Reg. No. ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Manipal College of Pharmaceutical Sciences
Manipal University, Manipal
First year B. Pharm- Annual Examinations-April 2010
Subject: MAT 101. Mathematics (credit system)

Date: 29-04-2010
Time: 10.00 am – 01.00 pm.   Max. Marks: 50

Answer All the questions. Use log tables If required.

I. Long Essays. 3×8 = 24 marks

1A. Obtain the equation of the circle passing through the center of
  $x^2 + y^2 - 2x - 4y - 20 = 0$ and having its center $(4, -2)$.   (3 marks)
1B. Find the coordinates of the circumcenter of the triangle whose vertices are
  $(1, 1), (2, -1)$ and $(3, 2)$.   (3 marks)
1C. Define and give an example of;
  a. Symmetric matrix   b. Transpose of a matrix   (2 marks)

2A. Solve by matrix method.
  $x - y - 2z = 3, \quad 2x + y + z = 5, \quad 4x - y - 2z = 11$ (3 marks)
2B. Find $\frac{dy}{dx}$ when $x = 1$ and $y = 2$ for the function $2x^2 - 3xy + 4y^2 = 1$.   (3 marks)
2C. Find the characteristic roots of A= $\begin{bmatrix} 2 & -1 \\ 0 & 1 \end{bmatrix}$ (2 marks)

3A. Form the differential equation from $\sin^{-1}x + \cos^{-1}y = c$, where 'c' is the
  parameter.   (3 marks)
3B. Prove that $\int_0^{\pi/2} \frac{sin^3 x}{sin^3 x + cos^3 x} \, dx = \frac{\pi}{4}$ (3 marks)
3C. Find the acute angle between the lines $x + 3y + 1 = 0$ and $2x - y + 4 = 0$. (2 marks)

II. Short Notes. 4×4 =16 marks

4. A= $(4, 7)$ B = $(5, 8)$ and C = $(4, 9)$ are the vertices of triangle ABC.
  Find the equation of
  a) the line through B and parallel to AC.   (1 mark)
  b) the line through A and perpendicular to BC.   (1 mark)
  c) the perpendicular bisector of line AB.   (1 mark)
  d) line BC   (1 mark)

[P.T.O]

5A. Find the order and degree of the differential equation.

$$\sqrt{1 + \left(\frac{dy}{dx}\right)^2} = 2 \ \frac{d^2y}{dx^2}$$ (1 mark)

5B. What will be the order of the differential equation formed after eliminating the arbitrary constants from $xy = ae^x + be^{-x} + x^2$. (1 mark)

5C. Evaluate: $\lim\limits_{n \to \infty} \left(\frac{1}{1-n^2} + \frac{2}{1-n^2} + \frac{3}{1-n^2} + \ldots\ldots\ldots + \frac{n}{1-n^2}\right)$ (2 marks)

6. Differentiate $e^{3x} \cos 5x + x^3 \log(\sin x)$ (4 marks)

7A. If $x = a\cos^4 t$ and $y = a\sin^4 t$, find $\frac{dy}{dx}$ (3 marks)

7B. Evaluate $\lim\limits_{t \to 0} \frac{Sin 5t}{Sin 9t}$ (1 mark)

III. Short Answers. 5×2 =10 marks

8. If $f(x) = \begin{cases} \frac{x^5 - 32}{x-2} & \text{when } x \neq 2 \\ k & \text{when } x = 2 \end{cases}$
is continuous at $x = 2$, find 'k'.

9. Evaluate $\int \frac{dx}{\sqrt{8-7x}}$

10. Solve the differential equation $\sqrt{1 - x^2} \ dy - dx = 0$

11. Find the equation of the circle, two of whose diameters are $x + y = 6$ and $x + 2y = 4$ and whose radius is 10 units.

12. If $A = \begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix}$ and $B = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$ and $AX = B$, then find 'X'.

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Answer __All__ the questions. Use log tables __IF__ required.

I. Long essays. (3×8 = 24 marks)

1. Form a correlation table for the following data;

CI	0	1	2	3	4
20 -30	-	-	1	2	3
30-40	-	4	6	5	7
40-50	1	2	4	3	5
50-60	1	2	6	8	7
60-70	3	5	7	3	2

2A. Find conditional distribution of Y on X (for the data given above in Q.No.1). (4 marks)

2B. Explain any two mathematical and one logical functions of MS-Excel with example.

