ENG-1101
Model Question Paper
English
Common to all Branches of **I/IV B. Tech** (BIOTECH)
(Effective from 2015-2016 Admitted Batch)
Semester-1

Time: 3 hours   **Max marks: 70**

Answer Question No.**1** compulsorily and
any **Four** questions from remaining.
All questions carry equal marks.
All parts of a question must be answered at one place only.

1. a) Write an Essay on "Commercialization of Education".   8M

    b) Correct the following sentences.   4M
        i.   She likes dogs, but she don't like cats.
        ii. I has not seen them yet.
        iii. One of my friends are going to Mumbai.
        iv. I have seen him yesterday.

    c) Use the appropriate articles in the given blanks (a, an, the, no article)   2M
        i.   I bought ....pair of shoes.
        ii. I saw.................movie last night.
        iii. Did you get married after leaving **...........**university?
        iv. I was at..............train station when you called me.

2. a) Write a feasibility report for setting up a Water / Power Unit at your campus.   8M

    b) Pick any <u>Four</u> of the following and explain them in one word and write sentences of your
       own using each word.   4M
        i.   Language which is confusing and unintelligible.
        ii. One who prepares plans for buildings.
        iii. A great lover of books
        iv. A person in charge of a museum
        v.   A man who thinks only for himself
        vi. One who kills animals and sells their flesh

    c) Write the appropriate quantifiers for each sentence.   2M
       (Some, few, much, lesser,)
        i.   There were .... at the college last year
        ii. The project is .... complicated that the last one
        iii. I have to buy ....pairs of blue and black jeans soon.
        iv. How ....cash do you need to purchase this CD player

3. a) Write a letter to a renowned person, requesting him to be the Chief Guest for the cultural
       festival of your college.   8M

b) Identify the types of the following sentences and write a similar sentence for each type.4M

     i. Oh, what a beautiful morning!
     ii. Eat your supper.
     iii. Today is my birthday.
     iv. What gifts did you receive for your birthday?

c) Re-write the sentences by using Gerunds and infinitives forms.   2M

     i. She is good at.................. (dance)
     ii. He is crazy about.................. (sing)
     iii. He'd like............... (fly) an aeroplane.
     iv. I enjoy............. (write) picture postcards.

4. a) Draft an E-Mail to your friend about your career plans.   8M

b) Punctuate the following sentences taken from the text correctly.   4M

     i. Sunil Sharma is Documentation Development Manager at Cerner Corporation one of the world's largest medical software developers

     ii. As part of his job Sunil writes web-based content for Cerner

     iii. One type of website that Cerner develops is marketed to health facilities for use by doctors nurses hospital administrators and patients

     iv. This explains the communication challenge that Sunil faces. Cerner's end user is diverse consisting of lay readers and high-tech specialists

c) Pick the right synonyms of the following words.   2M

i. Euphoria	ii. Vicious	iii. Remnant	iv. Acclaim
a) Sober	a)cruel	a)horror	a) praise
b) High spirits	b)kind	b)whole sale	b) blame
c) Mean	c)splendid	c)left over	c)honour
d) Feeble	d)dearest	d)energize	d)criticism

5. a) Develop a paragraph based on the following hints. The hints are from the text in about 150words.   8M

As the 11th President of India---- the Indian National Congress-------'people's president', he was--------. His contribution ---------Bharat Ratna. During ---------in India. He is the ------India: 2020 and Ignited Minds.

b) Fill in the blanks with appropriate idioms from the box.   4M
   (The cream of the crop, an arm and a leg, Eager beaver, shape up)

   i.   Frank always tries to finish his work before everyone else. He is an_____.
   ii. We chose the prettiest, best behaved puppy. She was certainly _____.
   iii. If Madge doesn't_____, she could lose her job.
   iv. Our new office was very expensive. It cost_____.

c) Pick the right antonyms of the following words.   2M

   i. Awake   ii. Create   iii. Emerge   iv. Warm

   a)alive   a) build   a) abandon   a) cold
   b) stir   b) beak   b) appear   b) pleasant
   c) asleep   c) deny   c) fall   c) unkind
   d) truce   d) refuse   d) hide   d)indifferent

6. a) Draft a pamphlet on any Electronic home appliances/Places of tourists' interest/an
       Educational institution.   8M

    b) Fill in the blanks using the appropriate forms of verbs given in the brackets.   4M

       i.   The wind ____ furiously. (Blow)
       ii. He ____ to his mother every week. (Write)
       iii. In a fit of rage, she ____ up the letter. (Tear)
       iv. We couldn't have _____ a better day for organizing the party. (Choose)

    c) Fill in the blanks with appropriate prepositions from the box.   2M
       (in ,at, the, at, on,)
       i.   They are staying at ____hotel
       ii. That is ____ girl I told you about
       iii. My birthday is____ May
       iv. We are going to see my parents ____the weekend

7. a) Present an argument in about 150 words on 'Women are not suitable to work in the
        industry.' Substantiate your argument with reasons.   8M

    b) Read the following paragraph and answer the questions :   4M

        The study of history provides many benefits. First, we learn from the past. We
    may repeat mistakes, but, at least, we have the opportunity to avoid them. Second,
    history teaches us what questions to ask about the present. Contrary to some people's
    view, the study of history is not the memorization of names, dates, and places. It is
    the thoughtful examination of the forces that have shaped the courses of human life.

We can examine events from the past and then draw inferences about current events. History teaches us about likely outcomes.

Another benefit of the study of history is the broad range of human experience which is covered. War and peace are certainly covered as are national and international affairs. However, matters of culture (art, literature, and music) are also included in historical study. Human nature is an important part of history: emotions like passion, greed, and insecurity have influenced the shaping of world affairs. Anyone who thinks that the study of history is boring has not really studied history.

i.   What is the main idea of this passage?
ii. In the first paragraph, inferences mean?
iii. Which method of teaching history would the author of this passage support?
iv. In the second paragraph, shaping of world affairs Means.

c) Fill the blanks by using appropriate conjunctions (because, neither-nor, and, and)   2M

i.   Receptionists must be able to relay information _____ pass messages accurately.
ii. Mary is a member of the Historical Society _____ the Literary Society.
iii. Susie _____ phoned _____ wrote after she left home.
iv. The committee rejected the proposal _____ they did not think it was practical.

ENG-1102
Model Question Paper
MATHEMATICS-I
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
&
I/VI B. TECH+M.TECH (SIX YEAR DOUBLE DEGREE COURSE)
(Effective from 2015-2016 Admitted Batch)
Semester-1

Time: 3 hours   Max marks: 70

First question is compulsory. And answer any Four out of the remaining seven questions. All questions carry equal marks. All parts of a question must be answered at one place only; otherwise they will not be valued.

PART – I

1. (a) Find the value of $\dfrac{du}{dt}$ from given $u = y^2 - 4x$, $x = 2t^2$, y=4t.

(b) If $u = \sin^{-1}\dfrac{x}{y} + tan^{-1}\dfrac{y}{x}$, then prove that $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = 0$.

(c) Write the necessary conditions for f(x, y) to have a maximum or minimum at (a, b).

(d) Formulate a differential equation from the relation $y = A\cos x + B\sin x$.

(e) Find the particular integral of the differential equation $\dfrac{d^2 y}{dx^2} + \dfrac{dy}{dx} + y = \left(1 - e^x\right)^2$.

(f) Test the convergence of the series $\sum \left(\dfrac{n}{n+1}\right)^n$.

(g) Define the absolute and conditional convergence of a series. Give simple examples.

PART – II

2. (a) If $x^x y^y z^z =$ c, show that $\dfrac{\partial^2 z}{\partial x \partial y} = -\left(x \log ex\right)^{-1}$.

(b)   If
$u = \dfrac{x+y}{1-xy}$ and v $= tan^{-1} x + tan^{-1} y$, then find $\dfrac{\partial(u, v)}{\partial(x, y)}$. Are u and v functionally related.

If so, find this relationship.

3. (a) Expand $e^x \sin y$ at $\left(-1, \frac{\pi}{4}\right)$ as far as the terms of third degree.

(b) Using the method of differentiation under the integral sign, prove that $\int_0^\infty e^{-x} \frac{\sin ax}{x} dx = \tan^{-1}(a)$.

4. (a) Solve $\sec^2 x \tan y \, dx + \sec^2 y \tan x \, dy = 0$.

(b) Solve $x \, dy - y \, dx + a\left(x^2 + y^2\right) dx = 0$ by reducing into exact form.

5. (a) Find the orthogonal trajectories of the family of coaxial circles given by

$x^2 + y^2 + 2\lambda x + c = 2$, λ being the parameter.

(b) The number N of bacteria in a culture grew at a rate proportional to N. The value of N was

initially 100 and increased to 332 in one hour. What would be the value of N after $1\frac{1}{2}$ hours?.

6. (a) Solve $\frac{d^2 y}{dx^2} - 2\frac{dy}{dx} + 10y = 0$, when y = 4 and $\frac{dy}{dx} = 1$ at x = 0.

(b) Solve $\left(D^2 - 4D + 3\right)y = \sin 3x \cos 2x$.

7. (a) Solve $\frac{d^2 y}{dx^2} + y = \tan x$ by applying the method of variation of parameters.

(b) Solve $x^3 \frac{d^3 y}{dx^3} + 2x^2 \frac{d^2 y}{dx^2} + 2y = 10\left(x + \frac{1}{x}\right)$.

8. (a) Test for convergence of the series $\frac{1}{2\sqrt{1}} + \frac{x^2}{3\sqrt{2}} + \frac{x^4}{4\sqrt{3}} + \frac{x^6}{5\sqrt{4}} \ldots \infty$.

(a) For what values of 'x' is the series $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5} \ldots \ldots \infty$ convergent?

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Model Question Paper
MATHEMATICS-II
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
&
I/VI B. TECH+M.TECH (SIX YEAR DOUBLE DEGREE COURSE)
(Effective from 2015-2016 Admitted Batch)
Semester-1

Time: 3 hours   Max marks: 70

Part A is compulsory.
Answer any FOUR questions from Part B.
Each question will carry 14 marks.

