[4817]-201

S.Y. B.Sc.

MATHEMATICS

MT-221:Linear Algebra-I

(2008 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1)   All questions are compulsory.
   2)   Figures to the right indicate full marks.

Q1) Attempt <u>any five</u> of the following: **[10]**

   a)   Show that the set $\{\sin^2 x, \cos^2 x, 1\}$ is linearly dependent.

   b)   Write the definition of basis set of vector space.

   c)   Write the definition of row space and column space of m×n matrix A.

   d)   For the linear transformation $T: \mathbb{R}^2 \to \mathbb{R}^3$ given by

   $$T\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x \\ x+y \\ y \end{bmatrix}$$ write down matrix of linear transformation T with respect

   to standard basis of $\mathbb{R}^2$ and $\mathbb{R}^3$.

   e)   If $A = \begin{bmatrix} -2 & 0 & 0 \\ 20 & 3 & 0 \\ 40 & 50 & 1 \end{bmatrix}$ Find eigen values of A^3.

   f)   Find the distance between the vectors p=1+*x*, q=*x* in vector space P$_2$

   with inner product $< p, q >= \int_{-1}^{1} p(x)q(x)dx.$

   g)   Find the co-ordinate vector of $\bar{u} = (1, -1)$ in $\mathbb{R}^2$ with respect to basis

   $S = \{(1,1), (1,3)\}$ for $\mathbb{R}^2$.

P.T.O.

Q2) Attempt <u>any Two</u> of the following: **[10]**

   a)   Prove that the set $\{\bar{v}_1, \bar{v}_2, \bar{v}_3\}$ is linearly dependent if and only if one of the vectors is linear combination of other two.

   b)   For the matrix A of order 2×3 and T: $\mathbb{R}^3 \to \mathbb{R}^2$ the matrix transformation

   $$T(X)=AX. \text{ Given that } T\left(\begin{bmatrix}1\\0\\0\end{bmatrix}\right)=\begin{bmatrix}1\\1\end{bmatrix}, T\left(\begin{bmatrix}0\\1\\0\end{bmatrix}\right)=\begin{bmatrix}3\\0\end{bmatrix}, T\left(\begin{bmatrix}0\\0\\1\end{bmatrix}\right)=\begin{bmatrix}4\\-7\end{bmatrix}.$$

   Find $T\begin{bmatrix}x\\y\\z\end{bmatrix}$ and hence find $T\begin{bmatrix}1\\-2\\3\end{bmatrix}$.

   c)   If $\bar{u}$ and $\bar{v}$ are orthogonal vectors in an inner product space V such that $\|\bar{u}\|=1$ and $\|\bar{v}\|=1$, then show that $\|\bar{u}+\bar{v}\|^2 + \|\bar{u}-\bar{v}\|^2 = 4$.

Q3) Attempt <u>any two</u> of the following: **[10]**

   a)   If W_1 and W_2 are subspaces of a vector space V, prove that $W_1 \cap W_2$ is a subspace of V.

   b)   Find the range and rank of the linear transformation T: $\mathbb{R}^3 \to \mathbb{R}^2$ defined by $T(x, y, z) = (x+y, y+z)$.

   c)   Find a linear transformation T: $\mathbb{R}^2 \to \mathbb{R}^2$ such that $T(1,0) = (1,1)$ and $T(0,1) = (-1, 2)$.

Q4) Attempt <u>any One</u> of the following: **[10]**

   a)   Let $\mathbb{R}^3$ have the Euclidean inner product. Use gram-schmidt process to transform the basis $\{\bar{u}_1, \bar{u}_2, \bar{u}_3\}$ into an orthonormal basis, where $\bar{u}_1 = (1,1,1), \bar{u}_2 = (0,1,1), \bar{u}_3 = (0,0,1)$.

   b)   i)   If $\bar{u}, \bar{v}$ and $\bar{w}$ are vectors such that

   $<\bar{u}, \bar{v}> = -1, <\bar{v}, \bar{w}) = 3, <\bar{u}, \bar{w}> = 2, \|\bar{u}\| = 3, \|\bar{v}\| = 2, \|\bar{w}\| = 1$ then evaluate

   $<\bar{u} - \bar{v} - 2\bar{w}, 4\bar{u} + \bar{v}>$.

   ii)   Find eigen values, eigen spaces and basis of eigen spaces of the matrix $A = \begin{bmatrix}3 & 0\\8 & -1\end{bmatrix}$.

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SEAT No. :

[4817]-202

S.Y.B.Sc.

MATHEMATICS

MT-222 (A): Vector Calculus - II

(2008 Pattern) (Paper - II (A)) (Semester - II) (511A2)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates:

1)   All questions are compulsory.

2)   Figures to the right indicate full marks.

Q1) Attempt <u>any</u> <u>five</u> of the following: **[10]**

a)   Find $\lim\limits_{t \to 2} \left[\dfrac{\sin(t-2)^2}{t-2} \bar{i} + \dfrac{t^2-4}{t-2} \bar{j} \right]$.

b)   If $\bar{u} = t\bar{i} + 2\bar{j} - t^2\bar{k}$ and $\bar{v} = e^t\bar{i} - e^{-t}\bar{j}$ then find $\dfrac{d}{dt}(\bar{u} \cdot \bar{v})$.

c)   For the curve $\bar{r}(t) = (t^2+1)\bar{i} + (3t-4)\bar{j} + (t^2-1)\bar{k}$. Find unit tangent vector at $t = 2$.

d)   If $\phi(x, y) = \dfrac{x^3}{3} - xy^2$, find $|\nabla \phi|$.

e)   State Gauss's divergence theorem.

f)   Find the value of 'a' if the vector field

$\bar{u}(x, y, z) = (2x+y)\bar{i} + (y-2z)\bar{j} + (x-az)\bar{k}$ is solenoidal.

g)   Evaluate the integral of $\bar{f} = x^2\bar{i} - xy\bar{j}$ from O(0,0) to P(1,1) along the parabola $y^2 = x$.

P.T.O.

Q2) Attempt <u>any two</u> of the following: **[10]**

a) If $\overline{f}(t)$ is differentiable at t_0 then show that it is continuous at t_0. Is the converse true? Justify it by giving example.

b) Find the directional derivative of $\phi(x, y, z) = x^2\, y\, z + 4\, z^2\, x$ at point $(1, -2, -1)$ in the direction $2\overline{i} - \overline{j} - 2\overline{k}$.

c) If $\overline{u} = 2xz^2\overline{i} - yz\overline{j} + 3xz^3\overline{k}$, $\phi = x^2\, y\, z$ verify that div (Curl $\phi\overline{u}$) = 0.

Q3) Attempt <u>any two</u> of the following: **[10]**

a) With usual meaning, prove that Curl $(\phi\overline{u}) = $ grad $\phi \times \overline{u} + \phi$ Curl $\overline{u}$.

b) Find the scalar potential ϕ if

$$\nabla\phi = (x + 2y + 4z)\overline{i} + (2x - 3y - z)\overline{j} + (4x - y + z)\overline{k} \text{ if } \phi(2,-2,0)=-4.$$

c) Prove that $\nabla^2 r^n = n(n+1)r^{n-2}$.

Q4) Attempt <u>any one</u> of the following: **[10]**

a) State Green's theorem in a plane. And verify it for the vector function $\overline{F} = (xy + y^2)\overline{i} + x^2\overline{j}$ over the region bounded by $y = x$ & $y = x^2$.

b) i) Evaluate $\iint \overline{F}\cdot\hat{n}ds$ using divergence theorem for

$$\overline{F} = 4xz\overline{i} - y^2\overline{j} + yz\overline{k} \text{ over a cube bounded by } x = 0, x = 1, y = 0,$$
$y = 1, z = 0, z = 1$.

ii) Prove that $\oint e^x dx + 2ydy - dz = 0$, where C is the curve $x^2 + y^2 = 4, z = 2$.

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S.Y.B.Sc.

MATHEMATICS

MT-222 (B) : Discrete Mathematics

(2008 Pattern)(Paper-II (B)) (Semester-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

    1)   All questions are compulsory.

    2)   Figures to the right indicate full marks.

    3)   Use of non-programmable scientific calculator is allowed.

Q1) Attempt any five of the following: **[10]**

    a)   In how many ways can 4 identical red pens, 6 identical green pens and 3 identical blue pens be arranged ?

    b)   Suppose A = event of selecting a prime number less than 10 and B=event of selecting an even number less than 10. Then in how many ways these events occur?

    c)   Solve the recurrence relation $a_n - 6a_{n-1} + ga_{n-2} = 0$

    d)   State second principle of mathematical induction.

    e)   Let A={2,3,4,8}, B= {4,6,9}. A relation R from set A to set B is given by R={(2,4) (2,6) (3,6) (3,9)(4,4)}. Find the matrix M_R of the relation R.

    f)   Define 'transportation network'.

    g)   Define complement of a graph G. Draw complement of a graph given below.
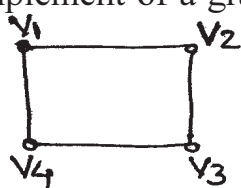
Q2) Attempt any two of the following: **[10]**

    a)   Using principle of induction, prove that the sum of first n natural numbers is $\dfrac{n(n+1)}{2}$

    b)   Prove that the number of vertices in a self-complementary graph is of the type 4K or 4K+1, where K is an integer.

    c)   Define linear recurrence relation and find the particular solution of $a_n - 7a_{n-1} + 12a_{n-2} = 3 + a_r$.

Q3) Attempt any two of the following: **[10]**

a) By using the laws of Boolean arithmetic, show that the Boolean expressions $(z' \vee x) \wedge [(x \wedge y) \vee (z' \vee y)]$ and $x \wedge y$ are equivalent.

b) Let S={2,4,6,8,10,12}. For $a, b \in s$ define $a \leq b$ if $a|b$ show that $(s, \leq)$ is a poset. Also draw Hasse diagram of this poset.

c) Using Fleury's algorithm find an Eulerian circuit in the following graph.
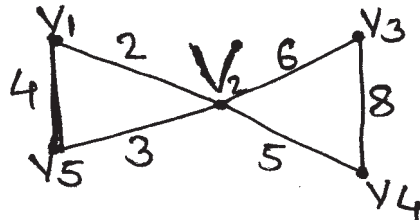
Q4) Attempt any one of the following: **[10]**

a) i) Using Kruskal's algorithm find the shortest spanning tree of the following graph.
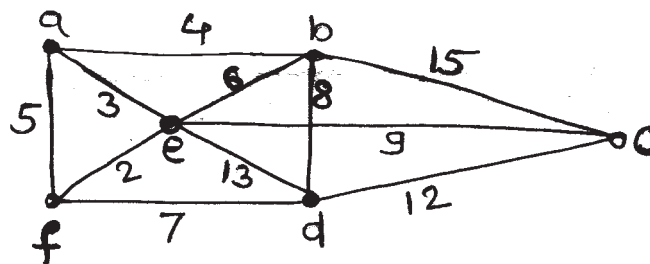
ii) If G is a connected graph and every vertex has even degree then prove that there is a Euler circuit in G.

b) i) A simple graph G has a vertex set {2,3,4,6,7,8,10,11}. An edge exists between two vertices x and y if $x \neq y$ and x divides y. Draw the graph G. Is G connected? Give reason.

ii) Let A ={a,b,c,d,e}. Find the digraph of the relation R defined on

$$A, \text{ whose matrix is } M_R = \begin{bmatrix} 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$

find the out degree and in degree of each vertex.

