

Total No. of Questions : 4]

SEAT No. :

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[Total No. of Pages : 2

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S.Y. B.Sc.

MATHEMATICS

MT-221: Linear Algebra

(2013 Pattern) (Semester-II) (Paper-I) (81112)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt any FIVE of the following. **[10]**

- a) Define subspace of a vector space.
- b) By inspection, explain why the set of vectors $S = \{(-1, 2, 4), (5, -10, -20)\}$ is linearly dependent in \mathbb{R}^3 ?
- c) Define basis of a vector space.
- d) Determine $(T_2 \circ T_1)(x, y, z)$ if $T_1(x, y, z) = (y, z)$ and $T_2(x, y) = x$.
- e) Let $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ be the linear operator given by $T(x, y) = (2x - y, -8x + 4y)$. Is $(5, 10)$ belongs to $\ker(T)$? Justify.
- f) Let P_2 be the vector space with inner product $\langle p, q \rangle = \int_{-1}^1 p(x) q(x) dx$.
show that $p(x) = 1$ and $q(x) = x$ are orthogonal in P_2 .
- g) If \bar{u} and \bar{v} are orthonormal vectors in an inner product space V , then find $\|\bar{u} + \bar{v}\|$.

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

- a) Let $B = \{\bar{v}_1, \bar{v}_2, \bar{v}_3, \dots, \bar{v}_n\}$ be a basis for a vector space V . Then prove that every vector $\bar{v} \in V$ is uniquely expressed as a linear combination of the vectors of B .

P.T.O.

b) Are the vectors $(1,1,2,4)$, $(2,-1,-5,2)$, $(-1,-1,-4,0)$, $(2,1,1,6)$ linearly independent in \mathbb{R}^4 ?

c) Determine the basis and dimension for the solution space of,

$$x_1 + 2x_2 + 2x_3 - x_4 + 3x_5 = 0$$

$$3x_1 + 6x_2 + 8x_3 + x_4 + 5x_5 = 0$$

$$x_1 + 2x_2 + 3x_3 + x_4 + 5x_5 = 0$$

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

a) State and prove Cauchy-Schwartz inequality.

b) Show that for vectors $\bar{u} = (u_1, u_2)$ and $\bar{v} = (v_1, v_2)$ in \mathbb{R}^2 ,

$$\langle \bar{u}, \bar{v} \rangle = 5u_1v_1 - u_1v_2 - u_2v_1 + 10u_2v_2$$

defines an inner product on \mathbb{R}^2 .

c) Let $T: \mathbb{R}^3 \rightarrow \mathbb{R}^3$ be defined by

$$T(x, y, z) = (4x + 3y + 2z, 2x + y - z, -x + y)$$

Find a basis and dimension of kernel of T .

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

a) i) In an inner product space V and for \bar{u}, \bar{v} in V , prove that

$$\|\bar{u} + \bar{v}\|^2 + \|\bar{u} - \bar{v}\|^2 = 2\|\bar{u}\|^2 + 2\|\bar{v}\|^2$$

ii) Let \mathbb{R}^2 have Euclidean inner product. Use Gram-Schmidt process to transform the basis vectors $\bar{u}_1 = (1, 3)$ and $\bar{u}_2 = (2, -2)$ into an orthonormal basis.

b) i) Prove that a linear transformation $T: V \rightarrow W$ has an inverse if it is bijective.

ii) Resolve the vector $\bar{v} = (1, 2, 1)$ into two perpendicular components along $\bar{u} = (2, 1, 2)$.



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S.Y.B.Sc.

MATHEMATICS

MT - 222 (A) : Multivariable Calculus-II

(2013 Pattern) (Semester - II) (Paper - II(A)) (811A2)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt any five of the following:

[10]

a) If $\vec{u} = (a \sin t)\vec{i} - (a \cos t)\vec{j} + bt\vec{k}$, find $\left| \frac{d\vec{u}}{dt} \times \frac{d^2\vec{u}}{dt^2} \right|$ at $t=0$.

b) Define Curvature.

c) Show that the vector field $\vec{F} = xy\vec{i} + zx\vec{j} - yz\vec{k}$ is solenoidal.

d) Evaluate $\int_C x^2 dx + xy dy + dz$ where C is given by

$$\vec{r}(t) = t\vec{i} + t^2\vec{j} + \vec{k}, 0 \leq t \leq 1.$$

e) State Stoke's theorem.

f) Prove that $\vec{F} = (y^2 \cos x + z^3)\vec{i} + (2y \sin x - 4)\vec{j} + (3xz^2 + 2)\vec{k}$ is a conservative force field.

g) Using divergence theorem, show that

$$\iiint_S (x + 5z) dydz + (2y - z) dzdx + (2x - y) dxdy = 3V$$

where V is the volume enclosed by the surface S.

P.T.O.

Q2) Attempt any Two of the following: [10]

- a) If $\vec{r}(t)$ is a differentiable function at t_0 , then show that it is continuous at t_0 . Is the converse true? Illustrate by an example.
- b) A particle moves along the curve $x = 2t^3$, $y = t^2 - 4t$, $z = 3t - 5$, where 't' is the time. Find the component of velocity and acceleration at time $t=1$ in the direction of $\vec{i} - 3\vec{j} + 2\vec{k}$.
- c) Find the acute angle between the tangents to the curve $\vec{r} = t^2\vec{i} + 2t\vec{j} - \frac{1}{2}t^2\vec{k}$ at the points $t=1$ and $t=-3$.

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

- a) If \vec{u} is a vector function which possesses continuous second order partial derivatives then prove that $\nabla \cdot (\nabla \times \vec{u}) = 0$
- b) Evaluate $\int_C \vec{F} \cdot d\vec{r}$, where $\vec{F} = yz\vec{i} + 2y\vec{j} - x^2\vec{k}$ along the path C consisting of line segments from (0,0,0) to (0,0,1) then to (0,-3,1) and then to (2,-3,1).
- c) If \vec{w} is a constant vector and $\vec{v} = \vec{w} \times \vec{r}$ then show that $\vec{w} = \frac{1}{2} \text{curl } \vec{v}$

Q4) Attempt any One of the following: [10]

- a) i) State Green's theorem. Using Green's theorem evaluate

$$\int_C (xy + y^2) dx + x^2 dy, \text{ where } C \text{ is the closed curve of the region}$$

bounded by $y = x$ and $y = x^2$.

- ii) Evaluate $\iint_S \vec{F} \cdot \hat{n} ds$, where $\vec{F} = 18z\vec{i} - 12\vec{j} + 3y\vec{k}$ and S is that part of the plane $2x + 3y + 6z = 12$ which is located in $x \geq 0$, $y \geq 0$, $z \geq 0$.

b) i) Prove by using Stoke's theorem that

$$\int_C (\sin z \, dx - \cos x \, dy + \sin y \, dz) = 2, \text{ where}$$

C is the boundary of the rectangle $0 \leq x \leq \pi$, $0 \leq y \leq 1$, $z = 3$

ii) Show that $\vec{F} = (2xy + z^3)\vec{i} + x^2\vec{j} + 3xz^2\vec{k}$ is a conservative field.
Find the scalar potential $\phi(x, y, z)$ such that $\vec{F} = \text{grad } \phi$.

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S.Y. B.Sc.

PHYSICS - I

**PH-221: Oscillations, Waves and Sound
(2013 Pattern) (Semester-II) (Paper-I)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt all of the Following:

[10]

- a) State different types of equilibria.
- b) Define energy density of wave. Give its unit.
- c) Define Quality Factor (Q) of damped harmonic oscillator.
- d) Give two applications of Lissajous Figures.
- e) State the conditions for critically damped oscillations in LCR circuit.
- f) In list the resonance phenomena occurs widely used in natural and in technology applications.
- g) What is red Shift?
- h) What are the Factors which affects quality of sound?
- i) Determine the bulk modulus of water. It the velocity of sound in water is 1500 m/s.
(Give density of water = 1000 kg/m³)
- j) Calculate the velocity of light, if a spectral line of wavelength 5890 Å° in spectrum of a star to be displayed towards red end by 1Å°.

P.T.O.