PART A

1. a) Find the value of λ for which the system of equations $2x + y + 2z = 0$, $x + y + 3z = 0$, $4x + 3y + \lambda z = 0$ have a non-zero solution.

    b) Define Hermitian matrix and give an example.

    c) Write any two properties of Laplace transforms

    d) Find the Laplace transform of unit step function

    e) Find $L^{-1}\left(\dfrac{s^2 - 3s + 4}{s^3} \right)$.

    f) Write the expressions for $J_{\frac{1}{2}}(x)$ and $J_{-\frac{1}{2}}(x)$.

    g) Express $x^2 - 2x + 5$ in terms of Legendre polynomials.

PART B

2. a) Find the rank of the matrix $A = \begin{bmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{bmatrix}$ by reducing into normal form.

    b) Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$.

3. a) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and use it to evaluate the

matrix equation $A^6 - 6A^5 + 9A^4 - 2A^3 - 12A^2 + 23A - 9I$.

b) If $A = \begin{bmatrix} 0 & 1+2i \\ -1+2i & 0 \end{bmatrix}$ then show that $(I - A)(I + A)^{-1}$ is a unitary matrix.

4. a) Reduce the quadratic form $2xy + 2xz - 2yz$ to canonical form by an orthogonal transformation and discuss its nature.

b) Solve: $x + 2y + 3z = 14$, $2x + 3y + 4z = 20$, $3x + 4y + z = 14$ by Gauss elimination method.

5. a) Find i) $L\{\dfrac{\cos at - \cos bt}{t}\}$ ii) $L\{\int_0^t e^{-t} \cos t \, dt\}$.

b) Find the Laplace transform of the triangular wave function of period $2a$ given by

$f(t) = t, \ 0 < t < a$

$= 2a - t, \ a < t < 2a$.

6. a) Evaluate: i) $L^{-1}\{\log\left(\dfrac{s+1}{s-1}\right)\}$ ii) $L^{-1}\{\dfrac{3s}{s^2 + 2s + -8}\}$.

b) State Convolution theorem and use it to evaluate $L^{-1}\{\dfrac{1}{(s-2)(s+2)^2}\}$.

7. a) Using Laplace transformation method, solve: $y'' + 2y' - 3y = \sin t, \ y = y' = 0$ at $t=0$.

b) Prove that $J_n'(x) = \dfrac{1}{2}[J_{n-1}(x) - J_{n+1}(x)]$.

8. a) Prove that $\displaystyle\int_{-1}^{1} P_n^2(x)\,dx = \dfrac{2}{2n+1}$.

b) Prove that $P_n(x) = \dfrac{1}{\angle n \ 2^n} \dfrac{d^n}{dx^n}(x^2 - 1)^n$.

ENG-1104
Model Question Paper
Chemistry
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
(Effective from 2015-2016 Admitted Batch)
Semester-1

Time: 3 hours   Max marks: 70

Question No.1 is compulsory.
Answer any FOUR from the remaining.
All questions carry equal marks.

1. Explain the following terms in short:
   (a) Pitting corrosion
   (b) EMF of a cell
   (c) Paints
   (d) Polymer
   (e) Break-point chlorination
   (f) Semiconductors.

2. (a) Explain boiler troubles and write methods to remove.

   (b) How do you determine hardness of water by complexation method.

3. (a) Discuss the band theory of solids.

   (b) Write short note on zone refining.

4. (a) What are the different types of polymerisation?

   (b) Write the preparation and properties of Nylon-6,6 and Bakelite.

5. (a) Write the different types of corrosion.

   (b) Discuss the various methods of corrosion control.

6. (a) Discuss the manufacture of cement.

   (b) What is meant by hardening and setting properties of cement.

7. (a) Discuss the fractionation of crude oil.

   (b) Explain cetane-number and octane-number.

8. (a) What are lubricants? Discuss any four properties of lubricants.

   (b) Write short note on types of propellants and their applications.

ENG-1106
Model Question Paper
COMPUTER PROGRAMMING AND NUMERICAL METHODS
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
(Effective from 2015-2016 Admitted Batch)
Semester-1

Time : 3 Hours   Maximum : 70 Marks

Answer any FIVE questions
First question is compulsory
Answer any FOUR from the remaining questions.
All questions carry equal marks

1. a) Write the precedence rules for arithmetic operators and give example.
    b) What is keyword? Write any five keywords and explain them.
    c) What are the advantages of functions?
    d) Distinguish between local and global variables.
    e) What is meant by structure within structure? Explain briefly.
    f) Explain Bisection method.
2. a) Write the general forms of if-else and switch-case statements and compare them.
    b) Write a program to compute roots of quadratic equation using switch-case statement.
3. a) What are loops? Explain various loop statements with suitable example.
    b) Write a C program to find the sum of digits in a given number.
4. a) Explain the following concepts associated with functions :
    i)   Function declaration.
    ii)   Function definition and
    iii)   Function call.
5. a) What is a Pointer? How is it initialized? What is the function of a pointer variable? What are its uses?
    b) Explain the concept of pointers to structures with suitable example.
6. a) Explain the following
    i)   Structure
    ii)   Accessing elements in structure
    iii)   Arrays of structures
    b) Write a program to process employee records by using structures.
7. a) Briefly explain file handling functions.
    b) Write a C program to copy the contents of one file to another file.
8. a) Find the root of the following equation using Newton-Raphson method, correct the result upto 3 decimal places.
    $$x^3 - 3x5 = 0$$
    b) Evaluate
    $$\int_{-2}^{2} x \sin(x)\, dx \text{ using Simpson's rule.}$$

ENG-1108
Model Question Paper
History of Science and Technology
Common to all Branches of **I/IV B. Tech** (BIOTECH)
(Effective from 2015-2016 Admitted Batch)

<u>**Time: Three Hours**</u>   <u>**Maximum Marks: 70**</u>

Answer Question No.**1** compulsorily and
any **Four** questions from remaining.
All questions carry equal marks.
All parts of a question must be answered at one place only.

1. **Write short answers for the following.**
   a) Explain the terms Science and Technology.
   b) Describe the role of Scientist in the society.
   c) Science and Technology Policy resolutions.
   d) Defense Spin-offs.
   e) Biosensors.
   f) Barriers of Technological change.
   g) Types of Technology transfer.

2. Describe the roots of science and technology in ancient period in India.

3. Explain the salient features of new technology fund and programs aimed at technological self reliance.

4. Describe the achievements of Council of Scientific and Industrial Research.

5. Explain the salient features of Space program and INSAT services.

6. Explain the importance of Nuclear energy and describe the nuclear explosion and India's safety measures.

7. Describe the importance of Ocean development and explain the marine research and capacity building.

8. What is Appropriate technology? Explain the criteria for selection of an appropriate technology.

ENG-1201
MODEL PAPER
I/IV B.Tech(BIOTECH) Second semester Degree Examination
MATHEMATICS-III
(Common for All Branches)
(Effective from the admitted batch of 2015-2016)

Time: 3 Hrs   Max. Marks: 70

Answer all questions in Part A and Four questions from Part B
All questions carry equal marks
Questions of Part A must be answered at one place

Part A

1. (a) Find the angle between the line $\dfrac{x+1}{2}=\dfrac{y}{3}=\dfrac{z-3}{6}$ and the plane $3x+y+z=7$.

(b) Define right circular cylinder.

(c) Change the integral $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}dxdy$ into polar coordinates.

(d) Express $\int_0^{\frac{\pi}{2}} \sqrt{\tan\theta}\,d\theta$ in terms of gamma function.

(e) Evaluate $\int_0^1 \int_0^{1-y} xy\,dxdy$ using Dirichlets integral.

(f) Is the function $f(x)=\begin{cases} -1+x, & -1<x\le 0, \\ -1-x, & 0\le x<1 \end{cases}$ odd or even ? Justify.

(g) State the Dirichlet's conditions for the expansion of a function as Fourier series.

Part B

2. (a) Find the image of the point (2, -1, 3) in the plane 3x - 2y – z – 9 = 0.

(b) Find the magnitude and the equations of the shortest distance between the lines
$\dfrac{x-1}{2}=\dfrac{y-2}{3}=\dfrac{z+3}{4}$ and $\dfrac{x-2}{3}=\dfrac{y-4}{4}=\dfrac{z-5}{5}$

3. (a) Find the equation of the sphere having its centre on the plane $4x-5y-z=3$ and

passing through the circle $x^2+y^2+z^2-2x-3y+4z+8=0,\ x-2y+z=8$.

(b) Find the equation of the right circular cone generated by rotating the line $\dfrac{x}{1}=\dfrac{y}{2}=\dfrac{z}{3}$

about the line $\dfrac{x}{-1} = \dfrac{y}{1} = \dfrac{z}{2}$.

4. (a) Evaluate the integral by changing the order of integration $\int_0^3 \int_1^{\sqrt{4-y}} (x+y)\,dxdy$.

   (b) Find by double integration the area of the lemniscate $r^2 = a^2 \cos 2\theta$.

5. (a) Evaluate the integral $\int_1^e \int_1^{\log y} \int_1^{e^x} \log z\, dzdxdy$.

   (b) Find the volume common to the cylinders $x^2 + y^2 = a^2$ and $x^2 + z^2 = a^2$.

6. (a) Find the centroid of the area enclosed by the parabola $y^2 = 4ax$, the x-axis and its latus rectum.

   (b) Prove that $\int_0^1 \dfrac{xdx}{\sqrt{1-x^2}} = \dfrac{1}{5}\beta\left(\dfrac{2}{5},\dfrac{1}{2}\right)$.

7. (a) Find the Fourier Series of $f(x) = \begin{cases} \pi x, & 0 \le x \le 1 \\ \pi(2-x), & 1 \le x \le 2 \end{cases}$, $f(x+2) = f(x)$ for all x.

   (b) Expand $f(x) = \begin{cases} 0, & 0 \le x \le \pi \\ \sin x, & \pi \le x \le 2\pi \end{cases}$ as Fourier Series.

8. (a) Find the half range cosine series for $f(x) = x$ in $0 < x < 2$.

   (b) Expand $f(x) = \begin{cases} \dfrac{-(\pi+x)}{2} & \text{for } -\pi \le x < 0 \\ \dfrac{(\pi-x)}{2} & \text{for } \quad 0 \le x < \pi \end{cases}$ as a Fourier series and hence deduce that

   $\dfrac{1}{1^2} + \dfrac{1}{2^2} + \dfrac{1}{3^2} + \ldots\ldots\ldots = \dfrac{\pi^2}{6}$.

