Total No. of Questions : 5]

SEAT No. :

P257

[Total No. of Pages : 3

[4717]-1001
F.Y.B.Sc.
MATHEMATICS
MT-101: Algebra and Geometry
(2013 Pattern) (Paper - I)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Attempt any eight of the following: **[16]**

a) If $a \mid b$ and $a \mid c$ then show that $a \mid bx + cy$ for any integers x and y.

b) If $a \equiv b \pmod{m}$ and $b \equiv c \pmod{m}$ then show that $a \equiv c \pmod{m}$.

c) Find g.c.d. of 119 and 272.

d) Use remainder theorem to compute the remainder when $f(x) = x^4 - 3x^3 - 7x^2 - 2$ is divided by $g(x) = x - 2$.

e) Find the eigenvalues of the matrix $\begin{bmatrix} 2 & 3 \\ 0 & 4 \end{bmatrix}$.

f) Find the center of the conic $5x^2 + 6xy + 5y^2 - 10x - 6y - 3 = 0$.

g) Find the joint equation of the planes $2x + 3y - z = 0$ and $x - y + 5z = 0$.

h) Find the center and radius of the sphere $x^2 + y^2 + z^2 - 2x + 4y + 6z + 5 = 0$.

i) Define right circular cylinder.

j) Find the angle between the planes $2x - y + 2z + 1 = 0$ and $3x + 2y + 6z - 5 = 0$.

Q2) Attempt any four of the following: **[16]**

a) Using principal of mathematical induction prove that

$1 + 2 + 3 + \text{---} + n = \frac{n(n+1)}{2}$ where n is a positive integer.

P.T.O.

b) Prove that if P is prime then $\sqrt{P}$ is an irrational number.

c) Show that if $(a, m) = (b, m) = 1$ then $(ab, m) = 1$.

d) Find the sum of the squares of the roots of $2x^4 - 8x^3 + 6x^2 - 3 = 0$.

e) Solve the system

$$2x + y - z + 3w = 8$$
$$x + y + z - w = -2$$
$$3x + 2y - z = 6$$
$$2y + 3z + 2w = -8$$

f) Find eigenvalues and eigenvectors of $A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix}$.

Q3) Attempt any <u>two</u> of the following: **[16]**

a) i) Find g.c.d. of 3645 and 2357. Also find x_0, y_0 such that $219 = 3645x_0 + 2357y_0$.

ii) Let A be the set of all the lines in the plane. Define a relation R on A by lRm if and only if l is parallel to m then show that R is an equivalence relation.

b) Prove that for any two non-zero integers a and b have a unique (positive) g.c.d. $d = (a, b)$ and can be expressed in the form $d = (a, b) = ma + nb$ for some $m, n \in Z$.

c) i) Solve: $4x^3 + 20x^2 - 23x + 6 = 0$ two of its roots being equal.

ii) Verify Cayley - Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

Q4) Attempt any <u>four</u> of the following: **[16]**

a) If by rotating the axes through an angle θ without changing the origin the equation $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ is transformed in to $a'x'^2 + 2h'x'y' + b'y'^2 + 2g'x' + 2f'y' + c = 0$ then show that $a + b = a' + b'$.

b) Prove that every equation of first degree in x, y, z represents a plane.

c) Find the equations of a line through (–2, 3, 4) and parallel to the planes $2x + 3y + 4z = 5$ and $3x + 4y + 5z = 6$.

d) Prove that the straight line $\frac{x+1}{4} = \frac{y-2}{1} = \frac{z-2}{1}$ touches the sphere $x^2 + y^2 + z^2 = 9$. Find the point of contact.

e) Find the equation of a cone with vertex at the point (3, 1, 2) and guiding curve is $2x^2 + 3y^2 = 1$, $z = 0$.

f) Find the equation of the right circular cylinder of radius 2 whose axis passes through (1, 2, 3) and has d.c.s. proportional to 2, –3, 6.

Q5) Attempt any <u>two</u> of the following: **[16]**

a) i) Find the condition that the two given lines $\frac{x-x_1}{l_1} = \frac{y-y_1}{m_1} = \frac{z-z_1}{n_1}$ and $\frac{x-x_2}{l_2} = \frac{y-y_2}{m_2} = \frac{z-z_2}{n_2}$ are coplanar. Also find the equation of the plane containing them.

ii) Show that the equation $12x^2 - 2y^2 - 6z^2 - 2xy + 7yz + 6zx = 0$ represents a pair of planes. Also find the angle between them.

b) Find the equation of the sphere passing through the points A(2, 4, –1), B(0, –4, 3), C(–2, 0, 1) and D(6, 0, 9).

c) i) Find the equation of the sphere described on the line joining the points $A(x_1, y_1, z_1)$ and $B(x_2, y_2, z_2)$ as a diameter.

ii) Reduce the equation $x^2 + 2xy + y^2 - 6x - 2y + 4 = 0$ to its standard form.

EEE

Total No. of Questions : 5]

SEAT No. :

P258

[Total No. of Pages : 4

[4717]-1002
F.Y.B.Sc.
MATHEMATICS
MT-102: Calculus and Differential Equations
(2013 Pattern) (Paper - II)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Attempt any eight of the following: **[16]**

a) Find the greatest lower bound and least upper bound of the set $S=\left\{(-1)^n+\frac{n+1}{n+2}, n\in N\right\}$, if they exists.

b) Evaluate $\lim_{x\to\infty}\frac{\sqrt{x}-5}{\sqrt{x}+3}$.

c) Discuss the continuity of f at the point $x=1$ where $f(x)=\begin{cases}2x-1\ , & x\le 1\\ x^2\ , & 1<x<2\end{cases}$

d) Verify L.M.V.T. for $f(x)=\log x$ on $[1,\ e]$.

e) If $y=(\sin^{-1}x)^2$ prove that $(1-x^2)\,y_1{}^2-4y=0$.

f) Evaluate $\int_0^{\pi/2}\cos^7 x\,dx$.

g) Define linear differential equation of first order and first degree.

h) Find the orthogonal trajectories of family of circles $x^2+y^2=a^2$, a being parameter.

P.T.O.

i) Solve $\frac{dy}{dx}+\sqrt{\frac{b^2-y^2}{a^2-x^2}}=0$

j) Solve: $(\sin x + \cos y)\, dy + (\cos x - \sin x)\, dx = 0$.

Q2) Attempt any four of the following: **[16]**

a) Prove that there exists a rational number between any two real numbers.

b) State and prove Rolle's theorem.

c) Discuss the continuity of $f(x)$ where $f(x)=\sqrt{(x-2)(x-4)}$.

d) Evaluate $\lim_{x\to 0}\frac{e^x-\cos x-x}{x\sin x}$.

e) If $y=\log\left(x+\sqrt{1+x^2}\right)$ prove that

i) $(1 + x^2)\, y_2 + xy_1 = 0$

ii) $(1 + x^2)\, y_{n+2} + (2n + 1)\, xy_{n+1} + n^2 y_n = 0$.

f) Obtain Maclaurins series expansion for $f(x) = \tan x$.

Q3) Attempt any two of the following: **[16]**

a) i) If $y = e^{ax} \sin(bx + c)$ then prove that

$$y_n=\left(a^2+b^2\right)^{n/2}\ e^{ax}\sin\left[bx+c+n\tan^{-1}\left(\frac{b}{a}\right)\right].$$

ii) If $y=\frac{16x+18}{2x^2+5x+3}$ then find y_n.

b) i) Let f be a continuous function on a closed and bounded interval $[a,b]$. Let $x_1, x_2 \in [a,b]$ such that $x_1 < x_2$ and $f(x_1) < k < f(x_2)$, where k is a real number then prove that there exist c in (x_1, x_2) such that $k = f(c)$.

ii) Find the numbers α and β if the function f is continuous at every point in $(-3, 5)$ where

$$f(x)=\begin{cases} x+\alpha & -3<x<1 \\ 3x+2 & 1\le x<3 \\ \beta+x & 3\le x<5 \end{cases}$$

c) i) Verify Cauchy's mean value theorem for the functions $f(x)=\frac{1}{x^2}$ and $g(x)=\frac{1}{x}$ on $[a,\ b]$, $a > 0$. Show that the point C of CMVT is the harmonic mean of a and b.

ii) By using Sandwich theorem show that $\lim\limits_{x\to a}\sqrt{x}=\sqrt{a}$ for any $a > 0$.

Q4) Attempt any four of the following: **[16]**

a) Evaluate $\int\frac{x^2+x+1}{(x+1)^2(x+2)}\,dx$.

b) Define Bernoull's equation and explain the method of solving it.

c) Solve: $(2x\cos y + 3x^2y)\,dx + (x^3 - x^2\sin y + 2y)\,dy = 0$.

d) Solve: $(1-x^2)\left(\frac{dy}{dx}\right)+2xy=x\sqrt{1-x^2}$.

e) Find orthogonal trajectories of family of curves $y = ax^2$, where a is a parameter,

f) Define Clairaut's equation and obtain its general solution.

Q5) Attempt any two of the following: **[16]**

a) If $I_n=\int\sin^n x\ dx,\ n\ge 2$ then prove that $I_n=\frac{-\cos x\sin^{n-1}x}{n}+\frac{n-1}{n}\ I_{n-2}$.

Hence evaluate $\int_0^{\pi/2}\sin^8 x\ dx$.

b) i) Solve: $x(x + y)\, dy - y^2\, dx = 0$.

ii) Explain the method of solving the differential equation

$$\frac{dy}{dx} = \frac{a_1x + b_1y + c_1}{a_2x + b_2y + c_2} \text{ when } \frac{a_1}{a_2} \neq \frac{b_1}{b_2}.$$

c) i) Solve: $y\left[xy\sin(xy) + \cos(xy)\right]dx + x\left[xy\sin(xy) - \cos(xy)\right]dy = 0$.

ii) Solve: $\left(\frac{dy}{dx}\right)^2 - 5\left(\frac{dy}{dx}\right) + 6 = 0$ where $\frac{dy}{dx} = p$.

EEE

Total No. of Questions : 5]

SEAT No. :

P259

[Total No. of Pages : 3

[4717]-1003
F.Y.B.Sc.
PHYSICS - I
Mechanics, Heat and Thermodynamics
(New 2013 Pattern) (Paper - I)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of logtable and calculator is allowed.***
4) ***Neat diagram must be drawn wherever necessary.***

Q1) Attempt all of the following:[Each of Two marks] **[16]**

a) Why Newton's first law is called law of inertia?

b) Define conservative force. Give its example.

c) What do you mean by streamline flow?

d) A wire of 0.8m long and 1 square.mm in cross section has Young's modulus 1.24 x 10^{11} N m^{-2}. How much work is done in stretching it through 1 mm?

e) Give the drawbacks of Van der Waal's equation of state.

f) What is indicator diagram. State its importance.

g) Give the disadvantages of using alcohol in liquid thermometers.

h) Calculate the change in entropy, when 5 gm of ice at 0^{o}C is converted in to water at the same temperature (Latent heat of ice = 80 cal/gm).

Q2) Attempt any four of the following:[Each of four marks] **[16]**

a) What is gravitational force? Give its properties.

b) State and prove work - energy theorem.

P.T.O.

c) Explain in detail the capillary rise method for the surface tension of water.

d) Find the workdone in moving a particle along a vector $\bar{r} = (3\bar{i} - 2\bar{j} + 6\bar{k})$ metre if the applied force is $\vec{F} = (2\bar{i} + 2\bar{j} + 2\bar{k})$.

e) Obtain the relation between volume strain and longitudinal strain.

f) A body floats with $\frac{2}{3}$ of its volume above the surface of water. Calculate the density of material of the body.

