

SEAT No. _____
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SARDAR PATEL UNIVERSITY

B.Sc. EXAMINATION-SEM-5 (BOTANY)

US05CBOT22-GENETICS AND MOLECULAR BIOLOGY

Date: 26/11/2020

Time 2-00 to 4-00PM

Saturday

Total marks: 70

Q-1 Mcq

[10]

a) One gene one enzyme hypothesis was the outcome of study on:

- i) the maize
- ii) the fruit-fly
- iii) the fungus
- iv) None

b) Operon consist of three kinds of genes. This concept was proposed by:

- i) Morgan
- ii) Mendel
- iii) Khurana
- iv) Jacob and Monod.

c) One gene-one enzyme theory was given by:

- i) Morgan
- ii) Mendel
- iii) Khurana
- iv) Beadle and Tatum

d) Linkage groups in neem are:

- i) one

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ii) Fourteen

iii) twenty eight

iv) hundred

e) The linked characters would always inherit together till they are:

i) Delinked due to segregation

ii) masked by dominance

iii) mutated

iv) separated due to crossing over

f) Mendel didn't get any linkage in his experiments on pea because:

i) he didn't keep record

ii) no linkage in pea

iii) he couldn't detect linkage

iv) all seven characters he selected were present on different chromosomes.

g) In a sample, DNA is found to have the base composition of A=40, T=22, G=21 and C=17. It shows that:

i) DNA is circular complex

ii) DNA is linear duplex

iii) DNA is single stranded

iv) DNA has melting point

h) The scientist who developed cytochemical technique for identification DNA was:

i) Abbe

ii) McClintok

iii) Feulgen and Rossenbeck

iv) none

i) The diameter of Z-DNA is:

i) 18 Å

ii)20A

iii)22A

iv)34A

j) Which of the following subunits of RNA polymerase is solely required for initiation of transcription?

a) ω (omega)

b) β (beta)

c) σ (sigma)

d) α (alpha)

k) Which of the following codons is the mRNA start codon that initiates translation?

a) AUG

b) UAA

c) UGA

d) UAG

[08]

Q-2

i) Which N base only present in DNA _____?

ii) Which ratio is constant for DNA _____?

iii) Genetic code is a _____.

iv) The enzyme involved in amino acid activation is:_____

v) Who coined the term linkage_____.

vi) The phenomenon of linkage first observed in_____

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vii) Model plant organism _____

viii) Botanical name of yeast- _____

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Q-3 Answer in short: [Any ten]

i) What are the main differences between the life cycles of higher plants and animals?

ii) What are the advantages of *Neurospora* for genetic research?

iii) What is the contribution of Bateson?

iv) How many linkage groups present in human male and female.

v) Why Mendel didn't discover the principal of linkage?

vi) Define-complete linkage

vii) What is the macromolecular composition of bacteriophage.

viii) If ratio of the base is $(A+C)/(T+G)=1$, what is your interpretation?

ix) What is telomere .

x) What is genetic code and who discovered it.

xi) What is the central dogma of mol biology?

xii) list types of RNA.

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Q-4 Attempt any four

i) Write a note on post translation modification in proteins.

ii) Post transcriptional modification

iii) Genetic code

iv) Write a note on RNA polymerase

v) How cells protect their telomere?

vi) Write an essay on linkage.

vii) Why do modern geneticists consider *Arabidopsis thaliana* as a far suitable material for plant genetics?

viii) What is the contribution of Boveri, Theoder and Sutton in genetics.

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