ENG-1202
MODEL PAPER
I/IV B.Tech(BIOTECH) Second semester Degree Examination
PHYSICS
(Common for All Branches)
(Effective from the admitted batch of 2015-2016)

Time: 3 Hrs   Max. Marks: 70

Answer FIVE questions.
The First question is compulsory.
Answer any FOUR out of the remaining Seven.

1. (a) State and Explain first law of thermodynamics. (4)
   (b) What is electric flux explain. (3)
   (c) Explain double refraction (4)
   (d) Explain the basic principle of optical fibre.(3)

2. (a) Explain the working of Carnot's heat engine. Obtain an expression for its efficiency. (10)
   (b) Explain the concept of entropy? (4)

3. (a) State and prove Gauss theorem in electrostatics. (7)
   (b) Explain what is Hall effect and its importance. (7)

4. (a) State and explain Ampere's law. (4)
   (b) Discuss the growth and decay of current in L-R circuit.(10)

5. (a) Obtain the conditions for the interference of light reflected by a thin parallel film. (7)
   (b) Discuss the qualitative description of diffraction of light at single slit. (7)

6. (a) Explain what is population inversion and pumping in lasers? (4)
   (b) With neat diagrams, describe the principle, construction and working of Ruby laser. Discuss the applications of lasers.(10)

7. (a) What is Piezoelectric effect? Explain how Ultrasonics can be generated by piezoelectric phenomena. (8)
   (b) State and explain Heisenberg's uncertainty principle. (6)

8. (a) Derive Schrödinger time independent wave equation. (8)
   (b) What are nano materials? Give some applications of nano materials. (6)

Model Question Paper
ENGINEERING GRAPHICS
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
&
I/VI B. TECH+M.TECH (SIX YEAR DOUBLE DEGREE COURSE)
(Effective from 2015-2016 Admitted Batch)

Time: 3 hrs   **Marks: 70**

Part A is compulsory. Answer any Four questions from Part B.
Part A is to be answered on the main answer book and Part B on the drawing sheet.
All questions carry equal marks.
Assume the missing data if any, suitably.

PART-A

1. Write the following in brief:
   (a). What is representative fraction?
   (b). Define the term horizontal trace.
   (c). What is meant by oblique plane?
   (d). What are the different types of solids?
   (e). Define the term section plane.
   (f). State the methods of development.
   (g). Define isometric scale.

PART-B

2. Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is $\frac{2}{3}$.

3. A line AB, 75 mm long, is inclined at 45° to the H.P. and 30° to the V.P. Its end B is in the H.P. and 40 mm in front of the V.P. Draw its projections.

4. Draw the projections of a regular pentagon of 40 mm side, having its surface inclined at 30° to the H.P. and a side parallel to the H.P. and inclined at an angle of 60° to the V.P.

5. Draw the projections of a cone, base 45 mm diameter and axis 50 mm long, when it is resting on the ground on a point on its base circle with the axis making an angle of 30° with the H.P. and its top view making 45° with the V.P.

6. A hexagonal prism, has a face on the ground and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T. of which makes an angle of 45° with xy and which cuts the axis at a point 20 mm from one of its ends. Draw its sectional front view and the true shape of the section. Take side of the base 25 mm long and height 65 mm.

7. Draw the development of the lateral surface of the part P of the cylinder in Fig.1.

8. Draw the isometric view of the below Fig.2.
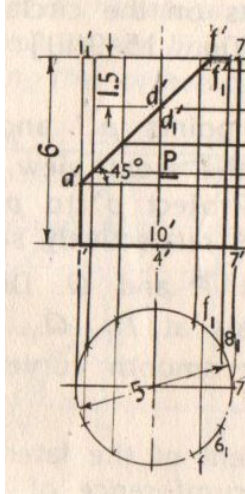
Fig.1.
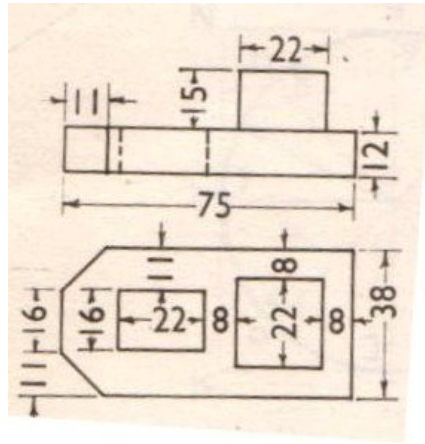
Fig.2

ENG-1206
Model Question Paper
PROFESSIONAL ETHICS AND HUMAN VALUES
Common to all Branches of I/IV B. Tech (BIOTECH)
Second Semester
(Effective from 2015-2016 Admitted Batch)

Time : Three hours   Maximum : 70 marks

Question No.1 is compulsory.
Answer any FOUR from the remaining
All questions carry equal marks.
1. Write short answers for the following:
   (a) Ethical Vision
   (b) Profession and Professionalism
   (c) Environmental Ethics
   (d) Bhopal Gas Tragedy
   (e) Gender discrimination
   (f) Cyber Crimes
   (g) Engineers as Managers

2. Discuss the scope and aim of Engineering Ethics.

3. Explain the role of Engineers in promoting ethical climate.

4. What are Values? Explain in detail the classification of human values.

5. Elucidate the moral responsibility of engineers towards safety and risk.

6. Define the concept of globalization and explain the role of MNCs in our country.

7. What are the functions of various sample codes of ethics?

8. Discuss the need to focus on professional ethics.

DS-1208
Model Question Paper
INORGANIC CHEMISTRY
Common to all Branches of I/IV B. Tech (FOUR YEAR COURSE)
(Effective from 2015-2016 Admitted Batch)

Time : Three hours   Maximum : 70 marks

Question No.1 is compulsory.
Answer any FOUR from the remaining
All questions carry equal marks.

1. (a) Explain the dual nature of matter.
    (b) What is de-Broglie's wavelengths?
    (c) What is Resonance?
    (d) How ionization potential queries among groups in the
        Periodic Table?
    (e) Define crystal field stabilization energy (CFSE).
    (f) What is the importance of significant figures in the representation of analytical data?
    (g) Define standard deviation.

2. (a) Explain Radial and angular functions of Hydrogen atom.

    (b) Write the important postulates of Rutherfords' model.

3. (a) Discuss the classification of elements in the Periodic Table.

    (b) Discuss the variation of electron affinity among the elements in the periods.

4. (a) Write the important postulates of Molecular orbital theory.

    (b) Draw and explain the M.O. diagram of O_2 molecule.

5. (a) How do you explain the multiple bonding characters of Second period elements and higher period elements?

6. (a) Write the salient features of valence bond theory.

    (b) Explain the bonding in BF_3 and CH_4 according to V-B. Theory.

7. (a) Describe the general physical and chemical properties of first Transition series.

    (b) How do you calculate the crystal Field stabilization energy in Coordination compounds?

8. (a) Explain the classification of reactions in titrimetric analysis With examples.

    (b) Explain the classification of errors with examples.

BT 2.1.1
Model question paper
II/IVB.Tech. Degree Examination
Biotechnology
First Semester
MICROBIOLOGY
(Effective from the admitted batch of 2015- 2016)

Time: 3 hrs   **Marks: 70**

Answer any 5 of the following. First question is compulsory. All questions carry equal marks .

1. Write short note on :   7X2=14M
    a. Leeuwenhoek
    b. Taxonomy
    c. Halophiles
    d. Bacteriophage
    e. Gas vacuole
    f. Culture collection
    g. Lyophilization

2. Describe the structure and functioning of bacterial cell?   14M

3. Define growth and explain the methods used to study measurement of growth?   14M

4. Explain nutritional requirements and nutritional types of bacteria?   14M

5. Describe different method used to control the microorganisms?   14M

6. Explain morphology and life cycle of yeast?   14M

7. Explain lytic and lysogenic cycles?   14M

8. Explain food borne disease and their control?   14M

BT 2.1.2
Model question paper
II/IVB.Tech. Degree Examination
Biotechnology
First Semester
PHYSICAL CHEMISTRY
(Effective from the admitted batch of 2015- 2016)

Time: 3 hrs   **Marks: 70**

Answer any 5 of the following. First question is compulsory. All questions carry equal marks .

1. Explain the following terms in short:

   (a) Eutectic point
   (b) EMF of a cell
   (c) Surface tension
   (d) Over-potential
   (e) Electrode potential
   (f) Critical constants

2. (a) Explain briefly the liquefaction of gases.

   (b) What is the difference between zeotropic and azeotropic mixtures.

3. (a) Derive phase rule and explain each term involved in it.

   (b) What is the difference between steam distillation and fractional distillation.

4. (a) Write short note on intermolecular forces in liquids and their importance.

   (b) Draw and explain the phase diagram of a one-component system.

5. (a) Derive the Claussius – Clapeyron equation.

   (b) How do you explain the effect of temperature on heat of reaction.

6. (a) Derive and discuss the importance of Vant-Hoff's equation.

   (b) Explain entropy and give an expression for entropy change accompanying a phase change.

7. (a) Discuss in short the importance of calomel electrode.

   (b) Explain the working of lead-acid battery.

8. (a) Write a short note on industrial catalysts and their importance

   (b) Discuss the kinetic equation involved in enzyme catalysis.

ORGANIC CHEMISTRY

(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

ANSWER QUESTION NO. 1 AND ANY OTHER FOUR QUESTIONS.

EACH QUESTION CARRIES 14 MARKS.