Q3) Attempt any <u>four</u> of the following:[Each of four marks] **[16]**

a) Give the difference between real gases and ideal gases.

b) Derive an expression for workdone of a gas during an isothermal process.

c) What is Carnot's cycle? Explain it with suitable diagram.

d) A definite mass of a perfect gas is compressed adiabatically to half of its original volume. Determine the resultant pressure if the initial pressure was one atmosphere. ($\gamma = 1.4$)

e) If the efficiency of Otto engine is 50%. If the value of the γ for the working substance is 1.5, find the compression ratio.

f) The resistance of platinum wire at 0^oC is 7.5Ω and at temp 't' it is 10.5Ω. Find temperature of wire if coefficient of temperature for platinum = $0.0039/^oC$.

Q4) Attempt any <u>two</u> of the following: **[16]**

a) Discuss in detail the working of venturimeter and obtain an expression for the rate of flow of water in a pipe.

b) i) Show that the value of Poisson's ratio lies between –1 and 0.5.

ii) A body of mass 25000 gm is acted upon by a force of 5N. Find the acceleration of the body in S.I system.

c) i) Describe the method of measurement of rigidity by torsional oscillations. Derive the necessary formula.

ii) Find the workdone in blowing a soap bubble of radius 5 cm. Surface tension of soap solution is 25 dyne/cm.

Q5) Attempt any <u>two</u> of the following: **[16]**

a) Explain Otto cycle with an indicator diagram and obtain an expression for the efficiency of the Otto engine.

b) i) Describe vapour compression Refrigerator.

ii) Van der Waal's constants are: $a = 0.464\ Nm^4\ mole^{-2}$, $b = 5.28 \times 10^{-5}\ m^3\ mole^{-1}$. Calculate the critical volume and critical temperature of the gas.

c) i) Give different types of thermometers.

ii) Calculate the change in entropy when 1 mole of an ideal gas is allowed to expand from a volume of 2 litre to a volume of 20 litres at 27^oC.

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Total No. of Questions : 5]

SEAT No. :

P260

[Total No. of Pages : 3

[4717]-1004
F.Y.B.Sc.
PHYSICS - II
Physics Principles and Applications and Electromagnetics
(New Course- 2013 Pattern) (Paper - II)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Attempt ALL of the following: **[16]**

a) What is optical pumping?

b) Define covalent bond. Give example.

c) Give the equation of wavelength in Balmer series of Hydrogen atom.

d) Microwave emits frequency of 2500 MHz. What is the energy of radiation? [Given: h= 6.625 x 10^{-34} Js]

e) What do you mean by dielectric material.

f) What is hysteresis?

g) State Ampere's circuital law.

h) A conductor having a charge density 150 $\mu C/m^2$ is kept in air. Find magnitude of electric intensity at a point near the conductor.

Q2) Attempt any FOUR of the following: **[16]**

a) What is X-ray radiography? State it's applications.

b) Explain any two applications of LASER in detail.

c) State principle and application of solar cell.

P.T.O.

d) The vibrational frequency for a diatomic molecule HF is 1.24×10^{14} Hz. The mass of hydrogen atom and fluorine atom are 1.67×10^{-27} kg and 3.15×10^{-26} kg respectively. Find force constant 'k' for the inter atomic force.

e) Find the linear and angular velocity in 1st orbit of hydrogen atom.

[Given: Diameter of 1st Bhor's orbit = $0.52A^{o}$, $\epsilon_{o} = 8.85 \times 10^{-12}$ C^2/Nm^2, $h = 6.625 \times 10^{-34}$ Js, $e = 1.6 \times 10^{-19}$C].

f) A microwave radiation has a frequency 12GHz. What would be the wavelength and energy of the photon corresponding to this radiation?

[Given: $h = 6.625 \times 10^{-34}$ Js and 1 GHz = 10^{9}Hz]

Q3) Attempt any FOUR of the following: **[16]**

a) State Biot -Savart's law. Obtain an expression for magnetic field produced in long straight conductor.

b) Distinguish between paramagnetic and Ferro-magnetic substances.

c) Using Gauss's theorem, obtain an expression for electric intensity at any point due to a line charge.

d) Calculate potential due to dipole of dipole moment 3×10^{-10} cm at a distance of 2m from it on its own axis.

[Give: $\epsilon_{o} = 8.85 \times 10^{-12}$ C^2/Nm^2]

e) A bar magnet made of iron has magnetic moment 3 A m^2 and mass of 5×10^{-3} kg, if the density of iron is 6×10^{-3} kg/m^3. Find the intensity of magnetization.

f) A long solenoid having 200 turns/cm carries a current of 4.00 A. Find the magnetic intensity H and magnetic field B at the centre of solenoid.

[Given: $\mu_{o} = 4\pi \times 10^{-7}$ Wb/A-m]

Q4) Attempt any TWO of the following: **[16]**

a) With neat diagram discuss electromagnetic spectrum.

b) i) Explain stimulated emission of radiation and how it is responsible for laser action.

ii) The lowest vibrational states of NaCl molecule are 0.063 eV apart. Find the approximate force constant of this molecule.

[Given: mass of Na = 3.82×10^{-26} kg, mass of Cl = 5.81×10^{-26} kg]

c) i) What do you mean by mettallic bonding? Explain the properties of mettallic crystals.

ii) The series limit wavelength for Balmer series of Hydrogen spectrum is 3645 A^o. Calculate the value of Redburg's constant.

Q5) Attempt any TWO of the following: **[16]**

a) Derive an expression for electric intensity at any point due to electric dipole.

b) i) Explain the concept of electric flux.

ii) An aluminium wire of a diameter 0.4cm carries a current of 25 A. Find the magnetic field at the surface of wire.

[Given: $\mu_o = 4\pi \times 10^{-7}$ Wb/A-m]

c) i) Explain the terms magnetic permeability and susceptibility.

ii) Two spheres of charges 20 and 80 coloumb's are placed 80 cm apart. Find the position of the point between them where the intensity is zero.

EEE

Total No. of Questions : 5]

SEAT No. :

P261

[Total No. of Pages : 3

[4717]-1005
F.Y.B.Sc.
CHEMISTRY - I
Physical and Inorganic Chemistry
(2013 Pattern) (Theory) (Paper - I)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

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

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

a) Give the rule of differentiation of a quotient of two functions.

b) Explain the photoelectric effect.

c) What is Tyndall effect?

d) Define third law of thermodynamics. Give its' limitations.

e) What are liquid crystals?

f) Define the terms:

i) Oxidising agent

ii) Reducing agent

g) Explain the term sigma bond and Pi bond.

h) How many atoms are present 112 gms of nitrogen?

Q2) Attempt any four of the following: **[16]**

a) Write the pastulates of kinetic theory of gases.

b) What is adsorption isotherm? Give postulates of Langmuir's adsorption isotherm.

P.T.O.

c) Draw the graph of linear function and find the expression for the following.

i) Linear function passing through (3, –1) and (1, –3).

ii) Linear function when slope and intercept are given. Slope = 3 and intercept = –3.

d) Describe the influence of frequency and intensity of incident electromagnetic radiation on the current in photoelectric effect.

e) Describe the operations of Carnot cycle.

f) Explain the terms frequency, wavelength and wave numbers. How are they related?

Q3) Answer <u>any four</u> of the following: **[16]**

a) i) If $y = \frac{1+x^2}{1-x^2}$ find $\frac{dy}{dx}$. (b)

ii) Solve the integral $\int (4 + x^{-3})\, dx$.

b) Write down schrödinger equation and explain the terms in it.

c) What is the catalyst? Explain general characteristics of catalytic reactions.

d) Explain spontaneous and non-spontaneous process with the help of suitable examples.

e) What is vapour pressure of liquid? Describe isotoniscope method for measurement of vapour pressure.

f) Derive the expression for de-Broglie wavelength in terms of momentum of particle.

Q4) Attempt <u>any four</u> of the following: **[16]**

a) What is SP^3 hybridisation? Explain with suitable example.

b) What is primary and secondary standard? Explain with example.

c) Balance the following reaction by oxidation number method.

$$K_2Cr_2O_7 + H_2SO_4 + Na_2SO_3 \rightarrow K_2SO_4 + Na_2SO_4 + Cr_2(SO_4)_3 + H_2O.$$

d) Draw the structures of $[Ni(CN)_4]^{2-}$; PCl_5, BF_3 and $[Cr(H_2O)_6]^{2+}$.

e) Explain the shape of BrF_5 molecule on the basis of VSEPR theory.

f) State the assumptions of Heitler -London theory.

Q5) Solve any Four of the following: **[16]**

a) In an experiment, 400 ml of a gas at 27°C and 655 mm pressure weigh o.568 grams. Calculate the mol. wt. of gas.

b) 25 ml of a solution of HCl containing 3.65 grams in 500 ml solution neutralised 30 ml NaOH solution 10 ml of this alkali required 12.5 ml of sulphuric acid for momplete neutralisation. Calculate normality and strength of sulphuric acid.

c) The densities of liquid A and water are 866 g dm^{-3} and 998 gm dm^{-3} at 20°C respectively. The time of flow of liquid A and water through Ostwald's viscometer are 70 and 100 seconds respectively. Calculate the viscosity of liquid A. (Given: Viscosity of water is 0.010 poise).

d) 5 moles of an ideal gas expand so that its temperature and volume change from 37°C and 10 liter to 47°C and 50 liter. Calculate the change in entropy. R= 8.314 J $mole^{-1}$ K^{-1}, $C_v = \frac{3}{2}$ x R J $mole^{-1}$.

e) Find the wavelength of carbon dioxide molecule at a velocity of 660 m S^{-1}.

f) A heat engine operators between 20°C and 125°C. It absorbes 64.53 kcals of heat from it's source. Calculate maximum work done by the engine. [Given: 1 cal = 4.184J].

EEE

Total No. of Questions : 5]

SEAT No. :

P262

[Total No. of Pages : 3

[4717]-1006
F.Y.B.Sc.
CHEMISTRY - II
Organic and Inorganic Chemistry
(2013 Pattern) (Theory) (Paper - II)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

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

a) Explain the following terms

i) Specific rotation.

ii) Plane polarised light.

b) What is bond length? Explain with suitable example.

c) Draw zig-zag structures for the following compounds.

i) Butanoic acid.

ii) Alanine.

d) Explain intramolecular forces with suitable examples.

e) Alcohols have higher boiling points than alkanes; Explain.

f) Alkaline earth metals show +2 oxidation state; Explain .

g) What is the general electronic configuration of group VI A and VIIIA elements?

h) Define inert pair effect. Explain with suitable example.

P.T.O.

Q2) Attempt <u>any four</u> of the following: **[16]**

a) What is steric effect? How does it affect the reactivity of molecules and strength of bases?

b) What are carboxylic acids? Describe any two general methods of preparation of carboxylic acids.

c) What is confirmational isomerism? Discuss confirmational isomerism in ethane with energy profile diagram.

d) What are alcohols? Give classification of alcohols. How will you prepare ethyl alcohol from ethylene.

e) What are aromatic compounds? Explain sulphonation and Fridel Crafts reactions of benzene.

f) What are alkynes? How will you prepare alkynes from,

i) Viccinal dihalides.

ii) Higher alkynes from acetylene.

Q3) Attempt <u>any Four</u> of the following: **[16]**

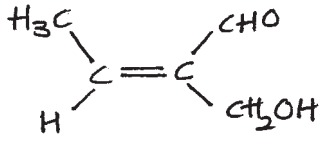
a) What are amines? How are they classified? How will you prepare ethyl amine from acetonitrile.

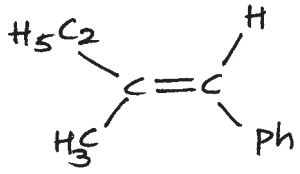
b) What are alkyl halides? What is the action of ethyl magnesium bromide on the following compounds?

i) Acetaldehyde

ii) Acetone

c) Assign E and Z configuration of the following compounds.

i) 

ii) 

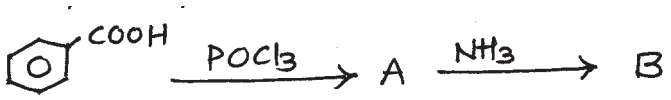
d) What is dehydrohalogenation reaction? How will you prepare propene and 2- butene by this reaction?