Q2) Attempt any two of the Following: **[10]**

- a) Discuss the phenomenon of sharpness of resonance and show how it depends on the damping Factor.
- b) Show that the energy density of a plane progressive wave propagating through medium is directly proportional to square of the amplitude of particle.
- c) Explain the following characteristic of musical sound
 - i) Loudness
 - ii) Pitch

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

- a) A particle performing S.H.M has velocity 8cm/sec and 10 cm/sec, when it is at distance 5cm and 4cm respectively from mean position. what is it's amplitude.
- b) The equation of forced oscillation is given by

$$2\left(\frac{d^2x}{dt^2}\right) + 3\left(\frac{dx}{dt}\right) + 16x = 30\sin 2t$$

All quantities are expressed in CGS units.

Find velocity, amplitude (V_0) and maximum kinetic Energy.

- c) The equation of damped harmonic motion is given by

$$2\left(\frac{d^2x}{dt^2}\right) + 12\left(\frac{dx}{dt}\right) + 50x = 0$$

Find frequency on damped oscillations.

Q4) A) Attempt any ONE: **[8]**

- a)
 - i) Obtain the equation of motion of simple harmonic progressive transverse wave.
 - ii) Show that Doppler effect of sound is asymmetric in nature.

b) i) Show that total energy of undamped simple harmonic oscillator is constant at any instant of motion and proportional to the square of amplitude of oscillation.

ii) Expression for it.

(B) Attempt any ONE: [2]

i) A fixed source emits sound of frequency 1000 Hz .

What is the Frequency as heard by observer moving away from source at the rate. 20 m/s . [Given velocity of sound in air $c = 340 \text{ m/s}$]

ii) The intensity of two sound waves are $2 \times 10^{-9} \text{ w/m}^2$ and $4 \times 10^{-10} \text{ w/m}^2$ respectively. Determine their relatively loudness in decibels.



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S.Y. B.Sc.

PHYSICS

PH-222: Optics

(2013 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt all of the following: (one mark each)

[10]

- a) Define the term power of the lens.
- b) Define the term radius of curvature of the lens.
- c) What is an aplantic lens?
- d) Define plane polarized light.
- e) Calculate grating element of plane Transmission grating with 5000 lines per centimeter.
- f) Find the angle of polarization for the glass plate. (Given $\mu = 1.54$ for the glass)
- g) What do you mean by aberration?
- h) What is meant by Negative crystal?
- i) Define term linear magnification.
- j) Why Ramsden eye-piece is called positive eyepiece?

P.T.O.

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

- a) Explain the phenomenon of interference in thin parallel sided film. Obtain the expression for minima and maxima for the reflected rays.
- b) Prove that for a combination of two thin coaxial lenses of focal lengths F_1 and F_2 , separated by distance x , the focal length of combination is given by equation $\frac{1}{F} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{x}{f_1 f_2}$.
- c) Define the Magnifying power of simple microscope. Draw neat ray diagram and show that maximum magnifying power of simple microscope is $\left(1 + \frac{D}{f}\right)$.

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

- a) The focal length of an achromatic combination of two lenses in contact is 90 cm. the dispersive powers of the lenses are 0.025 and 0.035. calculate focal length of each lens of the combination.
- b) Two optically plane glass plates, each 6cm long are placed one over the other. At one end a mica strip is introduced between them. Seen in the reflected light of wavelength 5.89×10^{-5} cm, we find 100 fringes in 3 cm length. calculate the thickness of mica strip. (Given: $\mu=1$)
- c) Unpolarized light falls on two polarizing sheets placed one on top of other. what must be angle between the characteristic directions of the sheets, if intensity of the transmitted light is one third of the incident beam.

Q4) a) Attempt the following:

- i) Show that refraction at single curved surface obeys an equation

$$\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{\mu_2 - \mu_1}{R}. \quad [4]$$

- ii) Show that the condition of minimum spherical aberration for coaxial system of two planoconvex lenses separated by distance x is given as $x = f_1 - f_2$. **[4]**

OR

- i) State and explain Rayleigh criterion for Resolution. [4]
- ii) Draw the ray diagram of Huygens eye-piece and obtain the principal points of Huygen's eyepiece. [4]
- b) Attempt any one of the following:
- i) In Newton's rings experiment, the diameter of 10th dark ring is found to be 4 mm. Assuming the air film and radius of curvature of plano convex lens 100 cm, calculate the wavelength of light. [2]
- ii) Explain term principle focus using convex lens and concave lens. [2]



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SEAT No. :

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S.Y. B.Sc.

CHEMISTRY

CH-221: Physical and Analytical chemistry

(2013 Pattern) (Semester II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of calculator is allowed.*
- 5) *Answer to both sections should be written on same answer book.*

SECTION - I

[Physical Chemistry]

Q1) Answer the following:

[5]

- a) Define standard free energy of formation.
- b) What is relation between k_p and k_c ?
- c) Define molality.
- d) What are Azeotropes?
- e) What are conjugate solutions?

Q2) a) Attempt any two of the following:

[6]

- i) Derive an expression for free energy change of a chemical reaction.
- ii) State Henry's law and give its applications.
- iii) Write note on fractionating column.

P.T.O.

b) Attempt any two of the following: [4]

i) Derive $\left[\frac{\partial G}{\partial T} \right]_P = -S$

ii) What is chemical equilibrium? Give its types.

iii) Define ideal and non-ideal solutions.

Q3) Solve any two of the following: [5]

a) For a reaction $\Delta G = -91630$ Joule at 25°C and 1 pascal pressure. Find out the temperature coefficient at 25°C , if the heat of reaction is -105060 Joule/deg.

b) The vapour pressure of water is 2.5×10^5 pascal at 27°C and 7.5×10^5 pascal at 37°C . calculate molar heat of vapourization of water.

[$R = 8.314$ J/K/mole].

c) The mixture of immiscible liquid and water boils at 98°C at 755 mm Hg. The vapour pressure of water at this temperature is 712 mm Hg. Find the weight composition of the distillate.

[Given : Mol. wt. of immiscible liquid = 204]

SECTION - II

[Analytical Chemistry]

Q4) Answer the following: [5]

a) Give any two examples of primary standard substance.

b) What is parts per thousand?

c) Define Reducing agent.

d) What is universal indicator?

e) Define Equivalence point.

Q5) a) Answer any two of the following. [6]

- i) What is calibration? How will you calibrate volumetric flask?
- ii) What is Titration? Explain the titration curve for a strong acid and a weak base.
- iii) What is Redox indicator? How will you prepare 0.1M. potassium dichromate.

(Mol.wt.of potassium dichromate =294.19 gm).

b) Answer any two of the following: [4]

- i) Discuss titration curve between Fe^{+2} and Ce^{+4} .
- ii) Give the pH transition range and colour in acid form and base form for.
 - a) Cresol red
 - b) phenolphthalein
- iii) What is principle of conductometry? what are types of conductometric titrations?

Q6) Solve any two of the following: [5]

- a) How many ml of 0.1N Hcl are required to neutralise 100 ml of 0.5N NaOH?
- b) What is the normality of solution, when 1000 ml 0.25 N NaoH mixed with 50 ml of 0.1N NaoH?
- c) What is the pH of the solution which contains 5% millimoles of sodium formate and 5.8 millimoles of formic acid in 100ml solution. [$K_a=1.7 \times 10^{-4}$].



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SEAT No. :

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S.Y.B.Sc.

CHEMISTRY

CH-222 : Organic and Inorganic Chemistry
(2013 Pattern) (Semester - II) (Paper - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

- 1) Answer of the two sections should be written in the same answer book.
- 2) All questions are compulsory.
- 3) Neat diagrams must be drawn wherever necessary.

SECTION-I

(Organic Chemistry)

Q1) Attempt the following.

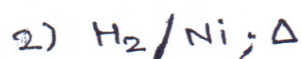
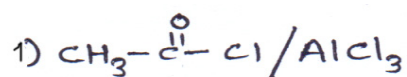
[5]

- a) What is Lindlar's catalyst? Give its important use.
- b) Why furan is aromatic?
- c) Define Biochemistry.
- d) Give any two applications of KMnO_4 .
- e) Explain the term 'Zwitter ion'.

Q2) a) Attempt any Two of the following:

[6]

- i) What is reduction ? Give two important applications of LiAlH_4 .
- ii) Give the synthesis of pyrrole. What is the action of following on pyrrole?