1.   Write a short note for each of the following (7×2=14)

   a)   Give Conformation structures for n-butane

   b)   What is Beyer's Strain Theory?

   c)   What is Saytzeff Rule?

   d)   What is vulcanisation of rubber?

   e)   Give reaction for halogenations of alkanes.

   f)   Give example for free radical polymerisation.

   g)   Give the reaction for converting carboxylic acid to amide

2.   a)   Explain the methods of determining the molecular weight of an acid   6 M
          and a base

     b)   An organic compound on analysis gave the following results. 0.73 g   4 M
          of the compound gave 1.32 g of CO_2 and 0.6 g of H_2O, 0.365 g of the
          compound gave 56 cc of N_2 at NTP. Calculate the percentage
          composition of the compound.

     c)   Give the confirmation tests for identifying carboxylic acid group and a   4 M
          primary amine group in an organic compound

3.   a)   Explain the concept of aromaticity with the structure of benzene   6 M

     b)   Give any two methods of preparation each for alkanes and alkenes   4 M

	c)	Explain Clemmensen and Wolffkishner reductions with examples	4 M
4.	a)	Explain the industrial preparation and any three chemical reactions of ethyl alcohol	6 M
	b)	Explain HVZ reaction and Hoffmann Bromamide reactions	4 M
	c)	Discuss the mechanism of E_2 and E_1 elimination reactions	4 M
5.	a)	Explain industrial method of preparation and any two chemical reactions of acetaldehyde and acetone	6 M
	b)	Explain Pinacol-Pinacolone rearrangement and Reimer-Tiemann reactions.	4 M
	c)	Give the structures of glucose and fructose and explain how you distinguish them chemically	4 M
6.	a)	Explain industrial method of preparation of aniline and give reaction and mechanism for Hoffmann elimination	6 M
	b)	Give the tests for distinguishing 1^0, 2^0 and 3^0 amines	4 M
	c)	Give the reactions for the preparation of sulphanilamide and write the mode of action of sulpha drugs	4 M
7.	a)	Give the method of preparation of melonic ester and acetoacetic ester and mention any two of their synthetic applications	6 M
	b)	Differentiate Soaps and Detergents	4 M
	c)	Give the reactions for the preparation and applications of Teflon and Nylon 6,6	4 M
8	a)	Explain the sequence rules in R and S configurations with suitable examples	6 M
	b)	What is a racemic mixture and how it is separated	4 M
	c)	Explain the synthetic applications of LAH and OsO_4 with two examples each	4 M

BT 2.1.4
Model question paper
II/IVB.Tech. Degree Examination
Biotechnology
First Semester
FUNDAMENTALS OF BIOLOGY
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Write in brief of the following:
    a) Dicot Stem
    b) Chloroplast
    c) Golgi Complex
    d) Photosynthetic pigments
    e) Lymphatic Ducts
    f) Reflex arc
    g) Macro elements
                                                                                          (7x2=14 marks)
2. a) What are the parts of a flower?   (7 marks)
    b) Discuss the process of fertilization and post fertilization changes.   (7 marks)
3. Describe the structure of a typical animal cell.   (14 marks)
4. Explain the internal structure of Monocot-root, stem and leaf.   (14 marks)
5. a) Describe the structure of heart.   (7 marks)
    b) Describe the structure of Mitochondria.   (7 marks)
6. Explain the methods of plant breeding.   (14 marks)
7. Enumerate the steps involved in biological nitrogen fixation.   (14 marks)
8. a) Describe the structure of kidney.   (7 marks)
    b) Write a note on plant growth regulators.   (7 marks)

BT 2.1.5
Model question paper
II/IVB.Tech. Degree Examination
Biotechnology
First Semester
GENETICS
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Write short note on :   7X2=14M

    a. Monohybrid ration

    b. Back cross

    c. Epistasis

    d. Multiple alleles

    e. Crossing over

    f. Colour blindness

    g. Monoploidy

2. Explain in detail about Mendels dihybrid cross and it mechanism?   14M
3. a. Write an example of quantitative inheritance?(7)M
   b. explain mutiple alleles by taking one example?(7)M   14M
4. a. Explain the molecular mechanism of recombination? (7)M
   b. Explain sex limited traits with respect to cock feathering in poultry?(7)M   14M
5. Write in brief about translocations and inversions?   14M
6. Explain the inheritance of sex linked (X-linked) traits eye colour in drosophila?   14M
7. Write in detail about cytoplasmic inheritance in
    a. Kappa particles in paramecium,?(7)M
    b. Plastid inheritance in variegated four-o-clock-plant?(7)M   14M
8. Write in detail about Aneuploidy?   14M

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   Max. Marks: 70

Answer THREE questions from Section-A and
TWO questions from Section-B
All questions carry equal marks.
Section -A

1. (a) State and explain Thevenin's and Reciprocity theorems.

    (b) Determine the value of 'R' shown in the circuit below when the Power in the 5 ohms resistor is 20 watts.
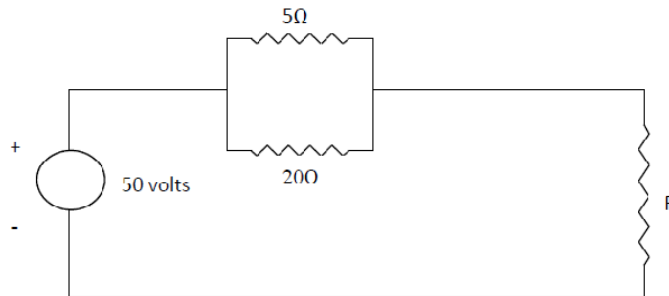
2. (a) Derive the phase and line voltage and current relationships of a 3-phase balanced star connected load connected to a balanced 3-phase supply.

    (b) Two pure circuit elements in a series connection have the following applied voltage and current relationships

$$v = 150 \sin (500\, t + 10^{0}) \text{ volts}$$

$$i = 13.42 \sin (500\, t - 53.4^{0}) \text{ AMps}$$

    Find the elements comprising the circuit.

3. (a) Why do you need a starter for D.C. shunt motor when it is a self starting one? Name the types of starters used.

    (b) What do you understand by Armature reaction in a D.C. machine? What are its

effects in D.C. machine?

(c)   A 4-pole D.C. generator has a lap wound armature having 400 conductors. It generates an e.m.f. of 300 volts when the flux per pole is 20 mWb. Find the speed of rotation of the armature.

4.   (a)   Develop the equivalent circuit of a 1-phase transformer referred to L.V. side.

(b)   The following data apply to a 1-phase transformer.

Output: 100 kVA; secondary voltage = 400 volts; primary turns = 200; secondary turns=40. Neglecting losses, calculate:

(i)   the primary applied voltage

(ii)   the full load primary and secondary currents at unity p.f. and

(iii)   the secondary current, when the load is 25 kW at 0.8 p.f. lagging.

5.   (a)   Derive the torque equation of a 3-phase induction motor from fundamentals. Hence, obtain the maximum torque condition.

(b)   Show that there is no starting torque available with 3-phase synchronous motor. Name the various methods of starting. Explain in detail on method of starting it.

Section – B

6.   (a)   Compare the three types of transistor configurations. Name which one is commonly used giving the reasons.

(b)   The current through a P-N junction diode is 60mA at a forward bias of 0.95 Volt. Calculate static and dynamic resistances at 27^0C.

7.   (a)   Draw the circuit diagram of Hartley oscillator and explain its operation.

(b)   Explain one application of CRO with a neat diagram.

8.   (a)   Distinguish between intrinsic and extrinsic semiconductors. Give examples for each. Draw V-I characteristics of P-N junction diode and explain.

(b)   Write short notes on pressure gauges.

BT 2.2.1
Model question paper
II/IVB.Tech. Degree Examination
Biotechnology
Second Semester
BIOCHEMISTRY
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Write short notes on

    a) Peptide bond

    b) Lactose

    c) Cholesterol

    d) Cofactor

    e) Denaturation of proteins

    f) Glycogenolysis

    g) Electron Transport   (7x2=14 marks)

2. Explain the sequence of reactions in HMP Shunt pathway. Add a note on its importance.   (14 marks)

3. Describe the primary, secondary, Tertiary and Quaternary structure of proteins.

                                                                                                (14 marks)

4. Explain the sequence of reactions of biosynthesis of proteins.   (14 marks)

5. a) Describe the classification of Carbohydrates.   (7 marks)

    b) Write a note on the biological significance of carbohydrates.   (7 marks)

6. a) Describe the classification of enzymes.   (7 marks)

    b) Write a note on mechanism of Enzyme action.   (7 marks)

7. Explain the chemistry and steps involves in the synthesis of Heme.   (14 marks)

8. a) Explain the structure and functions of water soluble vitamins.   (7 marks)

    b) Give an account of hormones and their importance.   (7 marks)

BT-2.2.2
MODEL PAPER
III/IV B.Tech I Semester
Biotechnology
BIOANALYTICAL TECHNIQUES
(Effective from the admitted batch of 2015- 2016)

Time:3 h   Max. Marks:70

Question No.1 is compulsory
Answer any FOUR from the remaining
All questions carry equal marks

1. Write short notes on   (2*7)
   (a) Distribution coefficient
   (b) Beer-Lambert's law
   (c) Isoelectric point
   (d) Isotopes
   (e) TLC
   (f) Radio dating
   (g) Agarose gel Electrophoresis
2. Explain the principle involved in HPLC in detail and its applications   (14)
3. Explain the principle involved in SDS-PAGE. Add a note on its applications   (14)
4. What is Beer Lambert's law? Explain the instrumentation of double beam
   spectrophotometer   (14)
5. Explain the following: (7*2)
   (a) NMR
   (b) X-ray crystallography
6. What is Sedimentation coefficient? Give an account of various centrifuges   (14)
7. Write short notes on:
   (a) Hyperfine splitting   (4)
   (b) MRI   (4)
   (c) Mass Spectroscopy   (6)
8. Explain   (7*2)
   (a) Radio activity and applications of radio isotopes in biotechnology.
   (b) Principle and applications of spectrofluorimetry

BT-2.2.3
MODEL PAPER
III/IV B.Tech I Semester
Biotechnology
CELL AND MOLECULAR BIOLOGY
(Effective from the admitted batch of 2015- 2016)

Time:3 h   Max. Marks:70
Answer any FIVE questions
First question is compulsory

1. Write short notes on: (7×2=14M)
    a) Cell cycle
    b) Wobble hypothesis
    c) Nucleosome
    d) Mutation
    e) Translation
    f) AMES Test
    g) Telomere
2. Describe the nucleosome organization in eukaryotic cell. (14M)
3. What is genetic material? Explain the double helical structure and functions of DNA. (14M)
4. a) Explain briefly the enzymes involved during the replication in prokaryotes and eukaryotes.
                                                                                                         (7 M)

    b) RNA processing in eukaryotes. (7 M)
5. a) Describe briefly the Genetic Code. (7 M)
    b) Describe briefly about protein synthesis in prokaryotes. (7 M)
6. Describe the translation mechanism in eukaryotes. (14 M)
7. Define Lac operon. Explain in detail about the regulation of Lac operon in *E.coli* (14 M)
8. a) Describe the mechanism for repair of DNA damage. (7 M)
    b) Explain about biochemical basis of mutants. (7 M)

BT-2.2.4
MODEL QUESTION PAPER
2/4 B.TECH(IInd sem)(CHEMICAL& BIOTECH)
SUB: CHEMICAL PROCESS CALCULATIONS
**(Effective from the admitted batch of 2015- 2016)**

Time: 3 hrs   **Marks:70**
ANSWER QUESTION NO.1 AND ANY FOUR FROM THE REMAINING QUESTIONS.
ALL QUESTIONS CARRY EQUAL MARKS.

