

**Year 11 MMS Semester 1 Sample Exam Answers**

**Section A: Multiple Choice**

1	B	6	C	11	C	16	B
2	B	7	B	12	C	17	A
3	A	8	B	13	C	18	A
4	D	9	C	14	B	19	B
5	B	10	D	15	B	20	C

**Section B: Short Answer**

**Qu21 (13 marks)**

a) (4 mark) Any 4 of:

- Warm water
- Light
- Suitable substrate to colonise
- Dispersal of larvae
- Clear water
- Saline water

b) (3 marks) From left to right respectively

- Fringe reef
- Barrier reef
- Atoll

c) (6 marks) *Answers may include, but are not limited to:*

(1 mark for way, 1 mark for explanation)

Any 3 of:

- Overfishing/destructive fishing techniques
- ↓ balance of ecosystem/↓ resilience
- ↓ water quality (pollution)
- ↑ stress for coral polyps leading to ↑ bleaching
- ↑ burning of fossil fuels leading to ↑ global warming
- ↑ stress for coral polyps leading to ↑ bleaching
- ↑ burning of fossil fuels leading to ↑ ocean acidification
- ↑ stress for coral polyps leading to ↑ bleaching
- ↑ tourism
- ↑ breakages of formations

**Qu22 (21 marks)**

a) (5 marks) *Answers may include, but are not limited to:*

- ↑ water temperature, water body is less dense
- less dense water rises to surface
- ↓ water temperature, water body is more dense
- more dense water sinks

- causing convection current to form.
- b) (3 marks) *Answers may include, but are not limited to:*
- surface currents
  - as formed by winds blowing across surface
  - water particles have kinetic energy and will therefore move object
- c) (4 marks) *Answers may include, but are not limited to:*
- ↑ evaporation at surface
  - due to maximum light penetration and heating of water via heat transfer from atmosphere
  - evaporation removes FW
  - thus ↑ salinity at surface
- d) (2 marks) *Answers may include, but are not limited to:*
- ↑ salinity = ↑ density
  - ↓ salinity = ↓ density
- e) (5 marks)
- a) temperate
  - b) equatorial
  - c) polar

*Answers may include, but are not limited to:*

- temperature range of 'c' indicates polar conditions
- seasonal thermocline of 'a' indicates temperate conditions as there would be mixing of the water (hence not permanent thermocline)

f) (2 marks)

- A= Indian Ocean Current/Gyre
- B = South Equatorial Current

**Qu 23 (13 marks)**

a) (4 marks) Any 2 of:

- Water (96.5%)
- Salts (3.5%)

Any 2 of:

- NaCl, MgCl<sub>2</sub>, Na<sub>2</sub>SO<sub>4</sub>, KCl, CaCl<sub>2</sub>

b) (1 mark)

- 35 grams/litre (g/L)

c) (5 marks) *Answers may include, but are not limited to:*

- Filter the water removed from the sea
- supersaturate the solution in an evaporation pond (& series of concentration ponds)
- water evaporates leaving salt solution (brine)
- brine is fed into crystallisation pond
- where salt precipitates onto the floors, ready for harvest
- harvested salt is washed to remove impurities
- then dried (via evaporation) in big stockpiles for a couple of months

d) (3 marks) *Answers may include, but are not limited to:*

- North of Australia (NW WA, Regional areas)
- Warm, dry temperature leads to ↑ rates of evaporation – more efficient production
- Large space for ponds to evaporate water, leaving crystals.
- Ocean water is saltier in northern areas (due to ↑ rates of evaporation) and this leads to a more concentrated starting solution.

**Qu 24 (6 marks)**

a) (3 marks) *Answers may include, but are not limited to:*

- Coastal areas (↑ nutrients due to ↑ runoff) lead to ↑ phytoplankton blooms
- Phytoplankton contain chlorophyll (green pigment) used in PHS
- Green wavelengths are reflected (from visible spectrum), hence green colour.

b) (3 marks)

- Black

*Answers may include, but are not limited to:*

- Light is preferentially absorbed by water (red wavelengths are absorbed first)
- Therefore no red light to reflect off fish so it appears black.

**Qu 25 (14 marks)**

a) (2 marks) *Answers may include, but are not limited to:*

- Pelagic – open ocean where floating and swimming organisms occur (can be coastal or oceanic)
- Benthic – lowest level of a water body (bottom sediment & subsurface levels)

b) (5 marks) *Answers may include, but are not limited to:*

- Cold water temperature
- ↓ light availability
- ↑ water pressure
- ↑ viscosity
- fluctuations in oxygen and nutrient concentrations

c) i) (1 mark) *Answers may include, but are not limited to:*

- light zone/maximum depth to which visible light spectrum penetrates.

c) ii) (3 marks) *Answers may include, but are not limited to:*

- primary production is carried out by producers
- measure of rate of PHS (converting light energy into chemical energy)
- ↑ light will ↑ rate of PHS (maximum light in photic zone)

c) iii) (3 marks) *Answers may include, but are not limited to:*

- upwelling brings cold, nutrient rich water into photic zone
- will ↑ rate of PHS
- therefore ↑ growth of producers/plants

#### Qu 26 (23 marks)

a) (2 marks)

