Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.PHARM(NEW)/SEM-6/PT-610A/2011

2011

COMPUTER APPLICATION IN PHARMACEUTICAL TECHNOLOGY & CLINICAL PHARMACY

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives of the following : $10 \times 1 = 10$

i) The statistical software package of the following is

a) Adobe Photoshop b) SPSS

c) Auto CAD d) MS Word.

ii) Geometric mean of x_1 , x_2 , ... x_n is

a) nx b) $\frac{\Sigma x}{n}$

c) $\frac{\log x}{n}$ d) $\left(\prod_{i=1}^{n} x_i \right)^{1/n}$.

iii) The median value of the dataset (4, 2, 3, 5, 2, 6, 8, 6) is

a) 2 b) 4

c) 4.5 d) 5.

iv) The probability that a normal patient has a cholesterol value below 170 ($\mu = 205$, $\sigma = 35$) is

a) 0.0228 b) 0.1587

c) 0.5000 d) 0.8413.

v) An experiment is producing only two results : success and failure with probability p and q respectively. Which type of distribution it is expected to match ?

a) Normal distribution

b) Binomial distribution

c) Chi-square distribution

d) t-distribution.

vi) Calculate the z-statistic of the value 40 when the mean = 56 and standard deviation = 8.

a) – 16 b) 8

c) 2 d) – 2.

vii) The correlation coefficient, r obtained from the data available for two variables x and y is 1.000.

Then which one of the following inferences will be correct ?

a) Half of the points will be on the regression line

b) All the points will be on the regression line

c) None of the points will be on the regression line

d) Correlation coefficient, r can never have a value of 1.

viii) In Hammet equation σ is used as a descriptor of

a) electronic property of the molecule

b) steric effect of a molecule on the biological activity

c) lipophilicity of the molecule

d) hydrophobicity of the molecule.

ix) What is 'tuple' ?

a) Another name for a table in an RDMMS.

b) Another name for the key linking different tables in a database

c) A row or record in a databse table

d) An attribute attached to a record.

x) Which of the following is not a characteristic of an RDBMS ?

a) Data are organized in a series of two-dimensional tables each of which contains records for one entity.

b) It cannot use SQL

c) Tables are linked by common data known as keys

d) Queries are possible on individual or groups of tables.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Calculate the variance of the following data : 5

Range	*Frequency*
14.0 - 14.4	1
14.5 - 14.9	3
15.0 - 15.4	2
15.5 - 15.9	4
16.0 - 16.4	5
16.5 - 16.9	6
17.0 - 17.4	12
17.5 - 17.9	6
18.0 - 18.4	5
18.5 - 18.9	3
19.0 - 19.4	2
19.5 - 19.9	1

3. Ten standard solutions of a pure drug [c_1 , c_2 , ..., c_{10}] are prepared and the absorbance values [a_1 , a_2 , ..., a_{10}] are taken in a UV-Spectrophotometer. The absorbance values corresponding to the standard concentrations are plotted. Write the steps involved in determining the slope (B) and intercept (A) of the straight line [Conc = A × Abs + B] obtained by Linear Regression Analysis by using Microsoft Excel software. 5

4. Explain Generalization, Specialization and Aggregation. 5

5. For the given table write down the SQL commands stated below :

Table name : student

Regno	Name	Combination	Total_marks
1004	Abir Roy	PCB	280
1002	Suvendu Das	PCM	254
1009	Surajit Banerjee	PCM	290
1007	Bimal Manna	PCB	254

i) Find out the Regno and Name of the students who get more than 260 marks.

ii) Find out the total number of students who have the combination PCM. $2 \times 2\frac{1}{2}$

6. What are left, right and full outer join ? Explain with examples. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What do you mean by computer aided drug design ? Name two softwares, which are used for computer aided drug design. Discuss how Hansch Analysis is carried out to predict biological action of a drug. 5 + 2 + 8

8. Explain with example the domain constraint and referential integrity of a DBMS. How the database is normalized in an RDMBS ? 6 + 9

9. a) Explain the various types of 2D and 3D descriptors used in QSAR.

   b) Write a brief account on Principal Component Regression Analysis (PCRA) in QSAR. 10 + 5

10. a) Write details about the Internal and external validation procedures involved in QSAR analysis. 10

    b) Write a short account on Partial Least Square (PLS) analysis. 5

11. The percentage of lisinopril released from its tablet dosage form at different time intervals are given in the following table.

Time in minutes (x)	5	10	15	20	25	30
Percentage of lisinopril released (y)	10.5	21.2	32.8	45.0	58.2	63.3

i) Determine the linear regression equation of percentage of lisinopril released (y) on time in minutes (x) at least up to 4 decimals. $7\frac{1}{2}$

ii) Determine the correlation coefficient between time in minutes and percentage of lisinopril released at least up to 4 decimals. $7\frac{1}{2}$