1.(a). Define Limiting reactant and degree of completion.

 (b). Briefly discuss about the reference substance plots.

 (c). State the law of Dalton and Avogadro principle.

 (d). Define percentage saturation and Dew point.

 (e). Explain about recycle and purge streams.

 (f). State Kopp's rule and Trouton's rule.

 (g). State the laws of thermochemistry.

2.Diborane, B_2H_6 can be made by using Lithium bromide(LiH).

 $6 \text{ LiH} + 2 \text{ BCl}_3 = B_2H_6 + 6 \text{ LiCl}.$
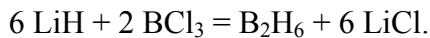
 If you mix 200 kg of LiH with 1000 kg of BCl_3, you recover 45 kg of B_2H_6.

Determine,(i). Limiting reactant, (ii).Percent excess reactant, (iii). Percent conversion of LiH to B_2H_6, (iv).Degree of completion of the reaction, (v).Yield of B_2H_6 based on LiH charged(kg/kg). Atomic weights of B=10.81, Li=6.94

3.A producer gas has the following composition by volume:

 $CO=23\%$, $CO_2=4.4\%$, $O_2=2.6\%$, $N_2=70\%$.

(i) Calculate the cubic feet of gas at 70^0F and 750 mmHg pressure per pound of carbon present.
(ii) Calculate the volume of air at the conditions of part 'a' required for the combustion of 100 cuft of the gas at the same conditions if it is desired that the total oxygen present before combustion shall be 20% in excess of that theoretically required.
(iii)Calculate the percentage composition by volume of the gases leaving the burner of part 'b' assuming complete combustion.
(a) Calculate the volume of the gases leaving the combustion in parts b and c at a temperature of 600^0F and a pressure of 750 mmHg per 100 cuft of gas burned.

4. A furnace is to be designed to burn coke at the rate of 200 lb per hour. The coke has the following composition. Carbon = 89.1% and Ash = 10.9%. The grate efficiency of the furnace is such that 90% of the carbon present in the coke charged is burned. Air is supplied in 30% excess of that required for the complete combustion of all the carbon charged. It may be assumed that 97% of the carbon burned is oxidized to the dioxide, the remainder forming monoxide.

(i).Calculate the composition by volume of the flue gases leaving the furnace.

(ii).If the flue gases leave the furnace at a temperature of 550^{0}F and a pressure of 743mmHg, calculate the rate of flow gases in cubic feet per minute for which the stack must be designed.

5. A continuous drier is operated under such conditions that 250 lb of water are removed per hour from the stock being dried. The air enters the drier at 175^{0}F and a pressure of 765 mmHg. The dew point of the air is 40^{0}F. The air emerges from the drier at 95^{0}F, a pressure of 755 mmHg and at 90% relative humidity. (a). How many cubic feet of the air must be supplied per hour? (b). How many cubic feet of the air emerge from the drier per hour? V.P. of water at 40 and 95^{0}F are 6.29 and 42.18 mmHg respectively.

6.The spent acid from a nitrating process contains 33% H_2SO_4, 36% HNO_3 and 31% H_2O by weight. This acid is to be strengthened by the addition of concentrated sulfuric acid containg 95% H_2SO_4 and concentrated nitic acid containg 78% HNO_3. The strengthened mixed acid is to contain 40% H_2SO_4 and 43% HNO_3. Calculate the quantities of spent and concentrated acids that should be mixed together to yield 1500 lb of the desired acid.

7.The following reaction is carried out at a temperature of 450^{0}C. Calculate the heat of reaction at this temperature. $N_2(g)+3H_2(g) = 2NH_3$, Std heat of formation of $NH_3(g)$= -11.04 Kcal/gmol . Heat capacities in cal/mol.K and T in ^{0}K.

$N_2(g)$: $C_P = 6.457+1.389X10^{-3}T-0.069X10^{-6}T^2$

$NH_3(g)$: $C_P = 5.92+8.963X10^{-3}T-1.764X10^{-6}T^2$

$H_2(g)$: $C_P = 6.946+0.196X10^{-3}T-0.4757X10^{-6}T^2$

8.Calculate the theoretical flame temperature of a gas containing 20%CO, 80%N_2 when burned with 150% excess air, both gas and air being at 25^{0}C.

Data:Heat of formation in cal/g mol at 25^{0}C : CO_2= -94,052, CO= -26,412

Avg. specific heat in cal/g mol K : CO_2= 12.10, O_2 = 7.9, N_2= 7.55

BT-2.2.5
MODEL QUESTION PAPER
II/IV B.Tech Degree Examination
Second semester
BIOTECHNOLOGY
FLUID MECHANICS & HEAT TRANSFER
(Effective from the admitted batch of 2015-16)

Time: 3 hours   Max. Marks: 70

Question no. ONE is compulsory and
answer any FOUR from remaining questions.
All question carry equal marks

1   Write briefly about the following
  (a)   Manometers   2
  (b)   Non-Newtonian Fluids   2
  (c)   Stream lines   2
  (d)   Hagen Poiseuille Equation   2
  (e)   Fourier's Law   2
  (f)   Forced Convection   2
  (g)   LMTD   2

2 (a) Test whether the following equation is dimensionally homogeneous.
        $$t = \frac{100\mu}{\rho_A - \rho_B}$$
                                                                               2
  (b)   Derive the equation that expresses mathematically the condition of hydrostatic   6
        equilibrium?
  (c)   A U tube manometer indicates a pressure drop of 250 mm water across an air filter. The air
        is at $27^{\circ}C$ and 1 atm. What is the pressure drop in atm? What percentage of error is
        introduced if the density of air in the manometer leads is neglected?   6

3 (a) Write a note on Boundary Layer separation and Wake formation.   7
  (b)   State and derive the Bernoulli's equation from Navier stokes equation   7

4 (a) Define fanning friction factor. How is it related to pressure drop ΔP_s and skin friction h_{fs}?   4

  (b)   Water at $60^{0}F$ is pumped from a reservoir to the top of a mountain through a 15 cm dia.
        pipe at an average velocity of 3.65 m/s. The pipe discharges into the atmosphere at a level
        915 mt above the level in the reservoir. The pipeline itself is 1370 m long. If the overall
        efficiency of the pump and the motor driving it is 70 percent and the cost of electric energy
        to the motor is 5 rupees per kilowatt-hour, what is the hourly energy cost for pumping this   10
        water.

5 (a) Explain the construction and working of centrifugal pumps   7
  (b)   A horizontal orifice meter ($C_O = 0.62$) having a throat diameter of 25mm is set in a 7.5
        cm i.d. pipe line. Water at $30^{\circ}C$ is flowing through the line. A U-tube manometer
        containing mercury under water measures the pressure differential over the instrument.
        When the manometer reading is 45 cm, what is the flow rate?   7

6 (a) Prove that in heat flow through a series of layers the overall thermal resistance equals the   7
         sum of the individual resistances.
   (b) Derive the equation for steady-state heat transfer through a hollow sphere shell of inner   7
         radius R_1 at temperature T_1 and the outer radius R_2 at temperature T_2.   Thermal
         conductivity of the material is k.

7 (a) What do you mean by overall heat transfer coefficient? Write down the expression of   7
         overall heat transfer heat coefficient by including all the resistance involved.
   (b) Explain heat transfer by forced convection inside tubes in laminar flow?   7

8   Write Short notes on any **two**   14
   (a) Condenser
   (b) Heat Exchanger
   (c) Rotary pumps

MODEL PAPER
II/IV B.Tech II Semester (Biotechnology)
ENVIRONMENTAL STUDIES
(Effective from the admitted batch of 2015-16)

Time:3 h   Max. Marks:70

Answer any FIVE questions
First question is compulsory

1. Write short notes on:
   a) Environmental studies
   b) Ecosystem
   c) Natural resources
   d) Erosion
   e) EIA
   f) Desertification
   g) Water logging

2. a) What are the impacts of construction of large dams? What are the possible measures to reduce impact? (7 M)
   b) Explain the structure and function of aquatic ecosystem. (7 M)

3. What do you understand by the term biodiversity? Write briefly about the different kinds of diversity in organism. (14 M)

4. a) What id ozone layer depletion? State its causes and effects in environment. (7 M)
   b) Explain the value of Biodiversity. (7 M)

5. Write short notes on: (14 M)
   a) Cloud seeding
   b) Watershed management
   c) Solid waste management.
   d) Global warming

6. a) Discuss the effects of urbanization and industrialization in the quality of environment. (7 M)
   b) What are the major problems faced in rehabilitation and resettlement of people? (7 M)

7. a) Write short notes on Earth Summit -1992. (7 M)
   b) Write the causes, effects and control measures of air pollution. (7 M)

8. Explain: (14 M)
   a) Narmada bachao andolan
   b) Rain water harvesting
   c) Acid rain

III/IV B.Tech Degree Examination
Biotechnology
First Semester
MASS TRANSFER – 1
MODEL QUESTION PAPER
(Effective from the admitted batch of 2015-16)

Time: 3 hours   Max. Marks:70

Answer questions No. 1 and any other FOUR questions.
All questions carry equal marks.