- $r = (b+i) - (d+e)$
- $r =$  rate,  $b =$  birth,  $i =$  immigration,  $d =$  death,  $e =$  emigration

b) (2 marks) Any 2 of:

- availability of food/space
- abundance of predators
- incidence of disease

c) (3 marks) *Answers may include, but are not limited to:*

- slow growing spp
- takes a long time to reach sexual maturity
- therefore add offspring/individuals to ↑ pop

d) (3 marks) *Answers may include, but are not limited to:*

- change sex, female to male (Protogyny)
- later in life cycle
- makes it difficult to protect brood stock sex ratio based on size limits

e) (6 marks) *Answers may include, but are not limited to:*

- spawning ground
- large numbers of sexually mature fish
- reproducing in the one area
- any fishing effort could remove entire brood stock
- further ↓ population size
- closure will prevent this from happening and ↑ population via reproduction.

f) (5 marks) *Answers may include, but are not limited to:*

- fishing mortality is above upper limit
- declining spawning potential
- mortality > reproduction = ↓ population size
- ↓ bag limits to ↓ number of individuals removed (leads to ↑ reproduction rate)
- complete closure of areas for fishing for extended periods of time).

g) (2 marks) *Answers may include, but are not limited to:*

- they are endemic to WA (not found anywhere else)
- if not managed properly then population could ↓ until endangered and then extinct (critical population levels)
- fish available for future generations to fish

### Section 3: Extended Answer

#### Qu 27 (25 marks)

a. (2 marks) *Answers may include, but are not limited to:*

- seagrasses are flowering plants with roots, stems and an internal transport system.
- Algae holdfast and transport nutrients through the body by diffusion

b. (3 marks) *Answers may include, but are not limited to:*

- Leaves – excrete excess salt / thick leathery reduce transpiration
- Roots - far-reaching, exposed roots / structural support in the soft soils. / adapted to stop the intake of salt.
- Reproductive - evolved to produce seeds that float /viviparous – germinating seed pod dropped into water

c. (5 marks) *Answers may include, but are not limited to:*

- Pink Snapper / Dhufish
- Seagrass – shelter /protection from larger predators
- Seagrass - Greater source of food, in the sediment, plants, in the water
- Calmer waters protection from strong wave actions
- Grow faster in seagrass than in other habitats (reefs)

d. (5 marks) *Answers may include, but are not limited to:*

- Both improve water quality - absorbing inorganic nutrient – cleaner for reef
- Binging sediment – allowing sediment to settle
- Reduce water flow /current - providing a calmer water for new mangroves to settle.
- Both provide secure/sheltered nurseries
- Important food source for invertebrates and juvenile fish

e. (6 marks) *Answers may include, but are not limited to:*

- Leads to an increased sediment on coral reefs
- Increase in nutrient input to corals – increase algae growth
- Degradation / loss of corals
- Impact the reef communities' loss of nurseries
- Less protected areas for juveniles – increase predation
- Change to shore line - erosion

f. (4 marks) *Answers may include, but are not limited to:*

- Increase in nutrients - fertilizer runoff, eutrophication

- leads to loss of mangroves/ seagrass therefore loss of coral reefs
- habitat destruction – clearing, dredging, coastal development, tourism
- removal of mangroves/seagrass leads to loss of coral reefs

#### Qu 28 (25 marks)

a) (6 marks) *Answers may include, but are not limited to:*

- geostrophic current
- difference in mean seawater level
- from NW shelf
- to SW corner/Southern Ocean
- forms a pressure gradient (gravity fed) and
- water flows southwards to ↓ gradient.

b) (4 marks) *Answers may include, but are not limited to:*

- warm Leeuwin current
- carries tropical spp to southern latitudes
- where they mix with temperate spp
- and form unique marine communities

c) (5 marks) *Answers may include, but are not limited to:*

- strong El Nino = weak Leeuwin current
- as there is weaker geostrophic current
- less south equatorial water piled up on NW shelf/less push
- this is due to break in Walker circulation in Pacific Ocean
- which ↓ volume of warm water pushed eastwards

d) (4 marks) *Answers may include, but are not limited to:*

- strong El Nino = weak Leeuwin current
- weak Leeuwin current = poor recruitment levels for puerulus larvae
- as they rely on current to disperse/transport them to coastal inshore reef systems
- if there are less puerulus settling on inshore reefs then there is less recruitment occurring.

e) (6 marks) 2 strategies, 3 marks each.

Answers may include, but are not limited to:

- females with tar spots are returned to the water if caught
- tar spot = sperm packet that females use to fertilise eggs
- ↑ number of females with tar spots will ↑ reproductive rate/success
  
- females that are 'berried' are returned to the water if caught
- 'berried' females have fertilised eggs on their abdomen/tail and they are nurturing them for a small period of time
- ↑ number of females that are 'berried' will ↑ reproductive rate/success
  
- size limits of lobster that can be caught
- ↑ size = ↑ age of lobster and therefore likelihood of sexually mature
- ↑ number of lobsters reproducing will (↑ number of individuals added to population, thus) ↑ population size

**End of marking key** 😊

**Semester 1 Exam reflection**

My greatest strengths in content knowledge were...

Aspects of exam technique that I used really well include...

Content areas I still need to work on are...

Aspects of my exam technique I need to work on before my next exam are...

The style of question I handled really well include...

The style of question I still need to work on include...