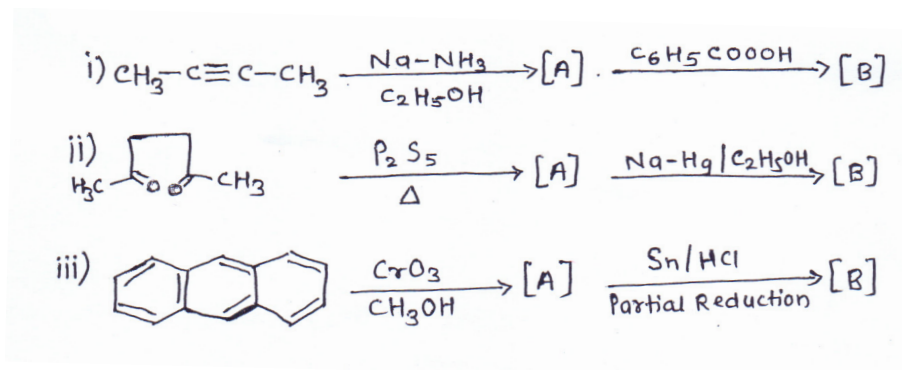


- iii) What are carbohydrates? Discuss the classification of carbohydrates with suitable examples.

P.T.O.

b) Assign [A] and [B] of the following reaction (Any Two)

[4]



Q3) Attempt any Two of the following:

[5]

- What are α -amino acids? Discuss the classification of α -amino acids.
- What is Jone's reagent? Give any two important applications of Jone's reagent.
- Define peptide linkage. Draw the structure of following amino acids.
 - Phenylalanine
 - Serine

SECTION-II

(Inorganic Chemistry)

Q4) Answer the following:

[5]

- Write the electronic configuration of copper (Atomic number, Cu=29).
- How many bridging carbonyls are present in $[\text{Co}_2(\text{CO})_8]$
- Define acids and bases according to Lewis theory.
- Define 'chemical toxicology'.
- What are amphoteric solvents?

Q5) a) Answer any Two of the following:

[6]

- What are d-block elements? Explain the following properties of d-block elements.
 - Atomic size
 - Catalytic activity
- Define EAN rule. Find out the valence electrons in the following metal carbonyls.
 - $\text{Cr}(\text{CO})_6$
 - $\text{Fe}(\text{CO})_5$(Atomic number of Cr=24 and Fe=26)
- Explain the Lowry-Bronsted concept of acids and bases. Give its merits and demerits.

- b)** Attempt any Two of the following: **[4]**
- i) Explain 'Biochemical methylation'.
 - ii) Why Transition metals have ability to form co-ordination compounds?
 - iii) Why "BF₃ is stronger lewis acid than BH₃"?

Q6) Answer any Two of the following: **[5]**

- a) Write a note on Biochemical effects of lead.
- b) What is spin only formula? Calculate magnetic moment of Co²⁺ and Ni²⁺ ion by using spin-only formula.
(Atomic number of Co=27 and Ni=28)
- c) Define back bonding. Draw the structure of
 - i) M₀ (Co)₆
 - ii) Ir₄ (Co)₁₂

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S.Y. B.Sc.

BOTANY

**BO-221 : Plant Anatomy and Embryology
(2013 Pattern) (Semester-II) (Paper-I)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following:

[10]

- a) Define secondary growth.
- b) What are trichomes?
- c) What are tyloses?
- d) Give the type of vascular bundle in dicot root.
- e) What is incompressibility?
- f) Define entomophily.
- g) What is double Fertilization?
- h) Define syngamy.
- i) What is bitegmic ovule?
- j) What is porogamy?

Q2) Answer any two of the following:

[10]

- a) Describe the distribution of mechanical tissues in monocot stem.
- b) Describe the anomalous secondary growth in Bignonia stem.
- c) Explain the process of development of nuclear endosperm.

P.T.O.

Q3) Write notes on (any two):

[10]

- a) Principle of incompressibility.
- b) Significance of double fertilization.
- c) Structure of female gametophyte.

Q4) What is embryo sac? Explain the development of tetrasporic embryo sac. **[10]**

OR

What is normal secondary growth? Describe the process of normal secondary growth in Helianthus annuus stem in detail.



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S.Y. B.Sc.

BOTANY

BO-222 : Plant Biotechnology

(2013 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following:

[10]

- a) What are plasmids?
- b) Name any two microorganisms used in fermentation.
- c) Enlist any two physical methods of enzyme immobilization.
- d) What is phytoremediation?
- e) Enlist any two methods of direct gene transfer.
- f) Write any two sources of SCP.
- g) What is nanobiotechnology?
- h) Enlist any two transgenic plants developed for pest resistance.
- i) What is gene cloning?
- j) Give importance of biotechnology in medicines.

Q2) Answer any two of the following:

[10]

- a) Give classification of enzymes.
- b) Write the process of phytoextraction.
- c) Describe economic implications of SCP.

P.T.O.

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

- a) Restriction enzymes.
- b) Applications of plant genetic engineering in abiotic stress tolerance.
- c) Industrial applications of enzymes.

Q4) Define genetic engineering. Describe the process of Agrobacterium mediated gene transfer in plants. **[10]**

OR

What is bioreactor? Describe in detail tubular tower bioreactor. **[10]**



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S.Y. B.Sc.

ZOOLOGY

ZY-221 : Animal Systematics and Diversity-IV

(Revised 2013 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following:

[10]

- a) What is hetero cercal tail?
- b) Give any two desert adaptations in Reptiles.
- c) What is mesovarium?
- d) Enlist any two examples of poisonous snakes.
- e) Write names of any two eye ball muscles at Scoliodon.
- f) What is hemibranch?
- g) Write any two examples of Theria.
- h) Enlist any two examples of Anapsida.
- i) Mention the names of paired fins in Scoliodon.
- j) Write any two disadvantages of bird migration.

Q2) Write short notes on (any two):

[10]

- a) Altitudinal migration.
- b) Any five modifications of original mammalian structure in Aquatic mammals.
- c) Ampullae of Lorenzini.

P.T.O.

Q3) Attempt the following (any two):

[10]

- a) Cursorial and Raptorial feet.
- b) Distinguishing characters of Archaeornithes.
- c) Sketch and label v.s. of eye of scoliodon.

Q4) Describe the structure and working of heart in scoliodon.

[10]

OR

Describe in detail aerial adaptations in birds.



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S.Y. B.Sc.

ZOOLOGY

ZY-222 : Applied Zoology - II (Apiculture and Sericulture)

(Revised 2013 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following:

[10]

- a) Write the biological name of western bee.
- b) What is swarming?
- c) Write any two bacterial diseases of honey bees.
- d) Write any two uses of honey.
- e) Mention the use of bee veil.
- f) Write biological name of Eri Silkworm.
- g) What is pruning?
- h) Write the Fungal disease of silkworm larvae.
- i) Write use of feather.
- j) What is hibernating egg?

Q2) Write short notes on (any two):

[10]

- a) Composition and uses of bee wax.
- b) Duties of worker bees.
- c) Branch cutting method.

P.T.O.

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

- a) Sketch and label pupa of Bombyx mori.
- b) Uzi fly.
- c) Describe Round dance.

Q4) Describe colony organization and division of labour in honey bees ? **[10]**

OR

Describe morphology and Lifecycle of Bombyx mori.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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[5315] - 211

S.Y. B.Sc.

GEOLOGY

GL-221 : Petrology

(2013 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following questions.

[10]

- a) Define Eutectic.
- b) Give genesis of spherulitic structure.
- c) Give any one point difference between metamorphism and diagenesis.
- d) Define the term crush conglomerate.
- e) Define Expansion crack structure.
- f) Give the temperature of the magma.
- g) Define reaction rim/corona structure.
- h) Give the names of the product of thermal. Metamorphism of pure and impure limestone.
- i) Define Poikilitic texture.
- j) Define Idioblastic crystals.

Q2) Write notes on (Any Two):

[10]

- a) Describe the concept of matrix and cement and its effects on porosity and permeability.
- b) Describe the modes of transportation including phases of traction.
- c) Describe sandstone rock deposits with respect to its definition, texture/structure mineral composition and name its varieties.

P.T.O.

Q3) Answer the following questions on (any two): **[10]**

- a) Describe the classification of igneous rocks based on its colour index, and feldspar content.
- b) Describe the Bauxite rock with respect to its texture / structure & mineral composition.
- c) Describe the following structures with respect to their origin and environmental significance.
 - i) Ripple mark &
 - ii) Lamination.

Q4) Describe the crystallisation of a bi-component magma with the help of solid-solution series. **[10]**

OR

Define metamorphism. Describe the regional metamorphism of argillaceous and basic igneous rocks.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

P677

[5315] - 212

S.Y. B.Sc.