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S.Y.B.Sc.

PHYSICS

PH-221: Oscillations, Waves and Sound

(2008 Pattern) (Paper - I) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:

    1)   All questions are compulsory.

    2)   Figures to the right indicate full marks.

    3)   Draw neat diagrams wherever necessary.

    4)   Use of log tables and calculators is allowed.

Q1) Attempt ALL of the following (one mark each):   **[10]**

    a)   What is phase of S.H.M.?

    b)   Give the reason for decrease in amplitude of damped oscillator.

    c)   The equation of forced oscillations of an oscillator is

$$5\frac{d^2x}{dt^2} + 20\frac{dx}{dt} + 245x = f_0 \sin qt \, .$$ Determine resonant angular frequency.

    d)   Define wave.

    e)   What is red shift?

    f)   Explain quality of sound.

    g)   Define linear S.H.M.

    h)   A capacitor of 0.4 µF,an inductor of 80 mH and resistor of 400Ω are connected in series . Can the electrical circuit be oscillatory?

    i)   What is resonance?

    j)   What are seismic waves?

P.T.O.

Q2) Attempt any TWO (five marks each): **[10]**

a) Define half width of resonance curve. Show that half width is given by $\Delta\omega = \dfrac{R}{2m}$.

b) Derive an expression for average energy of damped harmonic oscillator.

c) Derive an expression for acoustic pressure of sound in terms of intensity.

Q3) Attempt any TWO (five marks each): **[10]**

a) A particle performing S.H.M. has velocities 8cm/ sec and 10 cm/ sec when it is at distances 5 cm and 4 cm respectively from the mean position. What is it's amplitude?

b) The equation of forced oscillation is given by

$2\dfrac{d^2x}{dt^2} + 3\dfrac{dx}{dt} + 16x = 30\sin 2t$. Find velocity amplitude and maximum kinetic energy.

c) The velocity of sound in water of density 1000 kg/m³ is 1500 m/sec. Determine the bulk modulus of water.

Q4) a) Attempt the following (eight marks): **[8]**

i) Define angular S.H.M. and obtain the expression for frequency of oscillation.

ii) Write a note on Doppler shift and its applications.

OR

i) What do you meant by wave velocity and particle velocity. Show that wave velocity is given by $u = \dfrac{\omega}{K}$

ii) What is logarithmic decrement of damped oscillator? Show that the log decrement $\lambda = \dfrac{RT}{2m}$.

b) Attempt any ONE (two marks): **[2]**

i) A railway engine blowing a whistle of frequency 960 Hz and listener is moving with velocity 10 m/sec and 2 m/sec respectively towards each other. Determine apparent frequency of sound as heard by listener. (Given velocity of sound is 330 m/sec)

ii) The volume of space in a hall is 1350 m³. The total surface area of absorbers present is 135 m² (in open windows). Determine the reverberation time for the hall.

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S.Y. B.Sc.

PHYSICS

PH-222: OPTICS

(2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw neat diagrams wherever necessary.*
4) *Use of log tables and calculators is allowed.*

Q1) Attempt All of the following (One mark each)   **[10]**

a) Write Lens Maker's formula.

b) What is chromatic aberration?

c) A converging lens of power 25D is used as a simple microscope. Calculate magnifying power, if DDV=25cm.

d) What is plane diffraction grating?

e) What is positive crystal?

f) What are uses of Polaroid?

g) A convex lens has radii of curvatures 1m and 2m. If the RI of material is 2.33, what will be it's focal length?

h) Find the polarizing angle for transperent meterial of RI 1.732.

i) State the Brewster's law?

j) What are Haidinger's fringes?

Q2) Attempt any Two (five marks each):   **[10]**

a) Obtain the expression for equivalent focal length for the combination of two thin lenses seperated by finite distance.

b) Obtain the expression for magnifying power of a compound microscope.

c) Obtain the expression for path difference between two successive rays in transmitted system from a parallel sided film.

Q3) Attempt any two (Five marks each) **[10]**

    a) The focal length of an achromatic combination of two lenses in contact is 100 cm. The magnitude of the dispersive powers of the two lenses are 0.02 and 0.03. Calculate the focal lengths of two lenses.

    b) Light of wavelength 6.4×10^{-5} cm falls on a transperent film of thickness 0.0032 cm. Find the order of fringe corresponding to r=0°, if RI of film is 1.5 is the fringe is Bright or Dark?

    c) A 60° calcite prism is cut with its faces parallel to optic axis. Calculate the angle of minimum deviation for yellow colour of wavelength 6.0×10^{-5} cm for ordinary and extra ordinary rays. (Given: μ_o=1.658, μ_e=1.486)

Q4) A) Attempt any One (Eight marks):

    a) i) What is Distortion? State the cause and explain how it is reduced to minimum **[4]**

       ii) Obtain the expression for M.P. of simple microscope when image is formed at infinity. **[4]**

    b) i) Distinguish between Fresnel's and Fraunhoffer's diffraction. **[4]**

       ii) Explain Cardinal points for an optical system in detail. **[4]**

    B) Attempt any One (two marks): **[2]**

    a) State any two applications of Nicol's prism.

    b) Draw the diagram of Gauss's eyepiece.

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S.Y.B.Sc.

CHEMISTRY

CH-221: Inorganic Chemistry

(2008 Pattern) (Paper - I) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:

1)   All questions are compulsory.

2)   Figures to the right indicate full marks.

3)   Neat diagrams must be drawn wherever necessary.

Q1) Answer all the following (one mark each):   **[10]**

a)   What is roasting?

b)   Give the two names of aluminium ores.

c)   What is steel.

d)   Draw the structure of PCl_5 molecule.

e)   What is spin-only formula to calculate magnetic moment?

f)   Which antidote is used for arsenic poisoning?

g)   Define acids and bases according to Bronsted-Lowry theory.

h)   What is corrosion?

i)   What are paramagnetic substances?

j)   What is soft acid?

P.T.O.

Q2) Attempt any two of the following (five marks each): **[10]**

    a) Write the names symbols and electronic configuration of IIIA group elements. Explain the trends in the following properties of these elements:

        i)   Size of atoms and ions,

        ii)   Ionization potentials.

    b) Explain the Lewis concept of acids and bases with suitable examples. give their assumptions.

    c) Answer the following:

        i)   Explain biochemical effects of cadmium.

        ii)   Froth flotation process.

Q3) Attempt any two of the following (five marks each): **[10]**

    a) Give general electronic configuration of d-block elements. Explain following properties of these elements

        i)   Atomic and ionic sizes

        ii)   Oxidation states.

    b) Describe the Hoop's process of refining of aluminium.

    c) What is galvanization? Give the process of galvanization and its applications.

Q4) a) Attempt any one of the following (six marks each): **[6]**

        i)   Explain L.d. process of making steel. What are its advantages.

        ii)   What are various types of steel? Give their properties and uses.

    b) Attempt any one of the following (four marks each): **[4]**

        i)   What is passivity? Explain electrochemical passivity with applications.

        ii)   Distinguish between diamond and graphite.

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S.Y. B.Sc.

CHEMISTRY

CH-222: Analytical Chemistry

(2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Use of Calculator is allowed.*

Q1) Answer the following: **[10]**

    a) What is the equivalence point of a titration?

    b) Which is a group reagent for IIIA group?

    c) How are samples of gases obtained?

    d) Give relation between molecular formula and empirical formula.

    e) Define the term significant figure.

    f) Give the examples of primary and secondary standard substances.

    g) Why NH_4Cl is added before adding NH_4OH in inorganic qualitative analysis?

    h) What is a neutral reduction test?

    i) What are the limitations of distribution coefficient?

    j) What is bleaching powder?

Q2) a) Answer any Two of the following.   **[6]**

    i) Define the standard solution. Give the characteristics of standard solution.

    ii) Discuss different methods used to minimize errors.

    iii) Give various steps involved in organic qualitative analysis.

b) 0.2 gm of organic compound gave on combustion 28 ml of dry nitrogen measured at 27ºC and 700 mm pressure. Calculate the percentage of nitrogen in the compound. **[4]**

Q3) a) Answer any Two of the following. **[6]**

i) What is efficiency of extraction? Give the advantages of solvent extraction.

ii) Explain the term common ion effect. Give one application of it in qualitative analysis.

iii) Explain a method of estimation of Cu in crystallized Copper Sulphate.

b) Solve any One of the following. **[4]**

i) Following results were obtained by a student on repeating the same experiment four times i.e. 24.5%, 24.4%,24.6% and 24.3%. Calculate mean deviation, standard deviation and relative mean deviation.

ii) A metal was extracted to the extent of 90%, when equal volumes of aqueous and organic phases where shaken together. What will be the % extraction, if the volume of organic phase is triple?

Q4) a) Explain the Liebig's method of estimation of Carbon and Hydrogen in an organic compound. **[6]**

OR

Explain the titration curve of strong acid and strong base. Which indicator will you choose for this titration? Why?

b) Answer any One of the following. **[4]**

i) Discuss the use of yellow ammonium sulphide in inorganic qualitative analysis.

ii) What are the requirements for successful application of an adsorption indicator.

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S.Y. B.Sc.

BOTANY

BO-221: Structural Botany

(Anatomy, Embryology and Palynology)

(2008 Pattern) (Theory) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

    1)   All questions are compulsory.

    2)   Figures to the right indicate full marks.

    3)   Draw neat labelled diagrams wherever necessary.

Q1) Attempt the following: **[10]**

    a)   Enlist the mechanical tissues present in plants.

    b)   Define palynology.

    c)   What is microsporogenesis?

    d)   Mention types of epidermal outgrowths.

    e)   What is periderm?

    f)   What is pollengrain?

    g)   Define normal secondary growth.

    h)   Mention any two types of microspore tetrad.

    i)   What is porogamy?

    j)   What are growth rings?

Q2) Answer any Two of the following.   **[10]**

    a)   What are lenticels? Describe the structure and function of lenticels.

    b)   What are secretory tissues? Describe structure and functions of glandular tissue.

    c)   Describe the structure of dicot and monocot embryo.

Q3) Write shortnotes on any two of the following. [10]

    a)   Structure of tetrasporangiate anther.

    b)   Applications of palynology.

    c)   Xylem.

Q4) What is anomalous secondary growth? Explain it in <u>Raphanus</u> root. [10]

<center>OR</center>

What is embryo sac? Describe development of monosporic embryo sac.

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S.Y.B.Sc.

BOTANY

BO-222: Fundamentals of Plant Biotechnology

(2008 Pattern) (51422) (Paper - II) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:

1)   All questions are compulsory.

2)   Figures to the right indicate full marks.

3)   Draw neat labelled diagrams wherever necessary.

Q1) Attempt the following: **[10]**

a)   Write any two raw materials used as substrates in biotechnology.

b)   What is cytoplasmic male sterility?

c)   Give any two examples of GMOs plants.

d)   Enlist different phases in bioprocess technology.

e)   What is Immobilization of enzymes?

f)   Enlist any two biodiesel plants.

g)   Write any two economic implication of SCP.

h)   What is synthetic seeds?

i)   Write any two applications of plant tissue culture.

j)   Give any two methods of aerobic waste water treatment.

