Name : ………………………………………………………………

Roll No. : ……………………………………………………………

Invigilator's Signature : ……………………………………….

CS/BNS/SEM-1/BNS-104/2009-10
2009
PRINCIPLES OF NAVIGATION – I

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

    $10 \times 1 = 10$

    i) Is that specific Meridian through Greenwich from which longitudes are measured east or west

    a) Longitude of a place   b) Departure

    c) UTC   d) Prime meridian.

    ii) An error of a magnetic copass is

    a) the angle between True north & Magnetic north

    b) the angle between Magnetic north and Compass north

    c) the angle between True north and Compass north

    d) the angle between Compass north & True north.

    iii) The variation is

    a) same value in every place on the earth

    b) value varies with area

    c) none of these.

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iv) The value of deviations is

    a) not same in all ships

    b) value varies area wise

    c) all of these.

v) The Equator is a

    a) great circle on the earth surface

    b) it is the mid way between north and south poles

    c) it divides the earth into two equal halves

    d) all of these

    e) none of these.

vi) The great circle

    a) divides the sphere into 2 equal halves

    b) it is the shortest distance between any two points on a sphere

    c) all meridians are great circles

    d) the equator is a great circle

    e) all of these

    f) none of these.

vii) Difference of longitude (D'long) is

    a) the shorter arc of the equator

    b) the angle at the pole

    c) all of these.

viii) The polar distance of the equinoctial is

    a) $180°$ b) $120°$

    c) $90°$ d) $65°$.

ix) If arrival latitude is $23°\ 32 \cdot 9'$ N and d'lat $3°\ 21 \cdot 8'$ N, what would be the initial latitude ?

    a) $20°\ 11 \cdot 0'$ N

    b) $26°\ 54 \cdot 6'$ N

    c) $26°\ 54 \cdot 6'$ S.

x) If left longitude is 178° 46·0$'$ W and d$'$long is 3° 19·1$'$ W then arrived longitude is

a) 182° 05·1$'$ E

b) 182° 05·1$'$ W

c) 177° 54·9$'$ E.

xi) Te Rhumb line is one that

a) cuts all the meridians at same angles

b) which cuts each meridians at different angle

c) none of these.

xii) In Mercator Sailing formula D'long divided by difference of Meridian parts is equal to

a) cos course   b) tan course

c) sin course   d) cosec course.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following.   3 × 5 = 15

2. Derive the formula with diagram Dep = D'long × cos lat.

3. When it was 9 A.M at Kolkata (088° 30$'$ E) on the 1st January, 1986, what was the date and time is New York (074° W) ?

4. State Kepler's laws of Planetary motion with suitable sketches where required.

5. Ships X and Y are on same course. X travels at twice the speed of Y but only makes $1\frac{1}{2}$ times the D'long of Y. If ship X is in Lat 20° 15·0$'$ N, find Lat of Y.

6. In triangle ABC, Angle A = 90°, side AB = 34° 10$'$, side BC = 112° 15$'$, find all the remaining parts.

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GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.   3 × 15 = 45

7. a) What are the limitation of parallel sailing ?

    b) A ship is in position 0° N, 150° W. It starts sailing at 12 knot due North for 1 day, then due East for the next day. Again it changes course to South and sails for the third day, and finally it sails due West for the last 24 hours. Find the position arrived.

8. a) How would you compare between right angled triangle and quadrantal triangle ?

    b) A ship sailed from Hawaii Island (21° 30$^{\prime}$ N, 157° 50$^{\prime}$ W) to Vancouver in Canada (48° 20$^{\prime}$ N, 123° 15$^{\prime}$ W) and planned for great circle sailing. Calculate initial and final course.

9. a) What is chart projection ?

    b) Explain following projections :

    Conical projection, Stereographic projection, Gnomonic projection, Mercator projection.

10. a) Define DR position, Estimated position, Observed position.

    b) A arrived Dar Es Salam harbour in position 06° 49$^{\prime}$ S, 039° 19$^{\prime}$ E, having ocean current setting 015° at rate 1·8 knot through out the year. Due to piracy problem, master ordered to stay away from port in the night at a distance 50 M south of the original arrived position. 18 hour after staying away, port authority told the ship to come for loading cargo. Find out how much course and distance the ship has to steer to reach back to its original arrived position.

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