1) Explain the following   7X2 =14
   a) Fick's law and its limitations
   b) Significance of Schmidt number
   c) Absorption factor and its significance
   d) Relative volatility
   e) Gas film controlling
   f) Flash vaporization
   g) q-line

2) a) Obtain an expression for the steady state equimolal counter diffusion of two gases. (7)
   b) Discuss the analogy between momentum, heat and mass transfer (7)

3) a) Present different theories proposed to explain turbulent mass transfer   (7)
   b) Benzene is stored in a tank of diameter 10 m and open at the top. A stagnant air
      film 12 mm thick is covering the surface liquid beyond which benzene is absent. The
      atmospheric temperature and pressure are 25^0C and 1 atm, respectively. Estimate the
      rate of loss of benzene. The vapour pressure of benzene at 25^0C is 150 mm Hg and the
      diffusivity in air is 0.02 m^2/s.   (7)

4) a) Derive the relationship between individual and overall mass transfer coefficients (7)
   b) Explain the material balances in steady state counter current processes   (7)

5) a) With the help of a neat sketch, explain the functioning of agitated vessels for gas-liquid
      mass transfer operations. Discuss the merits and demerits of it.   (7)
   b) Describe the Sieve tray column for distillation operation   (7)

6) A packed tower is designed to recover 98% CO_2 from a gas mixture containing 10% CO_2
   and 90% air using water. A relation Y =14 X can be used for equilibrium conditions,
   where Y = kg CO_2/kg dry air and X = kg CO_2/ kg water. The water to gas rate is kept
   30% more than the minimum value. Find the height of the tower if (HTU)$_{OG}$ is 1 m. (14)

7) Explain the step wise graphical design procedure for estimation of number of theoretical
   stages in a fractionating column.   (14)

8) a) Derive an expression for Differential distillation.   (7)
   b) Differentiate between azeotropic and Extractive distillation   (7)

III/IV B.Tech. DEGREE EXAMINATION
Biotechnology
Second Semester
BIOSTATISTICS
(Effective from the admitted batch of 2015-16)

Time : 3 Hours   Max.Marks : 70

Question No.1 is compulsory.
Answer any FOUR from the remaining.
All questions carry equal marks.

1. a) What is a histogram?   (7x2 =14)

   b) What is scatter diagram?

   c) Write any two objectives of sampling?

   d) What is standard error of statistictic?

   e) Write any two properties of t-distribution.

   f) Define critical region?

   g) Classify the equation

$$\frac{\partial 2u}{\partial x2} + 4\frac{\partial u}{\partial x\partial y} + 4\frac{\partial 2u}{\partial y2} - \frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} = 0$$

2. a) Prepare a Histogram and Frequency polygon from the following data.

Class:	0-6	6-12	12-18	18-24	24-30	30-36
f:	4	8	15	20	12	6

   b) From the following data of the marks obtained by 60 students of a class, calculate the arithmetic mean.

Marks:	20	30	40	50	60	70
No.of students:	8	12	20	10	6	4

3. a) Calculate the standard deviation for the following distribution

Values:	10	20	30	40	50	60	70
Frequency:	1	5	12	22	17	9	4

b) Compute the two regression equations on the basis of the following information

	X	Y
Mean:	40	45
Standard Deviation:	10	9

Correlation coefficient between X and Y is 0.50. Also estimate the value of Y for X = 48 using the appropriate regression equation.

4. a) The following are scores of two batsmen A and B in a series of innings.

A:	12	115	6	73	7	19	119	36	84	29
B:	47	12	16	42	4	51	37	48	13	0

Who is the better score getter and who is more consistant?

b) For the continuous probability function $f(x) = Kx^2 e^{-x}$, when $x \geq 0$, find (i) K (ii) Mean (iii) Variance.

5. a) Fit Poisson distribution for the following data and calculate the expected frequencies.

n:	0	1	2	3	4	5
f:	125	95	49	20	8	3

b) In a Normal distribution, 7% of the items are under35 and 89% are under 63. Determine the mean and variance of the distribution.

6. a) In a big city 325 men out of 600 men were found to be smokers. Does the information support the conclusion that the majority of men in this city are smokers.

b) An ambulance service claims that it takes on the average less than 10 minutes to reach the destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and the variance of 16 minutes. Test the significance at 0.05 level.

7. a) Solve the partial different equation $\nabla^2 u = -10\ (x^2 + y^2 + 10)$ over the square with sides x= 0, y = 0, x= 3, y=3 with u = 0 on the boundary and mesh length is 1.

    b) Explain the Leibmann's iterian process for finding solution of Laplace's equation.

8. Answer any three of the following:

    a) Role of Skewness and Kurtosis in analysing a frequency distribution.

    b) Chief characteristics of the normal curve

    c) Errors in hypothesis testing

    d) Chi-square distribution

BT-3.1.3
MODEL QUESTION PAPER
III/IV B.TECH BIOTECHNOLOGY (SECOND SEMESTER)
BTM -324 DOWN STREAM PROCESSING
(Effective from the admitted batch of 2015-16)

Time: 3Hrs   **Maximum: 70marks**

Question no.1 compulsory and answer any four questions from the remaining

1) Explain the following: 7 x 2=14M
   a) Cell permeabilisation.
   b) Langmuir isotherm.
   c) Nucleation
   d) Partition coefficient
   e) Pervaporation.
   f) Supported liquid membrane.
   g) Raffinate

2) Discuss in detail about Enzymatic and Mechanical disruption of cells. (14M)

3)a) Discuss the theoretical principles of constant pressure filtration and working of
    continuous rotary filter.(7M)
 b) Explain the separation of solids by a disk bowl and basket centrifuge.(7M)

4) a)What are adsorption isotherms and write a note on Fixed bed adsorption process.(7M)
    b)Discuss about Ion-exchange chromotography with applications and advantages. (7M)
5) Explain in detail about aqueous 2- phase extraction for the extraction of various bio
    molecules, with necessary flow diagrams and applications   .   (14M)

6) a) Discuss about the membrane modules and membrane based separation theory.   (7M)
    b) Write short notes on reverse osmosis and ultra filtration with applications. (7M)

7) Explain the Various Protein precipitation methods and explain protein precipitation by
addition of salts. (14M)
8) a) Discuss the Meir's super saturation curve for crystal growth   (7M)
 b)Explain freeze drying process and its advantages. (7M)

BT-3.1.4
IV/IV B.Tech (Biotechnology)
I-Semester
Enzyme Engineering
MODEL QUESTION PAPER
(Effective from the admitted batch of 2015-16)

Time:3 hrs   Total:70M

1. Write a short notes on the following: (7X2=14M)
    a. Catalysis
    b. Enzyme activity
    c. Turn over number
    d. Effectiveness number
    e. Enzyme sources
    f. Cell disruption
    g. Thermal inactivation

2. a) Explain enzyme structure functionality and its relationship.   (7 M)
    b) Write about the classification of enzymes.   (7 M)

3. Explain in detail the synthesis, recovery and purification of enzymes.

4. a) Explain Michaels Menten's equation with rapid equilibrium and steady state hypothesis. (7M)

   b) Various type of kinetic inhibition and the effect of environmental variables.   (7 M)

5. a) Write about various methods of enzyme immobilization.   (7 M)

   b) Explain external and internal pore diffusion.   (7 M)

6. Explain design of ideal reaction with enzyme in batch reactor.   (14 M)

7. Write about mass transfer limitation on design and performance of enzyme reactions.   (14M)

8. Write about the following

   a) Application of enzymes in food processing.   (7 M)

   b) Application of enzyme of enzymes in medical and pharmaceutical.   (7 M)

BT-3.1.5
III/IV B.TECH (BIO TECHNOLOGY)
(FIRST SEMESTER)
THERMODYNAMICS
MODEL QUESTION PAPER
(Effective from the admitted batch of 2015-16)

Time: 3Hrs   **Maximum: 70marks**
Question no.1 compulsory and answer four questions from the remaining.

Explain the Following (7X2= 14 M)

   a. State function
   b. Enthalpy
   c. Open systems
   d. Reaction Thermodynamics
   e. Residual Properties
   f. Entropy
   g. Activity coefficient

2 a)Explain about energy balance for steady state flow process (4M)

  b) Fifty (50) kmol per hour of air is compressed from $P_1 = 1.2$ bar to $P_2 = 6.0$ bar in
   a steady-flow compressor. Delivered mechanical power is 98.8 kW. Temperatures and
   velocities are:

$$T_1=300K \quad T_2= 520K$$
$$u_1=10 \text{ m s}^{-1} \quad u_2=3.5 \text{ms}^{-1}$$

   Estimate the rate of heat transfer from the compressor. Assume for air that $Cp = 5/2R$
   and that enthalpy is independent of pressure.(10M)

3. Calculate the theoretical flame temperature when ethylene at 25 ℃ is burnt with 75% excess
air at 25 ℃. (14 M)

   Data: Components ΔH^{o}_{f298} J/mol

      i. Ethylene   52510

      ii. CO_2 -393509

      iii. H_2O (g)   -241818

Component	A	10^3 B	10^{-5} D
Oxygen	3.639	0.506	-0.227

Nitrogen	3.280	0.593	0.04
Carbon dioxide	5.457	1.045	-1.157
Water	3.470	1.450	0.121

4.a Derive the mathematical statement of second law of thermodynamics (6M)

b) One mole of an ideal gas is compressed isothermally at 400 K from 100 kPa. The work required for this irreversible process is 30% more than that for a reversible compression. The heat liberated during the process of compression is absorbed by a thermal reservoir at 300 K.

Calculate a) The entropy change of the gas b) The entropy change of the reservoir and c) The total entropy change. (8M)

5 a) Explain briefly about the fugacity and fugacity coefficient for pure species. (7M)

b) Estimate the fugacity of isobutylene as a gas at 300°C and 30 bar.