Q2) Answer any two of the following: **[10]**

    a)   Describe biomass strategy.

    b)   Give advantages of genetic modification in genetic engineering.

    c)   Sketch, label and describe stirred tank bioreactor.

Q3) Write short notes on (any two): **[10]**

    a)   Scale up technique.

    b)   Activated sludge fermenter.

    c)   SCP from wastes.

Q4) What is an embryogenesis? Describe various stages m embryogenesis. **[10]**

<div align="center">OR</div>

What is DNA amplification? Describe the procedure of DNA amplication

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S.Y. B.Sc.

ZOOLOGY

ZY-221 : General Zoology and Biological Techniques (Part-II)

(2008 Pattern) (Paper-I) (Semester-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

    1)   *All questions are compulsory.*

    2)   *Neat labelled diagrams must be drawn wherever necessary.*

    3)   *Figures to the right indicate full marks.*

Q1) Attempt the following: **[10]**

    a)   Write any two uses of scales in fishes.

    b)   What is leucocytosis?

    c)   Write any two examples of aquatic mammals.

    d)   What is protocercal fin?

    e)   What is fossil?

    f)   Enlist any two primary aquatic adaptations in vertebrates.

    g)   Write any two examples of cursorial feet.

    h)   What is hemibranch?

    i)   What is the function of scroll valve?

    j)   Write the names of any two chambers of heart in <u>Scoliodon</u>.

Q2) Write short notes on (Any Two): [10]

    a)   Ampulla of Lorenzini in <u>Scoliodon</u>.

    b)   Preparation of methylene blue and acetocarmine.

    c)   Tearing and piercing beak.

Q3) Attempt the following (Any Two): [10]

    a)   Sketch and label - male urinogenital system of <u>Scoliodon</u>.

    b)   Describe the method of preparation of molar solution.

    c)   Principle of compound microscope.

Q4) Describe in detail the brain of <u>Scoliodon</u>. [10]

<div align="center">OR</div>

What is migration? Describe the different types of migrations in birds.

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S.Y. B.Sc.
ZOOLOGY
ZY-222: Applied Zoology (Part-II) (Apiculture and Sericulture)
(51522) (2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
  1)   All questions are compulsory.
  2)   Neat labelled diagrams must be drawn wherever necessary.
  3)   Figures to the right indicate full marks.

Q1) Attempt the following.   **[10]**

   a)   What is swarming?

   b)   Mention biological name of Eri silk worm.

   c)   Give uses of Queen excluder.

   d)   Define the term deflossing.

   e)   Give the common name of <u>Apis dorsata</u>.

   f)   Give uses of chopsticks.

   g)   Mention two diseases of the bees.

   h)   Give two uses of Royal jelly.

   i)   Give two symptoms of flacherie disease of silk worm.

   j)   Define 'hibernating egg'.

Q2) Write short notes on (Any Two):   **[10]**

   a)   Hoffman type hive frame.

   b)   Composition and uses of bee wax.

   c)   Leaf plucking method of mulberry harvesting.

Q3) Attempt the following (Any Two): [10]

    a)   Describe tail-wagging dance in bees.

    b)   Explain rearing methods of mulberry silkworm.

    c)   Describe mature larve of 'Bombyx mori'.

Q4) Describe in detail 'Life cycle of honey bee'. [10]

<div align="center">OR</div>

Give an account of cultivation of mulberry.

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[4817]-212

S.Y. B.Sc.

GEOLOGY

GL-221:Petrology

(2008 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1)   All questions are compulsory.
   2)   Neat labelled diagrams must be drawn wherever necessary.
   3)   Figures to the right indicate full marks.

Q1) Answer the following questions: **[10]**

   a)   Mention two Arenaceous rocks.

   b)   What is Rhyolite?

   c)   Define load of transporting medium.

   d)   Define metamorphism.

   e)   What is Bauxite?

   f)   Define primary magma.

   g)   What is cataclasite?

   h)   Mention two stress minerals.

   i)   Name any two minerals of high silication.

   j)   Mention the two phases of magma.

Q2) Write notes on (Any Two):   **[10]**

   a)   Idioblastic and xenoblastic crystals.

   b)   Graphic and poikilitic texture.

   c)   Diagenesis.

Q3) Write notes on (any two): **[10]**

   a)   Orbicular and spherulitic structure.

   b)   Thermal metamorphism of Arenaceous rocks.

   c)   Biochemical Deposits.

Q4) Define primary sedimentary structures. Explain the origin and environmental significance of Graded Bedding and Ripple marks. **[10]**

<div align="center">OR</div>

   What are unicomponent and Bicomponent magmas? Describe the factors controlling grain size of Igneous rocks.

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S.Y. B.Sc.

GEOLOGY

GL - 222 : Stratigraphy & Palaeontology

(Semester - II) (Paper - II) (2008 Pattern)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Draw the diagrams wherever necessary.*
3) *Figures to the right indicate full marks.*

Q1) Answer the following questions: **[10]**

    a)   What are Pollens of Spores?

    b)   Enumerate any four uses of microfossils.

    c)   What is Trochospiral coiling in foraminifera?

    d)   What is Palynology?

    e)   Define evolution.

    f)   Define an unconformity.

    g)   What is marine transgression.

    h)   Define guide or Index fossil.

    i)   What are the two methods of correlation.

    j)   Define Marker beds.

Q2) Write notes on (any two):   **[10]**

    a)   Cyclothems.

    b)   Alternations and Varves.

    c)   No radical change in environment.

Q3) Explain the following (any two): **[10]**

    a)   Evolutionary trends in ammonoids.

    b)   Evolutionary trends in glabella of Trilobites.

    c)   Types of hinges in Ostracods.

Q4) What is meant by lithostratigraphic classification? Describe it units in detail.**[10]**

<div align="center">OR</div>

Explain the laboratory techniques for separation of microfossils.

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[4817]-214

S.Y. B.Sc.

STATISTICS

ST-221: Statistical Methods and National Income

(2008 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
 1) *All questions are compulsory.*
 2) *Figures to the right indicate full marks.*
 3) *Use of calculators and statistical tables is allowed.*
 4) *Symbols and abbreviations have their usual meanings.*

Q1) Attempt each of the following:

   a) Choose the correct alternative in each of the following: **[1 each]**

      i)   Cost of living index number depends on

           A)   Government prices.

           B)   Retail prices

           C)   Wholesale prices

           D)   Retail and wholesale prices

      ii) The regression planes coincide if

           A) $|R| = 0$ B) $|R| = 1$

           C) $|R| > 0$ D) $|R| \neq 1$

      iii) If $R_{1.23} = 1$ then var $(X_{1.23})$ is

           A)   0   B)   1

           C) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$

   b) State whether the given statement is true or false in each of the following: **[1 each]**

      i) $r_{12.3} = b_{12.3} \times b_{21.3}$

      ii) In test of significance two types of errors are possible.

      iii) Index numbers are unitless.

c) If $\sigma_1^2 = 4, |R| = 8$ and $R_{11} = 20$, compute var $(X_{1.23})$ [1]

d) Define the term national income. [1]

e) Define type-I error. [1]

f) If $r_{12} = r_{13.2} = \dfrac{1}{2}$, find $R_{1.23}$ [1]

Q2) Attempt <u>any two</u> of the following: [5 each]

a) Describe the large sample test procedure to test $H_0:P=P_0$ against the alternative hypothesis.
   i) $H_1:P>P_0$
   ii) $H_1:P<P_0$
   iii) $H_1:P \neq P_0$
   where P_0 is population proportion.

b) Derive an expression for multiple correlation coefficient $(R_{1.23})$ interms of total correlation coefficients.

c) With usual notations, prove that $b_{12.3} = \dfrac{b_{12} - b_{13}b_{32}}{1 - b_{23}b_{32}}$

Q3) Attempt any <u>two</u> of the following: [5 each]

a) Explain the product method and income method of measuring national income.

b) A random sample of 400 persons from country A gave mean height 170 cms. Another sample of 800 persons from country B gave mean height 178 cms. Can you say that persons in country B are taller than those of country A given that their population standard deviations are 6 cms and 8 cms respectively? Use 5% level of significance.

c) Compute the cost of living index number for year 2013 from the following data:

Items	Price in 2012	Price in 2013	Expenditure in percentage
Food	250	274	35
House rent	150	160	15
Clothing	100	125	20
Fuel	120	125	10
Others	160	190	20

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Q4) Attempt any <u>one</u> of the following:

    a)   i)   Derive the equation of least square regression plane of X_1 on X_2 and X_3. **[7]**

        ii)   Discuss advantages of chain base index number as compared to fixed base index number. **[3]**

    b)   i)   Show that the condition for consistency of given total correlation coefficients is $r_{12}^2 + r_{13}^2 + r_{23}^2 - 2r_{12}r_{13}r_{23} \leq 1$. **[4]**

        ii)   Explain how to construct 100 (1-α)% confidence interval for population mean (μ). **[3]**

        iii) State any three situations where logistic regression can be used. **[3]**

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S.Y. B.Sc.

STATISTICS

ST - 222 : Continuous Probability Distributions - II and Demography

(2008 Pattern) (Semester - II) (Paper - II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of calculator and statistical tables is allowed.*
4) *Symbols and abbreviations have their usual meaning.*

Q1) Attempt each of the following:

a) Choose the correct alternative in each of the following: **[1 each]**

   i) The moment generating function (m.g.f.) of a Chi-square (χ^2) distribution is $M_X(t) = (1 - 2t)^{-5}$, then mean of r.v. X is

      A) 10   B) 5

      C) 2   D) 4

   ii) If NRR > 1, we interpret it as:

      A) Decrease in population size

      B) Constancy in Population size

      C) Increase in Population size

      D) Cannot conclude about the population size

   iii) Total Fertility Rate (TFR) gives the total number of

      A) Still Births   B) Boys

      C) Girls   D) Children

      Born per 1000 women in the reproductive age group.

b)   State whether each of the following statements is true or false: **[1 each]**

    i)   The F-distribution is positively skewed.

    ii)   A statistic is a function of parameters of a distribution.

    iii) GRR is greater than NRR.

c)   State $100(1 - \alpha)$% confidence interval for the population mean when population variance is known. **[1]**

d)   State the test statistic used in paired t-test. **[1]**

e)   Define standard error of a statistic. **[1]**

f)   A random variable follows t distribution with 12 degrees of freedom. Obtain its variance. **[1]**

Q2) Attempt any two of the following: **[5 each]**

a)   Define Chi-square $\left(\chi^2\right)$ probability distribution with n degrees of freedom. Derive its mean.

b)   Derive the sampling probability distribution of mean of random sample drawn from a $N(\mu, \sigma^2)$ distribution.

c)   A wholesaler sells rice bags. He claims that the average weight (in kg) of rice bags is 50 kg. A random sample of 8 rice bags is drawn and the weights are noted:

48, 52, 50, 42, 44, 45, 43, 48.

Test whether the claim of the wholesaler is true, by carrying out an appropriate test. (Use l.o.s. $\alpha = 0.05$).

Q3) Attempt any two of the following: **[5 each]**

a)   Define Student's t distribution with n degrees of freedom and derive its probability density function (p.d.f.).

b)   Explain the test procedure for testing equality of two population variances.

c) The following information is collected:

	Healthy mother	Unhealthy mother
Healthy child	98	17
Unhealthy child	13	72

Using an appropriate test, check whether the two attributes health of mother and health of child are independent or not. Use l.o.s. $\alpha = 0.05$.

