Q11

Ans

1. Autosomal recessive 1 mark
2. Affected mother doesn't pass the trait to all her son (1 mark)
3. aa X AA hence zero . 1 mark
4. Aa and Aa 1 mark

Q12

Calculation and answer: 2 marks

$$\text{RF} = \frac{\#\ \text{recombinant offspring}}{\text{Total offspring}}$$

$$\text{RF} = \frac{13 + 17}{48 + 42 + 13 + 17}$$

$$= 0.25$$

Test cross (1 mark)

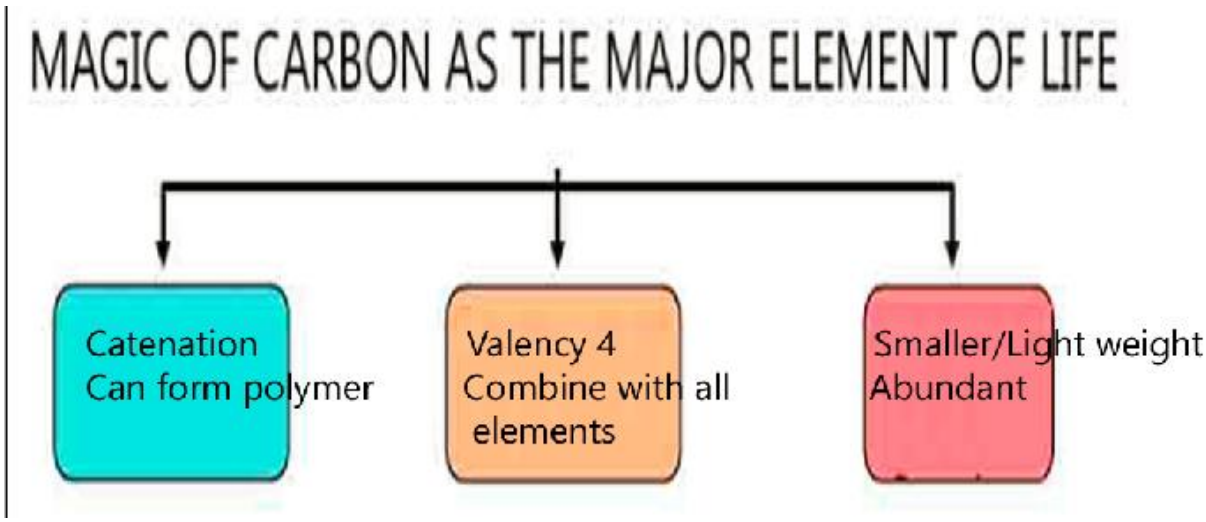
Q13

F2

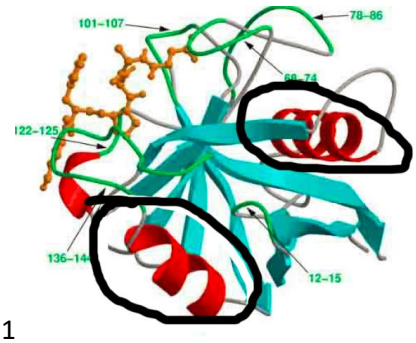
mendelian ratio, 9:3:3:1 followed in F2, hence factors are on different chromosome (1 mark)

	GA	Ga	gA	ga
GA	GGAA	GGAa	GgAA	GgAa
Ga	GGAa	GGaa	GgAa	Ggaa
gA	GGAA	GgAa	ggAA	ggAa
ga	GgAa	Ggaa	ggAa	ggaa

2 mark(No need to show phenotypic ratio)



15



1 Hydrogen bonding 1 mark

(Any one helix is fine)

2.U turn, hydrogen bonding 1 mark

3.Hydrogen bonding 1 mark, **(Do not consider the part "Can the protein no function")?**

16

Carbohydrate	Nature of bond	Remarkable engineering
Amylose	α1-4 glycosidic linkage	Only strait chain possible with alpha 1,4
Amylopectin	α1-4 glycosidic linkage α1-6 glycosidic linkage at branch point	alpha 1,6 enables branching
Cellulose	β-1,4 glycosidic bond	stabilized by hydrogen bonding both inter and inrachian makes mechanical structure

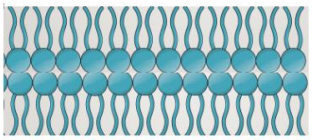
(Each column 1 mark)

17

1 Y involves hydrogen bonding, glycine is a neutral amino acid, hence hydrogen bonding not possible leading to weak or no enzyme reaction 1 mark

2 Both amino acids are negatively charged, however asp is slightly bigger. Hence enzyme will work with low efficiency (1 mark)

18

1 

1 mark

2.Earth is having hydrophilic atmosphere, hence not possible to survive 1 mark

19

A fly homozygous for red eyes and banded wings (RRHH) is crossed with a fly of type (RrHh). Recessive phenotypes are white eyes and bandless wings (2)

1. Predict the F1 genotype and phenotype 1 mark
2. Illustrate a Punnett square for the above cross 1 mark

	RH	
RH	RRHH	Red, Banded
Rh	RRHh	Red, Banded
rH	RrHH	Red Banded
rh	RrHh	Red Banded

(2 marks)