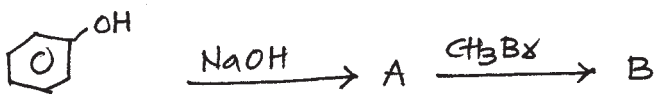
e) Explain Cannizzaro's reaction with suitable example.

f) Why phenol is more acidic than cyclohexanol? Explain.

Q4) Attempt <u>any Four</u> of the following: **[16]**

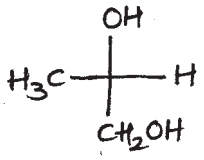
a) Identify the products A and B and rewrite the reactions. (Any two)

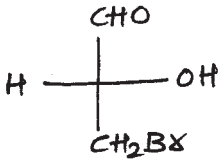
i) 

ii) 

iii) 

b) Assign the R or S configuration of the following compounds.

i) 

ii) 

c) What is hybridisation? Discuss formation of ethylene molecule using the concept of hybridisation.

d) Write short notes on:
   i) Markonikoff rule
   ii) Huckel's rule of aromaticity

e) Explain diagonal relationship between lithium and magnesium

f) Write note on silicates.

Q5) Attempt <u>any Four</u> of the following: **[16]**

a) Explain bonding and shape of diborane (B_2H_6)

b) Anomalous behaviour of nitrogen in group VA elements; Explain.

c) Define interhalogen compounds. Explain bonding and shape of IF_7 compound.

d) Explain periodicity in properties of alkaline earth metals with respect to
   i) atomic and ionic size
   ii) Oxidation state

e) What are the similarities of hydrogen with halogen elements?

f) Give different applications of alkali metals and their compounds.

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Total No. of Questions : 5]

SEAT No. :

P263

[Total No. of Pages : 2

[4717]-1007
F.Y.B.Sc.
BOTANY
BO-111: Fundamentals of Botany (Plant Diversity, Morphology and Anatomy)
(New Syllabus- 2013 Pattern))(Paper - I)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

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

a) Define Fungi.

b) What are cryptogams.

c) Name any two classes of Algae.

d) What is phycobiont?

e) Give any two characters of Monocotyledons.

f) Define Anatomy.

g) What is inflorescence?

h) Give any two importance of anatomy.

Q2) Attempt any four of the following: **[16]**

a) Write the symptoms of white rust disease.

b) Describe foliose lichens.

c) Describe the structure of sporangium in Nephrolepis.

d) Describe the structure of typical leaf.

e) Describe types of seed.

f) Give the characteristics of meristem.

P.T.O.

Q3) Write short notes on any four of the following: **[16]**

a) Outline classification of fungi according to G.M. Smith (1955).

b) Characters of Lycophyta.

c) Characters of Dicotyledons.

d) Tuber.

e) Functions of root.

f) Legume.

Q4) Attempt any two of the following: **[16]**

a) Describe lateral conjugation in Spirogyra.

b) Describe the external structure of thallus in Riccia.

c) Describe any two types of racemose inflorescence.

d) Give the structure of typical monocot stomata and add a note on functions of epidermal tissue system.

Q5) Describe the structure of sporophyte and T.S. of primary root of Cycas.**[16]**

OR

Describe the anatomy of leaf and stem of Dicotyledons.

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Total No. of Questions : 5]

SEAT No. :

P264

[Total No. of Pages : 2

[4717]-1008
F.Y.B.Sc.
BOTANY
BO-112: Industrial Botany - I & II
(New Syllabus- 2013 Pattern) (Theory) (Paper - II)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

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

a) What is floriculture?

b) Give any two plant resources of gum.

c) Define budding.

d) Enlist the types of layering.

e) Give any two plants used for biofuel production.

f) What is indiara?

g) Name any two fungi used in various industries.

h) Enlist types of nitrogen fixing biofertilizers.

Q2) Attempt any four of the following: **[16]**

a) Describe the process of hardening.

b) Explain the need of organic farming.

c) Describe any two value added products of mushrooms.

d) Give the applications of Aspergillus.

e) Explain the concept and need of fruit processing.

f) Give the active principle and medicinal uses of Asparagus.

P.T.O.

Q3) Write short notes on any four of the following: **[16]**

a) Preparation of media for plant tissue culture.

b) Spawn.

c) Fodder industry.

d) Applications of Trichoderma.

e) Jam.

f) Commercial significance of Amla.

Q4) Answer any two of the following: **[16]**

a) What is grafting? Describe in detail the approach grafting.

b) What is ginning? Describe steps of ginning process.

c) Describe in detail biodiesel production from castor.

d) Explain the method of preparation and uses of azadirachtin.

Q5) Give an account of cultivation practices and harvesting of Tuberose in open field. **[16]**

OR

What is biofertilizer? Describe its need and comment on phosphate solubilising biofertilizers.

EEE

Total No. of Questions : 5]

SEAT No. :

P265

[Total No. of Pages : 2

[4717]-1009
F.Y.B.Sc.
ZOOLOGY
ZY-101: Animal systematics and Diversity -I & II
(2013 Pattern) (Theory) (Paper - I)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Define / Explain: **[16]**

a) Kingdom

b) Setae

c) Cytostome

d) Medusa

e) Neoteny

f) Aestivation

g) Apoda

h) Catadromous migration

Q2) Write short notes on (Any Four): **[16]**

a) Contractile vacuoles in Paramoecium.

b) Binomial nomenclature.

c) Functions of body wall of Earthworm.

d) General characters of urochordata.

e) Parental care in Urodela.

f) Sexual dimorphism in Frog.

P.T.O.

Q3) Attempt the following (Any Four): **[16]**

a) State the general characters of kingdom Monera.

b) Explain the process of binary fission in Paramoecium.

c) Give an account of general characteristics of polychaeta.

d) Explain the amphidromous migration in Fishes.

e) State the salient features of Hemichordata.

f) Sketch and label - V.S. of eye of Frog.

Q4) Explain in brief (Any Two): **[16]**

a) Distinguishing characters of phylum protozoa. Name any three classes with suitable examples.

b) Economic importance of Earthworm.

c) Salient features of pisces with two examples.

d) Female reproductive system of Frog.

Q5) Give an account of reproductive system of Earthworm. **[16]**

OR

Describe in detail the Central Nervous system of frog.

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Total No. of Questions : 5]

SEAT No. :

P266

[Total No. of Pages : 2

[4717]-1010
F.Y.B.Sc.
ZOOLOGY
ZY-102: Fundamentals of Cell Biology and Genetics
(2013 Pattern) (Theory) (Paper - II)

Time : 3Hours] *[Max. Marks :80*

Instructions to the candidates:

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

Q1) Define / Explain the following: **[16]**

a) Cell

b) Vital stain

c) Phagocytosis

d) Cell wall

e) Phenotype

f) Dihybrid cross

g) Autosomes

h) Lethal genes

Q2) Write short notes on (Any Four): **[16]**

a) Ultrastructure of animal cell.

b) Lipid membrane model.

c) Structure of nuclear pore complex.

d) Supplementary factors (9:3:4 Ratio).

e) Klinefelter's syndrome.

f) Haemophilia.

P.T.O.

Q3) Attempt the following (Any Four): **[16]**

a) Describe any four biological properties of cytoplasm.

b) Write any four functions of Endoplasmic reticulum.

c) Explain in brief cytoplasmic inheritance.

d) Sketch and label - prokaryotic cell.

e) Haploid - diploid method of sex determination.

f) A man with blood group B(Homozygous) maries a woman with blood group O. workout the possible blood groups of their children.

Q4) Attempt the following (Any two): **[16]**

a) Describe the structure of mitochondria.

b) Describe in details the functions of plasma membrane

c) Skin colour inheritance in man.

d) Importance of multiple alleles.

Q5) What is mitosis? Describe in details the process of mitosis. **[16]**

OR

Give an account of structure of chromosome in details. Add a note on type of chromosomes on the basis of centromeric position.

EEE

Total No. of Questions : 5]

SEAT No. :

P267

[Total No. of Pages : 2

[4717]-1011
F.Y. B.Sc.
GEOLOGY
Mineralogy and Petrology
(2013 Pattern) (Paper-I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

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

a) What is structural geology?

b) What is dip direction?

c) What is granite?

d) Define centre of symmetry.

e) What is petrology?

f) What is streak?

g) Define magma.

h) Explain gneissose structure.

Q2) Answer the following questions (Any Four): **[16]**

a) Explain the supergene enrichment and placer deposits in mineral formation.

b) Explain Residual Bonding in minerals with suitable examples.

c) Describe Inosilicate structure with suitable examples.

d) Give an account of mins used in cement industry.

e) Define fracture. Explain different types of fracture.

f) Define specific gravity. Describe the use of Walker's steel yard in determining the specific gravity of minerals.

P.T.O.

Q3) Answer the following questions (Any Four): **[16]**

a) Give the diagnostic characters of Metamorphic Rocks.

b) Give the classification of minerals based on colour Index.

c) Describe the Residual Deposits.

d) Explain Dynamothermal Metamorphism with suitable examples.

e) Describe the clastic texture in sedementary rocks.

f) Explain granulose structure.

Q4) Answer the following questions (Any Two): **[16]**

a) State the various optical properties of minerals in Plane Polarised Light. Explain cleavage in detail.

b) Give the tabular classification of Igneous Rocks.

c) Describe the various agents of metamorphism.

d) Give the various forms with indices present in Triclinic system with indices.

Q5) Define an unconformity. State the different types of unconformities. Write notes on: **[16]**

a) Non-conformity.

b) Angular unconformity.

OR

Give the elements of symmetry, crystallographic axes, the various forms present with indices in cubic system, Type-Galena.

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Total No. of Questions : 5]

SEAT No. :

P268

[Total No. of Pages : 2

[4717]-1012
F.Y. B.Sc.
GEOLOGY
Physical Geology and Palaeontology
(Revised Course 2013 Pattern) (Paper-II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

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

a) Draw a neat diagram of mesa and butte landforms.

b) Define Varves.

c) Mention the Average density and temperature of the earth.

d) Define Hinge line.

e) Give the earthquake belts of the earth.

f) What are tracks and trails?

g) List the modern radiometric dating methods.

h) Draw a neat labelled diagram of Gastropod shells.

Q2) Answer the following questions (Any Four): **[16]**

a) Define weathering. Describe the following chemical weathering types:

i) Oxidation and Reduction.

ii) Hydration and Hydrolysis.

b) Describe the causes of earthquakes.

c) Define disaster and describe how to take precaution and mitigation.

d) Describe the uses of fossils.

e) Describe the types of septa.

f) Describe the geological and geographical distribution of Gastropod shells.

P.T.O.

Q3) Answer the following questions (Any Four): **[16]**

a) Describe the products of volcanoes.

b) Define Geology. Describe Mineralogy, Petrology, Structural Geology and Stratigraphy.

c) Define earthquake and describe the effects of an earthquake.

d) Describe the life through Mesozoic era.

e) Describe the Head / cephalon of trilobites.

f) Distinguish between Regular and Irregular echinoids.

Q4) Answer the following questions (Any Two): **[16]**

a) Describe the geological evidence in support of the continental drift theory.

b) Explain the Big Bang theory for the origin of universe.

c) Describe the following modes of preservation of fossils:

i) Petrification ii) Mould and casts

iii) Imprints iv) Carbonisation

d) Describe the variation in Apical disc.

Q5) Describe the various erosional and depositional landforms formed by the action of wind. **[16]**

OR

a) Give the similarities and dissimilarities between lamellibranchs and brachiopods. **[8]**

b) Define fossil. Describe the necessary conditions for fossilization. Add a note on collection techniques of fossils in the field. **[8]**

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Total No. of Questions : 5]

SEAT No. :

P269

[Total No. of Pages : 4

[4717]-1013
F.Y. B.Sc.
STATISTICS / STATISTICAL TECHNIQUES
Descriptive Statistics
(2013 Pattern) (Paper-I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt each of the following:

a) i) Define the term population.

ii) State any 2 merits of arithmetic mean.

iii) Define the term ultimate class frequency.

iv) Define the term kurtosis. **[4 x 1 = 4]**

b) Choose the correct alternative for the following: **[4 x 1 = 4]**

i) The value of 30^{th} percentile is equal to:

A) Third decile B) Third quartile

C) Median D) Sixth decile

ii) If corr(X, Y) = 0, then we conclude that

A) $\sigma_X = \sigma_Y$

B) $\bar{X}=\bar{Y}$

C) There is no linear relationship between X and Y.

