SAMPEL PERCUMA

Skema Jawapan Trial STPM Biologi Semester 3

Set penuh: Kertas Percubaan STPM

Semester 3 · 10 subjek (2024)

Sampel ini: 4 muka surat. Set penuh ada:

- 2 fail PDF
- Semester 1: kertas percubaan (trial) negeri, subjek yang dipilih + skema
- Blueprint 30 hari Semester 1 (setiap subjek)
- Semester 3: percubaan 2024, 10 subjek, banyak negeri, soalan + skema dalam satu fail

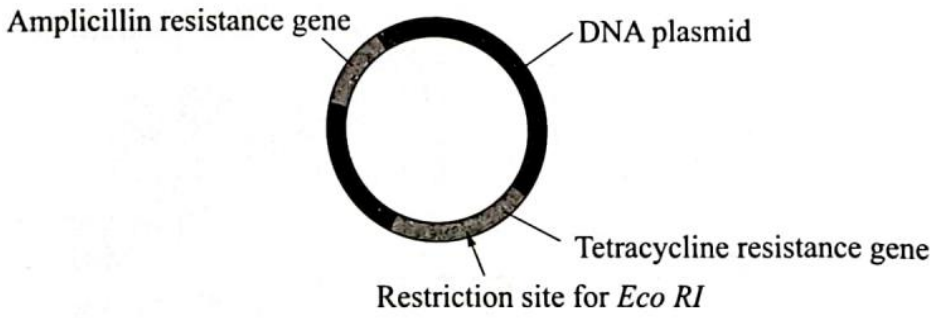
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Sampel bermula di muka surat sebelah

14. DNA plasmid is shown in the diagram below. One of the steps in the production of recombinant bacteria capable of producing human insulin is the insertion of the insulin gene into the plasmid. Screening was done by the culturing the bacteria in two agarose media, one containing ampicillin and another containing tetracycline.



Which result shows that human insulin gene has been taken in by the bacteria?

	Bacteria cultured in ampicillin	*Bacteria cultured in tetracycline*
A.	Colonie formed	No colonies formed
B.	No colonies formed	Colonies formed
C.	Colonies formed	Colonies formed
D.	No colonies formed	No colonies formed

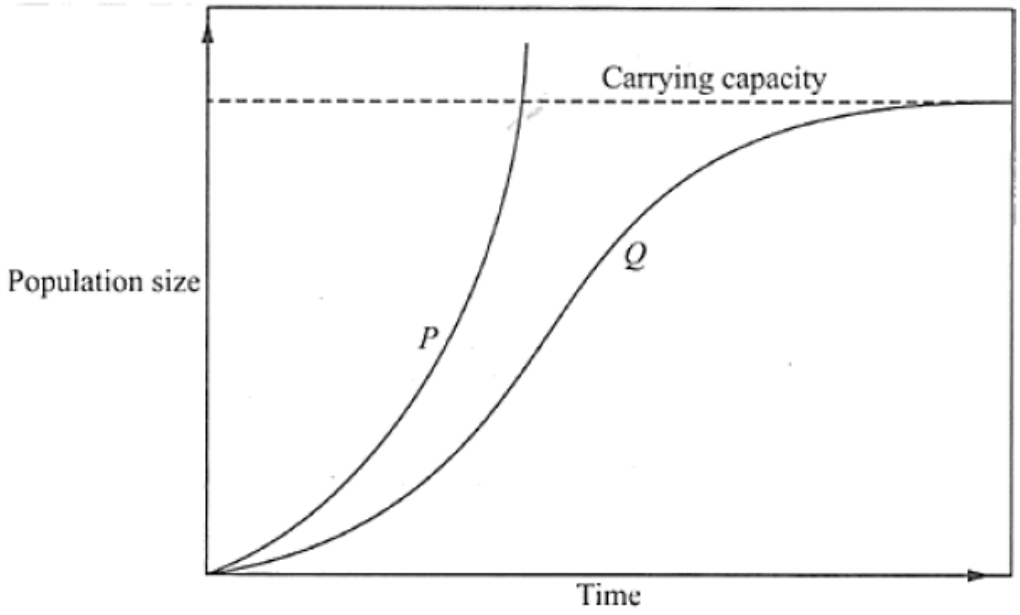
15. In order to perform DNA fingerprinting in a forensic investigation, which technique is used when the amount of DNA is very small?

A. DNA cloning
B. Gel electrophoresis
C. Polymerase chain reaction
D. Restriction fragment length polymorphism

Section B [15marks]

Answer all questions.
Write the answer in the answer sheet provided

16. The population growth curves P and Q, are shown in the graph below



(a) Name the type of curve for population P and Q?
[2 marks]

(b)(i) Define carrying capacity?
[1 mark]

(ii) Explain how overfishing can influence the carrying capacity of a habitat.
[2 mark]

(iii) State another factor that can give the same impact.
[1 mark]

(c) Explain what happens if a population exceeds carrying capacity?
[2 marks]

17. In sheep, the characteristics of normal fur is controlled by a dominant alelle R, while non uniform fur is controlled by a recessive allele, r. In a population of 1 000 sheep that mate randomly, it is found out that 250 sheep have non-uniform fur.

a) Calculate the frequency of recessive allele in the population. [1mark]

Section C

[30 marks]

Answer two questions only.

18. (a) State the importance of taxonomy in biology. [5 marks]

(b) Compare the characteristics of phylum Coniferophyta and phylum Angiospermophyta by referring to an example for each phylum. [10 marks]

19. (a) What is speciation? [2 marks]

(b) There are a few methods by which a new species is formed for example isolation, genetic drift, hybridisation and adaptive radiation. Explain two types of isolation. [13 marks]

20. (a) i. What is meant by *non- disjunction*? [2 marks]

ii. Explain the disease that may occur due to choromosomal disorder at chormosome 21. [5 marks]

(b) With reference to named examples, explain the large-scale production of food or drinks by the process of fermentation [8 marks]

Answer:

(a) Given that 250 of 1000 sheep have the genotype rr (recessive allele)
q^2 is the frequency of rr

Thus, $q^2 = \frac{250}{1\,000}$

$q = \sqrt{\frac{250}{1\,000}}$

$q = 0.5$

(b) Frequency of heterozygous Rr genotype = 2pq
$= 2 \times 0.5 \times 0.5$
$= 0.5$

(c) (i) Number of sheep with RR genotype = $p^2 \times 1000$
$= 0.25 \times 1000$
$= 250$

(ii) Number of sheep with heterozygous Rr genotype
$= 2pq \times 1000$
$= 0.5 \times 1000$
$= 500$

(d) Dominant allele in the new population

Genotype	RR	Rr	rr
Number of genotype	250	500	0
Number of allele, R	2 × 250	500	0
Number of allele, r	–	500	–
Total number allele	500	1 000	0

Frequency of dominant allele R = $\frac{500 + 500}{1\,500} = 0.67$

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Section C

18. (a) State the importance of taxonomy in biology. [5 marks]

P1	To classify and organize all living organism on earth based on their traits	1M
P2	To make it easier to understand organism	1M
P3	To identify organism that need conservation action	1M
P4	To carry out study and research on organism	1M
P5	For scientist to communicate the information on	1M

TAMAT SAMPEL

Suka sampel ini?

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