OFFSHORE SUPPORT INDUSTRY

November 2025

EXAMINERS REPORT

Question 1.

(a) A Sketch should provide sufficient detail to demonstrate understanding of the basic structure.
ie. sketches showing pontoons, columns, deck, derrick and topside modules.
Most rigs comprise 2no. pontoons and 4no. columns, however large modern units are constructed with 6 or 8 columns.
Usually 1 derrick, but 2 on large modern units.
Detail should include mooring arrangements and that some rigs can be self-propelled with thrusters.

(b) Floating structure, can be ballasted to obtain optimum draft between transport and operational modes.
Can be self-propelled, although most units will be towed between locations.
Towed to location or transported by Heavy Lift vessels (Dry Tow).
Anchoring arrangements usually 8 (2/corner) or 12 (3/corner).
Anchors deployed/recovered by AHTS.
Can operate in deeper water than Jack-up rigs.
Modern semis operating in water depths up to 3,500m
More stable than drillships.
Deepwater operations units can be held on station by thrusters on DP. (usually DP3)
Specification advances loosely referred to as 'generations' covering around a decade, hence latest rigs termed '7th generation' from 2015 onward.
Operating Draft circa. 25m
Transit Draft circa 8m

Question 2.

Students are expected to provide a brief description of each term.

<u>AUV</u>
Autonomous Underwater Vehicle
Type of robotic device that can operate underwater without direct human control.
A self-guided submerged vehicle that differs from an ROV in that it is designed to conduct workscopes independently, navigating based on pre-programmed instructions.
No umbilicals or real-time remote control.

<u>Jacket</u>
A steel lattice framework that forms the foundation support for fixed offshore platforms
Generally utilised in the construction of oil and gas installations and wind farm installations where the jacket supports the topsides (platform deck, drilling rigs, production facilities, etc. or wind turbine units, sub-station)
Usually made of tubular steel members forming a truss-like arrangement.
The jacket is placed on the seabed and secured by driving in piles at the leg bases or down the jacket legs).

Generally used in shallow to moderate water depths (40m – 300m)

MoA

Memorandum of Agreement

Formal written document that outlines the terms and details of an agreement prior to signing a more detailed contract.

Usually, but not necessarily legally binding (more formal than an MoU)

Generally defines:

- Purpose of the agreement
- Roles and responsibilities of each party
- Duration/timeline
- Financial arrangements
- Signatures from party's authorized representatives

ERRV

Emergency Response and Rescue Vessel.

A vessel dedicated to patrolling the area around an offshore installation in order to provide emergency response/rescue and protect the 500m exclusion zone around the installation.

Vessels will generally be equipped with a number of FRCs and Daughter Craft for search and rescue (SAR) recovering casualties from the sea, scramble nets, helicopter winching area extensive accommodation for casualties, hospital facilities, fire-fighting and pollution response capability.

Additional features on some modern vessels may include a heli-deck and emergency towing capability and may be equipped with DP

Daughter Craft

Small, fast rescue or workboats that are carried by larger vessels, such as ERRVs, and are launched when needed to perform specific tasks at sea.

Vessels are usually RIBs with a protected wheelhouse, capable of operating at a distance from a mother vessel for extended periods usually with the role of providing standby cover to a platform or other installation.

Although normally used in conjunction with an ERRV, some DCs are used operationally in other workscopes such as air diving, personnel transfer or as part of an IRM programme undertaken by an OSV.

Allows for more than one platform/installation to be covered by the mother vessel.

ISPS Code

International Ship and Port Facility Security Code.

Purpose is to establish a framework to detect security threats and take preventive measures against security incidents affecting ships and port facilities.

A requirement for vessels/ports to have:

- An approved Ship Security Plan (SSP)
- Appointed an onboard Ship Security Officer (SSO)
- Have in place an onshore Company Security Officer (CSO)
- Port Facility Security Plan (PFSP)
- Security Level to be prominently displayed onboard the vessel

Question 3.