D) There is no relationship between X and Y.

P.T.O.

iii) Given that (A) = 150, (Aβ) = 50, (B) = 180, (AB) = 100 and N = 270, the class frequency (αβ) is equal to:

A) 80 B) 90

C) 40 D) 120

iv) Mean deviation is least when measured from:

A) Zero B) Mean

C) Median D) Mode

c) i) If $b_{yx} = 0.4$, $\sigma_x = 2\sigma_y$, then find r. **[2]**

ii) Give one illustration of positive and negative correlation each. **[2]**

iii) Given that A.M. = 160, mode = 157, s.d. = 50, find Karl Pearson's coefficient of skewness. **[2]**

iv) Find the frequency of (αβC) in terms of positive class frequencies using method of dot operator in case of three attributes A, B, C. **[2]**

Q2) Attempt Any Four of the following: **[4 x 4 = 16]**

a) What is dispersion? Explain relative measure of dispersion and state its utility.

b) Is the following information consistent? Justify your answer.

$\mu_1' = 2, \mu_2' = 20, \mu_3' = 40, \mu_4' = 50$.

c) State any 4 characteristics of good statistical average.

d) Compute Fisher's price index number for the following data:

Commodities	2011		2012	
	Price p_0	Quantity q_0	Price p_1	Quantity q_1
A	20	8	40	6
B	50	10	60	5
C	40	15	50	10
D	20	20	20	15

e) Explain stratified random sampling with illustration.

f) Given that (AB) = 256, (αB) = 768, (Aβ) = 48, ($\alpha\beta$) = 144, find out whether A and B are independent.

Q3) Attempt Any Four of the following: **[4 x 4 = 16]**

a) For two observations *a* and *b*, show that A.M. $\geq$ G.M. $\geq$ H.M.

b) With usual notations prove that $\frac{\mu_3'}{\mu_1'} = 3\mu_2 + \mu_1'^2$, for a symmetric distribution.

c) Find number of pairs from the following data: r = –0.4, Σx = 100, Σx^2 = 2250, Σy^2 = 2250, Σy = 100, Σxy = 1900.

d) Out of 100 students interviewed, 40 liked Indian music, 70 liked Western music and 20 did not liked both. Find the number of students who

i) liked both types of music.

ii) at least one type of music.

iii) only one type of music.

e) Two groups of n_1 and n_2 observations have same arithmetic means and standard deviations σ_1 and σ_2 respectively. State the formula for combined s.d.

f) The first 3 moments of a certain variable about the value '1' are 2, 25 and 80. Find the coefficient of skewness and interprete the result.

Q4) Attempt Any Two of the following: **[2 x 8 = 16]**

a) i) What is correlation? Explain its different types with real life examples.

ii) What is meant by association of two attributes? How it is measured.

b) Explain the following terms.

i) Positive attribute and positive class.

ii) Order of a class.

iii) Coefficient of determination.

iv) Coefficient of skewness.

c) Karl Pearson's coefficient of correlation between X and Y obtained from 10 pairs of items is 0.5. Means of X and Y are 12 and 15 respectively. Standard deviations of X and Y are 3 and 4 respectively. While checking it was noticed that one of the items was wrongly entered as 16 instead of 26 for X series and as 9 instead of 18 for Y series. Calculate correct coefficient of correlation.

d) i) Show that $\beta_2 \geq 1$.

ii) Calculate harmonic mean of the following series of monthly expenditure of a batch of students: 125, 130, 75, 10, 45, 5, 0.5, 0.4, 500, 150.

Q5) Attempt Any One of the following:

a) i) Explain procedure of fitting the curve $y = a + bx + cx^2$ for a bivariate data. **[8]**

ii) If mean of the following frequency distribution is 15.82. Find missing value of x. **[4]**

x	10	12	13	17	x	25	18	30
Frequency	25	17	13	15	14	8	6	2

iii) Define Laspeyre's and Paasche's price and quantity index numbers. **[4]**

b) i) Show that Bowley's coefficient of skewness lies between –1 and +1. **[4]**

ii) Define the Spearman's rank correlation coefficient assuming no ties and derive an expression for it. **[8]**

iii) Given the following frequencies, obtain the remaining frequencies:

$(AB) = 20$, $(A\beta) = 10$, $(\alpha B) = 15$, $(\alpha\beta) = 55$. **[4]**

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Total No. of Questions : 5]

SEAT No. :

P270

[Total No. of Pages : 4

[4717]-1014
F.Y. B.Sc.
STATISTICS / STATISTICAL TECHNIQUES
Discrete Probability and Probability Distributions
(2013 Pattern) (Paper-II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt each of the following:

a) i) Give one real life situation of Poisson distribution. **[1]**

ii) Give an expression for m.g.f. of a binomial distribution with mean 2.4 and variance 1.48. **[1]**

iii) Define independence of 2 events A and B on Ω. **[1]**

iv) Write the sample space of a random experiment of tossing 2 coins. **[1]**

b) Choose correct alternative for the following: **[1 each]**

i) The classical approach to probability assumes that all possible outcomes of an experiment are-

A) independent B) dependent

C) mutually exclusive D) equally likely

ii) If A and B are independent events with P(A) = 0.4 and P(B) = 0.5, then $P(A \cup B)$ is

A) 0.7 B) 0.6

C) 0.9 D) 0.8

P.T.O.

iii) If X follows discrete uniform distribution on 1, 2, ---- n. Mean of X is-

A) $\frac{n}{2}$ B) $\frac{n+1}{2}$

C) $n+\frac{1}{2}$ D) $\frac{n}{2}+1$

iv) For a degenerate distribution at X = c, mean and variance are-

A) c, c B) c, 0

C) 0, 0 D) 0, c

c) i) Give classical definition of probability. **[2]**

ii) Define conditional probability of an event. **[2]**

iii) Find mean of a Bernoulli distribution with parameter 'p'. **[2]**

iv) Two cards are drawn from a pack of well shuffled playing cards. Find the probability that both are of same colour. **[2]**

Q2) Attempt Any Four of the following: **[4 each]**

a) Let A, B, C be three mutually exclusive and exhaustive events defined on Ω. If 3P(A) = 2P(B) = P(C) find $P(A \cup B)$.

b) For a Poisson distribution with P(X = 0) = 2P(X = 1), compute P(2 < X < 6) and $P(X \geq 1)$.

c) A committee of 4 persons has to be formed from 3 doctors and 4 Engineers. Find the probability that the committee consists of (i) All Engineers, (ii) All doctors.

d) Let (X, Y) be a two-dimensional discrete r.v. with joint p.m.f.

Y \ X	0	1	2
0	0.1	0.2	0.3
1	0.1	0.1	0.2

Obtain E(2X + 3Y).

e) Given that $P(A_1) = P(A_2) = P(A_3) = \frac{1}{3}$ and $P(B|A_1) = \frac{2}{7}$, $P(B|A_2) = \frac{4}{9}$, $P(B|A_3) = \frac{1}{5}$, find $P(A_1|B)$.

f) If X and Y are two discrete r.v's, then prove that E(X + Y) = E(X) + E(Y).

Q3) Attempt Any Four of the following: **[4 each]**

a) Suppose X follows binomial distribution with parameters n and p. Obtain the probability distribution of Y = n – x using its m.g.f.

b) Define the following terms:

i) mutually exclusive events defined on Ω.

ii) Partition of a sample space.

c) Let the joint p.m.f. of (X, Y) be

$$P(x, y) = \begin{cases} k(2x+5y); & k>0;\ x=1, 2;\ y=1, 2 \\ 0, & \text{otherwise} \end{cases}$$

Determine the value of k and find marginal p.m.f. of X.

d) Obtain moment generating function of Poisson distribution with parameter 'm'.

e) Define a Geometric distribution assuming all non-negative integer values with parameter 'p'. Also obtain its mean.

f) If X and Y are two independent discrete r.v's with $\sigma_x = 3$ and Var(2x + 3y) = 72, compute σ_y.

Q4) Attempt Any Two of the following:

a) i) Define central moment of a discrete r.v. X and express first three central moments in terms of raw moments. **[4]**

ii) Show that cumulant generating function (CGF) of sum of two independent discrete r.v's is equal to the sum of their CGF's. **[4]**

b) The following table gives the joint probability distribution of X and Y: **[4 + 4]**

Y \ X	0	1	2
2	0.2	0.1	0.2
3	0.3	0.1	0.1

Find (i) Cov (X, Y) (ii) Var (Y | X = 1).

c) Define a binomial distribution. Obtain its mode, is it unique. **[8]**

d) i) State and prove Bayes' theorem. **[6]**

ii) For two discrete r.v's X, Y; var(X) = var(Y) = 1, Cov (X, Y) = $\frac{1}{2}$.

Compute Corr $\left(\frac{X-5}{2}, 2-\frac{Y}{3}\right)$. **[2]**

Q5) Attempt Any One of the following:

a) i) Define a discrete uniform distribution on integers 1 to n. Obtain its variance and also comment on its median. **[8]**

ii) In a summer season a truck driver experience on an average one puncture in 1000 km. Applying Poisson distribution, find the probability that there will be atleast 3 punctures in a journey of 4000 kms. **[4]**

iii) Derive moment generating function (M.G.F) of a Geometric distribution with parameter 'p' assuming all non-negative integer values. **[4]**

b) i) Let $X \to B(n_1, p)$, $Y \to B(n_2, p)$ and are independent r.v's. Obtain the conditional distribution of X given X + Y = n. Identify it. **[5]**

ii) If A, B, C are any three events defined on Ω, with P(B) > 0, then prove that

$P(A \cup C|B) = P(A|B) + P(C|B) - P(A \cap C|B)$. **[5]**

iii) Show that Cov (aX + b, cY + d) for any bivariate r.v. (X, Y) defined on some sample space. **[4]**

iv) Define complete independence of three events defined on a sample space Ω. **[2]**

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Total No. of Questions : 5]

SEAT No. :

P271

[Total No. of Pages : 2

[4717]-1015
F.Y. B.Sc.
GEOGRAPHY-I
Gg-110 : Geomorphology
(New Course 2013 Pattern) (Paper-I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***All questions carry equal marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Use of map stencils is allowed.***

Q1) Answer the following in twenty words (Any Eight): **[16]**

a) What is mono discontinuty?

b) Define metamorphic rock.

c) What is mean by isostatic equilibrium?

d) What are diastrophic movements?

e) What are symmetrical folds?

f) Define fault.

g) What are seismic waves.

h) Define weathering.

i) What do you mean by soil creep?

j) Define Delta.

Q2) Explain the following in 150 words (Any Four): **[16]**

a) Nife.

b) Rift valley.

c) Types of faults.

P.T.O.

d) Earths crust.

e) Mechanical weathering.

f) Waterfall and Rapids.

Q3) Answer the following in 150 words (Any Four): **[16]**

a) Branches of physical geography.

b) Geological time scale.

c) Difference between rock and minerals.

d) Sea cliff formation.

e) Flood plains and levees.

f) Types of folds.

Q4) Answer the following in 300 words (Any Two): **[16]**

a) Explain the nature of Geomorphology.

b) Explain plate tectonic theory.

c) Explain the types of igneous rocks.

d) Explain the landforms associated with depositional work of sea waves.

Q5) Answer the following in 500 words (Any One): **[16]**

What is earthquakes? Explain the causes and effects of earthquakes.

OR

Describe the landforms associated with erosional work of wind.