Data: $\omega = 0.194$, Tc / K = 417.9, Pc / bar = 40 (7M)

6. For the system benzene (1) /toluene (2) in VLE obeying Raoult's law , the Antoine equations are given below:

$$lnP_1^{sat} = 13.7819 - \frac{2726.81}{T-55.578}$$

$$lnP_2^{sat} = 13.932 - \frac{3056.96}{T-55.525}$$

Where T is in ^{O}K and P is kPa. Calculate

a) DEW P and y_i for x_1=0.25 and T = 100°C.(6M)
b) BULB T and x_i for y_1=0.25 and P= 120 kPa. (8M)

7.a)Derive the relation between Gibbs energy change and the equilibrium constant.(6M)

b). A system Initially containing 3 mol of C_2H_4 and 2 moles of O_2 undergoes the reactions:

$$C_2H_4(g) + \frac{1}{2} O_2(g) \rightarrow [(CH_2)_2]O(g)$$

$$C_2H_4(g) + 3 O_2 (g) \rightarrow 2CO_2(g)+2H_2 (g)$$
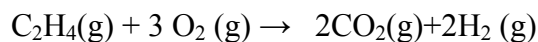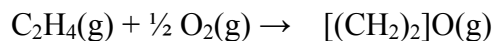
Develop expressions for the mole fractions of the reacting species as function of reaction coordinates for the two reactions.(8M)

8.a) Explain the thermodynamics of microbial growth (7M)

b) Discuss about the oxygen consumption in aerobic cultures. (7M)

BT 3.1.6 A
Model question paper
III/IV B.Tech. Degree Examination
Biotechnology
First Semester
Elective-I:FOOD TECHNOLOGY
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Write short notes on the following :   (7*2)
    a. Bioprocessing
    b. Pasteurization
    c. Botulism
    d. Food preservation
    e. Size reduction
    f. Fermentation
    g. Membrane separation
2. Explain in detail about the food Processing operations.   (14)
3. Explain briefly about: (14)
    a. Food colors & flavors
    b. Food spoilage
4. Explain in detail about the enzymes and chemicals used in food processing. (14)

5. Explain briefly about: (14)
    a. Nutritive value of food.
    b. Micro organisms associated with food.
6. What is single cell protein? Explain single cell protein (SCP) production.   (14)
7. What is CANNING? Explain various processing steps involved in canning of vegetable materials.   (14)

8. (a)Describe bacterial growth curve and name the various factors influencing microbial growth in foods.
    (7)
    (b) Explain the procedure in the preparation of making wine.   (7)

Model question paper
III/IV B.Tech. Degree Examination
Biotechnology
Second Semester
CHEMICAL REACTION ENGINEERING
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max. Marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Write very briefly about the following:
 (a) Law of mass action
 (b) Recycle reactor
 (c) Heterogeneous reactions
 (d) Arrhenius theory
 (e) Pseudo first order
 (f) Space time and residence time
 (g) Non - elementary reactions

2. (a) Explain the silent features of the three theories that I proposed to explain the temperature dependence of the of a reaction
   (b) Derive the Michelis and Menten rate for enzyme substrate reaction

3. (a) Derive the performance equation (for constant density system) for an ideal plug flow reactor and discuss the design procedure.
(b) A zero order homogeneous gas reaction, A   r R proceeds in constant volume batch reactor, 20 % inerts and the pressure rises from 1 to 1.3 ATM in 2 minutes. If the same reaction takes place in a constant pressure batch reactor, what is the fractional volume change in 4 minutes, if feed is at 3 atm and consists of a 40 % inerts.

4. A serious reaction A   R   S , with k_1 and k_2 as rate constant for the first and second steps actively with C $_{R0}$=C$_{S0}$ =0 is to be   conducted in a plug flow reactor. Both the steps are first order .Obtain an expression for a space-time corresponding to maximum concentration of R.Also find C$_{Rma}$x if $k_1=k_2$.

5. (a) Discuss the integral and differential methods of analyzing kinetic data with their limitations.
 (b) A homogeneous liquid phase second order reaction A   R takes place with 50 % conversion in a CSTR,   if this CSTR is replaced by another CSTR have a volume 2 times more than that of the earlier one. How much and enhancement in conversion will be possible? All other parameters remain same is the original CSTR is replaced by a PFR of same size how much and enhancement in conversion will be possible?

6.   A is decomposed according to the following scheme:
        A→   R r_R=1;   →A   R r_s=2CA→   A   R, $r_T =C_A^2$
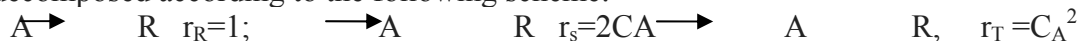
It C_{A0} is 4 , find the maximum expected C_s for isothermal operation in
(i) a plug flow reactor (ii) a mixed flow reactor.

7. (a) A first order reaction is to be treated in a series of mixed flow reactors .show that the total volume of the   mixed flow reactors is minimum , when the reactors are equal in size

(b) a liquid reactant system (1 mol/lit) passes through two mixed flow reactors in series . The concentration of A in the exit of the first   reactor is 0.5 mol/ lit. Find the concentration in the exit system of the second reactor. The reaction is second order with respect to A and $V_2/V_1=2$

8. (a) Explain the recycle reactor and governing equations

(b) At present conversion is 2/3 for our elementary second order liquid reaction .

   $2A \longrightarrow 2R$, when operating in an isothermal plug flow reactor with a recycle ratio of unity , what will be the conversion if the recycle steam is shut off?

BT 3.2.2
Model question paper
III/IV B.Tech. Degree Examination
Biotechnology
Second Semester
IMMUNOLOGY
(Effective from the admitted batch of 2015- 2016)

Time: 3 Hours   **Max.**
Marks: 70

Answer question No. ONE and any other FOUR questions from the
remaining.
All questions carry equal marks.

1. Write short answers for the following:
    (a) Innate Immunity
    (b) Hapten
    (c) Agglutination
    (d) Immune tolerance
    (e) Autoimmunity
    (f) Interferons
    (g) Immunofluorescence

                                                                      (7x 2 = 14marks)

2. Write notes on organs of Immune system and various cells of immune system. (14Marks)
3. Explain the classification, structure and functions of immunoglobulins.   (14 marks)
4. a) Describe antigen – antibody reactions with examples.   (7 marks)
    b) Explain the ELISA technique and its applications.   (7 marks)
5. Explain the mechanism of classical complement fixation pathway and
    Consequences.   (14 marks)
6. What is immune response? And describe the immune responses –humoral
    and cell mediated immune responses.   (14 marks)

7. What is hypersensitivity? Explain the role of hypersensitive reactions in
    graft rejection.   (14 marks)

8. a) Describe the production of monoclonal antibodies and their applications   (7 marks)
    b) What are vaccines? Describe various types of vaccines.   (7 marks)

BT-3.2.3
MODEL PAPER
III/IV B.Tech II Semester Biotechnology
ENGINEERING ECONOMICS AND BIOPROCESS DESIGN
(Effective from the admitted batch of 2015-16)

Time:3 h   Max. Marks:70
Answer any FIVE questions
First question is compulsory

1. Write briefly on the following   (7X2 =14)
    a) Value of money
    b) Discrete interest
    c) Scrap value
    d) Ledger
    e) Agitation
    f) Effective interest rate
    g) Baffle

2. a) Explain present worth, future worth and uniform payment with suitable examples.
    b) Derive relation between ordinary annuity and the periodic payments. (7+7)

3. a) What is depreciation? List out different methods of depreciation. Explain any two methods
        of it in detail.

    b) A piece of equipment having negligible salvage value is estimated to have a service
        life of 10 years. The original cost of the equipment was Rs.40,000. Determine the
        depreciation charges for the fifth year using any two methods of depreciation. Money
        is worth 10%. (7+7)
4. a) Explain bonds, debentures and perpetuities with suitable examples.
    b) What price should be paid, if 8% yield is desired for a 10 year 6 % bond of Rs.1000

        face value has 4 more years before maturity. (7+7)

5. Explain in detail the various factors involved in bioreactor design. (14)
6. a) Why are pilot plant studies necessary?
    b) Explain in detail the role of pilot plant studies in the scale up of microbial
        processes.(4+10)
7. Explain in detail, how one has to select material of construction in a
    fermentation industry under different prevailing conditions
8. Write notes on the following
        a) Various types of interests
        b) Capitalized costs
        c) Steam traps (5+5+4)

BT-3.2.4
MODEL PAPER
III/IV B.Tech II Semester Biotechnology
BIOPROCESS ENGINEERING
(Effective from the admitted batch of 2015-16)

Time:3 h   Max. Marks:70

Answer any FIVE questions
First question is compulsory

1. Write short notes on: (7X2=14M)

   a. Enzyme specificity

   b. Scale up

   c. Yield co-efficient

   d. Dilution rate

   e. Degree of reduction

   f. Wash out

   g. Fed-batch reactor

2. Explain the chronological development of biotechnology since its practice to date.   (14M)

3. a. Derive Michaeli's- Menten equation.   (4M)

   b. An enzyme was assayed at an initial substrate concentration of 2×10^{-5} M. In 6 min half of the
      substrate had been used. The Km for the substrate is 5×10^{-5}M. Calculate: (10M)

      a. K

      b. V_{max}

      c. Concentration of product produced by 15min.

4. Assume that experimental measurements for a certain organism have shown that the cells can
   convert two-thirds (w/w) of the substrate carbon (alkaline or glucose) to biomass.   (14 M)

   a. Calculate the stoichiometric coefficients for the following biological reactions

       Hexadecane: $C_{16}H_{34} + aO_2 + b\ NH_3$ ----→ c $(C_{44}H_{73}N_{0.86}O1_{.2}) + d\ H_2O + e\ CO_2$

       Glucose: $C_6H_{12}O_6 + aO_2 + b\ NH_3$ ----→ c $(C_{44}H_{73}N_{0.86}O1_{.2}) + d\ H_2O + e\ CO_2$

   b. Calculate the yield coefficient $Y_{x/s}$ (g dw cell/ g substrate), $Y_{x/O2}$ (g dw cell/ g O_2) for
       both reactions.