The question is looking firstly for a description of the various areas and the influences their geographical situation has on the conditions encountered, and from that a description of the types of vessel required to support operations, highlighting the high differential in required specification and operational procedures between geographical areas.
Environmental weather conditions categorised as Polar Regions, Harsh Weather, Moderate Waters and Benign Waters.
Remote areas - (logistic and service impacts)
Political regime – (Regulatory/Cabotage/Political unrest)
Environmental policies - (ie emission control areas)
Crime & Law enforcement – (Corruption/Piracy)
Looking for details/examples of the effects of these influences have on offshore operations, rather than just stating them.
Detail on vessel equipment, ie increased winterization standards for vessels operating in Polar areas – ice strengthening of the hull;. insulated and heated cargo lines; under deck heating to prevent cargo/containers freezing to the deck; heat traces on walkways, handrails etc; enclosed and heated forecastles; DP programming specific for ice flow areas.
Harsh weather – high foredecks, greater freeboard, more power, enhanced redundancy across all systems, DP2, more powerful winches, greater chain and rope storage facilities, larger accommodation, better insulation and soundproofing.
Reference to specific areas within each category:
Harsh Areas: North Sea, West of Shetland, NE Canada (Nova Scotia/Newfoundland), South Atlantic (Falkland Islands), Sakhalin.
Benign areas: Middle East, Mediterranean, Black Sea and Caspian.
Moderate areas: West Africa, Brazil, GoM, Caribbean, SE Asia
Polar Areas: Alaska, Barents Sea, Norwegian Sea, Greenland

Question 4.

Students should demonstrate awareness of current market situation for the sector and include discussion on topics such as:

- General indication of spot and term rates.
- General awareness of newbuild costs and recent S&P values
- General awareness of newbuild order book.
- Recent growth in subsea developments and OCV/MPSV
- Interface between O&G and OREI projects
- Implication of oil price particularly for high cost subsea developments.
- Political issues – Russian sanctions – expectation of considerable growth in this market.
- Environmental issues – ECAs – IMO Tier 4 - Climate Change lobby.

The answer should include clear recommendation with reasoned projections.

Question 5.

Students should explain that the class notations listed are from DNVGL and that they indicate the specific rule requirements that have been met.

The vessel is likely to be either a DSV or OCV with a saturation diving spread, equipped with DP3 a subsea crane, helideck, Ice Class C and with the highest level of crew comfort rating.

Typical notations (DNVGL)

✠	Vessel was constructed under the full supervision of class from the keel laying to delivery
1A1	Highest class for hull and machinery - ship is designed, built and maintained to meet all applicable class rules
EO	Can operate with Unmanned Machinery Space or Periodically Unmanned Engine Room
Supply Vessel	Designed specifically for supply services to offshore installations. Suffix 'Basic' after Supply Vessel designates areas excluding North Sea and other harsh weather environments. (DNV now use 'Offshore Service Vessel' designation)
SF	Special damage stability requirements for Supply Vessel notations.
TUG	Vessel designed especially for towing operations.
DYNPOS(AUTRO)	Dynamic Positioning Class 3 (DP3) Definition of DP classes 1, 2 &3
DK(+)	Specially strengthened and certified by class for heavy loads or heavy point loading
CRANE	Crane is designed, built, and certified according to specific class rules for safe lifting/heavy lifting operations.
HELDK	Helideck for Helicopter operations – Landing area or erected platform.
HELDK-SH	Certified to safely accommodate 'super heavy' helicopters, typically those weighing more than 15t
ICE-C	Vessel classed for operation in light (first year) ice Definition of ICE-A (heavy) and ICE-B (moderate)
CLEAN DESIGN	Class approved to minimize environmental impact beyond standard regulatory requirements for emissions, noise and waste management in regard to environmental emissions to land (garbage), air and sea
NAUT-A	Safe bridge design, efficient workstation layout, improved visibility and ergonomics, sufficient redundancy and reliability of navigation systems
Comf-V(3) C(3)	Comfort Class Notation. Certifies a ship provides a high standard of comfort for crew or passengers V: Vibration; C: Noise (lower the better 1-best, 3- acceptable
DSV-SAT	Diving Support Vessel with Saturation Diving Spread.
OILREC	Notation covering collection, retention and transportation of recovered oil after an oil spill in emergency situations.

Question 6.

Students should demonstrate a general understand the basic concept of:

Diesel main engines driving propeller shafts.

Combined alternator/electric motor units (Power Take Off - PTO/Power Take In - PTI) integrated with main engine gearbox.

Additionally, they should demonstrate awareness of the key advantages:

- Improved vessel performance
- Reduced emissions
- Lower operating costs due to lower fuel consumption
- Lower maintenance costs related to engines
- Reduced noise levels and vibrations on board - also reducing noise in water
- Improved long-term efficiency of the power supply system
- Higher redundancy

Additional marks were awarded for more detailed description/examples:

- In addition to conventional shaft driven propulsion, electrical power drives large electric motors connected via the gearbox to the propeller shafts.
- Main engines provide direct power to prop shafts and/or indirectly via PTO/PTIs
- Describe/Provide example:
  - ie. Port ME can drive both prop shafts - Port shaft driven directly while simultaneously generating electric power from Port PTO which can be fed via
  - Stbd PTI to starboard prop shaft – and vice versa.