Q4) Attempt any one of the following:

a) i) Define F distribution with n_1 and n_2 degrees of freedom. Derive its mean and variance. **[6]**

ii) If a r.v. $X_1 \sim N(0, 1)$ and r.v. $X_2 \sim N(0, 1)$, X_1 and X_2 are independent r.v.s then obtain $P[(X_1 + X_2)^2 \leq 2.5, (X_1 - X_2)^2 \geq 2.2]$. **[4]**

b) i) Explain the following terms: **[5]**

1) Age specific death rate.

2) Standardized death rate.

3) Crude Birth Rate.

ii) State the interrelations among Normal, Chisquare, t and F distributions. **[5]**

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S. Y. B.Sc.

GEOGRAPHY

Gg-221: Distribution, Development and Planning of Resources

(Paper-I) (2008 Pattern)(Semester-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

  1)   All questions are compulsory.

  2)   Figures to the right indicate full marks.

  3)   Draw neat diagrams and sketches wherever necessary.

  4)   Use of map stencil is allowed.

Q1) Answer the following questions in two to three sentences each: **[10]**

  a)   Name any four major countries producing iron ore.

  b)   Name any two states producing bauxite in India.

  c)   Give any two petroleum producing states in India.

  d)   What do you mean by non-conventional energy resources.

  e)   Give any two names of coal fields in India.

  f)   Name any two densely populated states in India.

  g)   What is under population?

  h)   What is meant by resource planning?

  i)   What are the various types of Coal?

  j)   What are the various uses of land resources?

Q2) Write short notes on the following (Any Two) :   **[10]**

    a)   Distribution of iron-ore in India.

    b)   Nuclear energy in India.

    c)   Distribution of natural gas in the world.

Q3) Answer the following questions (Any Two):   **[10]**

    a)   Give an account of the world production of bauxite.

    b)   Explain the significance of wind energy.

    c)   Explain the need of resource planning.

Q4) Explain the role of land resources in economic development.   **[10]**

OR

Discuss the problems of over-population.

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S.Y. B.Sc.

GEOGRAPHY

Gg-222: Surface Water and Ground Water Hydrology

(2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks*
3) *Draw neat diagrams and sketches wherever necessary.*
4) *Use of map stencil is allowed.*

Q1) Answer the following questions in two or three sentences each: **[10]**

  a)   Define ground water hydrology.

  b)   What do you mean by surface runoff?

  c)   What do you mean by river regime?

  d)   Define intermediate zone.

  e)   What do you mean by ground water basin?

  f)   Name any two methods of evaporation control.

  g)   What is urban hydrology?

  h)   Define subsurface water.

  i)   Give any two causes of flood.

  j)   Give any two applications of rational method

Q2) Write short notes on the following (Any Two):   **[10]**

  a)   Approaches to urban hydrology

  b)   Snow melt hydrology.

  c)   Evapotranspiration.

Q3) Answer the following (Any Two): **[10]**

    a)   Describe the factors affecting surface runoff.

    b)   Describe the peak flow method.

    c)   Explain the flood hydrograph.

Q4) Define evaporation. Explain the methods to control evaporation. **[10]**

<div align="center">OR</div>

Give an account of distribution of subsurface water.

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S. Y. B. Sc

MICROBIOLOGY

MB-221: Bacterial Systematics and analytical Microbiology

(2008 Pattern) (Semester-II)(Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to candidates:
1) *All questions are compulsory.*
2) *Draw neat labelled diagrams wherever necessary*
3) *Use of calculators, log tables and statistical table is allowed.*
4) *Use graph paper if necessary.*

Q1) Attempt the following.   **[10]**

 a) Define mode

 b) In strtified random sampling _____

   i)   Samples are chosen at random

   ii) Samples are chosen at random from different strata of population.

   iii) Samples are drawn from selected clusters.

 c) Define dendogram

 d) Derivative of constant is _____

 e) State True or False

$$\frac{d}{dx}(x^n) = nx^{n+1}$$

 f) Write the formula for range.

 g) Continuous variables are represented by _____

   i) Histogram   ii) Line Diagram   iii) Bar diagram

 h) Define variables

 i) Define - DNA hybridization

 j) Ist edition of Bergey's manual of systematic bacteriology includes _____ sections.

Q2) Attempt the following.(any two)   **[10]**

     a)   Draw graph of following linear equation 2x-3y<6

     b)   Calculate the standard deviation for the following data

         18, 20, 22, 27, 21, 29, 27, 29, 28, 29

     c)   Describe G + C content as a tool for classification of bacteria.

Q3) Attempt the following.(any two)   **[10]**

     a)   Find $\dfrac{dy}{dx}$ if $y = \dfrac{x^2 + 1}{x^3 + 4}$

     b)   Draw pie chart of percentage expenditure of middle class family on various items.

Item	Food	House	Clothing	Education	Saving	Miscellaneous
Percentage Expenditure	50	10	10	10	15	05

     c)   What is Numerical taxonomy? Describe various steps involved in it.

Q4) Attempt the following (any two)   **[10]**

     a)   Comment on chemotaxonomy based on cell wall composition.

     b)   Evaluate : $\int (2x + 1)^2 dx$

     c)   Draw the bar diagram from the following data.

year	1950-1951	1960-1961	1970-1971	1975-1976	1980-1981	1985-1986	1986-1987
Yield per hectare	668	1013	1123	1235	1336	1552	1482

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S.Y. B.Sc.

MICROBIOLOGY

MB-222: Applied Microbiology-I

(2008 Pattern) (Theory) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

    1)   *All questions are compulsory.*

    2)   *Figures to the right indicate fullmarks*

    3)   *Draw neat labelled diagrams wherver necessary.*

Q1) Attempt the following.   **[10]**

    a)   Enlist any two methods of Air-sanitation.

    b)   MPN of municipal potable water should be_____

        i)   0   ii)   100   iii)   50   iv)   500

    c)   Activated sludge system is _____stage of effluent treatment

        i)   Primary   ii)   Tertiary   iii)   Quaternary   iv)   Secondary

    d)   What is meant by 'Master culture' in fermentation industry.

    e)   Enlist any 4 parts of CSTR.

    f)   Give any one example of dual fermentation

    g)   Enlist any two air borne infections

    h)   Slow sand filter is used in purification of _____

        i) Air   ii) Sewage   iii) Water   iv) Soil.

    i)   Name any two fermentation parameters requiring manitoring and control.

    j)   What is meant by "ground water"

Q2) Attempt of the following any two. **[10]**

    a) Comment on the use of E.coli and <u>campylobacter</u> spp as indicators of faecal pollution of water.

    b) Enlist the desirable characteristic of an Industrial strain

    c) Give the principle & significance of B.O.D test.

Q3) Attempt of the following any two. **[10]**

    a) Justify: Air flora is transient.

    b) Write a short note on: Continous fermentation.

    c) Enlist the methods of primary screening of industrially important micro-organisms and describe any one in detail.

Q4) Attempt the following any one. **[10]**

    a) Enlist two examples and describe the nutritional aspect of the following in preparation of fermentation media

       i) Carbon source   ii) Vitamin source

       iii) Mineral source   iv) Buffer

    b) Enlist various bacteriological tests used for checking the potability of water. Explain any two in detail.

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S. Y. B. Sc.

PSYCHOLOGY

Health Psychology

(Semester - II) (Paper - I) (2008 Old Course)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
  1) *Attempt all questions.*
  2) *Draw the figures and diagrams wherever necessary.*
  3) *Figures to the right indicate full marks.*

Q1) Answer in <u>two or four</u> sentences.   **[16]**

  a)   Define coping.

  b)   State the full form of AIDS.

  c)   Define life style.

  d)   State any two effects of overeating on health.

  e)   Define frustration.

  f)   Define health Psychology.

  g)   Define burnout.

  h)   Define illness.

Q2) Attempt <u>any two</u> of the following in eight or ten sentences.   **[8]**

  a)   Explain in detail the Bio-medical model of illness.

  b)   Describe problem focused constructive coping.

  c)   Explain the effect of smoking on health.

Q3) Write short notes on <u>any two</u> of the following: **[8]**

    a)   Lack of exercise and health.

    b)   Stress embedded in the environment.

    c)   Behaviour & AIDS.

Q4) Define stress. Explain in detail the potential effects of stress on health.   **[8]**

<div align="center">OR</div>

Describe in detail common coping patterns.

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S. Y. B. Sc.

PSYCHOLOGY

Counselling Psychology

(Semester - II) (Paper - II) (Old - 2008 Pattern)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
  1) *All questions are compulsory.*
  2) *Draw the Figures and diagrams wherever necessary.*
  3) *Figures to the right indicate full marks.*

Q1) Answer in two or four sentences.   **[16]**

  a)   What is Gestalt view?

  b)   Define assessment in counselling.

  c)   What is confidentiality?

  d)   Define person centered counselling.

  e)   State the ethics in counselling.

  f)   Who introduced cognitive therapy?

  g)   Define counselling.

  h)   What is the full form of REBT?

Q2) Attempt any two of the following in eight or ten sentences.   **[8]**

  a)   Explain the stages of counselling.

  b)   Explain Gestalt counselling.

  c)   Explain the difference between children & adult counselling.

Q3) Write short notes (any two):   **[8]**

   a)   Counselling agenda of older adults.

   b)   Cognitive theory of counselling.

   c)   Characteristics of effective counsellor.

Q4) Explain in detail the characteristics of older patients.   **[8]**

                              OR

Explain in detail the communicating process at the time of counselling of children & Parents.

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S.Y. B.Sc.
ELECTRONIC SCIENCE
EL - 212 : Electronic Instrumentation
(2008 Pattern) (Semester-I) (Paper-II) (New)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1) All questions are compulsory.
   2) Draw the neat diagrams wherever necessary.
   3) Figures to the right indicate full marks.
   4) Use of non-programmable calculator is allowed.

Q1) Answer All of the following

   a)   Define Resolution of measuring instrument.   **[1]**

   b)   What type of coupling is used in CRO current probes?   **[1]**

   c)   What is function generator?   **[1]**

   d)   Define use of speedometer.   **[1]**

   e)   Define load-regulation of power supply.   **[2]**

   f)   Find attenuation in dB while output of signal generator varies from 0 to 0.3V.   **[2]**

   g)   Design 0-10V Voltmeter having full scale deflection current 50 micro amp. and internal resistance 500Ω.   **[2]**

   h)   Write any two applications or measurements taken by CRO.   **[2]**

Q2) Attempt Any Two of the following:

   a) Draw block diagram of function generator and explain its advantage over signal generator. **[4]**

   b) Draw block diagram of single trace CRO and explain deflection sensitivity. **[4]**

   c) Explain various types of measurement errors. **[4]**

Q3) Attempt Any Two of the following:

   a) Draw block diagram of luxmeter and explain it in brief. **[4]**

   b) With the help of neat block diagram explain working of variable power supply. **[4]**

   c) What is digital storage oscilloscope? Explain its working in brief. **[4]**

Q4) Attempt All of the following:

   a) Explain working principle of Electronic Voltmeter. Draw block diagram of it. **[6]**

   b) What is pH? Draw and explain digital pH meter in brief. **[6]**

<div align="center">OR</div>

Attempt All of the following:

   a) Determine static error if a digital voltmeter reads 4.75V and the true value of the voltage is 4.5 volts. **[4]**

   b) Design 0-250 mA range D.C. milliammeter with internal resistance 150Ω and fullscale deflection current 1mA. **[4]**

   c) Find the percent load regulation for a fixed voltage power supply when load voltage with zero load current is 10V and load with full load current is 9.5V. **[4]**

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S.Y. B.Sc.
ELECTRONIC SCIENCE
EL - 221 : Digital System Design
(2008 Pattern) (Semester-II) (Paper-I) (Old)

Time : 2 Hours] *[Max. Marks : 40*
Instructions to the candidates:
   1) *All questions are compulsory.*
   2) *Neat & labelled diagrams must be drawn whenever necessary.*
   3) *Figures to the right indicate full marks of the question.*

Q1) Attempt All of the following:

   a)   What is a parity bit? **[1]**

   b)   What is meant by VART? **[1]**

   c)   Define state table. **[1]**

   d)   Define accuracy of DAC. **[1]**

   e)   "R-2R ladder is better than resistive divider method of DAC" - Comment. **[2]**

   f)   "Synchronous counter is faster than Asynchronous Counter" - Comment. **[2]**

   g)   Solve the following: **[2]**

      i) $(11001)_{Gray} = (?)_2$.

      ii) $(11110)_{Gray} = (?)_2$.

   h)   For given Vcc = +5V, current through diode is 10mA and voltage drop across LED is 1.7V.