5. a. Describe Monod growth kinetics.   (7M)

   b. The following data have been obtained for an initial enzyme concentration of an
       enzyme-catalysed reaction.   (7M)

V [Eo] (g/l min)	1.16	0.89	0.72	0.61	0.52	0.46	0.41	0.37
[S] g/l	22	12	8.6	7	6	5.3	4.9	4.5

Calculate:

a. Find K_m

b. Find V_m

6. a. What is air sterilization? Explain with a suitable example.   (7M)

   b. Describe methods of air sterilization.   (7M)

7. a. Describe batch growth cultivation.   (7M)

   b. Write an account on plug flow fermentors.   (7M)

8. Write notes on:

   a. Non conventional bioreactors.

   b. Bioreactors instrumentation and control

   c. multistage chemostat systems

BT-3.2.5
Model Question Paper
III/IV B.TECH II SEM (Bio-Technology)
PROCESS CONTROL
(Effective from the admitted batch of 2015-16)

Time: 3 hours   Max. Marks: 70

Question no.1 is Compulsory,
Answer Four questions from remaining questions

1.Explain the following

  (i)   Process control
  (ii)   Servo system
  (iii) Negative feedback
  (iv)   Regulatory system
  (v)   Corner frequency
  (vi)   Rate control
  (v) Transportation Lag   [14]

2.(a)   Derive the transfer function for mercury thermometer with Step input.
  (b)   What is a distributed parameter system Explain   [9+5]
3.(a)   What is an interacting system.
  (b)   Considering a two-tank interacting liquid system ,develop an expression for the transfer
  function. Also obtain an expression for a unit step response of such a system   [5+9]
4.(a) *Derive the transfer functions for P,P-D,P-I,P-I-D controllers.*
  (b)   Show typical feedback control system and explain the different components involved
                                                          [7+7]

5.(a)   *Discuss the Bode stability criteria*
  (b)   Sketch the Root locus for the following equation

$$G = \frac{K}{(S+4)(S+2)(S+3)}$$

     On your sketch you should locate quantitatively all poles, zeroes and asymptotes
     [6+8]
 6.   (a) Explain the Cascade controller

   (b) Explain the F-F controller   [7+7]

7.(a) Describe completely the Internal model control structure
    (b) Design an IMC controller for the process which is first order

$$G_m = \frac{K}{(\tau S + 1)}$$ [7+7]

 8. .(a) Explain the Cascade controller
    (b) Write notes on Control valve characteristics   [7+7]

BT-3.2.6 A
III/IV B.Tech Biotechnology
Second Semester
MODEL QUESTION PAPER
ELECTIVE-II: PHARMACEUTICAL BIOTECHNOLOGY
(Effective from the admitted batch of 2015-16)

Time:3 hrs   Marks: 70

First question is compulsory and any four questions from the remaining.
All questions carry equal marks.

1. Write short notes on the following :   (7*2)
    a. Pharmacokinetics
    b. Drug metabolism
    c. Granulation
    d. Non steroid contraceptives
    e. Therapeutic agents
    f. Coating of tablets
    g. Vitamins

    2. Discuss briefly about the Development of Drug and Pharmaceutical Industry. (14)
3. Explain bulk drug manufacturing and types of reactions in bulk drug manufacturing.
    (14)
4. Why pharmacokinetic models are most important in case of drug metabolism? Explain in
   detail.
   (14)
5. Discuss briefly
   (14)
    a. Injections
    b. Capsules
6. (a) Write differences between batch mixing and continuous mixing.   (14)
   (b) What type of packaging is essential for final pharmaceutical product?

7. Write about the different evaluation procedures for parental dosage forms. (14)
8. Discuss briefly   (14)
    a. Sustained action dosage forms Capsules
    b. Industrial quality management

BT-4.1.1
IV/IV B.Tech Biotechnology
I-Semester
MODEL QUESTION PAPER
ENVIRONMENTAL BIOTECGNOLOGY
(Effective from the admitted batch of 2015-16)

Time:3 hrs   Marks: 70

First question is compulsory and any four questions from the remaining.
All questions carry equal marks.

1. Write short note on: 7X2=14M
   a. Waste water
   b. RBC
   c. Bioventing
   d. Biogas
   e. Xenobiotics
   f. Transformation
   g. Biofilm

2. Describe waste water characteristics and explain domestic waste water processing?   14M

3. Define biodegradation, bioremediation and biotransformation and explain in situ
   bioremediation process?   14M

4. Define phytoremediation and explain different aspects of phytoremediation?   14M

5. Explain different methods of bioleaching?   14M

6. Describe biohydrogen production process?   14M

7. How microorganisms used in petroleum recovery?   14M

8. Explain in general how hazardous wastes management by
   Biotechnological processes?   14M

IV/IV B.Tech Biotechnology
I-Semester
MODEL QUESTION PAPER
Genetic Engineering
(Effective from the admitted batch of 2015-16)

Time:3 hrs   Marks: 70

First question is compulsory and any four from the remaining

1.Write a short notes on the following: (7X2=14M)

      a.Ligases
      b.Linkers
      c.Adaptors
      d.Homopolymer Tailing
      e.Probes
      f.Primers
      g.Mutagenesis

2. Explain the process of isolation and purification of total cell DNA?   14M

3. a) Write in detail about plasmid vectors ?   7M

   b) Write in detail about Bacteriophage vectors?   7M

4. a). Explain in detail about DNA finger printing technique?   7M

   b) Explain about DNA sequencing method?   7M

5. a) Write about Southern blotting ?   7M

  b) Explain. about Northern blotting ?   7 M

   6. Write in details about Gene Knock Technologies?   14 M

7. Explain in detail about gene transfer techniques. ?   14M

8. Write about the following

  a) Application of genetic engineering in agriculture.   7 M

  b) Application of genetic engineering in medicine environmental   7 M

BT-4.1.3
IV/IV B.Tech Biotechnology
I-Semester
MODEL QUESTION PAPER
Bioinformatics
(Effective from the admitted batch of 2015-16)

Time:3 hrs   Marks: 70

First question is compulsory and any four from the remaining

1. Explain the following   (7 x 2)
    a) Define File Transfer Protocol **(FTP)**

    b) What is TrEMBL

    c) Explain the MIPSX

    d) Define the Multiple Sequence Alignments **(MSA)**

    e) State BLAST and FASTA

    f) What is a CLUSTALW

    g) Define *ab initio* structure prediction

2. State the Introduction, Scope, Applications of bioinformatics and various file formats for bio-molecular sequences   (14)
3. Elaborate the following
    a) The need and basic concepts of various approaches for Multiple Sequence Analysis (7)
    b) Human Genome Mapping   (7)
4. Explain the Primary Sequence Databases in details   14)

5. Explain the following

    a) Sequence Alignment techniques   (7)
    b) Chou Fasman Algorithms   (7)
6. Explain the Tertiary Structure prediction   (14)

7. Explain in detail the Phylogenetic Analysis Methods (PAM)   (14)

8. Explain the following

    (a) An *embarrass de richesses*.   (4)
    (b) Conceptual Translation.   (5)
    (c) Markov Models.   (5)

BT- 4.1.4
Model question paper
IV/IV B. Tech Degree Examination
Biotechnology
First Semester
INDUSTRIAL BIOTECH PRODUCTS
(Effective from the admitted batch of 2015- -2016)

Time: 3Hours   **Max. marks: 70**

Answer question No. ONE and any other FOUR questions from the remaining.
All questions carry equal marks.

1. Explain briefly on the following:
   (a) Fermentor
   (b) Microbial enzymes
   (c) Sulfite waste liquor
   (d) Uses of L-glutamic acid
   (e) Natural medium
   (f) Mushrooms

      (g) Biopolymers   (7x 2=14 marks)

2. Describe the process of maintenance and improvement of industrial culture for better
   production.
                                                                                    (14 Marks)

3. Explain the various steps in the production of Industrial Alcohol by the process of
   fermentation.
                                                                                    (14Marks)

4. a) Describe the fermentation process for the production of Acetone-Butanol. (7marks)

   b) Describe the fermentation process for the manufacturing of Vinegar.   (7marks)

5. Explain the process details for the production of Citric Acid by fermentation on an
   industrial scale.
   (14marks)

6. Explain the fermentation process for the production of Vitamin B_{12} (14 marks)

7. Write in detail the microbial production of Streptomycin and its applications.
                                                                                    (14 marks)

8. a) Write notes on Baker s' Yeast and its production.   (7marks)
   b) Describe the fermentation process for the production of industrial enzyme
    Amylase.   (7marks)

BT-4.1.5
IV/IV B.Tech Biotechnology
First Semester
Plant cell and Tisuue culture
MODEL QUESTION PAPER
(Effective from the admitted batch of 2015-16)

Time: 3 hrs   **Marks: 70**

Answer any five of the following, first question is compulsory

1. Write a short notes on the following: (7X2=14M)
    a. Cytodifferentiation?
    b. Aseptic inoculation
    c. Importance of totipotency
    d. Somatic hybridization
    e. Plasmids and cosmids
    f. Chemically defined medium and chemically undefined medium
    g. Habituation of callus tissue

2. a. Why are all cells not totipotent in culture?   (7M)

    b. Mention the importance of totipotency in plant science.   (7M)

3. a. Discuss the different types of protoplast fusion.

    b. what chemical compounds have been used as fusogen agents?

4. a. What is organogenesis   (4M)

    b. Give an general account of organogenesis.   (10M)

5. a. What is callus tissue?   (4M)

    b. Describe the protocol and discuss the significance of callus culture   (10M)

6. Discuss the application of plant tissue culture in plant breeding and plant improvement.

                                                                                             (14M)

7. a. What is somatic embryogenesis?   (4M)

    b. Discuss the principle of somatic embryogenesis   (10M)

8. a. Discuss the growth pattern of cells in suspension culture   (5M)

    b. Describe the methods for the measurement of cell growth in suspension culture.
                                                        (5M)

    c. How do you test the viability of cells from culture?   (4M)

BT-4.1.6 A
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First Semester
Elective-III: Agriculture Biotechnology
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Time: 3 hrs   **Marks: 70**

Answer Question No. **1** and any **four** from the remaining
All questions carry equal marks

1. Explain the following briefly
    a. Gene Silencing
    b. Genome Mapping
    c. Bio pesticides
    d. Molecular farming
    e. Neutraceuticals
    f. Transgenic plants
    g. SNPs
2. Explain the basic concept of of genes and their potential scope in crop improvement.

3. Explain the signaling pathways in the production of transgenic plants for viral disease resistance.

4. What are different types of molecular markers? Explain in detail the technique of RFLP

5. Define Agricultural biotechnology in classical vs. modern approach

6. Explain the signaling pathways in the production of plants for pest and abiotic stress resistance

7. Explain the role of RAPD in crop improvement and genome mapping

8. Explain
    a. Production of biofertilizers
    b. how plants act as biofactories