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Total No. of Questions : 5]

SEAT No. :

P272

[Total No. of Pages : 2

[4717]-1016
F.Y. B.Sc.
GEOGRAPHY-II
Gg-120 : Climatology and Oceanography
(New Course 2013 Pattern) (Paper-II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***All questions carry equal marks.***
3) ***Draw neat diagrams wherever necessary.***
4) ***Use of map stencils is allowed.***

Q1) Answer the following in twenty words (Any Eight): **[16]**

a) Define weather.

b) What is Global Warming?

c) What do you mean by La-Nina?

d) Define Monsoon winds.

e) What do you mean by hail?

f) Define Salinity.

g) Define Submarine Relief.

h) What do you mean by tides?

i) What is sea wave amplitude?

j) Give types of ocean currents.

Q2) Explain the following in 150 words (Any Four): **[16]**

a) Hydrological cycle.

b) Heat Budget of the earth.

c) Land and sea breezes.

d) Nature of Oceanography.

P.T.O.

e) Ria Coasts.

f) Salinity of Indian Ocean.

Q3) Answer the following in 150 words (Any Four): **[16]**

a) Inversion of temperature.

b) E1 Nino.

c) Low clouds.

d) Relief of Pacific Ocean.

e) Causes of Salinity.

f) Effects of Ocean Currents.

Q4) Answer the following in 300 words (Any Two): **[16]**

a) Composition of Atmosphere.

b) Explain any four factors affecting horizontal distribution of temperature.

c) Explain continental shelf and continental slope.

d) Explain types of tides and give their causes of formation.

Q5) Define climatology. Explain its nature and scope. **[16]**

OR

With a neat diagram explain formation of ocean currents in Atlantic Ocean.

●●●●●

Total No. of Questions : 5]

SEAT No. :

P273

[Total No. of Pages : 2

[4717]-1017
F.Y. B.Sc.
MICROBIOLOGY
Introduction to Microbiology
(New Course 2013 Pattern) (Paper-I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

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

a) Name any two diseases caused by bacteria.

b) Give any two examples of gram negative bacteria.

c) Define - pH.

d) The two purines found in DNA are _____ and _____.

e) State - true or false:

i) Pili are organs of motility in gram negative bacteria.

ii) Sporozoa are non-motile protozoa.

f) Name the different sexual spores produced by fungi.

g) What is a base? Give two examples.

h) Match the following:

i) Elie Metchnikoff: Genes as regulating agents

ii) Beadle & Tatum: Vaccination

: Phagocytosis by immune system cells.

Q2) Write short notes on Any Four: **[16]**

a) Rickettsia.

b) RNA.

P.T.O.

c) Germ theory of Fermentation.

d) Biocontrol Agents.

e) Metachromatic granules.

f) Antony Von Leeuwenhoek.

Q3) Attempt Any Four of the following: **[16]**

a) Discuss the developments in Immunology.

b) State River's postulates.

c) Write about Hooke's micrographia.

d) Explain Redox potential.

e) Give structure & function of Haemoglobin.

f) Write in brief about Industrial Microbiology.

Q4) Answer Any Two of the following: **[16]**

a) Give the differentiating characters of viruses. Add a note on prions & viroids.

b) Explain Tyndall's experiment with a neat labelled diagram.

c) Explain structure & function of bacterial capsule.

d) What are weak interactions? Give their significance in biomolecules.

Q5) Attempt Any One of the following: **[16]**

a) What are carbohydrates? Comment on structure & role of carbohydrates as biomolecules.

b) With a neat labelled diagram explain composition, structure and function of cell membrane.

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Total No. of Questions : 5]

SEAT No. :

P274

[Total No. of Pages : 2

[4717]-1018
F.Y. B.Sc.
MICROBIOLOGY
Basic Techniques in Microbiology
(New Course 2013 Pattern) (Paper-II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

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

a) Name any two heavy metal compounds showing inhibition of bacterial growth.

b) Enlist any two counting chambers used for enumeration of bacteria.

c) Define - Resolving power.

d) Fill in the blanks.

i) 1 litre is equal to _____ ml.

ii) 1 ml is equal to _____ µl

e) State true or false:

i) In synchronous culture all bacteria are in logarthmic phase.

ii) Cell carbon is measured by Kjeldahl method.

f) Name any two decolourizers.

g) What is specific growth rate?

h) Match the following and rewrite:

i) Grows best at alkaline pH - Acidophile

ii) Grows best at acidic pH - Basophile

- Neutrophile.

P.T.O.

Q2) Write short notes on Any Four: **[16]**

a) Effect of salt concentration on growth of bacteria.

b) Diauxic growth.

c) Enrichment culture technique.

d) Lyophilization.

e) Mode of action of quaternary ammonium compounds.

f) Accentuators.

Q3) Attempt Any Four of the following: **[16]**

a) Describe spherical aberration with diagram.

b) Describe characteristics of an ideal disinfectant.

c) Describe checking of efficiency of sterilization using chemical indicators.

d) Explain role of water and salt in bacteriological media.

e) Describe counting of bacterial cells by direct microscopic count.

f) Explain the role of Mac Conkey's agar as a selective and differential medium.

Q4) Attempt Any Two of the following: **[16]**

a) With proper ray diagram explain principle and working of fluorescence microscope.

b) Describe mechanism of sterilization by filtration.

c) Explain enumeration of bacterial cells using pour plate technique.

d) Describe nutritional classification of bacteria.

Q5) Attempt Any One of the following: **[16]**

a) What is differential staining? Give examples of differential staining. Explain any one in detail.

b) Explain growth phases of bacteria in a batch culture with suitable diagram.

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Total No. of Questions : 5]

SEAT No. :

P275

[Total No. of Pages : 2

[4717]-1019
F.Y. B.Sc.
EXPERIMENTAL PSYCHOLOGY
General Psychology
(2013 Pattern) (Paper-I)

Time : 3 Hours] *[Max. Marks : 80*

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.***

Q1) Answer in 20 words (8 out of 10): **[16]**

a) Define Psychology.

b) What is observation?

c) What is need for achievement?

d) Define frustration.

e) Define emotion.

f) What is anger?

g) State the full name of TAT.

h) Define personality.

i) What is perception?

j) State full form of DAT.

Q2) Answer in 50 words (4 out of 6): **[16]**

a) Write short note on geometrical illusion.

b) Illustrate James-Lange theory of emotion.

c) Explain trial and error method of learning.

d) Describe thirst drive with its physiology.

P.T.O.

e) Explain trait approach of personality.

f) Write short note on Maslow's hierarchy of motivation.

Q3) Answer in 150 words (4 out of 6): **[16]**

a) Explain survey method of psychological research.

b) Define sensation and explain its nature.

c) Enumerates the sources of frustration.

d) Describe the physiology of emotion.

e) Explain Cannon-Bard theory of emotion.

f) Write note on STM.

Q4) Answer in 300 words (2 out of 4): **[16]**

a) Explain the fields of psychology.

b) Enumerates types of attention.

c) Discuss psychoanalysis.

d) Illustrate Pavlov's experiment of classical conditioning.

Q5) Answer in 500 words (1 out of 2): **[16]**

a) Describe the nature and function of human brain.

b) What is mental retardation? Explain its types and causes.

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Total No. of Questions : 5]

SEAT No. :

P276

[Total No. of Pages : 4

[4717]-1020
F.Y. B.Sc.
PSYCHOLOGY
Experimental Psychology
(2013 Pattern) (Paper-II) (New)

Time : 3 Hours] *[Max. Marks : 80*

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.***

Q1) Answer in 20 words (8 out of 10): **[16]**

a) Define psychophysics.

b) Which are the alternative names of method of limit?

c) Who established the first laboratory in psychology?

d) Define thinking.

e) What is problem solving?

f) Define reaction time.

g) Define fore period.

h) What is psychological testing?

i) State the full name of GATB.

j) Define intelligence.

Q2) Answer in 50 words (4 out of 6): **[16]**

a) State the nature of experimental psychology.

b) Explain the rules of concept formation.

c) Explain various areas related with language.

d) State the importance of reaction time.

P.T.O.

e) Write short note on individual psychological test.

f) State the characteristics of psychological test.

Q3) Answer in 150 words (4 out of 6): **[16]**

a) History of experimental psychology-Describe in brief.

b) Explain Weber's law.

c) Explain the concept of mental image in thinking.

d) Write a short note on self-report inventory.

e) Explain the group test in testing.

f) Describe social implications of psychological tests.

Q4) Answer in 300 words (2 out of 4): **[16]**

a) Explain the goals of experimental psychology.

b) Describe basic concepts of psychophysics in brief.

c) Explain the types of reaction time.

d) Describe DAT with various aptitudes.

Q5) Answer in 500 words (1 out of 2): **[16]**

a) Define variable. Explain the various types of variables.

b) What is learning? Describe the types of learning.

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Total No. of Questions : 5]

P276

[4717]-1020
F.Y. B.Sc.
PSYCHOLOGY
Experimental Psychology & Psychological Testing
(2008 Pattern) (Paper-II) (Old)

Time : 3 Hours] ***[Max. Marks : 80***

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.***

Q1) Answer the following questions in two to four sentences: **[16]**

a) Define PSE.

b) What is foreperiod?

c) Define reliability.

d) State any two applications of reaction time.

e) Define intelligence.

f) What is AL?

g) What is test retest method of reliability?

h) What is aptitude?

Q2) Attempt Any Four questions in six to eight sentences. **[16]**

a) Enlist types of Psychological tests.

b) Explain DAT in brief.

c) Describe Wechsler's intelligence Scale for Adult.

d) Explain types of reaction time.

e) Explain the definition and nature of personality.

f) Describe Rorschach inkblot as a projective test.

Q3) Attempt Any Four questions in six to eight sentences: **[16]**

a) State Fechner's law in psychophysics.

b) Explain various uses of Psychological tests.

c) Explain KR-20 reliability.

d) State basic assumptions about aptitudes.

e) Explain any two personality inventories.

f) Describe any one self report inventory.

Q4) Answer any Two of the following: **[16]**

a) Illustrate method of average error.

b) Describe determinants of reaction time.

c) Enumerates characteristics of a good Psychological test.

d) Explain meaning and types of validity.

Q5) a) What is problem solving? Discuss various stages in problem solving. **[16]**

OR

b) What is variable? Explain various types of variables.

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Total No. of Questions : 5]

SEAT No. :

P277

[Total No. of Pages : 3

[4717] - 1023
F.Y.B.Sc.
ELECTRONIC SCIENCE
EL - 101 : Principles of Analog Electronics
(Paper - I) (2013 New Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer the following questions in brief: **[16]**

a) Draw the circuit symbols for resistor, potentiometer, LDR and thermister.

b) Give the different signals used in electronics. Draw any two of them.

c) What is time constant? Give its importance.

d) What is diode? Draw its circuit symbol. Give its one application.

e) Draw the circuit symbols for PNP and NPN transistors.

f) What is DC load line? Draw it for transistor.

g) Draw the circuit symbols for UJT, FET and MOSFETS.

h) What is op-amp? Draw its circuit symbol showing all terminals.

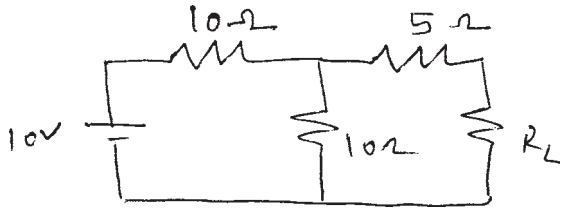
Q2) Attempt any <u>four</u> of the following: **[16]**

a) i) What is inductor? Draw its circuit symbol. Give its one application.

ii) What is a switch? Give at least four types of switches.

b) What is phasor? Draw a phasor diagram showing sine wave generation.

c) What is Thevenin's theorem? Determine the Thevenin's equivalent circuit for the following network.



P.T.O.

d) What is rectifier? Give its types. Draw the circuit diagram for one of them.

e) What is voltage amplifier? Draw its circuit diagram using transistor. Explain its working.

f) Draw the circuit diagram of voltage follower using op-amp. Derive its o/p voltage expression.