GEOLOGY

GL-222 : Stratigraphy and Palaeontology

(2013 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following questions:

[10]

- a) Define correlation.
- b) Define index fossil.
- c) What is the definition of stratigraphy given by a palaeo - geographer?
- d) Define magnetostratigraphy.
- e) Define bedding.
- f) Give importance of stratigraphy.
- g) Define a chronozone.
- h) Enumerate the chemical deposits resulting in stratification.
- i) Define biostratigraphy.
- j) Enumerate the biological factors associated with the development of stratification.

Q2) Write notes on (Any Two):

[10]

- a) Types of Microfossils.
- b) Systematic position and palaeo-ecological significance of foraminifera.
- c) Morphology of hard parts of Ostracods.

P.T.O.

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

- a) Evolutionary trends in Glabella and Eyes of Trilobites.
- b) Uses of Microfossils.
- c) Field techniques for collection of microfossils.

Q4) Define chronostratigraphy and a chronostratigraphic unit. Describe chronostratigraphic units in detail. **[10]**

OR

What is meant by vertical succession in stratigraphy? Describe the characters by which vertical successions are identified.



- b) State whether the given statement is true or false in each of the following: **(1 each)**
- If $R_{Y.X_1X_2} = 0$ then both $r_{y_{x_1}}$ and $r_{y_{x_2}}$ must be equals to zero.
(i.e if $R_{1.23} = 0$ then $r_{12} = r_{13} = 0$)
 - Critical region is the region of acceptance of null hypothesis H_0 .
 - NRR is greater than GRR.
- c) Define total fertility rate (T.F.R.) **[1]**
- d) Write a command in R- software to draw a random sample of size 5 out of 50 units by SRSWOR and store it in a vector **[1]**
- e) Define term ‘traffic density’ in queuing theory. **[1]**
- f) Define Level of significance (.l.o.s.) **[1]**

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

- Derive the formula for the partial correlation coefficient $r_{y.x_1.x_2}$ (i.e $r_{12.3}$) in terms of total correlation coefficients.
- A company manufacturing electric bulbs claims that the average life of bulbs is 1200 hours. A random sample of 100 bulbs shows the average life is 1180 hours. The standard deviation of the life of bulbs is known to be 150 hours. Test the company’s claim at 5% l.o.s.
- Tests in communication skills were taken for 6 persons before and after they were given a training. The scores are as follows:

Scores (before):	48	60	45	70	65	55
Scores (after) :	54	72	50	78	68	62

Write commands in R-software to carry out a paired t-test to check whether there is any effect on the average score of the training or not.

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

- Explain a large sample test to test $H_0: \mu_1 = \mu_2$ against $H_1: \mu_1 \neq \mu_2$, where μ_1 and μ_2 are population means of two populations. TWO independent random samples of large sizes n_1 and n_2 are taken from these populations. The population variances are known.

- b) One customer arrives at a counter in a bank after every 15 minutes. Staff on the counter take 10 minutes on an average for serving a customer. Under the assumptions for applying M/M/1 : ∞/FC FS model, find
- Average queue length
 - A second counter will be started if waiting time of customer in the queue is atleast 15 minutes. Can you justify a need of second counter?
- c) Compute (i) C.B.R. (ii) G.F.R. and (iii) Age - S.F.R. for the following data.

Age - group	No. of Women	No. of Births
20-24	24,000	800
25-29	20,000	2,400
30-34	15,000	2,000
35-39	12,000	600
40-44	6,000	120
45-49	4,000	10

The total population is 1,86,300

Q4) Attempt any one of the following:

- Derive the equation of least square regression plane of Y on X_1 and X_2 . [7]
 - Explain the terms: P-value, confidence-interval. [3]
- Explain how to construct a $100(1-\alpha)$ % Confidence interval for population mean (μ) of normal distribution when standard deviation σ is known, while testing $H_0: \mu = \mu_0$ against $H_1: \mu \neq \mu_0$. [5]
 - A quality control manager of an electronic plant thinks that, handicaped people do better work than the normal people. A sample of 400 items produced by the handicaped found to have 20 defectives. On the other hand a sample of 500 items producedl by the normal people found to have 32 defectives.
Do the above data supports managers claim? Use 1% l.o.s., Justify the answer. [5]



Total No. of Questions : 4]

SEAT No. :

P679

[Total No. of Pages : 4

[5315] - 214

S.Y. B.Sc.

STATISTICS

**ST-222: Sampling Distributions and Inference
(2013 Pattern) (Semester- II) (Paper-II)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt each of the following:

- a) Choose the correct alternative in each of the following: **[1 each]**
- i) If X_1 and X_2 are independent random variables (r.v.s) having $N(0,1)$ and $N(0,16)$ distribution respectively then probability distribution of $X_1^2 + \frac{1}{4}X_2^2$ is
- A) $N(0,17)$ B) χ_2^2
C) t_2 D) $F_{1,1}$
- ii) If a r.v. has chi-square distribution with variance equal to 8 then its moment generating function (m.g.f.) is given by
- A) $(1-2t)^{-2}$ B) $(1-t)^{-2}$
C) $(1-2t)^2$ D) $(1-t)^2$
- iii) Suppose e_1, e_2, e_3 and e_4 are expected frequencies such that $e_1, e_2 > 5$ and $e_3 + e_4 = 8$ are obtained after fitting a probability distribution in which one parameter is estimated. Then under H_0 : fitting of probability distribution is good, the test statistic used
- A) χ^2 with 1 degrees of freedom (d.f.)
B) χ^2 with 2 d.f.
C) χ^2 with 4 d.f.
D) χ^2 with 3 d.f.

P.T.O.

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

i) If r.v. F follows $F_{2,2}$ distribution with $Q_1 = 5$ then $Q_3 = \frac{1}{5}$.

ii) Let X be a r.v. having t- distribution with 5 d.f. Then the value of μ_4 is equal to $\frac{25}{2}$.

iii) Let X_1, X_2, \dots, X_n be a random sample (r.s.) from $N(\mu, \sigma^2)$, μ is unknown. To test $H_0: \sigma^2 = \sigma_0^2$ against $H_1: \sigma^2 > \sigma_0^2$ the rejection region is $\chi_{n-1}^2 \leq \chi_{n-1, 1-\alpha}^2$ at α level of significance (l.o.s.).

c) State limiting behaviour of χ_n^2 as $n \rightarrow \infty$ according to Fisher's approximation. **[1]**

d) State the standard error of the statistic $\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n}$ **[1]**

e) Give one real life situation where chi-square test of independence can be used. **[1]**

f) Distinguish between two sample t-test and paired t-test. **[1]**

Q2) Attempt ANY TWO of the following: [5 each]

a) Find the mode of a chi-square distribution with n d.f. Also if $X \sim \chi_n^2$ and mode of the distribution is 5 find $P(X > 2.167)$.

b) If a r.v. $U \sim N(0,1)$, $V \sim \chi_n^2$ and are independent then find the distribution of $\frac{U}{\sqrt{\frac{V}{n}}}$.

- c) If $X \sim \chi_{10}^2, Y \sim \chi_9^2$ and are independent r.v.s then find
- $P [12.242 < Y < 21.666]$
 - Median of Y
 - $P[X+Y \geq 21.689]$.

Q3) Attempt ANY TWO of the following:

[5 each]

- If a r.v. $X \sim F_{n_1, n_2}$ then find the distribution of $\frac{1}{X}$.
- Derive a test statistic to test $H_0: \sigma_1^2 = \sigma_2^2$ against $H_1: \sigma_1^2 \neq \sigma_2^2$. Also state the assumptions if any.
- If \bar{X} and S^2 are the mean and the variance of a r.s. of size 10 from $N(4, 16)$ then find $P(-1 < X < 4, 6.6688 < S^2 < 17.0496)$.

