INDIAN MARITIME UNIVERSITY
(A Central University Government of India)
END SEMESTER EXAMINATIONS- JUNE 2019
DIPLOMA IN NAUTICAL SCIENCE
SEMESTER - I
APPLIED MATHEMATICS (UD11T2101)

Date: 24-06-2019 Max. Marks: 70
Time: 02 hours Pass Marks: 35

Note : Attempt any 5 questions. Use of calculator is permitted.

Q.1. a) By vector method,find the area of the triangle whose vertices are (3,-1,2),(1,-1,3) and (4,-3,1). (7 marks)

b) If $\vec{a}, \vec{b}$ and $\vec{c}$ are non coplanar vectors then prove that

$2\vec{a} - 4\vec{b} + 4\vec{c}$, $\vec{a} - 2\vec{b} + 4\vec{c}$ and $-\vec{a} + 2\vec{b} + 4\vec{c}$ are collinear. (7 marks)

Q.2. Q.2. a) A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six.

(7 marks)

b) Calculate the rank cancelation coefficient from the following data showing the ranks of 10 students in 2 subjects

Navigation	3	8	9	2	7	10	4	6	1	5
Cargo	5	9	10	1	8	7	3	4	2	6

(7 marks)

Q.3. a)Find the equation of the circle passing to the point of intersection of the lines 3x – 2y – 1 = 0 and 4x + y – 27 = 0 and whose centre is the point (3,-2) . (7 marks)

b)Find the equation of ellipse whose focus is the point (-1,1) and the corresponding directrix is the line x – y + 3 = 0 and eccentricity is ½ .
(7 marks)

Q.4. a) Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ using Simpson's 1/3rd rule dividing the interval (0,1) into 4 equal parts. (7 marks)

b) Metallic spheres of radii 6 cm, 8 cm and 10 cm, respectively, are melted to form a single solid sphere. Find the radius of the resulting sphere. (7 marks)

Q.5. The angles of elevation of the top of the tower from two points at a distance of 4m and 9m from the base of the tower and in a same line with

it are complimentary. Prove that the height of the tower is 6m. (14 marks)

Q.6. a) In a spherical ΔABC, A = $88^{o}36'$, B = $121^{o}\ 36.5'$ and C = $69^{o}\ 34.5'$, find c. (7 marks)

b) In a spherical ΔPXY, p = $53^{o}\ 20'$, X = $92^{o}\ 05'$ and Y = 90^{o} calculate P & y. (7 marks)

Q.7. a) Given f(-2) = 46 , f(-1) = 4 , f(1) = 4 , f(3) = 156 and f(4) = 484, use the Lagrange interpolation formula to compute f(0). (14 marks)