**MSQ Unit 32**

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| Title: | **Marine engineering dynamics** |
| QCF Level: | **3** |
| Credit value: | **4** |
| Learning outcomes  *The learner will:* | Assessment criteria  *The learner can:* |
| 1. Be able to solve problems involving velocity vector diagrams | * 1. Solve problems involving the resolution of a velocity vector into its vertical and horizontal components   2. Draw a velocity vector diagram to determine the resultant of a number of vectors |
| 1. Be able to compare linear and angular dynamic quantities and equations | * 1. State the meaning of the terms Moment of Inertia and Radius of Gyration   2.2 Complete a table which compares linear and angular dynamic system quantities and equations |
| 1. Be able to solve problems involving angular dynamic systems. | * 1. Apply the equations of motion for constant acceleration to the solution of problems involving angular systems   2. Apply a velocity/time diagram to the solution of a problem involving an angular system   3. Apply equations of motion for constant acceleration to solve problems involving a system containing one linear and one angular element |
| 1. Be able to solve problems involving accelerating or decelerating a solid uniform disc | * 1. Calculate the Moment of Inertia of a solid uniform disc   2. Calculate mechanical quantities associated with accelerating and/or decelerating a solid uniform disc   3. Calculate mechanical quantities associated with accelerating and/or decelerating a solid uniform disc by applying the principle of the conservation of energy |
| 1. Be able to solve problems involving centripetal and centrifugal forces | * 1. State the meaning of the terms centripetal force and centrifugal force   2. State the relationship between centripetal and centrifugal force and mass, angular velocity and radius.   3. Solve problems involving centripetal and centrifugal forces |
| 1. Understand the principle of the conservation of momentum | * 1. Explain the principle of the conservation of momentum |
| 1. Be able to solve problems using the principle of the conservation of momentum | * 1. Solve problems on linear dynamic systems involving the equations of motion and the principle of the conservation of momentum |
| **Additional information about the unit** |  |
| Unit aim(s) | To provide candidates with knowledge and understanding of dynamics in a marine engineering context |
| Unit expiry date |  |
| Details of the relationship between the unit and relevant national occupational standards (if appropriate) | MNTB NOS (Jan 2006) – C11 Prepare and operate vessel propulsion machinery and ancillary systems  C12 Operate vessel auxiliaries and service machinery  C34 Carry out maintenance of vessel mechanical machinery and systems |
| Details of the relationship between the unit and other standards or curricula (if appropriate) | Maritime and Coastguard Agency Marine Guidance Notice regarding Certificates of Competency – Engine Department |
| Assessment requirements specified by a sector or regulatory body (if appropriate) | MSA Assessment Strategy  MCA requirements |
| Endorsement of the unit by a sector or other appropriate body (if required) | MCA…. |
| Location of the unit within the subject/sector classification system | Transportation |
| Name of the organisation submitting the unit | Scottish Qualifications Authority |
| Availability for use |  |
| Availability for delivery |  |
| Guided Learning Hours | 40 |