Q4) Attempt ANY ONE of the following:

- If X_1, \dots, X_n is a r.s. from $N(\mu, \sigma^2)$ distribution then show that sample mean (\bar{X}) and sample variance (S^2) are independently distributed. **[6]**
 - For two independent normal populations we have the following information :

Sample means	$\bar{X}=10$	$\bar{Y}=12$
Sample variances	$S_1^2=46$	$S_2^2=50$
Sample sizes	$n_1=15$	$n_2=15$

To test $H_0: \mu_1 = \mu_2$ against $H_1: \mu_1 \neq \mu_2$, calculate the 95% confidence interval for $(\mu_1 - \mu_2)$. Also give the conclusion. (Use $\alpha=5\%$) **[4]**

b) i) If $X \sim F_{n_1, n_2}$ and $Y \sim F_{n_2, n_1}$ then show that $P(X \geq a) + P\left(Y \geq \frac{1}{a}\right) = 1$ [2]

ii) A certain stimulus is administered to each of 12 patients resulted in the following increase in blood pressure:

5, 2, 8, -1, 3, 0, 4, 6, -2, 1, 5, 0

Can it be concluded that the administration of the stimulus in general will be accompanied by increase in the b.p.? Use appropriate test to give the answer. (Use l.o.s. = 0.05) [4]

iii) Write a short note on McNemar's test. [4]



Total No. of Questions :4]

SEAT No. :

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[Total No. of Pages :2

S. Y. B. Sc.

GEOGRAPHY

**Gg - 221: Geography of Resources -II
(2013 Pattern) (Semester-II) (paper -I)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer the following questions in two or three sentences each (Any Ten):

[10]

- a) Name the types of coal with carbon content.
- b) Name any four iron ore producing countries in the world.
- c) Name four leading bauxite producing countries in the world.
- d) Write any four nuclear power generating countries in the world.
- e) What is meant by optimum population?
- f) Name any four sparsely populated regions of the world.
- g) Write any two densely populated states in India.
- h) What are the components of natural gas?
- i) Write any two uses of land resources.
- j) State any two significances of solar energy.
- k) Write any two uses of water resource.
- l) Define resource planning.
- m) Write any two needs of resource planning in India.

P.T.O.

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

- a) Production of bauxite in India.
- b) Advantages and disadvantages of nuclear energy.
- c) Population as a resource.
- d) Resource Planning in India.

Q3) Answer the following questions in 100 words each (Any Two): [10]

- a) What are the advantages and disadvantages of wind energy.
- b) Give an account of distribution of population in India.
- c) Explain the role of energy resources in economic development.
- d) Explain the concept resource planning.

Q4) Answer the following questions in 200 words (Any One): [10]

- a) Give an account of distribution and production of iron ore in world.
- b) Explain the role of mineral resources in economic development.



Total No. of Questions :4]

SEAT No. :

P681

[5315]-216

[Total No. of Pages :2

S. Y. B. Sc.

GEOGRAPHY

**Gg - 222: Watershed Management -II
(2013 Pattern) (Semester-II) (paper -II)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

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

- a) What is watershed?
- b) What is drainage map?
- c) Define watershed survey.
- d) What is hydrologic data?
- e) Write any two advantages of participatory planning.
- f) What is capacity building?
- g) Write any two components of livelihood security.
- h) What is cost sharing?
- i) What is check dam?
- j) Give any two traditional methods of storage of harvested water.
- k) Define contour bunding.
- l) Write any two benefits of soil conservation.
- m) What is dryland farming?

P.T.O.

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

- a) Benefits of survey methods.
- b) Food security.
- c) Gully plugging.
- d) Resource Mapping.

Q3) Answer the following questions in 100 words (Any Two): **[10]**

- a) Explain database generation method in resource appraisal.
- b) Explain livelihood security.
- c) Explain traditional methods of soil conservation.
- d) Explain crop production techniques

Q4) Answer the following questions in 200 words (Any One): **[10]**

- a) Explain the need of planning for small rainfed catchments.
- b) Explain the watershed based farming system.



Total No. of Questions :4]

SEAT No. :

P682

[5315]-217

[Total No. of Pages :2

S. Y. B. Sc.

MICROBIOLOGY

MB - 221: Bacterial Genetics

(2013 Pattern) (Semester-II) (Paper -I) (Regular)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Attempt the following:

[10]

- a) Define Spontaneous mutations.
- b) Define Base Analogues.
- c) Define Relaxed plasmids.
- d) Write 2 example of Alkylating agents.
- e) Structure of Thymine.
- f) Plasmid DNA replicates by _____ mechanism
- g) Fluctuation test was devised by _____.
- h) Purine replaced by a Pyrimidine in DNA is referred to as _____.
- i) State True or False: A form of DNA erusts under dehydrated conditions.
- j) State True or False: Bacterial genome is positively supercoiled.

Q2) Attempt any two of the following.

[10]

- a) Define mutations. Explain using conditional lethal mutants.
- b) Define plasmids Explain the phenomenon of plasmid Incompatibility with suitable example.
- c) Define mutagens. Give role of biological mutagen with a suitable example.

P.T.O.

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

- a) Leading and Lagging strand synthesis.
- b) Hershey and chase experiment.
- c) Q model of Semi- discontinuous replication

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

- a) What is central dog ma. Explain in detail the mechanism of Translation in bacteria.
- b) Define Induced mutations Enlist the various mutagenic agents. Explain in detail the mechanism of action of U.V and X rays on DNA.



Total No. of Questions :4]

SEAT No. :

P683

[5315]-218

[Total No. of Pages :2

S. Y. B. Sc.

MICROBIOLOGY

**MB - 222: Air and Water Microbiology
(2013 Pattern) (Semester-II) (paper -II)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer the following.

[10]

- a) Define : Droplet.
- b) Air flora is transient in nature.T/F.
- c) Causative agent of Tuberculosis is
- d) Ground water is relatively free from bacteria.T/F.
- e) Write the use of "Eijkman test".
- f) 'MPCB' stands for.
- g) Define: Demineralized water.
- h) PPM is the permissible limit of BOD of any waste water body to be disposed off in any fresh water body.
- i) What is activated sludge.
- j) Write the effect of Arsenics on human health.

Q2) Attempt any two of the following.

[10]

- a) Diagrammatically explain Anderson's air Sampler.
- b) Describe E.coli & Streptococcus faecalis are used as a indicators of faecal pollution.
- c) Explain; toxicity testing by fish bioassay.

P.T.O.

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

- a) What is air Sanitation, Describe physical methods of it.
- b) Describe the presumptive test to check potability of water.
- c) Write the applications of biogas.

Q4) Describe solid waste management with respect to Raw materials, organisms involved & their activity. **[10]**

OR

Q4) Describe waste water treatment by.

- a) Oxidation ponds / Lagoons.
- b) Trickling filters.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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[5315] - 219

S.Y. B.Sc.

PSYCHOLOGY

EP-221 : Health Psychology

(2013 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer in two or four sentences.

[16]

- a) Define illness.
- b) Define self imposed.
- c) Define pressure.
- d) Define coping.
- e) Define overeating.
- f) Define poor nutrition.
- g) Define pressure a stress.
- h) Define Burnout.

Q2) Attempt any two of the following in eight or ten sentences.

[8]

- a) Explain the post Traumatic stress disorders.
- b) Explain the Bio-Medical model of illness.
- c) Describe effect of smoking on health.

P.T.O.

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

- a) Behaviour and AIDS.
- b) Problem focused constructive coping.
- c) Frustration.

Q4) What is stress? Describe the major types of stress. **[8]**

OR

Explain in details the effect of the life style of Health.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

P685

[5315] - 220

S.Y. B.Sc.

PSYCHOLOGY

**Psychological Testing and Assessment
(2013 Course) (Semester-II) (Paper-II)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer in two or four sentences.

[16]

- a) Define Neuro psychology.
- b) State full form of SVIB.
- c) Define psychological test.
- d) What is achivement ?
- e) Define clinical psychology.
- f) Define intellectual ability.
- g) What is job satisfaction.
- h) Define attitude.

Q2) Attempt any two of the following in eight or ten sentences.

[8]

- a) Explain the general Aptitude test Battery.
- b) Describe Interview method for perschool Assessment.
- c) Describe the any two tests of general Intlectual ability.

P.T.O.

Q3) Write short notes on any two of the following.

[8]

- a) Controlled word association test.
- b) Assessment center.
- c) Observational method.

Q4) a) Define Aptitude. Explain the any two types of Aptitude Test. In educational assessment. **[8]**

- b) Define Neuropsychological Assessment ? Explain any two tests of Neuropsychological Assessment.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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[5315] - 223

S.Y. B.Sc.

ELECTRONIC SCIENCE

**EL-221: Electronic Instrumentation
(2013 Pattern) (Semester-II) (Paper-I)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer All of the following:

- a) What is resolution in instrumentation? [1]
- b) List any two electrical temperature sensors. [1]
- c) Define sweep generator. [1]
- d) Give any two specification of SMPS. [1]
- e) “Initial zero setting for pH measurement is at pH=7”. comment [2]
- f) “On line Ups is also called True Ups”. Comment. [2]
- g) Determine Static error if digital voltmeter read 4.65 voltage and the true of the voltage is 4.52 volts. [2]
- h) In tachometer if number of pulses per seconds are 200 and number of teeth on rotar 20. Find speed of tachometer in rpm. [2]

Q2) Answer any Two of following:

- a) Explain various types of errors in measurement system. [4]
- b) What is digital storage oscilloscope? Draw it's block diagram. [4]
- c) With suitable example, explain voltage and current setting of CVCC Power supply. [4]

P.T.O.

