SARDAR PATEL UNIVERSITY
S.Y.B.Sc EXAMINATION, IVth Semester
Tuesday, 3rd May 2016, 02.30a.m to 05.30p.m
Genetics: [Molecular Genetics & Biostatistics]

U504C GE402

NOTE- Figures in the right indicate full marks.   **Maximum Marks-70**

Q.1. Multiple Choice Questions (10 marks- One Mark for Each MCQ)   [10]

1. Which method of obtaining isolated colonies is commonly used for most applications?

a. Streak plate method   c. Pour plate method

b. Loop dilution method   d. Spread plate method

2. Thermal death time is

a. Time required to kill all cells.   c. Time and temperature needed to kill cells

b. Temperature that kills all cells.   d. All of the above

3. The enzyme that creates a short RNA oligonucleotide at initiation sites of replication is

a. Primase   b. DNA Ligase   c. DNA Gyrase   d. Exonuclease

4. Which of the following statements is true about DNA polymerase?

a. DNA polymerase can synthesize mRNA in the 3' to 5' direction

b. DNA polymerase can synthesize DNA in the 5' to 3' direction

c. DNA polymerase can synthesize mRNA in the 5' to 3'direction

d. DNA polymerase can synthesize DNA in the 3' to 5' direction

5. In bacterial promoters, which of the following describes the 'Pribnow box'?

a. The 5' untranslated region   b. The -10 box   c. The -35 box   d. The termination sequence

6. Total of gene frequency is

a. 1   b.100%   c. both a and b   d. none of above

7. HW law is applicable to

a. large population   b. random mating population   c. small population   d. All of above

8. The correlation coefficient lies between _____.

a. 0 to 1   b. $-\infty$ to ∞ c. -1 to 1   d. none of these

9. _____ is method of studying correlation.

a. negative correlation   b. positive correlation   c. scatter diagram   d. none of these

10. Chi square test is used for testing of independence of

a. means   b. standard deviation   c. proportion   d. attributes

Q.2. Short Question (any 06 question X 2 marks each)   [12M]

1. What is culture media? Describe its significance.

2. Discuss the contribution of **Robert Koch**.

3. Discuss the rolling circle mode of replication.

4. What is primer?

5. Describe processing of rRNA.

6. Give characteristics of Quanlitive traits

7. Give factors changing gene and genotype frequency

8. Explain the positive correlation with two examples.

9. Define Regression.

10. Discuss the application of t-Distribution.

(P.T.O.)

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Q.3.a. Discuss any one methods of isolating pure cultures. [4]

Q.3.b. Describe the Principles of staining of microorganisms. [4]

OR

Q.3.a.Discuss transformation experiment with neat diagram. [4]

Q.3.b.What is Bacterial growth curve? Discuss it with neat diagram. [4]

Q.4.a. Describe the initiation of prokaryotic replication. [4]

Q.4.b. Discuss the D-loop mode of replication. [4]

OR

Q.4.a.Discuss prokaryotic DNA polymerase with its function. [4]

Q.4.b.Describe the Semi-conservative mode of replication. [4]

Q.5.a. Discuss prokaryotic RNA polymerase with its function. [4]

Q.5.b. Describe the initiation of prokaryotic translation. [4]

OR

Q.5.a. Describe the processing of tRNA with neat diagram. [4]

Q.5.b. Describe the function of antisense RNA in gene silencing. [4]

Q.6.a. Give an account of factors affecting changes in allele & genotype frequencies. [08]

OR

Q.6.a.Give an account of Migration, Genetic Drift; Mutation affecting changes in allele and genotype frequencies. [08]

Q.7.a. Explain the scatter diagram method of studying correlation between two variables. [4]

Q.7.b.Find Pearson's correlation coefficient [4]

Wage	100	101	102	102	100	99	97	98	96	95
cost of living index	98	99	99	97	95	92	95	94	90	91

OR

Q.7.a. Write difference between correlation and regression. [4]

Q.7.b.Find the equations of regression lines from the following data and also estimate y for x=1 and x for y=4. [4]

X	3	2	-1	6	4	-2	5	7
y	5	13	12	-1	2	20	0	-3

Q.8.a. Write a formulae of chi-square statistic, discuss the applications and limitations of it. [4]

Q.8.b Write the applications of t-test and discuss degrees of freedom. [4]

OR

Q.8.a. Discuss the formula for Student's t-Distribution. [8]

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