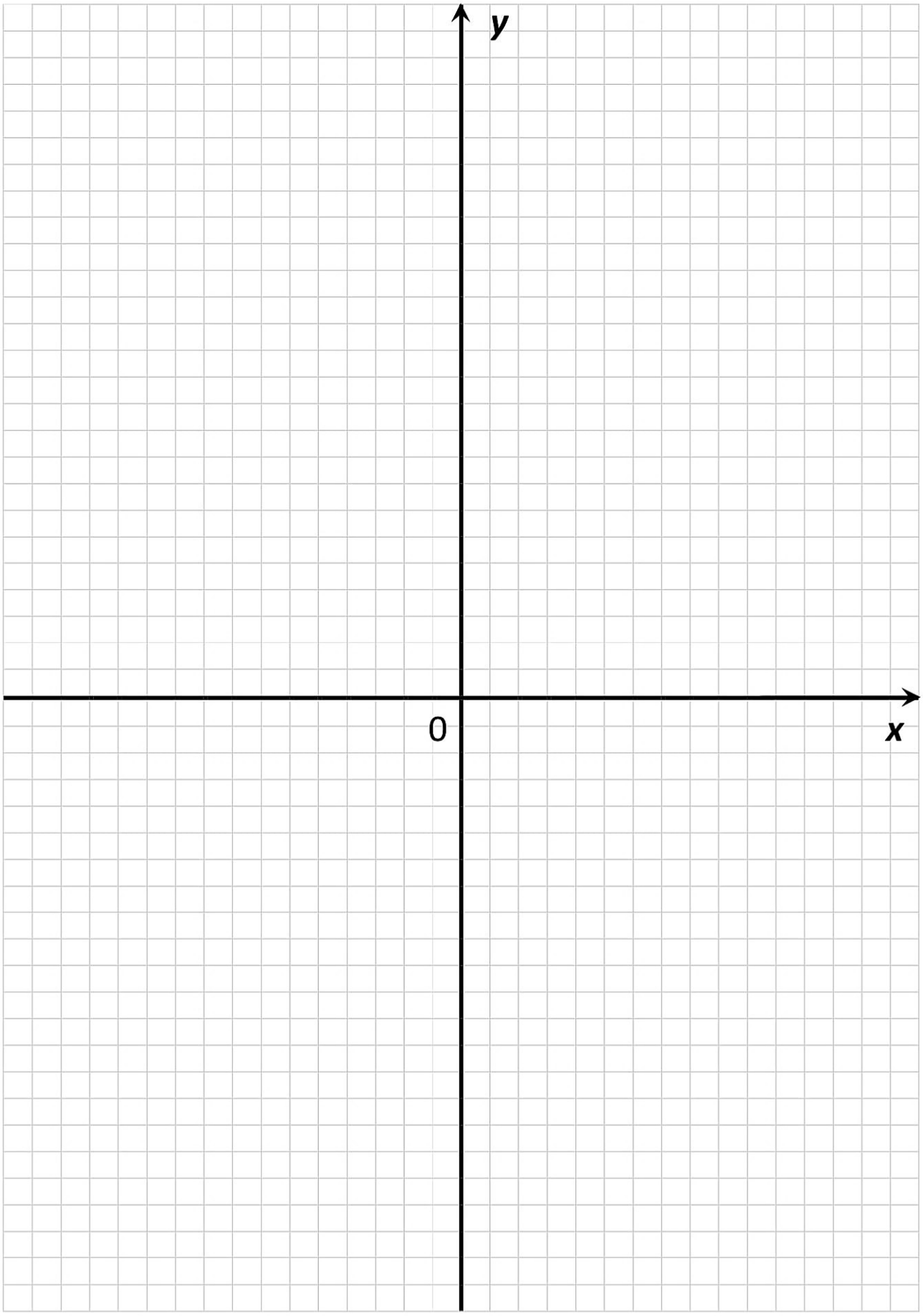
	I(B)	B(B)	E(B)
I(A)	*	T	*
B(A)	*	*	*
E(A)	F	F	*

3.

	I(B)	B(B)	E(B)
I(A)	T	*	*
B(A)	*	*	*
E(A)	F	F	*

4.

	I(B)	B(B)	E(B)
I(A)	F	T	*
B(A)	*	*	*
E(A)	*	*	*


y
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