Q3) Answer Any Two of the following:

- a) Draw the neat diagram of Dc Voltmeter and explain its working in detail. [4]
- b) What is signal generator? state its specifications. [4]
- c) Explain with block diagram DC to DC converter. [4]

Q4) Answer All of the following:

- a) Draw and explain block diagram ofDFM and give its modes of operation.[6]
- b) Explain working of function generator with block diagram. [6]

OR

- a) Calculate the percentage load regulation for power supply if $V_{ML} = 5v$ and $V_{FL} = 4.95v$ and state ideal values for load regulation. [4]
- b) Design multirange voltmeter for range $v = 0$ to 10 volt and $v = 0$ to 50 volt. when internal resistance $R_m = 50 \Omega$ full scale deflection current $1mA$. [4]
- c) Caluculate percentage duty cycle of square wave having [4]
 - i) T_{ON} time 0.5 m sec and T_{OFF} time 0.7 m sec.
 - ii) $T_{ON} = T_{OFF}$ time.



Total No. of Questions : 4]

SEAT No. :

P687

[Total No. of Pages : 2

[5315] - 224

S.Y. B.Sc.

ELECTRONIC SCIENCE

EL-222 : Communication Electronics

(2013 Pattern) (Semester-II) (Paper-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer all of the following:

- a) Define baud rate. [1]
- b) State the role of pre-emphasis in F.M. [1]
- c) Define sensitivity of a radio receiver. [1]
- d) What is the role of hybrid in basic telephone hand set. [1]
- e) "In FM, band width is relatively larger than an equivalent AM signal". Comment. [2]
- f) "Walky-talky is half duplex two way communication". Comment. [2]
- g) Compute the noise temperature if the noise factor is 1.5. [2]
- h) If a superheterodyne receiver uses IF of 455 KHz for receiving frequency of 2000 KHz. What is the frequency of local oscillator? [2]

Q2) Attempt any two of the following.

- a) Distinguish between pulsed and DTMF dialing. [4]
- b) Describe the working of single tuned discriminator. What are its drawbacks. [4]
- c) Explain the principle of heterodyne and draw a block diagram of super heterodyne AM receiver. [4]

P.T.O.

Q3) Attempt any two of the following:

- a) Explain with block diagram basic communication system. [4]
- b) Compare serial and parallel communication system. [4]
- c) Explain the concept of TDM and FDM. [4]

Q4) Attempt all of the following:

- a) Show that in AM
 - i) Two side bands are generated and draw frequency spectrum of AM.
 - ii) $P_C = \frac{2}{3} P_T$ [6]
- b) Explain the concept of ASK, FSK and PSK. [6]

OR

- a) A 50Ω resistor operates at 29°C . How much noise voltage it provides to a matched load over the bandwidth of 6MHz. [4]
- b) Determine the percentage modulation of an FM wave with a frequency deviation of 15kHz for
 - i) FM broadcast.
 - ii) For TV broadcast. [4]
- c) Calculate the power in each sideband if carrier power is 500 W and modulation index is 70%. [4]



Total No. of Questions : 4]

SEAT No. :

P688

[Total No. of Pages : 2

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S.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS-201:Conflicts Management and Resolution

(2013 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer in two to four sentences.

[8×2=16]

- a) What do you mean by world organization.
- b) State the meaning of ADR.
- c) Define ethnic conflict.
- d) Define Disarmament.
- e) Define International law.
- f) Write any two relationships between conflict and communication.
- g) Write any two sources of International law.
- h) Write the meaning of conflict resolution.

Q2) Answer in 8 to 10 sentences.(any two)

[2×4=8]

- a) Describe historical background of war studies.
- b) Write the causes of clash of civilization.
- c) Discuss pacific methods of conflict settlement.

P.T.O.

Q3) Write short notes on (any two):

[2×4=8]

- a) Arms control and world order.
- b) Problems of peace research.
- c) World order and peace keeping force (IPKF).

Q4) Answer in 18 to 20 sentences (any one).

[1×8=8]

- a) Write a note on the role of U.N in maintaining world peace.
- b) Discuss nature and scope of peace studies.



Total No. of Questions :4]

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[Total No. of Pages :2

S. Y. B. Sc.

DEFENCE AND STRATEGIC STUDIES

DSSY - 202: Geopolitics

(2013Pattern) (Semester-II)(Paper -II)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer in 2 or 1 sentences each.

[16]

- a) Define "Territorial sea".
- b) State the meaning of geopolitics.
- c) Define "state".
- d) Write any two names of land locked state.
- e) Whose the Andaman & Nicobar Islands situated?
- f) State the meaning of Buffer state.
- g) Write the location of Diego Garcia Islands.
- h) State any two factor of geopolitics.

Q2) Answer in 8 To 10 sentences (Any Two).

[8]

- a) Explain the concept of strategic Minerals.
- b) Highlight on various uses of Exclusive Economic Zone.
- c) Write in brief geostrategic importance of Siachen Glacier.

P.T.O.

Q3) Write short notes on (Any Two). **[8]**

- a) Concept of State.
- b) Geostrategic importance of Andoman & Nicobar Islands for India.
- c) Organizing capacity as a factor of geopolitics.

Q4) Answer in 16 To 20 sentences (Any One). **[8]**

- a) Evaluate the problems & solution on Land Locked State.
- b) Explain the concept of Line of Actual control with special reference to LOC between India & Pakistan in Jammu & Kashmir.



Total No. of Questions :4]

SEAT No. :

[Total No. of Pages :2

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[5315]-227

S. Y. B. Sc.

DEFENCE AND STRATEGIC STUDIES
DS - 203: Contemporary World and Security
(2013 Pattern) (Semester-II)(Paper - III)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer in two to four sentences.

[2×8=16]

- a) What do you mean by national values?
- b) State any two aims of national security.
- c) What do you mean by dynamics of Geopolitics?
- d) State the meaning of Non- state actors.
- e) Define Insurgency.
- f) Write the meaning of world order.
- g) Define nationalism.
- h) Define conflict management.

Q2) Answer any two in 8 to10 sentences.

[2×4=8]

- a) Describe issues of human rights.
- b) Explain problems of energy security.
- c) Discuss comprehensive security.

P.T.O.

Q3) Write short notes on (any two).

[2×4=8]

- a) India and South Asia.
- b) Sources of conflict in West Asia.
- c) India's relations with Russia.

Q4) Answer in 18 to 20 sentences (any one).

[1×8=8]

- a) Write a note on the issues of India's security concern.
- b) Discuss role of Geopolitics in world politics.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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S.Y. B.Sc.

ENVIRONMENTAL SCIENCE

EVS-201 : Biological Diversity & its Conservation

(2013 Pattern) (Semester-II) (Paper-I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following in one to two lines:

[10]

- a) Define the term: Biological Diversity.
- b) What is Endemism?
- c) Write the full form of IUCN.
- d) What are sacred groves?
- e) Write the names of Biodiversity hotspots of India.
- f) What are Transgenic organisms?
- g) State the difference between Insitu & Ex- Situ conservation techniques.
- h) Enlist any two Mega diversity countries of world.
- i) What are GMO's ? Name any two examples.
- j) Define: Environmental pollution.

Q2) Write short notes on Any Two of the following:

[10]

- a) Udvardy's classification of Ecosystem diversity.
- b) Western Ghat as a hotspot.
- c) Measurement of Genetic Diversity.

P.T.O.

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

- a) Describe any two traditional methods of Biodiversity conservation.
- b) Write in detail - Environment (Protection) Act 1986.
- c) Evolution and significance of Agrobiodiversity.

Q4) Answer Any One of the following in 10-15 lines. [10]

- a) Explain any five threats to Biodiversity.
- b) Discuss the community Participation in Biodiversity conservation.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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S.Y. B.Sc.