      Calculate value of resistance Rs. **[2]**

Q2) Attempt Any Two of the following:

    a)   Draw logic diagram of universal shift register and explain it. **[4]**

    b)   Draw logic diagram of MOD-10 counter using JK Flip-Flop and explain its operation. **[4]**

    c)   Explain single slope ADC with circuit diagram. **[4]**

Q3) Attempt Any Two of the following:

    a)   Design one bit magnitude comparator using K-map. **[4]**

    b)   Explain the concept of pressettable binary up/down counter. **[4]**

    c)   Explain CMOS NOT gate. **[4]**

Q4) Attempt All of the following:

    a)   Explain any three characteristics of CMOS logic family. **[6]**

    b)   What is a totempole? Explain in brief about open collector gates. Give its advantage. **[6]**

<div align="center">OR</div>

    a)   Find percentage resolution and resolution in volt for the following: **[4]**

        i)   A 12 bit DAC with full scale output 10 volt.

        ii)   A 9 bit DAC with fullscale output +5V.

    b)   If A = 1010 and B = 1000 are two binary inputs, then compare them using four bit magnitude comparator. **[4]**

    c)   Explain the operation of the circuit shown in the following fig. Identify the gate. Assume Enhancement MOSFETs. **[4]**
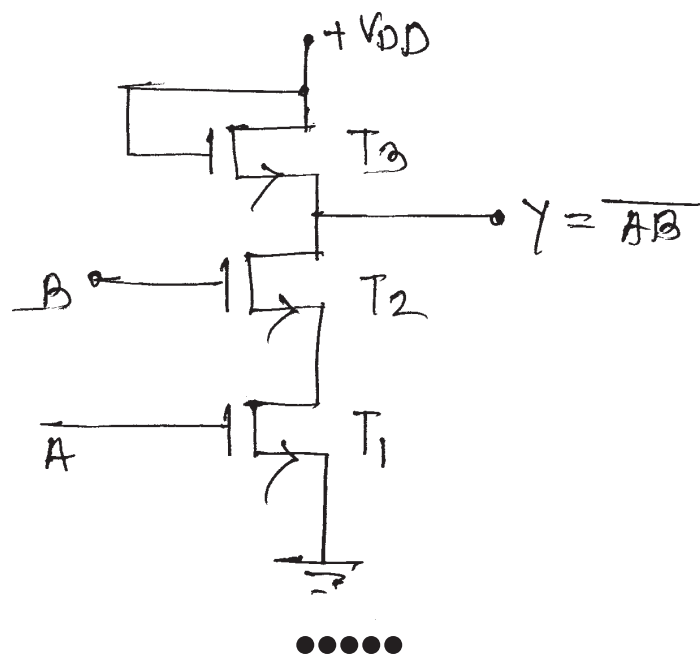
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S.Y. B.Sc.

ELECTRONIC SCIENCE

EL-222: Communication System

(2008 Pattern) (Old Course) (52222) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1)   *All questions are compulsory.*
2)   *Neat diagrams must be drawn wherever necessary.*
3)   *Use of non programmable Calculator is allowed.*

Q1) Attempt all of the followig.

a)   What is meant by simplex communication?   **[1]**

b)   Define Dynamic range of a radio receiver.   **[1]**

c)   Give features of co-axial cable.   **[1]**

d)   What is Modem?   **[1]**

e)   "In a TV synchronization pulses appear on the top of blanking level".__Comment.   **[2]**

f)   "Fax in half duplex type of communication". Comment.   **[2]**

g)   Calculate Modulation index, if carrier amplitude after modulation it varies between 4.2V & 0.6V.   **[2]**

h)   Find the number of links required to connect 100 parties in Telephone network.   **[2]**

Q2) Attempt any two of the following.

a)   Explain with neat circuit diagram of crystal receiver.   **[4]**

b)   Differentiate between pulse and DTMF dialing.   **[4]**

c)   Explain diode amplitude modulater with the help of circuit diagram. **[4]**

Q3) Attempt any two of the following.

    a)   Describe the classification of Telephone exchange. **[4]**

    b)   Derive expression for power in AM wave. **[4]**

    c)   Explain the purpose of synchronization pulses, front porch and back porch in TV signal.

Q4) Attempt the following.

    a)   Explain in detail ground wave propagation. **[6]**

    b)   Write a notes on **[6]**

        i)   Set top box   ii)   Dish TV

<div align="center">OR</div>

    a)   An Audio frequency signal $10 \sin 2\pi 500t$ is used to amplitude modulate a carrier of $50 \sin 2\pi 10^5 t$ calculate. **[4]**

        i)   Modulation Index.   ii)   Side band frequency.

    b)   A carrier swing of frequency modulated signal is 80 kHz and modulating signal is a 8 kHz sinewave determine the modulation index of FM signal. **[4]**

    c)   FM radio broadcast station operates at frequency 101 MHz is mixed with local oscillator frequency of 111.7 MHz, find Image frequency. **[4]**

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[4817]-226

S.Y. B.Sc.
DEFENCE AND STRATEGIC STUDIES
DS - 201 : Strategic International Relations
(2008 Pattern) (Semester - II) (Paper - I) (Old)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q1) Answer in 2 to 4 sentences each: **[16]**

a) Define "Armed Forces".

b) Introduce "Global Warming".

c) Define "Foreign Policy".

d) Introduce "GULF WAR I".

e) What do you mean by 'Strategic Culture'?

f) Write the role of "National Human Right Commission".

g) Differentiate between "Nation and State".

h) Introduce "Transfer of Military Technology".

Q2) Answer in 8 to 10 sentences each (any two):   **[8]**

a) Explain about the strategic advantage of "Military Pacts and Treaties".

b) Differentiate between Old and New Diplomacy.

c) Write about the need and reasons of Arms Control.

Q3) Write short notes on (any two): **[8]**

    a)   SAARC.

    b)   Human Rights.

    c)   Functions of Diplomacy.

Q4) Answer in 16 to 20 sentences (any one): **[8]**

    a)   Discuss about the complexity and obstacle in executing the arms control and disarmament.

    b)   Explain how "terrorism" can be controlled at International level?

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[4817]-227

S. Y. B. Sc

DEFENCE AND STRATEGIC STUDIES

DS-202; India's National Security

(2008 Pattern) (Old) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
  1)   *All questions are compulsory.*
  2)   *Figures to the right indicate full marks.*

Q1) Answer in 2 or 4 Sentences each   **[16]**

   a)   Define national security

   b)   Define human security

   c)   Define environmental security

   d)   Define maritime security

   e)   Define Insurgency

   f)   Define Nation

   g)   Define Diplomacy

   h)   Define Terrorism

Q2) Answer in 8 to 10 Sentences each (any two)   **[08]**

   a)   Explain importance of energy security

   b)   Discuss non military threats to India's security.

   c)   Discuss problems of air-space security

   d)   Explain India's security threats from Eastern Border

Q3) Write short notes on (any two) **[08]**

    a)   Insurgency in Assam

    b)   Maritime security

    c)   India's Foreign policy

    d)   Naxalism in India

Q4) Answer in 18 to 20 sentences (any one) **[8]**

    a)   Explain present challenges to India's security

    b)   Describe India's land border and its management

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[4817]-228

S.Y.B.Sc.

DEFENCE & STRATEGIC STUDIES

DS-203: Military Geography

(2008 Pattern) (Old Course) (Paper - III) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:

    1)   *All questions are compulsory.*

    2)   *Figures to the right indicate full marks.*

Q1) Answer in 2 or 4 sentences each: **[16]**

    a)   Write any four principles of logistics.

    b)   State any two names of "Tacticians".

    c)   Define "Grandstrategy".

    d)   How you would like to define Military Geography?

    e)   Write any two characteristics of plain warfare.

    f)   What was the "Grand Strategy" of Shivaji?

    g)   State the ideal period a High Altitude warfare.

    h)   What do you know about ship of desert?

Q2) Answer in 8 or 10 sentences (any two):   **[8]**

    a)   Explain the tactical problems of plain warfare.

    b)   Discuss in brief the logistics problems of Jungle warfare.

    c)   Explain the concept of "Tactics".

Q3) Write short notes on (Any two): [8]

    a)   Foresight" as a principle of logistics.

    b)   Concept of logistics.

    c)   Significance of Military Geography.

Q4) Answer in 16 to 20 sentences (Any one): [8]

    a)   Explain the logistics problems during High Altitude warfare.

    b)   Explain in detail grand strategy, strategy & tactics of Shivaji.

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[4817]-229

S.Y. B.Sc.

ENVIRONMENTAL SCIENCE

ENV-201: BIOLOGICAL DIVERSITY

(2008 Pattern) (New Course) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1)   All questions are compulsory.
   2)   Neat and labelled diagrams must be drawn wherever necessary.
   3)   Figures to the right indicate full marks.

Q1) Attempt the following in 1-2 lines each.   **[10]**

   a)   Define ecosystem Biodiversity.

   b)   What is meant by Endemism?

   c)   Name any 2 endemic species of India.

   d)   Name any 2 domesticated micro-organisms & their uses.

   e)   What are invasive species? Give one example.

   f)   Name any 2 National parks with a characteristic organism found in each.

   g)   Write the full form of IUCN.

   h)   What are Sacred Groves?

   i)   Name any 2 Genetically modified plant crop.

   j)   What is meant by habitat Fragmentation?

Q2) Write a short note on (Any Two):   **[10]**

   a)   Grassland ecosystems.

   b)   Convergence & Divergence in species

   c)   Endemism in India.

Q3) Answer any two from the following: **[10]**

   a)   What are hot spots? Explain the basis of hot spot identification.

   b)   What is meant by Human-Wildlife conflict? Explain with example, how it can be a threat to biodiversity.

   c)   Describe the factors responsible for agrobiodiversity.

Q4) Attempt any one of the following. **[10]**

   a)   Explain in detail the various threats, to the regions with high endemism.

   b)   Describe the various in-situ, ex-situ & traditional methods for the conservation of biodiversity.

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[4817]-230

S.Y.B.Sc.