Q3) Attempt any <u>four</u> of the following: **[16]**

a) i) What is cable? Give its applications.

ii) What is the difference between primary and secondary battery?

b) Explain the concept of T and Π networks. How to convert T network into Π network?

c) Explain regulator using zener diode.

d) Give the classification of amplifiers on the basis of operating point.

e) Explain the working principle of n-channel MOSFET.

f) Draw the circuit diagram for subtractor using op-amp. Derive its output voltage expression.

Q4) Attempt any <u>four</u> of the following: **[16]**

a) i) Give color code for 470 Ω resistor with 20% tolerance.

ii) Explain the terms: Turns ratio, efficiency for transformer.

b) With neat circuit diagram explain step response of RC circuit.

c) What is photodiode? How it works? Draw its I-V characteristics.

d) What is biasing a transistor? Explain the voltage divider bias.

e) Draw I-V characteristics of UJT. Show different regions on it. Give its one application.

f) What is Schmitt trigger? Draw its circuit diagram. Explain its working.

Q5) Attempt any <u>four</u> of the following: **[16]**

a) i) What is fuse? How it works?

ii) Write a short note on co-axial cable.

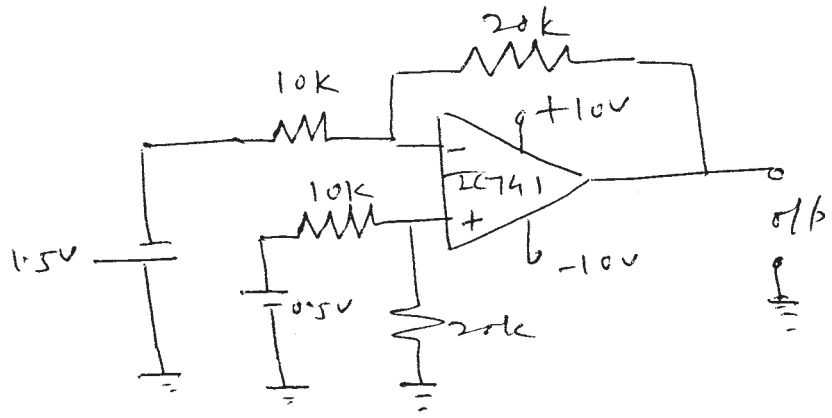
b) Explain with neat diagram how RC circuit works as integrator.

c) What is clipper? Draw its circuit diagram. Explain its working.

d) Explain how transistor can be used as switch.

e) Draw the frequency response of amplifier. How to find bandwidth from it?

f) Obtain the value of o/p voltage for following circuit.



Total No. of Questions : 5]

SEAT No. :

P278

[Total No. of Pages : 2

[4717] - 1024
F.Y.B.Sc.
ELECTRONIC SCIENCE
EL - 102 : Principles of Digital Electronics
(Paper - II) (New - 2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat labelled diagram must be drawn wherever necessary.***
3) ***Use of calculator and log table is allowed.***
4) ***Figures to the right indicate full marks.***

Q1) Answer the following questions in brief: **[16]**

a) What is Excess-3 code. Give one example.

b) Define Full Adder. Give its application.

c) What is binary comparator?

d) What is radix used in different number systems?

e) What is K-map? Where is it used?

f) Define the term de-multiplexer? Give its application. (any one).

g) What is decade counter?

h) State advantages of MOS family over bipolar family. (any two).

Q2) Answer any FOUR of the following: **[16]**

a) Use only NAND gates to design OR gate. Verify using truth table.

b) Explain Tristate buffer.

c) Compare CMOS and TTL logic families (any 4 points).

d) Describe BCD to seven segment decoder with proper circuit.

e) Draw the circuit of 4bit asynchronous UP counter.

f) i) Convert Binary to gray : 10110, 11011

ii) Obtain is complement : 10110, 11011

P.T.O.

Q3) Answer Any FOUR of the following: **[16]**

a) Explain Gray code system with suitable example.

b) Explain different types of shift registers.

c) What is parallel adder? Draw logic circuit of 4bit parallel adder.

d) Explain Half Subtractor with the help of logic diagram.

e) Simplify the expression using K-map:- $Y = \bar{A}\,\bar{B}\bar{C} + \bar{A}\,B\bar{C} + A\,B\bar{C} + A\,\bar{B}\bar{C}$.

f) Explain D FF with proper diagram and truth table.

Q4) Answer any FOUR of the following: **[16]**

a) State and verify De-Morgan's theorem: $\overline{(A \cdot B)} = \bar{A} + \bar{B}$.

b) Explain application of EXOR gate as parity checker.

c) Explain PISO shift register with proper logic diagram.

d) Explain 1:4 demultiplexer with proper logic diagram.

e) Construct 4:1 multiplexer using two 2:1 multiplexers.

f) How EXOR gate can be used in two bit comparator.

Q5) Answer any FOUR of the following: **[16]**

a) Describe basic gates with symbols and truth table. (any two).

b) Explain CMOS inverter with logic diagram.

c) Perform subtraction using 2's complement method:
$(45)_{16} - (22)_{16}$.

d) Simplify the following expression using Demorgan's theorem.
$\overline{(\overline{A + B} + \bar{C})}$.

e) Explain Decimal to BCD encoder with circuit diagram.

f) If clock frequency is 8MHz, how long it will take to shift 8bit number into SISO shift register.

Total No. of Questions : 4]

SEAT No. :

P279

[Total No. of Pages : 2

[4717] - 1025

F.Y.B.Sc. (Annual)

DEFENCE AND STRATEGIC STUDIES

DS - 1 : Evolution of Strategic Thought

(Paper - I) (New Course) (2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer in 20 words [Any Ten]: **[20]**

a) Define "Tactics".

b) State the meaning of "Air Power".

c) Define "Strategy".

d) Which theory it was introduced by Douhet?

e) Who had introduced the theory of sea power.

f) Define "Geopolitics".

g) By whom the theory of Heartland it was introduced?

h) Which warfare it was conducted by Sun-tzu?

i) Who was Machiavelli?

j) What do you mean by "Nationalism"?

k) Who was the founder of professional Army?

l) Define "Total War".

m) By whom the well known literature "Arthasastra" it was wrote?

Q2) Answer in 50 words: (Any Two) **[10]**

a) Write a Few lines on "Haushofer"

b) What do you know about Adamsmith?

c) Explain the concept of Geopolitics.

d) Write in brief "Industrial Revolution".

P.T.O.

Q3) Answer in 150 words [Any Two]: **[20]**

a) Evaluate the views of Mao-Tse-Tung on Guerrilla Warfare".

b) Write a note on "various causes of war".

c) Explain the Kautilya as a "Strategic Thinker".

d) Discuss the origin of Modern war.

Q4) Answer in 300 words [Any Two] **[30]**

a) Highlight on "Impact of American Civil War".

b) Explain the elements of naval power as per A.T.Mahan.

c) Write a note on views of Douhet on "Air Power".

d) Evaluate the geopolitical thoughts of Prof. Mackinder.

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Total No. of Questions : 4]

SEAT No. :

P280

[Total No. of Pages : 2

[4717] - 1026
F.Y.B.Sc. (Annual)
DEFENCE AND STRATEGIC STUDIES
DS - 2 : India's National Security
(2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer in 20 words each (any ten): **[20]**

a) What is National Security?

b) Introduce *Bharat.*

c) How many Pakistani POW were captured in 1971?

d) How the term 'India' came into existence?

e) Write the duration of Kashmir Operation.

f) Introduce Himalaya.

g) Introduce Red Cliff.

h) What is Deccan Plateau?

i) Define Terrorism.

j) Who was Maharaja Hari Singh?

k) Briefly introduce Kargil WAR.

l) What is meant by SAARC?

m) What do you mean by AWACS?

Q2) Answer in 50 words each (any two): **[10]**

a) Write about the India-Sri Lanka relation.

b) Write about the Military Operations in Hyderabad.

c) Explain the value of technology in national defence.

d) Explain about the civil defence.

P.T.O.

Q3) Answer in 150 words (any two): **[20]**

a) What are the constraints and compulsion in a democracy in controlling LIC?

b) Explain about the Civil-Military relations in India.

c) Explain about the role of Airpower in 1971.

d) Explain about the role of Science & Technology in defence preparedness.

Q4) Answer in 300 words (any two): **[30]**

a) Where India failed in dealing with Pakistan?

b) Explain about India defence policy since 1990.

c) Can India ignore an assertive China anymore? Submit your argument.

d) Explain about India's nuclear policy.

Total No. of Questions : 4]

SEAT No. :

P281

[Total No. of Pages : 2

[4717] - 1027
F.Y.B.Sc. (Annual)
DEFENCE AND STRATEGIC STUDIES
DS - 3 : International Security
(2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer in 20 words (Any Ten): **[10×2 = 20]**

a) Define Balance of power (BOP).

b) Define Non-Alignment?

c) Define Disarmament.

d) State the meaning of Nationalism.

e) Write the meaning of nation vital values.

f) Define state.

g) Define International security.

h) Define Regionalism.

i) What do you mean by conflict studies?

j) Define pacific settlement.

k) Define globalization.

l) Define conflict management.

m) Define collective security.

Q2) Answer in 50 words (Any Two): **[2×5 = 10]**

a) Explain advantages of Balance of Power (BOP).

b) Discuss characteristics of Non-Alignment.

c) Explain basic features of Common Security.

d) Write a note on the problems of Disarmament.

P.T.O.

Q3) Answer in 150 words (Any Two): **[2×10 = 20]**

a) Write a note on challenges to India's national security.

b) Discuss collective security under U.N.

c) Explain problems of Non-alignments movement (NAM).

d) Write a note on Cold War.

Q4) Answer in 300 words (Any Two): **[2×15 = 30]**

a) Discuss role of International law in maintaining world peace.

b) Explain globalization of world politics.

c) Write a short note on the scope of peace studies.

d) Write a short note on Regionalism.

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Total No. of Questions : 5]

SEAT No. :

P282

[Total No. of Pages : 2

[4717] - 1028
F.Y.B.Sc.
ENVIRONMENTAL SCIENCE - I
EVS - 101 : Fundamentals of Environmental Chemistry & Fundamentals of Environmental Biology
(2013 Pattern) (Paper - I)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer the following in not more than 5 lines: **[16]**

a) Define Molarity.

b) Enumerate any 2 natural sources of atmospheric S-oxides.

c) What are biogeochemical cycle.

d) Enumerate any two applications of environmental chemistry.

e) What was the name of the ship & the duration of Darwin's voyage.

f) Define speciation.

g) Name any two Fauna found in oriental realm.

h) Give the taxonomic heirarchy.

Q2) Answer <u>any four</u> of the following: **[16]**

a) Explain the hydrogen bonding in water.

b) Describe the microbial transformation of C and H-C.

c) What changes are observed in water properties on addition of solute?

d) Enumerate the characteristics of life.

e) Give the characteristics of aquatic life forms. (Floral & Faunal).

f) What are live stocks? Name the major world varieties of it. How are live stocks a significant bioresource?

P.T.O.

Q3) Write short notes on <u>any Four</u> of the following: **[16]**

a) Conductivity meter.

b) Hydrophytes.

c) Titrimetric methods.

d) The current mass extinction.

e) Components of systematics.

f) Atmospheric chemical reactions.

Q4) Answer <u>any two</u> of the following: **[16]**

a) Give an account of water interactions with gases & earth minerals.

b) Describe the properties of any four chemicals found in Food. Add note on its effects on human.

c) Describe any two ecological adaptations in animals. Give 3 examples for each.

d) Describe any four vertebrate forms with a suitable example for each.

Q5) Answer <u>any one</u> of the following: **[16]**

a) Describe the physical & chemical properties of Pb. How do Pb and its compounds effect human health.

b) Discuss the factors responsible for the present day distribution of life on earth.

Total No. of Questions : 5]

SEAT No. :

P283

[Total No. of Pages : 2

[4717] - 1029
F.Y.B.Sc.
ENVIRONMENTAL SCIENCE - II
EVS - 102 : Fundamentals of Environmental Geosciences and Fundamentals of Environmental Pollution
(2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Answer the following in not more than 5 lines: **[16]**

a) Define Dew and Frost.

b) What are igneous rocks? Give Examples.

c) What is mean temperature and temperature range.

d) Name the layers of internal structure of Earth.

e) Define Pollution and Pollutant.

f) What is photochemical smog?

g) What are the instruments used and units of noise measurement.

h) Name any two water and radioactive Pollution Disasters.