ENVIRONMENTAL SCIENCE

**EVS-202 : Pollution Control and Environmental Technology
(2013 Pattern) (Semester-II) (Paper-II)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following in 1 to 2 lines each:

[10]

- a) Define gray water.
- b) Give two names of disinfection of water methods.
- c) Define reverse osmosis.
- d) Define adsorption.
- e) What is pyrolysis.
- f) Role of catalytic conversion in fuel combustion.
- g) Give any two methods of in - situ treatment - in solid waste.
- h) Define Biogasification.
- i) Give two examples of attach growth treatment in waste water.
- j) Define phytoremediation.

Q2) Write a short notes on Any Two of the following:

[10]

- a) Sanitary landfill.
- b) Volume reduction methods in solid waste.
- c) Sound insulation.

P.T.O.

Q3) Answer any two of the following:

[10]

- a) Briefly explain the working principle of wet scrubbing.
- b) What are the methods used for noise control.
- c) Explain the adsorption theory with suitable example.

Q4) Answer Any One of the following:

- a) Explain the methods of anaerobic waste water treatment add a note on UASB. **[10]**
- b) Explain the health hazards of nuclear waste and add note on its disposal methods.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

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[5315] - 230

S.Y. B.Sc.

ENGLISH (Optional)

Text Book : Literary Vistas

(2013 Pattern) (Revised) (Semester-II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) a) Attempt any one of the following in about 100 words. **[5]**

- i) What is the significance of the little box that Rosemary Fell wanted to buy?
- ii) How did the narrator react to the changes made to his features in the photograph?

b) Attempt any one of the following in about 100 words. **[5]**

- i) Draw a character sketch of Rosemary Fell.
- ii) Do you think the narrator refers to the photographer's changes as his brutal work?

Q2) a) Attempt any one of the following in about 100 words. **[5]**

- i) How are the daffodils depicted by Wordsworth?
- ii) How does the poem 'Ozymandias' portray the idea that human life and power is temporary?

b) Attempt any one of the following in about 100 words. **[5]**

- i) What kind of advice does the poem 'If' convey for any good life?.
- ii) Describe the emotion that still remains on the face of the sculpture in the poem 'Ozymandias'.

P.T.O.

Q3) Attempt any two of the following:

[10]

- a) Write a short paragraph of about 100 words on ‘ My views on College life’.
- b) You have applied for a bank loan to study abroad and have been asked to attend an interview. Anticipate any five questions that you could be asked and write down your responses to them.
- c) Aniket, Archana, Rakesh and Amit are asked to have a group discussion on the topic ‘Are Indian films losing their charm’? Write a transcript of a group discussion using the following points:
don’t believe that, completely agree, see your point, it’s true, I’m afraid like to add, inclined to agree, make a point, to summarize, think that.
- d) Prepare five slides of 20 words each for a power point presentation on one of the topics from your textbook.

Q4) Attempt any two of the following:

[10]

- a) Write an essay on the impact of GST on Indian Economy.
- b) Write a review of your favorite television serial.
- c) Write a report of two short paragraphs on new superfast train from Ahamadabad to Mumbai.
- d) Summarize the following paragraph-

Science affects the average man and woman in two ways already. He or she benefits by its applications, driving a motor car or omnibus instead of a house drawn vehicle, being treated for disease by a doctor or surgeon rather than witch, and being killed with an automatic pistol or a shell in place of a dagger or a battle-axe. It also affects his or her opinions. Almost everyone believes that the earth is round, and the heavens nearly empty, instead of solid. And we are beginning to believe in our animal ancestry and the possibility or vast improvements in human nature by biological methods.



[5315]-231

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

मराठी (MARATHI) (Theory)

मराठी विज्ञानसाहित्य आणि व्यावहारिक मराठी
(2013 पटर्न)

वेळ : 2 तास]

[एकूण गुण : 40

- सूचना :- 1) सर्व प्रश्न सोडविणे आवश्यक आहे.
2) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्रश्न 1) i) खालील इंग्लिश परिच्छेदाचे मराठीत भाषांतर करा.

[10]

Punyashlok Ahilyadevi was born at Chaundi in Maharashtra in 1725. She was a daughter of Manakoji Shinde Patil. He was a vatandar. She was very pretty and very impressive in her childhood. Everyone was impressed instantly by her personality. The story of her wedding is very interesting. She became the daughter-in-law of the Subhedar of Malawa, Malharrao Holkar. Malharrao was very brave and gallant. He had a son, Khanderao. Khanderao was good for nothing. He was addicted and loved a life of luxury. He was not interested in the administration of his kingdom. Malharrao was very sad and worried for his useless son. He worried for his kingdom. He wanted it to prosper. Apparently Khanderao was not to fulfill his wish, Malharrao felt. He thought if Khanderao gets a good wife she would take care of the kingdom. He was always thinking about it.

Once he was travelling to take account of his subjects (people). Bhanoji was with him. They were riding on horsebacks. They saw a temple by a river. Malharrao wanted to rest for a while in that temple. He went with his four Soldiers and Dhanoji to the temple. The atmosphere in the temple was very holy. The sound of Jay Shiv Shambhu filled the temple. It was Lord Shankar's temple. Malharrao sat on a bench out side the temple a very impressive girl came to the temple. Malharrao was struck with her personality. He thought, "one should have such a daughter-in-law". The girl entered the temple, Malharrao looked at her very carefully. Dhanoji understood his thoughts. He said, " Maharaj, the girl is very impressive". Malharrao said, " As if Goddess Gauri has come to the temple!" Dhanoji said, "Chote Sarkar should get such a bride". "You stole words from my lips, " said Malharrao.

P.T.O.

ii) खालील परिच्छेदाचा 1/3 सारांश करा.

[10]

नीती जेवढी धर्मनिरपेक्ष तेवढेच विज्ञानही धर्मनिरपेक्ष आहे. त्याहीपुढे जाऊन सगळे ज्ञानच धर्मनिरपेक्ष किंवा सेक्युलर आहे असे म्हणता येईल. धर्म, वंश, जात, भाषा किंवा आताच्या प्रादेशिक चौकटीत वाढलेल्या संस्कृती यांसारख्या जन्मदत्त निष्ठांपैकी कोणत्याही निष्ठेला ज्ञान-विज्ञानाचा आणि नीति-मूल्यांचा येत्या काळातील वेग आणि विजय रोखता येणार नाही. जन्मदत्त निष्ठांच्या चौकटी मजबूत असण्याच्या काळातही त्यांना तेंव्हाही जमले नाही. ज्या काळात या चौकटींच्या मागे समूहमन आणि त्या मनामागे श्रद्धांची बळकटी उभी होती त्या काळात जर त्या श्रद्धा नव्या जीवनमूल्यांना थोपवू शकल्या नसतील तर आताच्या स्वातंत्र्य, समता, बंधुता आणि सर्वस्वी व्यक्तिकेंद्री मानसिकतेच्या युगात त्यांना ते जमणे अशक्यही आहे. नव्या मन्वंतराला सामान्य माणसांनी घडविलेल्या कायद्यांचा, घटनांचा आणि लोकशाही व्यवस्थांचा भक्कम आधार आहे आणि तो जुन्या जन्मदत्त निष्ठांची मान्यता व बळकटी काढून घेणारा आहे.

आताचा मानवी मूल्यांच्या दिशेने होत असलेला प्रवास केवळ समूहगततेकडून व्यक्तिगततेकडे एवढाच मर्यादित नाही. तो धर्मश्रद्धेकडून धर्मनिरपेक्षतेकडे, वंशनिष्ठेकडून मानवी ऐक्याकडे आणि खऱ्या अर्थाने होणाऱ्या माणसांच्या मुक्तीच्या दिशेने होणार आहे. पूर्वीच्या संरक्षक चौकटींचे जाचकपण व्यक्तीएवढेच समूहांनाही जाणवू लागले आहे. या चौकटींचे अनैसर्गिक असणे आणि तरीही त्यांचे टिकून राहणे याच गोष्टींना आताच्या खऱ्या समस्यांचे स्वरूप आले आहे.

वयात आलेल्या स्त्रीपुरुषांवर कोणतेही बंधन, अगदी लैंगिक स्वातंत्र्या-विषयीचा निर्बंधही आता कोणाला घालता येणार नाही. तसे त्यांच्या आई-वडिलांएवढेच जातीधर्मांनाही करता येणार नाही. जगभरातील प्रगत देश एके काळी निषिद्ध मानलेल्या समलिंगी विवाहांना मान्यता देऊ लागले आहेत. समूहाने दिलेले सतीसारखे, केशवपनासारखे किंवा आताच्या खाप पंचायतींनी दिलेल्या प्रतिगामी निवाड्यांसारखे निर्णय आताच्या व्यवस्थेला नुसते अमान्यच नाहीत तर तीत दंडनीय अपराधही ठरणारे आहेत.