ENVIRONMENTAL SCIENCE

ENV-202: Soil Science

(2008 Pattern) (New Course) (Paper - II) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:

   1)   *All questions are compulsory.*

   2)   *Neat and labelled diagrams must be drawn wherever necessary.*

   3)   *Figures to the right indicate full marks.*

Q1) Attempt the following in 1-2 lines each: **[10]**

   a)   Define: Soil profile.

   b)   Mention any two adverse effects of micronutrients.

   c)   What is contour farming?

   d)   Give examples of organic manure.

   e)   What is weathering?

   f)   Enlist any 2 functions of Actinomycetes in soil.

   g)   Name the instrument used for mesuring soil moisture.

   h)   What is meant by Bioremediation of soil?

   i)   State the difference between pedology & pedogenesis.

   j)   Give the sources of organic matter in soil.

Q2) Write a short note on (Any two):   **[10]**

    a)   Functions & Deficiency syndromes of Potassium & Manganese.

    b)   Factors affecting soil structure. (any five)

    c)   Soils of India.

Q3) Answer any two from the following: **[10]**

    a)   Explain detailed classification of soil with ref. to texture & colour.

    b)   Describe effects of fertilisers on soil properties.

    c)   Discuss the role of soil microbes in soil fertility.

Q4) Attempt any one of the following: **[10]**

    a)   Describe in detail functions of any five macro nutrients required for plant growth.

    b)   Explain soil pollution with reference to types, sources & effects.

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[4817]-231

S.Y. B.Sc.

ENGLISH (Optional)

Enriching Oral and Written Communication in English

(2008 Pattern) (Semester-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*

Q1) Attempt Any Two of the following: **[10]**

a) Write a transcript of a group discussion on 'Students and Politics' using the following points:

aim of education, present education system, role of youth in politics, politics in education, Govt. policies regarding students' involvement in politics.

b) Imagine that you are facing an interview in a Multi-National Company for the post of Marketing Manager, Anticipate any five questions and write down your responses to them.

c) Give one example each for the following:

i) Introducing your friend to your sister.

ii) Asking permission.

iii) Making request.

iv) Expressing thanks.

v) Giving your opinion.

Q2) Attempt Any Two of the following: **[10]**

a) Write a paragraph of about 10 lines on 'Pollution'.

b) Punctuate the following passage.

i want my photograph taken i said the photographer looked at me without enthusiasm he was a drooping man in a gray suit with dim eye of a natural scientist but there is no need to describe him everybody knows what a photographer is like

c) Summarize the following paragraph in one third of its length.

Suggest a suitable title. Prepare a rough draft as well. 'Religion, as it is generally understood, is supposed to be the spirit of Science. The method of science is empirical while that of religion is dogmatic. Science does not rely on authority but appeals to communicable evidence that any trained mind can evaluate. Science does not admit any barriers to freedom of thought and inquiry. It welcomes new knowledge and experience. A true scientist does not take refuge in dogmatism. His out-look is marked by modesty, self-criticism and readyness to learn from others. If we esteem freedom of inquiry, we find that it is incompatible with authoritarianism, which is the dominant feature of religion'.

Q3) Attempt Any Two of the following: **[10]**

a) Write a review of a 'Holiday Resort'.

b) Write a short paragraph of 100 words on 'Hostel Days'.

c) Use the words in the list given below to write a short paragraph of 100 words.

a gentle breeze, drumming on the roof, drench, cooling breeze, cleansing, pouring cats and dogs, continuous raining for 15 minutes, soothing atmosphere, delightful experience.

Q4) Attempt Any Two of the following: **[10]**

a) Write an e-mail to a chemists' shop asking for supply of chemicals for your college laboratory. Mention the list the items you intend to buy and also mode of payment.

b) Write a short telephone conversation between two friends on 'recently released Hindi Film'.

c) Prepare 5 slides of about 20 words each for a power-point presentation on 'Environmental Pollution'.

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S.Y. B.Sc. (Semester - II)

हिंदी (HINDI)

(2008 Pattern) (General) (सामान्य)

पाठ्यपुस्तके :1) प्रतिनिधि कहानियाँ

संपादक – हिंदी विभाग एस.एन.डी.टी.विश्वविद्यालय, मुंबई

2) छायावाद : प्रतिनिधि रचनाएँ

संपादक – नीरा परमार

समय : 2 घंटे]   [पूर्णांक : 40

सूचनाएँ :– 1) सभी प्रश्न अनिवार्य हैं।

2) दाहिनी ओर लिखे अंक प्रश्न के पूर्णांक हैं।

प्रश्न 1) अ) निम्नलिखित में से किन्हीं दस संक्षिप्तियों के हिंदी पूर्ण पर्याय लिखिए।   [10]

i) D.I.R.   ii) F.S.S.

iii) D.R.D.A.   iv) I.T.D.C.

v) N.I.B.M.   vi) N.E.T.

vii) U.N.I.C.E.F.   viii) D.Litt.

ix) Ph.D.   x) U.N.O.

xi) S.A.A.R.C.   xii) I.B.R.D.

आ) निम्नलिखित अनुच्छेद का एक–तिहाई सारांश लिखते हुए उसे उचित शीर्षक दीजिए।[4]

मनुष्य को जीवन में हिम्मत से संकटों का सामना करना चाहिए । जो हिम्मत हार जाते हैं वे मनुष्य नहीं । मनुष्य ताउम्र केवल अपने सुख के बारे में सोचता है पर उसमें परदुखकातरता होनी चाहिए । दूसरों के लिए जो जीवन जीता है वही श्रेष्ठ होता है । पर दुनिया स्वार्थी लोगों से भरी है संकीर्ण मनोवृत्ती के कारण आदमी और छोटा बन जाता है । लोग दौलत के पीछे

P.T.O.

दीवाने बने भागते नजर आते है । दौलत की चकाचौंध में अपनों को भी पैरोंतले रौंद देते है पर निस्वार्थ भाव, हिम्मत, ईमानदारी आदमी के आभूषण है । जिनके कारण वह शोभायमान है । उसके सद्गुणों से ही उसकी कीर्ती संसार में फैल जाती है ।

प्रश्न 2) अ) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए ।   [8]

   i)   हरगोबिन का चरित्र – चित्रण कीजिए ।

   ii)   सोमा बुआ के पति ने सन्यास क्यों लिया ?

   iii) 'जिंदगी और गुलाब' कहानी में लेखिका ने बेकारी की समस्या का किस प्रकार वर्णन किया है ?

   iv)   'चीफ की दावत' के बूढ़ी माँ की मानसिकता का वर्णन कीजिए ।

आ) निम्नलिखित अवतरण की ससंदर्भ व्याख्या कीजिए।   [5]

''बड़ी बहुरिया, राह – खर्च देने की जरुरत नहीं । मैं इन्तजाम कर लूँगा ।''

अथवा

''सबूत चाहिए, तो जाकर देखो हमारे कब्रिस्तान, सबके सब मौजूद है वहाँ – खुद गद्दार हैं और हम पर इल्जाम लगाते हैं । नौकरी न देने का अच्छा बहाना ढूँढ़ा है ।''

प्रश्न 3) अ) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए ।   [8]

   i)   'जागो फिर एक बार' कविता के द्वारा कवि कौनसा संदेश देता है ?

   ii)   'वन – बेला' कविता में कवि ने प्राकृतिक सौंदर्य का वर्णन किस प्रकार किया है ?

   iii) 'द्रुत झरो' कविता प्रतिकात्मक है, स्पष्ट कीजिए ।

   iv)   'भारत माता' कविता के भावार्थ का परिचय दीजिए ।

आ) निम्नलिखित अवतरण की ससंदर्भ व्याख्या कीजिए। **[5]**

"तीस कोटी संतान नग्न तन,

अर्ध क्षुधित, शोषित, निरस्त्र जन

मूढ, असभ्य, अशिक्षित, निर्धन

नत मस्तक तरू तल निवासिनी ।"

अथवा

"निष्प्राण विगत – युग! मृत विहंग ।

जग नीड़ शब्द औ धास – हीन,

च्युत, अस्त – व्यस्त पंखों से तुम

झर – झर अनन्त में हो विलीन !"

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S.Y. B.Sc.

SANSKRIT (Semester - II)

गीर्वाणभारती (Girwanbharati)

(2008 Pattern)

Time : 2 Hours]   **[Max. Marks : 40**

Q1)   Write short answers of the following questions. (2-4 lines)   **[16]**

पुढील प्रश्नांची 2-4 ओळीत उत्तरे लिहा.

a)   What is the meaning of शास्त्र & give the two examples.

     शास्त्र म्हणजे काय ते सांगून त्याची दोन प्रकार लिहा.

b)   What did Old man says to his children?

     वृद्धमाणूस आपल्या मुलांना काय म्हणाला?

c)   What are the types of 'चुम्बक'?

     चुम्बकाचे प्रकार कोणते?

d)   How many types of Aeroplane & give the three examples?

     विमानाचे एकूण किती प्रकार होतात ते सांगून तीन प्रकार लिहा.

e)   From which book the lesson 'अमरसंदेश:' is taken & who is the author of this book?

     'अमरसंदेश:' हा पाठ कोणत्या पुस्तकातून घेतला आहे व त्या ग्रंथाचा कर्ता कोण?

f)   Explain the meaning of 'काकोऽपि जीवति चिराय बलिश्च भुङ्क्ते'?

     'काकोऽपि जीवति चिराय बलिश्च भुङ्क्ते' या वाक्याचा अर्थ स्पष्ट करा?

g)   Explain the meaning of 'हुतं च दत्तं च तथैव तिष्ठति'?

     'हुतं च दत्तं व तथैव तिष्ठति' या वाक्याचा अर्थ स्पष्ट करा?

h)   Explain the meaning of 'मूढ: परप्रत्ययनेयबुद्धि:'?

     'मूढ: परप्रत्ययनेयबुद्धि:' या वाक्याचा अर्थ स्पष्ट करा?

P.T.O.

Q2) Write short note on **any two** of the following in 8 - 10 lines.   **[8]**

पुढीलपैकी **कोणत्याही दोहोंवर** 8 - 10 ओळीत संक्षिप्त टीपा लिहा.

   a)   गणितशास्त्रम्।

   b)   पदार्थविज्ञानम्।

   c)   वास्तुशास्त्रम्।

Q3) Write short note on **any two** of the following in 8 - 10 lines.   **[8]**

पुढीलपैकी **कोणत्याही दोहोंवर** 8 - 10 ओळीत संक्षिप्त टीपा लिहा.

   a)   लीलावती ।

   b)   वीर सावरकर in अमरसंदेश:. अमरसंदेश: पाठातील वीर सावरकर.

   c)   Importance of mood of disinterestedness वैराग्याचे महत्त्व.

Q4) Answer **any one** of the following in 16 - 20 lines.   **[8]**

पुढीलपैकी **कोणत्याही एका** प्रश्नाचे 16 - 20 ओळीत उत्तर लिहा.

   a)   Write a Summary of 'प्राचीनशास्त्रपरिचय: – द्वितीयो भाग:'

       'प्राचीनशास्त्रपरिचय:– द्वितीयो भाग:' या पाठाचा सारांश लिहा.

   b)   What is meant by सुभाषित and critically appreciate of lesson 'सुभाषितानि'.

       सुभाषित म्हणजे काय ते सांगून सुभाषितानि या पाठाचे विवेचक रसग्रहण करा.