Q2) Answer any four of the following: **[16]**

a) Give any one soil classification. Explain each class and sub-class with suitable examples.

b) Describe the Horizontal structure of earth's atmosphere. Give chemical composition of each verticle layer of the atmosphere.

c) What is thermal inversion? Describe any 2 types of thermal inversion.

d) Describe the effect of thermal water pollution on the physiochemical quality of water and aquatic life.

e) What control measures can be taken against Noise Pollution.

f) Describe effect and control measures of radioactive pollution.

P.T.O.

Q3) Write short note on any 4 of the following: **[16]**

a) Soils of India and their Agricultural significance.

b) Mitigation of Natural Calamities.

c) Significance of Atmosphere.

d) Appropriate irrigation and Drainage techniques.

e) Marine Pollution.

f) Classification of Pollutants.

Q4) Answer any two of the following: **[16]**

a) Explain the various factors regulating the atmospheric temperature.

b) Describe any four rock forming minerals.

c) Explain any four effects of pollution on soil quality.

d) Discuss the causes and effects of solid waste pollution with suitable case study.

Q5) Answer <u>any one</u> of the following: **[16]**

a) What do Evaporation and Precipitation mean? Explain the factors affecting these. Describe the different forms of precipitation.

b) Describe the effect of air pollution on biological and non-biological systems.

Total No. of Questions : 10]

SEAT No. :

P284

[Total No. of Pages : 3

[4717] - 1031
F.Y.B.Sc.
INDUSTRIAL CHEMISTRY
Surface Chemistry and Catalysis
(Vocational) (Paper - I) (New) (2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Answers to the two Sections should be written in separate answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Draw neat diagrams wherever necessary.***

SECTION - I

Q1) Define and explain the following: **[8]**

a) Promotors.

b) Catalyst.

c) Swelling.

d) Gold number.

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

a) Explain why potash alum is used for removing impurities from water.

b) Give characteristics of enzyme catalysis.

c) Explain autocatalysis.

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

a) Intermediate compound formation theory.

b) Auto catalysis.

c) Cataphoresis.

d) Applications of colloids.

P.T.O.

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

a) What are gels? How are they classified? Describe two methods for preparation of gels.

b) State and explain Freundlich adsorption isotherm in detail.

Q5) Answer any two of the following: **[8]**

a) Explain the term catalytic poisoning.

b) What are the factors which govern the efficiency of a catalyst?

c) What are micelles? Describe its mechanism of formation.

SECTION - II

Q6) Define and explain the following terms: **[8]**

a) Specific heat.

b) Selectivity.

c) Power.

d) Latent heat of fusion.

Q7) Answer any two of the following: **[8]**

a) Explain the material balance involved in crystallization.

b) State and explain Henry's Law.

c) What do you understand by limiting reactant? Explain with suitable examples.

Q8) Write short notes on <u>any two</u> of the following: **[8]**

a) Triple point of water.

b) Yield.

c) Applications of recycling operations.

Q9) Answer <u>any one</u> of the following: **[8]**

a) State and explain Raoult's Law and what is the importance of Raoult's law in solution chemistry.

b) State and explain Gibb's phase rule. How it is applied to one component system?

Q10)Solve <u>any two</u> of the following: **[8]**

a) Calculate molarity & normality for a solution with 98 gms of H_2SO_4 dissolved in water to prepare 1 litre of solution.

b) Calculate the standard heat of reaction of the following reaction.

$$2FeS_2(s)+\frac{11}{2}O_2(g)\rightarrow Fe_2O_3(s)+4SO_2(g)$$

Given:

ΔH_f^o FeS_2 (s) = –42520Cal.

ΔH_f^o Fe_2O_3 (s) = –196500Cal.

ΔH_f^o SO_2 (g) = –70960Cal.

c) 5Kg of O_2 contained in a closed containes of volume $1m^3$ is heated without exceeding a pressure of 7 atmosphere. Calculate maximum temperature of gas attained.

Total No. of Questions : 5]

SEAT No. :

P587

[Total No. of Pages : 2

[4717] - 1033
F.Y.B.Sc. (Vocational)
PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION
Basic Photography & Appreciation of Media
(2013 Pattern) (Paper - I)

Time : 3 Hours] *[Max. Marks : 80*

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

a) Mention the sharpness indicators used for confirming image sharpness.

b) The focal length of a camera lens is 250 mm. It is set at f f 4. What will be the diameter of its aperture?

c) Draw a diagram and discuss the features of a pin-hole image.

d) Discuss the nature of the image formed on the focusing screen of a DSLR camera.

e) Draw a diagram and show the distortions produced by a simple convex lens.

f) What is ISO? How is it useful in photography?

g) Discuss two unique advantages of a DSLR camera.

h) Calculate two equivalent exposures of f 4 @ 1/125 sec for ISO 100.

Q2) Answer ANY FOUR of the following: **[16]**

a) Discuss the features of an ideal shutter.

b) Draw a diagram and explain the magnification produced by a lens. How is it useful for a photographer?

c) Discuss what do you understand by an 'amateur photographer'.

d) Draw suitable sketches and explain the rule of thirds. What effect does it have on the photographic image?

e) Discuss any four technical features of a photographic image.

P.T.O.

Q3) Answer ANY FOUR of the following: **[16]**

a) Give suitable examples and explain the difference between a 'news' and a 'photo news'.

b) What is 'depth of field'? Explain its importance in photography. What are the factors that affect the depth of field?

c) Discuss the ethical norms you should observe as a photographer.

d) Give suitable examples and explain what equivalent exposure is. How is it useful for a photographer?

e) Discuss the importance of light and colour in photography.

Q4) Answer ANY TWO of the following: **[16]**

a) Draw suitable sketches and explain the working of a focal plane shutter. What are the advantages and disadvantages of the focal plane shutter?

b) Discuss the importance of a photographic image in society.

c) How would you analyze photography as a medium of mass communication?

Q5) Answer ANY ONE of the following: **[16]**

a) Draw a neat labeled diagram and explain the construction of a DSLR camera.

b) Explain what photographic composition is. Draw suitable sketches and discuss any four elements of composition.

Total No. of Questions : 5]

SEAT No. :

P285

[Total No. of Pages : 2

[4717] - 1034
F.Y.B.Sc. (Vocational)
ELECTRONIC EQUIPMENT MAINTENANCE
Maintenance Concepts, Instruments and Appliances
(Paper - I) (New Course) (2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt all of the following: **[16]**

a) What are different types of Failures?

b) What is mean time to repair?

c) A meter resistance is 1000 Ω & it can pass max. 1mA current. What is value of R_{SH} to read meter 100mA?

d) What is function of delay line in CRO?

e) What is resolution & sensitivity of an instrument?

f) What are advantages of SMPS over linear power supply?

g) What is typical current consumption in digital clock?

h) What is working principle of emergency light?

Q2) Attempt any four of the following: **[16]**

a) What are the factors on which MTBF depends?

b) Explain the working of Megger.

c) Explain the working of digital voltmeter.

d) Explain the working of dual trace CRO.

e) What are front panel control on CRO?

P.T.O.

Q3) Attempt any <u>four</u> of the following: **[16]**

a) What are the precautions to be taken when handling analog multimeter?

b) Write a short note on dual beam oscilloscope.

c) Explain the working of RF signal generator with its block diagram.

d) What are the errors in measurement in measuring instruments?

e) Explain the working of ON line UPS.

Q4) Attempt any <u>two</u> of the following: **[16]**

a) How to convert PMMC movement into AC voltmeter? Explain with suitable diagram.

b) What is DFM? How it can be used for measurement of time period?

c) Explain the working of switch mode power supply with its block diagram.

Q5) Attempt any <u>two</u> of the following: **[16]**

a) Explain the working of circuit breaker.

b) Explain the working of pulse generator with its block diagram.

c) What are advantages of digital meters over analog meters?

Total No. of Questions : 5]

SEAT No. :

P286

[Total No. of Pages : 2

[4717] - 1035
F.Y.B.Sc. (Annual)
INDUSTRIAL MICROBIOLOGY
Microorganisms & Systems for Fermentation Processes
(Paper - I) (Vocational) (2013 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

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 labeled diagrams wherever necessary.***
5) ***Use of scientific calculator is allowed.***

Q1) Answer each sub-question in one or two lines; Fill in the blanks. **[16]**

a) Limiting Reagent.

b) Accuracy.

c) What is Process flow diagram?

d) Patent types.

e) Aspect ratio.

f) What is GILSP?

g) Baume scale uses _____ instrument to measure concentration of solute in solution.

h) What is ensured by quality assurance process?

Q2) Attempt *any four* of the following: **[16]**

a) Discuss different meanings of word 'Fermentation'.

b) Explain the process of Isolation of industrially important microorganism from environment.

c) Sketch the Cyclic process of model construction, verification and application.

d) How Least square analysis applied in finding Goodness of Fit of data?

e) List five names of microorganisms and fermentation product produced by them.

f) Describe the Firmicutes important in industrial microbiology.

P.T.O.

Q3) Write short note on *any four* of the following: **[16]**

a) Components of modelling.

b) Error types.

c) Classification of physical variables.

d) Stoichiometry.

e) Upstream process.

f) Culture collections.

Q4) Answer *any two* of the following: **[16]**

a) Describe the measurement of temperature and pressure quantity.

b) Explain the process of development of pharamaceutical product.

c) Enlist and explain the characteristics important in microbes used in industrial microbiology.

d) Following are the 10 measurement carried out on *Saccharomyces cerevisae* cell diameter. Calculate and represent Mean, Standard deviation and variance.

Diameter in micrometer : 3.32, 3.6, 3.49, 3.25, 3.33, 3.38, 3.27, 3.1, 3.45, & 3.29.

Q5) Answer *any one* of the following: **[16]**

a) Describe the Linear and non linear models of data analysis.

b) Discuss the WHO's classification of microorganisms on the basis of hazards and containment level followed.

Total No. of Questions : 5]

SEAT No. :

P287

[Total No. of Pages : 2

[4717] - 1036

F.Y.B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

Essentials of Computer

(2013 Pattern) (Paper - I) (78710)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt the following **[16]**

a) Define bluetooth.

b) What is BIOS?

c) Explain motherboard of computer.

d) List various input devices of computer.

e) Explain the working of MOUSE.

f) Define web camera.

g) Explain touch screen.

h) What is add-on card?

Q2) Attempt any four **[16]**

a) Write short notes on micro processor.

b) What is SMPS?

c) Write short notes on HDD.

d) Explain the working of inkjet printer.

e) Define control unit of computer.

f) Explain front and rare panel of computer cabinet.

P.T.O.

Q3) Attempt any four **[16]**

a) Explain CPU with block diagram.

b) Write short notes on notebook & tablet.

c) Explain BUS structure of computer.

d) Define Device Controller.

e) What is DMA?

f) Write short notes on cables & connectors.

Q4) Attempt any two **[16]**

a) Explain the generations of computer.

b) Explain the different types of RAM.

c) Write short notes on

i) Key board

ii) Interrupt

Q5) Attempt any two **[16]**

a) Explain the different types of softwares

b) Define on line and off-line UPS.

c) Write short notes on

i) CD. ROM

ii) Scanner

Total No. of Questions : 5]

SEAT No. :

P288

[Total No. of Pages : 2

[4717] - 1037
F.Y.B.Sc. (Vocational)
SEED TECHNOLOGY
Morphology, Plant Breeding and Testing for Cultivar Genuineness
(2013 Pattern) (Paper - I) (New)

Time : 3 Hours] *[Max. Marks : 80*

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) Answer in two lines (Any eight) : **[8×2 = 16]**

a) Which are the essential whorls of a typical flower?

b) What is vegetative type of reproduction?

c) Give an example of capsule type of fruit.

d) Define plant breeding.

e) Give any two merits of plant introduction.

f) What is a Fruit?

g) Define mutagens.

h) What is peroxidase test?

i) Define tissue culture.