- Hybridization systems allow the use of an optimal energy source for the required task, giving you a range of benefits - less environmental emissions, noise reductions and reduced maintenance.
- Understand batteries and smaller diesel alternators can be used to provide energy to the vessel when it is transiting, standing-by or WoW and the main engines can be stopped.
- Power 'shaving' is term used to describe using batteries to provide a small amount of additional power in combination with a running engine to avoid necessity of starting another engine
- Reducing 'spinning capacity' or 'turning and burning' to those periods when it is needed means more efficient power generation as fuel driven engines are working at their optimum power point.

Examples from an operational context could include:

Min Load – Standing-by / WoW: Could reduce to one genset providing both electric power and sufficient propulsive power to both propellers to maintain manoeuvrability.

Max. Load – Full power chasing out large anchor in deep water: Both main engines Driving prop shafts and gensets providing additional power to prop shafts via PTI gearboxes.

Disadvantages are cost and complexity.

Question 7.

Marks were awarded for understanding the issues that need to be covered.

a. Helicopter Operations
   D-rating of helideck
   Helideck Loading
   Re-fuelling capability or not, responsibilities and safety
   Helideck certification and recertification
   Cost of certification/recertification
   Non-availability of helideck.
   Weather limits
   Number of HDA's and HLO's
   Responsibility for HDA's and HLO's
   Additional Helicopter Communications

b. Passengers
   Maximum number of passengers
   Cabin number and type
   Catering standard, regularity and menus
   Laundry facilities, standard and regularity
   Preplanning passenger numbers
   Number of hotel and catering staff
   Owners or charter to provide
   Cost schedule (staff and catering) and accounting
   Master's authority over passengers
   Maritime Labour Convention compliance and responsibility.

c. ROV Operations
   Number and type of ROV's
   Modifications required to vessel and reinstatement
   Costs of installing, carrying and operating ROV's
   Division of Responsibilities
   Power Supply requirements and arrangements

d. Sub-Sea Crane Operations
   Specification of Crane + Crane curves
   Wire supply, testing, renewal and damage.
   Crane Drivers, number and supply of.
   Division of responsibilities.
   In event of breakdown of crane is vessel on hire or off hire or does she remain on hire on a proportion of the day rate.

e. Saturation Diving Operations
Specification of Dive Systemincluding number of divers and support staff
Division of Responsibilities
Subsea operations insurance
Power supply requirements
In event of breakdown of Sat system is vessel on hire or off hire or does she remain on hire on a proportion of the day rate

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Question 8.

Students should demonstrate awareness of the issues involved with the listed scenarios.

Collision with Installation
Working in close proximity to offshore installations with little room for error so maximum attention must be given to ability to maintain position safely alongside installation.
Serious risk if collision does occur: Contact damage; damage/loss of property; pollution; injury or loss of life.
Consequential loss can be very significant. (Installation downtime)
KK and MHHA discussed.
All instances however serious or level of injury must be investigated, cause identified and remedial actions taken.
Investigations could involve owner, charterer and regulatory body.
DP incidents formally recorded in logbook and should be forwarded to IMCA for inclusion in DP Accident Database.
Charterer will require results of the incident investigation before vessel will be allowed to operate alongside an installation again.

Unscheduled Dry Docking/Breakdown
Docking or major repair work not arranged in advance to comply with Class requirements.
Examples requiring drydock: Hull damage; fouled/leaking propellers/thrusters; leaking propeller shafts; leaking propeller blade seals; damage to propellers or rudders.
Problem for owners – loss of hire; sourcing available drydock; completing the repair.
Problems for charterers – Replacement vessel; cargo/equipment still onboard.
Communication between owner/charterer – understanding relevant CP clauses.

Heavy Weather
Recognising the need for higher specification vessels in harsh weather environments.
Assuming vessel specification matched to operating environment, most heavy weather problems are associated with operational issues rather than vessel integrity.
Most common integrity issues are those caused by bridge/accommodation windows broken by heavy seas and associated water ingress effecting electrical/electronic equipment – ie loss of power/ steering.
Other issues: Damaged plating; loss/damaged deck equipment etc.
Insurance issues; Replacement vessel; time to effect repairs; early termination of CP.
Good communication between vessel, operator, installation and charterer to ensure proper planning of operations to avoid heavy weather situations.
Releasing vessel to seek shelter.