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[4817]-237

S.Y. B.Sc.

INDUSTRIAL CHEMISTRY (Vocational Course)

VOC - 221 : Unit Processes in Organic Chemical Industries

(2008 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:

   1)   All questions are compulsory.
   2)   Figures to the right indicate full marks.
   3)   Draw neat diagrams where necessary.

Q1) Give balanced equations with conditions for the following reactions / synthesis:

[16]

a)	Benzene	$\rightarrow$	dodecyl benzene
b)	Benzene	$\rightarrow$	aniline
c)	Benzene	$\rightarrow$	p-dinitrobenzene
d)	Acetanilide	$\rightarrow$	n-ethyl aniline
e)	Chloroacetic acid	$\rightarrow$	acetic acid
f)	Benzene	$\rightarrow$	chlorobenzene
g)	Cellulose	$\rightarrow$	cellulose acetate
h)	Toulene	$\rightarrow$	benzoic acid

Q2) Attempt Any Two of the following: **[8]**

   a)   Discuss the orientation effects in the sulfonation of substituted benzene with suitable examples.

   b)   What is reduction and reducing reagents? Name any four reducing reagents.

   c)   Discuss the mechanism of acylation of benzene.

Q3) Write notes on Any Two of the following: **[8]**

     a)   Halogenating reagents.

     b)   Esterification process.

     c)   Friedel Crafts alkylation.

Q4) Describe the industrial manufacture of aniline from o-nitrobenzene with the help of a flow sheet. **[8]**

<div align="center">OR</div>

Describe the synthesis of vinyl acetate with the help of a flow sheet.

<div align="center">●●●●●</div>

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S.Y. B.Sc. (Vocational)
BIOTECHNOLOGY
Voc. Biotech. - 221 : Plant and Animal Tissue Culture
(2008 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1)   *All questions are compulsory.*
2)   *Figures to the right indicate full marks.*
3)   *All questions carry equal marks.*

Q1) Answer each of the following in 1-2 lines: **[10]**

a)   Define: Finite life span cell line.

b)   State the role of phenol red in medium.

c)   Justify: Trypsinisation helps in initiation of cell culture.

d)   Give any two applications of ATC.

e)   Why trypan blue is used in cell counting?

f)   Write the role of 2, 4 D in PTC.

g)   Define: callus culture.

h)   Enlist various applications of meristem culture.

i)   Why incubation racks in PTC lab are illuminated with lights?

j)   Plant cell give rise to complete plant: Justify.

Q2) Write short notes on <u>Any Two</u> of the following: **[10]**

a) Primary culture.

b) Maintenance of cell line.

c) Organogenesis in PTC.

Q3) Answer <u>Any Two</u> of the following in brief: **[10]**

a) Why surface sterilisation of explant is necessary in PTC?

b) What is karyotyping? Explain how it is useful in cell line characterisation.

c) Instrumentation in ATC lab is different: Explain.

Q4) How transformed cells leads to establish a cell line? Give different applications of cell lines. **[10]**

<div align="center">OR</div>

What is micropropagation? Explain it's steps in detail. Add a note on it's applications.

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[4817]-239

S. Y. B.Sc. (Vocational)
PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION
Colour Photography
(Semester - II) (Paper - I) (2008 Pattern)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
    1)   *All questions are compulsory.*
    2)   *Draw neat and labelled diagrams wherever necessary.*
    3)   *Figures to the right indicate full marks.*

Q1) Answer in short: **[16]**

    a)   Mention two advantages of a CMOS sensor.

    b)   Draw a diagram and explain the Purkunje shift.

    c)   Colour temperature of a light source is 3500 K. Convert it to mired.

    d)   What are additive colours? Give two examples.

    e)   Explain the difference between the saturation and brightness of a colour.

    f)   What is the use of 'histogram' in digital photography?

    g)   State the law of transmission and absorption of light.

    h)   What is the difference between continuous and intermittent light source? Give one example of each.

Q2) Attempt any two of the following: **[8]**

    a)   Draw a suitable diagram and explain what primary, secondary and complementary colours are. Give appropriate examples.

    b)   Explain how the black body radiation curve is useful in defining the colour temperature of a light source.

    c)   Discuss the RGB and the CMYK colour models in photography.

Q3) Write short notes on any two of the following: **[8]**

    a)   Social responsibilities of a photographer.

    b)   Colour vision.

    c)   Documentary photography.

Q4) Attempt any one of the following: **[8]**

    a)   Discuss the importance of light and colours in photography.

    b)   Draw a suitable diagram and explain the construction of a typical sensor used in a digital camera. Explain the purpose of each 'layer' of the sensor. Discuss the sequence of events taking place when the sensor is exposed to a 'scene'.

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[4817]-240

S.Y. B.Sc. (Vocational)
ELECTRONIC EQUIPMENT & MAINTENANCE
VOC-EEM - 221 : Audio, Video & Office Equipments-B
(2008 Pattern) (Semester-II) (Paper-I) (Old Course)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1)   All questions are compulsory.
   2)   Neat diagrams must be drawn wherever necessary.
   3)   Figures to the right indicate full marks.
   4)   Use of calculator is allowed.

Q1) Answer the following:

   a)   State the different type of output devices of computer.   **[1]**

   b)   What is computer virus?   **[1]**

   c)   Give one difference between mouse & keyboard.   **[1]**

   d)   What is screen saver?   **[1]**

   e)   State the different types of storage devices used in PC.   **[2]**

   f)   What is bar code? Where is it used?   **[2]**

   g)   How touch-screens work?   **[2]**

   h)   What is FAX machine? Give its one application.   **[2]**

Q2) Answer <u>Any Two</u> of the following:

   a)   Write a short note on Multimedia projector.   **[4]**

   b)   Explain with neat diagram the Flat-bed scanner.   **[4]**

   c)   Explain the working principle of Ink-Jet printer.   **[4]**

Q3) Answer <u>Any Two</u> of the following:

    a)   Explain with neat diagram the working of Dot-Matrix printer (DMP). **[4]**

    b)   Explain the various video standards used for PC monitor. **[4]**

    c)   Explain the working principle of EPABX system. **[4]**

Q4) Answer the following:

    a)   How Xerox machine works? Give its sequence of operation. **[6]**

    b)   Explain the working of Large Screen Display. Give its one example. **[6]**

<div align="center">OR</div>

Answer the following:

    a)   State the types of mouse. Explain the working of any one. **[4]**

    b)   Explain the working of Over-head projector. **[4]**

    c)   Draw the block-diagram of mother board of PC. Explain the function of each block. **[4]**

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[4817]-241

S.Y. B.Sc. (Vocational)

COMPUTER HARDWARE & NETWORK ADMINISTRATION

Microprocessor & Interfacing Techniques

(2008 Pattern) (Semester-II) (Paper-I) (New Course)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*

Q1) a)   Attempt the following: **[4 × 1 = 4]**

i)   What is full form of MPEG?

ii)   What are plotters?

iii) State different types of controllers located on mother board.

iv)   State atleast two types of Scanners.

b)   Attempt the following: **[4 × 2 = 8]**

i)   What is display adaptor? List various display adaptors.

ii)   What is advantage of serial communication?

iii) List various types of storage devices with their capacities.

iv)   What are ADD-ON cards? List atleast two ADD-ON cards you know.

Q2) Attempt Any Two of the following: **[2 × 4 = 8]**

a)   What is multimedia PC? What are minimum requirement for a multimedia PC.

b)   Explain asynchronous protocol in brief.

c)   What is Green PC?

P.T.O.

Q3) Attempt Any Two of the following: **[2 × 4 = 8]**

   a)   What is Bluetooth? Explain features of Bluetooth.

   b)   What is advantage of flash BIOS? Explain the important functions of BIOS.

   c)   Write a note on Speech recognition technology.

Q4) Attempt Any Two of the following: **[2 × 6 = 12]**

   a)   What are advantages and disadvantages of matrix, laser and inkjet printers?

   b)   What is network? What are advantages of network? Classify computer networks.

   c)   What is advantage of wireless communication system? Explain features of zigbee protocol.

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[4817]-242

S.Y. B.Sc. (Vocational)
SEED TECHNOLOGY
Vegetable Seed Production
(2008 Pattern) (Old Pattern) (Semester-II) (Paper-III)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1)   All questions are compulsory.
   2)   Figures to the right indicate full marks.
   3)   Draw neat and labelled diagrams wherever necessary.

Q1) Attempt the following: **[10 × 1 = 10]**

   a)   Which type of nursery bed is required for growing onion seedlings?

   b)   Give types of hybridization.

   c)   Define seed drying.

   d)   What is sexual reproduction?

   e)   Write any two applications of population improvement.

   f)   What is CMS?

   g)   Give diagrammatic representation for classifying the vegetable crops based on growing season in vegetable crops.

   h)   What is the isolation distance for foundation seed in Okra?

   i)   Write any two objectives of vegetable seed production.

   j)   Define self incompatibility.

Q2) Attempt Any Two of the following: **[2 × 5 = 10]**

a) Explain any two vegetative methods of reproduction in vegetable crops.

b) Describe in detail the genetic male sterility.

c) Give the objectives of hybridization techniques in vegetable crops.

Q3) Write notes on (Any Two): **[2 × 5 = 10]**

a) Bulk method.

b) Classification of vegetable crops based on plant parts used for consumption.

c) Progeny selection.

Q4) Give an account of seed production in Okra. **[10]**

OR

Give an account of seed production in Onion with reference to land requirement, isolation, nursery management, cultural practices, roughing, plant protection, harvesting, seed extraction, drying and storage.

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[4817]-243

S.Y. B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
VOC-IND-MIC-221 : Microbial Fermentations &
Downstream Processing
(2008 Pattern) (Semester-II) (Paper-I) (Theory)

Time : 2 Hours]   *[Max. Marks : 40*
Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *All questions carry equal marks.*
4) *Draw neat labelled diagrams wherever necessary.*
5) *Use of scientific calculators is allowed.*

Q1) Answer each sub-question in One or Two lines; State whether the statement is true or false: **[10]**

a) State whether the statement is true or false:

Ashbya gossypii is natural overproducer of Vit. B2.

b) Fill in the blank:

_____ organism is used for glutamic acid production.

c) State any two applications of enzyme amylase.

d) Fill in the blank:

In the process of Vit. B12 production harvested broth is treated with _____ to bring about conversion of cobalmine to cynocobalmine.

e) Define: Salting out.

f) Name the two phosphate solubilizers.

g) What is rennet and its use in cheese production?

h)   Name the enzyme used for removing side chain of penicillin G.

i)   Give the action of detergents in the recovery of intracellular products.

j)   What is meant by 'formulation' with reference to a pharmaceutical product?

Q2) Answer Any Two of the following: **[10]**

a)   Explain principle of gel exclusion chromatography with the help of suitable example.

b)   What are bioinoculants? What are the advantages of using bioinoculants over their chemical counterparts?

c)   With the help of a diagram, explain the principle of any process used for solid-liquid separation in downstream processing.

Q3) Answer Any Two of the following: **[10]**

a)   Describe continuous distillation process used for solvent recovery.

b)   List the physical methods used for cell disruption. Describe any two of them.

c)   With the help of the flow-chart explain steps involved in cheese production.

Q4) Answer Any One of the following: **[10]**

a)   Describe the phases of methane production by microorganisms by using agricultural waste.

b)   Describe the liquid-liquid extraction process used in downstream processing with respect to:

i)   Principle

ii) Types of liquid extraction process.