Q2) Attempt any four of the following : **[4×4 = 16]**

a) Describe Flower of wheat in detail.

b) Explain any one method of artificial vegtative propagation.

c) Give advantages and disadvantages of cross pollination.

d) Comment on evaluation activity in plant breeding.

e) Explain any two types of mutations.

P.T.O.

Q3) Write notes on any four of the following **[4×4 = 16]**

a) T.S. of typical anther.

b) Development of Female gametophyte.

c) Development of dicot embryo.

d) Procedure for plant introduction.

e) Phenol colour test.

Q4) Attempt any two of the following : **[2×8 = 16]**

a) Describe in detail, the process of double Fertilization.

b) Describe cypsela and caryopsis type of fruits with suitable example.

c) What is hybridisation? Give the objectives and difficulties in hybridisation.

Q5) Write the diagnostic characters, Floral Formula and Floral diagram of Families Fabaceae & Asteraceae. **[16]**

OR

Define clonal selection. Write procedure, advantages, disadvantages and achievements of clonal selection.

Total No. of Questions : 10]

SEAT No. :

P289

[Total No. of Pages : 3

[4717] - 1038
F.Y.B.Sc. (Vocational)
INDUSTRIAL CHEMISTRY - II
Material and Energy Balance
(New 2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***All questions carry equal marks.***
5) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***All questions are compulsory.***

SECTION - I

Q1) Answer the following: **[8]**

a) What is oil gas?

b) Give two advantages of gaseous fuel.

c) Give composition of kerosene oil.

d) Name any two petrochemicals derived from alkanes.

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

a) Write a short note on LPG.

b) What are the uses of natural gas.

c) What are reforming processes? Explain.

Q3) Attempt any two of the following: **[8]**

a) Describe the synthesis of bio-gas. What are the limitations of bio-gas?

b) Write a short note on coke - oven gas.

P.T.O.

c) A sample of coal has the following percentage composition C = 80% H = 3.1% S = 1.3% N = 0.9% O = 3.8% ash = 10.9% Calculate approximate calorific value in cal g^{-1}.

Q4) Answer <u>any one</u> of the following: **[8]**

a) Define the terms:

i) Flash point

ii) Ignition temperature

iii) Cracking

iv) Fixed carbon

b) What is a fuel gas? Give a detailed account of analysis of fuel gases.

Q5) Answer <u>any one</u> of the following: **[8]**

a) Describe the origin and sources of petroleum.

b) Discuss classification of fuels. Give a brief account of cleaning and storage of coal.

SECTION - II

Q6) Answer the following: **[8]**

a) What is leaching? Give example.

b) Give the divisions of metallurgy.

c) Define smelting.

d) What is metasilicate? Give structure.

Q7) Attempt <u>any two</u> of the following: **[8]**

a) What is alumina? How is it prepared?

b) Write a short note on clay.

c) Discuss concentration of ore by Froth-Floatation process.

Q8) Attempt any two of the following: **[8]**

a) Define flux. Discuss the different types of fluxes used in metallurgy.

b) Write a short note on pulverization.

c) Discuss the structure and working of any one furnace used in metallurgy.

Q9) Answer any one of the following: **[8]**

a) What is refining? Discuss different techniques used in refining.

b) Give a detailed account of different allotropes of carbon.

Q10) Answer any one of the following: **[8]**

a) Give a detailed account of thermodynamics or reduction.

b) Discuss the principles of extraction of metals from sulphide ores.

Total No. of Questions : 5]

SEAT No. :

P588

[Total No. of Pages : 2

[4717] - 1040
F.Y.B.Sc. (Vocational)
PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION
Introduction to Mass Communication & Media Scene in India
(2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

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 any two of the following: **[16]**

a) Explain the importance of 5W and 1H questions. Illustrate how the inverted pyramid is the best method of writing news.

b) What are the different barriers in communication? Give suitable examples to illustrate each of the barriers.

c) Write a news report of about 100 words on the visit of the Chief Minister of Maharashtra to Fergusson College to inaugurate the Library. You can imagine the details.

Q2) Attempt any four of the following: **[16]**

a) You are asked to interview an award winning cricket player. What questions would you ask him for a youth magazine?

b) Explain the meaning of intra-personal communication.

c) Explain the importance of audience in communication.

d) What are the merits of television as a medium of communication?

e) What is the difference between group communication and mass communication?

P.T.O.

Q3) Attempt <u>any four</u> of the following: **[16]**

a) Explain with suitable examples the definition of 'communication'.

b) Hum Log was a trendsetter serial started by Doordarshan. Explain.

c) Explain the hierarchy of the editorial department in a newspaper.

d) Write a short note on 'mass culture'.

e) Explain how a website can be used as a news portal.

Q4) Attempt <u>any two</u> of the following: **[16]**

a) What is the difference between verbal and non-verbal communication? Explain the limitations of verbal communication.

b) Draw the block diagram and explain the Shanon and Weaver model of communication.

c) What is the meaning of news value? What are the different types of news value? Give suitable examples for each of these types.

Q5) Attempt <u>any two</u> of the following: **[16]**

a) Explain the importance of photographs in newspapers. What are the different restrictions put on the freedom of expression?

b) Write short notes on:

i) Aristotle's model.

ii) Bharatshastra.

c) Write about the different ways in which communication impacts an audience.

Total No. of Questions : 5]

SEAT No. :

P290

[Total No. of Pages : 2

[4717] - 1041
F.Y.B.Sc. (Vocational)
ELECTRONIC EQUIPMENT AND MAINTENANCE
Electronic Components, Circuit and Equipment Assembly
(2013 Pattern) (Paper - II) (New)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt the following questions **[16]**

a) What is rod earthing?

b) What are different connectors and jacks in PC?

c) Explain difference between fuse and MCB.

d) Explain the difference of battery and cell.

e) What is 7 segment display?

f) How to test soldering joints of PCB?

g) Enlist different types of enclosures of equipments.

h) What are colour convensions in cables?

Q2) Attempt any four of the followings **[16]**

a) Draw electrical wiring diagram of 2 bulbs, 2 buttons and fuse.

b) What are common faults occured in transformers?

c) Explain applications of Inductors?

d) What are advantages of ultrasonic soldering?

e) Explain resistance depend factors in brief.

P.T.O.

Q3) Attempt any four of the followings **[16]**

a) Write short note on circuit boards.

b) What are common faults occured in resistors?

c) Explain MCB with the help of diagram.

d) Write testing procedures for semiconductor devices.

e) Explain semiconductor device numbering standards.

Q4) Attempt any two of the followings **[16]**

a) What is transformer? Gives it's symbols, properties and uses.

b) Explain colour codes of resistor, capacitor and inductors.

c) What are various tools used for servicing of equipments?

Q5) Answer any two of the followings **[16]**

a) What is artificial earth? Explain plate earthing with diagram.

b) Explain various tools used for desoldering.

c) What is SMD? Explain lead styles, lead pitch and packaging techniques in details.

Total No. of Questions : 5]

SEAT No. :

P291

[Total No. of Pages : 2

[4717] - 1042
F.Y.B.Sc. (Vocational) (Annual)
INDUSTRIAL MICROBIOLOGY
Industrial Processes and Products
(2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

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.***
4) ***Assume suitable data, if necessary.***

Q1) Answer any eight of the following **[16]**

a) Enlist the organisms that can be used as probiotics.

b) Give two examples of bacteria classified as GRAS.

c) Which organisms are used for industrial production of ethanol?

d) Enlist the culture collections established in India.

e) Describe in brief the use of enzymes in leather manufacturing.

f) Explain why '*enablement*' is a critical criterion of a patent?

g) Enlist the bacterial vaccines.

h) Concept of strain stability.

i) What is a typical elemental formula of microbial cell?

j) Give examples of natural food preservatives of microbial origin.

Q2) Answer any four of the following **[16]**

a) Write in brief about mushroom as microbial biomass.

b) Discuss the concept and importance of due diligence.

c) Enlist the critical tests for a CEO of a new biotechnology startup and discuss their importance.

P.T.O.

d) Write in brief about inducers and elicitors being used in raw material.

e) Enlist the applications of biotechnology companies in 'Medicines sector'

f) What are the applications of microbial exopolyssacharides?

Q3) Write a short note on any four of the following **[16]**

a) Strain improvement

b) Biodegradation of xenobiotics.

c) Hierarchical structure for management in biotech industry.

d) Shotgun approach to isolate microorganisms from environment.

e) Exit route for a startup company.

f) Variable operating cost.

Q4) Answer any two of the following **[16]**

a) Types of investments in biotechnology industries.

b) Discuss in brief the ideal characteristics of an industrial strain.

c) Write in details about food and beverage fermentation.

Q5) Answer any one of the following **[16]**

a) With the help of suitable example discuss different forms of competitive advantage.

b) Discuss in details the carbon sources available for biotech industries.

Total No. of Questions : 5]

SEAT No. :

P292

[Total No. of Pages : 2

[4717] - 1043

F.Y.B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

Computer Organisation (Hardware & Software Aspects)

(2013 Pattern) (Paper - II) (78720)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt the following **[16]**

a) What is HDMI?

b) Define USB.

c) What is POST?

d) Write short notes on software packages.

e) Define Hardware.

f) Write short notes on i-series microprocessor.

g) Explain flag register of 8086.

h) What is BIOS?

Q2) Attempt any four **[16]**

a) Explain any two logical instructions of 8086.

b) Write short notes on Rs.232.

c) Explain logical system architecture of computer.

d) Define math - co processor.

e) Explain W: - Fi system.

f) Write short notes on Internet.

P.T.O.

Q3) Attempt any four **[16]**

a) Explain Tri-state buffer.

b) State the main functions of operating system.

c) Define application software.

d) Explain different network topologies.

e) Explain any two arithmatical instructions of 8086.

f) Define Assembler and compiler.

Q4) Attempt any two **[16]**

a) Explain ANDROID operating system.

b) Explain Architecture of 8086 with block diagram.

c) Write short notes on

i) Multimedia

ii) Simulator

Q5) Attempt any two **[16]**

a) Explain control panel of window operating system.

b) Write short notes on network operating system.

c) Explain the following

i) bluetooth

ii) firm ware

Total No. of Questions : 5]

SEAT No. :

P293

[Total No. of Pages : 2

[4717] - 1044
F.Y.B.Sc. (Vocational)
SEED TECHNOLOGY
Seed Physiology and Seed Production
(2013 Pattern) (Paper - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt the following (Any eight) **[8 × 2 = 16]**

a) Define seed dormancy.

b) What is seed deterioration?

c) Define seed longevity.

d) What are synthetic seeds?

e) Define roguing.

f) What are Foundation seeds?

g) Enlist different methods of irrigation.

h) Define genetic purity of seed.

i) What is seed ageing?

Q2) Attempt any four of the following **[4 × 4 = 16]**

a) Describe structure of seed.

b) Explain different factors affecting seed dormancy.

c) Comment on physiology of seed storage.

d) Explain, seed as a basic in put in agriculture.

e) Describe methods of sowing.

f) Comment on cultural practices and isolation distance in seed production.

P.T.O.

Q3) Write notes on any four of the following **[4 × 4 = 16]**

a) Seed vigour.

b) Physiology of seed development.

c) Biochemical changes during seed germination.

d) National Seed Corporation and its objectives.

e) Evaluation of new varieties for release.

f) Nursery beds.

Q4) Attempt any two of the following **[2 × 8 = 16]**

a) Explain various methods to break seed dormancy.

b) Describe various factors affecting seed vigour.

c) What is land preparation? Add a note on land preparation in chilli.

d) Explain any four steps involved in maintenance of genetic purity.

Q5) Define seed germination. Explain types of seed germination and add a note on seedling abnormalities and its causes. **[16]**

OR

Give causal organism, symptoms, disease cycle and control measures for tikka disease on groundnut.