                                                    (4 marks)

3. Write an essay on the features of any three MS-Office applications.

II. Short notes. (4×4 = 16 marks)

4. Illustrate with an example to find mode by column method.

5. Find the value of y when x = 2011 for the table given below;

X	1961	1971	1981	1991	2001
Y	34	45	23	14	10

6. Describe any two Windows OS applications.

7. Write the HTML code to get the following output;
     Manipal University: 1. MCOPS, 2. KMC, 3. MCODS, 4. MCONS

III. Short answers. (5×2 = 10 marks)

8. State the properties of regression coefficients.

9. State the formula for rank correlation with tie and without tie.

10. What are features of mail merge?

11. Mention various computer networks and explain briefly.

12. Write short note on generation of computers.

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MANIPAL UNIVERSITY

FIRST YEAR B. PHARM. DEGREE EXAMINATION – APRIL/MAY 2010

SUBJECT: ANATOMY AND PHYSIOLOGY (APH 102)
(CREDIT BASED SYSTEM)

Monday, May 03, 2010

Time: 10:00 – 13:00 Hrs.   Max. Marks: 50

✍ **Answer ALL the questions.**

✍ **Long Essay.**

1.   With necessary diagram explain the excitation contraction coupling of skeletal muscles.

(8 marks)

2.   Discuss the functions of kidney. Draw a diagram of nephron and label it. Describe any two mechanism of reabsorption of sodium in kidney tubules.

(2+4+2 = 8 marks)

3.   Discuss the formation, storage, release and regulation of release of thyroid hormones. Explain their functions.

(2+1+1+2+2 = 8 marks)

✍ **Short Essay.**

4.   Define hemostasis. Explain briefly about three stages of hemostasis.

(1+3 = 4 marks)

5.   Explain lymph formation and lymph flow. Discuss the functions of lymph.

(2+1+1 = 4 marks)

6.   Describe the types of movements in small intestine.

(4 marks)

7.   Discuss briefly about the neural and chemical regulation of respiration.

(4 marks)

✍ **Short Answer.**

8A. How the lactic acid is generated during the exercise? How it is removed from the muscles and body?

8B. Define ganglia and enteric plexus.

8C. Define Myopia. How it can be corrected?

8D. What are the functions of bone marrow?

8E. Name the specialized conduction systems in the heart.

(2×5 = 10 marks)

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MANIPAL UNIVERSITY

FIRST YEAR B. PHARM. DEGREE EXAMINATION – APRIL/MAY 2010

SUBJECT: BIOCHEMISTRY (BCM 103)
(CREDIT BASED SYSTEM)

Wednesday, May 05, 2010

Time: 10:00 – 13:00 Hrs.   Max. Marks: 50

✍ Answer **ALL** the questions.

1. **Long Essays.**

1A. Give the reactions of aerobic glycolysis and add a note on its energetics.

1B. Discuss glycine metabolism under the following headings:

   i)   Biosynthesis

   ii)   Catabolism

   iii)   Special compounds

   iv)   Disorders

1C. Discuss the process of translation. Add a note on post translational modifications.

(8×3 = 24 marks)

2. **Short Essays.**

2A. Write a note on "fatty liver".

2B. How uric acid is formed? Give the reactions.

2C. Explain competitive inhibition of enzyme and its medical importance.

2D. Write the components of electron transport chain in order, indicating the ATP producing sites and also name the inhibitors.

(4×4 = 16 marks)

3. **Short Answer.**

3A. Name any two-cell organelles and give their functions.

3B. What is 'Van den Bergh' test? Give its importance.

3C. Give one reaction each for the coenzymes of thiamin and pyridoxine.

3D. What are "High energy compounds"? Give two examples.

3E. Explain the role of carnitine transport system.

(2×5 = 10 marks)

MANIPAL UNIVERSITY

FIRST YEAR B. PHARM. DEGREE EXAMINATION – APRIL/MAY 2010

SUBJECT: PHARMACEUTICAL INORGANIC CHEMISTRY (PCH 104)
(CREDIT BASED SYSTEM)

Friday, May 07, 2010

Time: 10:00 – 13:00 Hrs.   Max. Marks: 50

✎ **Answer ALL the questions.**

✎ **Long Essays.**

1A. Explain, how chemical and physical instability results in the formation of impurity in pharmaceutical substances.
1B. With the help of chemical equation, explain sulphate limit test.
1C. Explain with justification, the modification required in case of sulphate limit test for alkaline substances.

$(4+1+3 = 8 \text{ marks})$

2A. What is the physiological role of Zinc? Write the method of preparation and assay of Zinc chloride.
2B. What are polishing agents? Write the method of preparation of Tribasic calcium phosphate.

$(1+3+4 = 8 \text{ marks})$

3A. What are emetics? How do they act? Write the method of preparation of Copper Sulphate.
3B. What are radio-isotopes? Mention the properties of different radioactive rays.