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[4817]-244

S.Y. B.Sc.(Vocational Course)
INDUSTRIAL CHEMISTRY
VOC-222:INDUSTRIAL POLLUTION
(2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
   1) *All questions are compulsory.*
   2) *Figures to the right indicate full marks*
   3) *Neat diagrams must be drawn wherever necessary.*

Q1) Answer the following: **[16]**

   a)   Define noise pollution.

   b)   Define biosphere.

   c)   What is the cause of permanent hardness in water?

   d)   Define night soil.

   e)   Define soil profile.

   f)   Name two Green House Gases.

   g)   State the cause of inversion of temperature in the stratosphere.

   h)   Name the unit used to measure trace gas pollutants in air.

Q2) Attempt <u>any two</u> of the following: **[8]**

   a)   Discuss the criteria for sewage treatment.

   b)   Explain how COD and BOD are measured.

   c)   Distinguish between electrostatic and thermal precipitators

Q3) Attempt <u>any two</u> of the following: [8]

a)   Distinguish between smog and fog

b)   Discuss pollution due to pesticides.

c)   Write a note on the carbon cycle.

Q4) Describe the different chlorinating agents used to disinfect water.   [8]

OR

Discuss the toxic effects of As and Pb. How are these elements estimated?

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[4817]-245

S.Y. B.Sc.(Vocational)
BIOTECHNOLOGY
VOC-222:Immunology
(2008 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:
   1)   *All questions are compulsory.*
   2)   *Figures to the right indicate full marks carry.*
   3)   *All questions carry equal marks.*

Q1) Answer each of the following in 1-2 lines: **[10]**

   a)   Give the role of immune system.

   b)   What is the role of monocytes.

   c)   Define immunoglobulin.

   d)   What is secondary Immune response?

   e)   Define acquired immunity

   f)   Name two types of vaccines.

   g)   Give role of neutrophils.

   h)   Give the functions of secondary lymphoid organs.

   i)   What is western blotting.

   j)   What are APCs?

Q2) Write short notes on any two of the following: **[10]**

   a)   IgG

   b)   Thymus.

   c)   Primary immune response.

Q3) Attempt any two of the following: **[10]**

    a)   Describe type-I hypersensitivity

    b)   Explain recombinant vaccines.

    c)   What is innate immunity? Add a note on the defensive barriers of innate immunity.

Q4) What is MHC complex? Describe in detail MHC class I and MHC class II. **[10]**

<div align="center">OR</div>

    a)   Describe sandwitch ELISA

    b)   Describe radial Immuno assay.

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S. Y. B. Sc. (Voc.)

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION

Principles & Applications of Analog and Digital Communications

(Semester - II) (Paper - II) (2008 Pattern)

Time : 2 Hours]   *[Max. Marks : 40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Draw neat and labelled diagrams wherever necessary.*
3) *Figures to the right indicate full marks.*

Q1) Solve following questions:

a) State whether the following statements are TRUE or FALSE: **[2]**

   i) Timing error is reduced due to synchronization.

   ii) Serial transmission is faster transmission.

b) Comment on the following statements: **[4]**

   i) SSB generation is preferred over DSB.

   ii) FSK is normally used in MODEM.

c) Attempt the following: **[6]**

   i) For a binary PCM system, the number of bits per transmitted word is 8 and the sampling frequency f_s = 8 Khz. Calculate the:

   1) bit rate and

   2) baud rate

   ii) Six message signals each of BW 5 KHz are Time Division Multiplexed and transmitted. Calculate

   1) Signaling rate

   2) Minimum channel BW of the PAM/TDM channel.

Q2) Explain **ANY TWO** of the following: [8]

   a)   Explain TDM system with the help of diagram.

   b)   What is the need of Modulation? Describe its advantages?

   c)   Calculate the maximum bit rate for a channel having Band Width 300 Hz and S/N ration is 40db.

Q3) Explain **ANY TWO** of the following: [8]

   a)   Explain the Shanon's theorem on the Channel Capacity. What is the importance of Channel Bandwidth?

   b)   Compare the FM and AM Systems.

   c)   What is PAM? Explain the Generation of PAM with diagram.

Q4) Solve **ANY TWO** of the following Numericals: [12]

   a)   Calculate the Carrier Swing, frequency deviation and modulation Index of FM signal which reaches a maximum frequency of 99.05 MHz and minimum frequency of 99.03 MHz. The frequency of modulating signal is 6 KHz.

   b)   The rms antenna current from an AM transmitter measures by 15% over its unmodulated value when sinusoidal modulation is applied, Determines the m.

   c)   A FM wave is represented by the following equation,

      $V = 10 \sin [5 \times 10^8 \, t + 41250t]$

      Find

      i)   Carrier and modulating frequencies.

      ii)   Modulation index and maximum deviation.

      iii)   The power dissipated by this FM wave in 5 ohm resistor.

<div align="center">OR</div>

Q4) Attempt **ANY TWO** of the following: [12]

   a)   Explain natural PAM sampling and flat topped sampling.

   b)   Explain Bell 103 and Bell 212 modems.

   c)   Explain the working of super heterodyne AM receiver with a neat block diagram.

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S.Y. B.Sc.(Vocational)

ELECTRONIC EQUIPMENT MAINTENANCE

VOC-EEM-222:Maintenance Concepts and Repairs

(2008 Pattern Old) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

1) All questions are compulsory.

2) Figures to the right indicate full marks

Q1) Attempt all of the following:

    a)   State the function of 'Vertical blanking pulse'. **[1]**

    b)   What is the cause of non linear distortion in FM receiver output? **[1]**

    c)   What makes TV picture Roll up and down. **[1]**

    d)   State the operating principle of VCR. **[1]**

    e)   What care should be taken in placement of a loudspeaker in PA system?**[2]**

    f)   Why de-emphasis is required in FM and not in AM? **[2]**

    g)   What is the importance of talk time and stand by time for a mobile phone battery? **[2]**

    h)   List the common tools required for troubleshooting of TV. **[2]**

Q2) Answer any two of following:

    a)   Describe common faults and their remedies in a PA system. **[4]**

    b)   State the working principle of LCD monitor. Give its advantages over CRT based monitor. **[4]**

    c)   Describe troubleshooting procedure for an audio cassette recorder player.**[4]**

Q3) Answer any two of following

a) Explain the alignment and tracking adjustment of super heterodyne receiver **[4]**

b) Give typical faults and their remedies in LASER printer. **[4]**

c) Explain how to check TV Antenna. **[4]**

Q4) Answer the following:

a) Write a note on typical faults and remedies in VCR. **[6]**

b) State the need for AGC. Explain the faults in diode detector and AGC. **[6]**

OR

a) Explain common faults in DVD player. How can these be corrected? **[6]**

b) List the faults in picture and sound sections of a TV Receiver and likely causes behined these faults. **[6]**

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[4817]-248

S.Y.B.Sc. (Vocational)
COMPUTER HARDWARE & NETWORK ADMINISTRATION
Computer System Management - II
(2008 Pattern) (New Course) (Paper - II) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*

Q1) a) Attempt the following :   **[4x1=4]**

     i) What is a Utility Software?

     ii) List one PDA Device.

     iii) State any one Role of a Security Administrator.

     iv) List one use of a ROUTER.

   b) Attempt the following: **[4x2=8]**

     i) What is a Device Driver?

     ii) Give any two roles of a End User.

     iii) Give any Two Flavors of Linux Operating System.

     iv) List any two network Devices.

Q2) Attempt any <u>Two</u> of the following: **[2x4=8]**

   a) What are different Roles and responsibilities of a Database Administrator?

   b) Write a Note on Operations Management.

   c) Explain the importance of PDA Devices in Modern World.

P.T.O.

Q3) Attempt any <u>Two</u> of the following: **[2x4=8]**

   a)   Explain the Procedure for Disposal of a Storage Media.

   b)   Give Steps to Install a Device Driver for an Ethernet Card in Linux.

   c)   Give Uses of the Following:

        i)   Camera

        ii)   Keyboard

        iii)   Pendrive

        iv)   MIC

Q4) Attempt any <u>Two</u> of the following: **[2x6=12]**

   a)   What are the various components required for Assembling a Desktop PC?

   b)   Give Steps to Install Win XP on a Desktop Harddrive.

   c)   Classify Different types of Users in a Computer System.

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S.Y.B.Sc.

SEED TECHNOLOGY

Seed Quality Control

(2008 Pattern) (Paper - III) (Semester - II) (Vocational)

Time : 2 Hours] *[Max. Marks :40*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw neat and labeled diagrams wherever necessary.*

Q1) Attempt the following : **[10x1=10]**

a) What is roughing?

b) Define seed legislation.

c) Give any two objectives of seed certification agency.

d) What is field inspection?

e) Enlist any two powers of seed inspector.

f) Define breeders seed.

g) Sketch any two walking patterns in field inspection.

h) What is the maximum period of member on central seed committee?

i) Central seed committee is constituted with how many members?

j) Give any one concept of seed quality?

Q2) Attempt any two of the following: **[2x5=10]**

a) Give an account of International organizations for seed certification

b) Explain in brief the classes of seed.

c) What are the principles of field inspection?

P.T.O.

Q3) Write notes on (Any two): **[10]**

    a)   Central seed testing laboratory.

    b)   General seed certification standards.

    c)   Appellate authority.

Q4) Describe in brief techninque of field inspection for seed production plots of hybrid varieties in wheat. **[10]**

<div align="center">OR</div>

Describe in brief technique of field inspection for seed production plots of hybrid varieties in cotton.

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[4817]-250

S.Y.B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
VOC-IND-MIC-222: Quality Assurance in Industrial Products
(2008 Pattern) (Paper - II) (Semester - II)

Time : 2 Hours]   *[Max. Marks :40*

Instructions to the candidates:
  1) *All questions are compulsory.*
  2) *Figures to the right indicate full marks.*
  3) *All questions carry equal marks.*
  4) *Draw neat labelled diagrams wherever necessary.*
  5) *Use of scientific calculators is allowed.*

Q1) Attempt the following :   **[10]**

  a) State the meaning of the acronym - cGMP.

  b) Explain in 2-3 lines- importance of AGMARK.

  c) State True or False

      All injectables are both pyrogen free and sterile

  d) State True or False

      Mutants are able to grow on His+ medium in Ames test

  e) Define: Endotoxin

  f) Define: Efficacy of an antibiotic

  g) What is 'commercially sterile' means?

  h) What is 'Pharmacopoeia'?

  i) What is FDA?

  j) Write any two roles of SOPs in industries.

Q2) Answer any two of the following: **[10]**

  a) Write the principal and brief protocol of LAL test in Pyrogen testing.

  b) What are Carcinogens? Explain the steps in Ames test with the help of a flow chart

  c) Define Allergen. Explain RAST test in detail.

P.T.O.

Q3) Answer any two of the following: **[10]**

    a) The quality control tests performed for Mineral water and explain any one in detail.

    b) Give important characteristics of Thioglycolate medium used in sterility testing.

    c) Define Quality Assurance and give importance of ISO in industrial products.

Q4) Answer any one of the following: **[10]**

    a) Define Assay. State the relationship between zone diameter and concentration of active compound, in the gel diffusion assay for the product.

    b) What are industrial standards? Enlist different standards used in industries. Elaborate on ISO series.

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