$(4+4 = 8 \text{ marks})$

✎ **Short Essays.**

4A. How do you prepare the following pharmaceuticals?
   i)   Sodium sulphate
   ii) Activated charcoal
4B. What are antacids? Give examples. Explain acid neutralizing capacity test for antacids.
4C. Describe the contents of monograph.
4D. How is Boric acid prepared and assayed?

$(4 \times 4 = 16 \text{ marks})$

✎ **Short Answers.**

5A. What do you mean by oral re-hydration therapy? Explain.
5B. How do you prepare Potassium citrate?
5C. What is the mechanism of action of inorganic antimicrobials and astringent agents?
5D. Give the method of preparation of Oxygen and mention its storage conditions.
5E. List out any two factors influencing the design of limit tests.

$(2 \times 5 = 10 \text{ marks})$

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MANIPAL UNIVERSITY

FIRST YEAR B. PHARM. DEGREE EXAMINATION – APRIL/MAY 2010

SUBJECT: PHARMACEUTICAL ORGANIC CHEMISTRY (PCH 105)
(CREDIT BASED SYSTEM)

Monday, May 10, 2010

Time: 10:00 – 13:00 Hrs.   Max. Marks: 50

✍ **Answer ALL the questions.**

✍ **Long Essays.**

1A.   Explain the Bimolecular displacement mechanism for Nucleophilic Aromatic Substitution.

1B.   What are Carbenes? How are they generated?

1C.   What are the characteristic IR absorption frequencies of the following functional groups:

    i)   -OH

    ii)   -COOH

(4+2+2 = 8 marks)

2A.   Explain Reformatsky reaction with mechanism and synthetic applications.

2B.   Give the orbital picture of allyl radical and explain its stability.

(5+3 = 8 marks)

3A.   Explain the mechanism and reactivity in S_N2 reaction with suitable example.

3B.   Explain Markownikoff's and anti-markownikoff's addition with example.

(4+4 = 8 marks)

✍ **Short Essays.**

4A.   Write brief notes on Hyperconjugation and Inductive effect.

4B.   Explain the various methods used for the separation of a racemic mixture.

4C.   Explain four chemical reactions of amines with equations.

4D.   Explain the method of preparation and assay of citric acid.

(4×4 = 16 marks)

✍ **Short Answers.**

5A.   Explain the mechanism of nitration in Electrophilic aromatic substitution.

5B.   Discuss about the orientation in E1 reaction.

5C.   Give the structure and medicinal uses of Methyl paraben.

5D.   Write the effect of solvent in S_N1 and S_N2 reaction.

5E.   Explain how Benzaldehyde is converted to Cinnamaldehyde.

(2×5 = 10 marks)

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MANIPAL UNIVERSITY

FIRST YEAR B. PHARM. DEGREE EXAMINATION – APRIL/MAY 2010

SUBJECT: COMPUTER SCIENCE AND STATISTICS (PCE 106)
(CREDIT BASED SYSTEM)

Friday, April 30, 2010

Time: 10:00 – 13:00 Hrs.   Max. Marks: 50

✍   **Answer ALL the questions.**

✍   **Long Essays.**

1.   Explain about "partitional values" in detail.

(8 marks)

2A.   Derive regression co-efficients.

2B.   How internet works? Write a note on WWW.

(4+4 = 8 marks)

3A.   Write notes on the following:

i)   Cell referencing in MS-Excel.

ii)   Two statistical functions with examples used in MS-Excel.

3B.   Discuss the components of CPU and various input devices of a modren computer.

(4+4 = 8 marks)

✍   **Short Notes.**

4A.   The expenditure of 100 families are given below:

Expenditure :	0-10	10-20	20-30	30-40	40-50
No. of families:	14	f_1	27	f_2	15

$N = 100$, $M_0 = 24$ ($M_0 \rightarrow$ mode)

Find the missing frequency.

4B.   Explain briefly about the relation between σ^2 and $s^2 \rightarrow$ square deviation

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4C.   Discuss two special features of MS-Windows.

4D. Write shortcut key commands for the following in MS-Word:

    i)   Inserting page break

    ii)   Change case

    iii)   Paragraph justification

    iv)   Undo

<div align="right">(4×4 = 16 marks)</div>

✍ Short Answers.

5A. In a bivariate data, if bxy = -7.3 and byx = -0.11. Find rxy = ?

5B. Define M.D (Mean Deviation).

5C. What are the slide transition effects in MS-PowerPoint?

5D. Mention the advantages of electronic mail.

5E. Expand the following:

    i)   ASCII

    ii)   BITS

    iii)   HTTP

    iv)   OS

<div align="right">(2×5 = 10 marks)</div>