विज्ञानाने जगाच्या उत्पत्तीचा शोध सुरू केला आहे. स्वित्झर्लंड आणि फ्रान्सच्या सीमेवर भूपृष्ठाखाली कित्येक मीटर खोल, अठरा मैल लांबीचे व तीन मीटर व्यासाचे प्रचंड गोलाकार रिंगण त्यासाठी तयार केले आहे. या रिंगणात दर सेकंदाला हजारो किलोमीटर वेगाने प्रवास करणारे इलेक्ट्रॉन आणि प्रोटॉनचे सूक्ष्म कण सोडून त्यांची टक्कर घडवून आणली जात आहे. अशा पहिल्याच टक्करीने घडविलेल्या महास्फोटात (बिग बॅंग) नवे जडद्रव्य (मॅटर) निर्माण झाल्याचे वैज्ञानिकांना आढळले आहे. जडद्रव्यापासून चेतन (याला त्यांनी सध्या दिलेले नाव आहे, अँटीमॅटर) वेगळे करण्याचा आणि जडचेतन विश्वाची निर्मितीप्रक्रिया समजून घेण्याचा हा प्रयत्न आहे. (390 शब्द)

- प्रश्न 2) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे लिहा. [15]
- अ) 'सुशिक्षितांची अंधश्रद्धा' या विषयावर वर्तमानपत्रासाठी दोनशे शब्दांत लेख लिहा.
- ब) 'वाढती महागाई' या विषयावर आकाशवाणीसाठी दोनशे शब्दांत भाषणसंहिता तयार करा.
- क) 'परीक्षा व ताण-तणाव' या विषयावर मानसोपचार तंत्रांची दूरदर्शनसाठी घेतलेली 5 मिनिटांची मुलाखत तयार करा.

प्रश्न 3) खालील पारिभाषिक संज्ञाना मराठीतील पर्यायी पारिभाषिक संज्ञा लिहा. (कोणतेही पाच)[5]

- i) Transport
- ii) Merit
- iii) Virus
- iv) Research
- v) Radiology
- vi) Square
- vii) Fungal
- viii) Solar energy
- ix) Director
- x) Laboratory



Total No. of Questions : 3]

SEAT No. :

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[Total No. of Pages : 2

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

हिंदी (HINDI)

(नया पाठ्यक्रम) (सामान्य) (General)

(2013 Pattern)

- पाठ्यपुस्तकें : 1) भारती गद्य संग्रह सं. - डॉ. मधु धवन
2) कवितायन सं. - डॉ. भोलानाथ तिवारी

समय : 2 घंटे]

[पूर्णांक : 40

सूचनाएँ :- 1) सभी प्रश्न अनिवार्य हैं।

2) दाहिनी ओर लिखे अंक प्रश्न के पूर्णांक हैं।

प्रश्न 1) अ) निम्नलिखित पारिभाषिक शब्दों में से किन्हीं आठ के हिंदी पर्याय लिखिए। [8]

- | | |
|-----------------|-----------------|
| i) Anemia | ii) Atom |
| iii) Catalyst | iv) Diagnosis |
| v) Energy | vi) Geology |
| vii) Operation | viii) Satellite |
| ix) Supersonics | x) Take off |

आ) निम्नलिखित परिच्छेद का एक-तिहाई शब्दों में सार लेखन कर उसे उचित शीर्षक दीजिए।[4]

स्वाधीनता प्राप्ति के बाद राष्ट्रपति ने उन्हें राज्यसभा का सदस्य मनोनीत किया था। आप कुछ समय तक भागलपुर विश्वविद्यालय के उपकुलपति तथा कुछ समय तक हिंदी सलाहकार समिति के सदस्य भी रहे। विश्वकवि सम्मेलन में भारत का प्रतिनिधित्व किया। साहित्यिक सेवाओं के प्रति सम्मान व्यक्त करने के लिए भारत सरकार ने 'पद्मभूषण' से विभूषित किया था। आपको 'साहित्य अकादमी' और 'ज्ञानपीठ' पुरस्कार से सम्मानित किया गया। आपकी गणना हिंदी की राष्ट्रीय सांस्कृतिक काव्य-धारा के ओजस्वी कवि के रूप में होती है। क्रांति, शौर्य और राष्ट्रीयता का स्वर आपके साहित्य में सुनाई देता है। अन्याय, दमन और शोषण के विरोध में आप लेखन करते रहे।

P.T.O.

प्रश्न 2) अ) निम्नलिखित गद्य अवतरण की ससंदर्भ व्याख्या कीजिए। [4]

क) मैं तुम्हें अपने अनुभवों के अलावा विश्वसनीय स्रोत नाभिकीय, कृषि प्रभाग, भाभा परमाणु अनुसंधान केंद्र, ट्रांबे की एक रिपोर्ट मंगवाकर उत्तर दे रहा हूँ।

अथवा

अपनी असाधारण मेधा शक्ति के कारण गणित के क्षेत्र में आपने ऐसा चमत्कार किया कि दुनिया विस्मित हो देखती रह गई।

आ) निम्नलिखित पद्य अवतरण की ससंदर्भ व्याख्या कीजिए। [4]

ख) पर - पीड़ा से पूर-पूर हो
अमर-धवल गिरि के शिखरों पर
प्रियवर! तुम कब तक सोए थे!
रोया यक्ष कि तुम रोए थे?

अथवा

चाहे इस प्रार्थना सभा में
तुम सब मुझ पर गोलियाँ चलाओ
मैं मर जाऊँगा
लेकिन मैं कल फिर जन्म लूँगा
कल फिर आऊँगा।

प्रश्न 3) अ) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए। [10]

च) घर लौटते हुए लेखक के मन में कौन से विचार आ रहे थे?

छ) रेशम का निर्माण किस प्रकार होता है?

ज) सुरक्षा और किरणीयन का प्रयोग कैसे किया जाता है?

आ) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए। [10]

ट) कवि अज्ञेय किन बातों को लेकर मुझे आज हँसना चाहिए कहते हैं?

ठ) दैनिक कविता का उद्देश्य लिखिए।

ड) कवि ने अर्जुन को सामान्य मनुष्य के साथ कैसे जोड़ा है?



Total No. of Questions : 4]

SEAT No. :

P696

[Total No. of Pages : 2

[5315]-233
S.Y. B.Sc. (Semester - II)
SANSKRIT
गीर्वाणभारती (Girwanabharati)
(2013 Pattern)

Time : 2 Hours]

[Max. Marks : 40

Q1) Write short answers of the following questions. (2 - 4 lines)

[16]

पुढील प्रश्नांची 2 - 4 ओळीत उत्तरे लिहा.

- i) Which are the Nāstika Darśanas?
नास्तिक दर्शने कोणती ?
- ii) What is meant by पुण्डरीक and what is the peculiarity of that?
पुण्डरीक म्हणजे काय ? त्याचे वैशिष्ट्य काय ?
- iii) State any two types of Natural Sciences.
नैसर्गिक शास्त्रांचे कोणतेही दोन प्रकार सांगा.
- iv) What is meant by ज्योतिषशास्त्रम् ?
ज्योतिषशास्त्र म्हणजे काय ?
- v) In which book the method of नगररचना is mentioned?
नगररचना पध्दती कोणत्या ग्रंथात सांगितली आहे ?
- vi) State the meaning of 'यन्त्र'.
'यन्त्र' शब्दाचा अर्थ लिहा.
- vii) Who is the author of 'वैनायकम्'.
'वैनायकम्' ग्रंथाचा रचयिता कोण ?
- viii) Explain the meaning of 'यत् सौहृदानि सुजने शिथिली भवन्ति'।
'यत् सौहृदानि सुजने शिथिलीभवन्ति' अर्थ स्पष्ट करा.

P.T.O.

प्रश्न 2) Write short notes on any two of the following in 8 - 10 lines. [8]

पुढीलपैकी कोणत्याही दोहोंवर 8 - 10 ओळीत संक्षिप्त टीपा लिहा.

- i) सद्धर्मपुण्डरीककथा।
- ii) चुम्बकप्रकाराः।
- iii) वास्तुशास्त्रम्।

प्रश्न 3) Write short notes on any two of the following in 8 - 10 lines. [8]

पुढीलपैकी कोणत्याही दोहोंवर 8 - 10 ओळीत संक्षिप्त टीपा लिहा.

- i) भास्कराचार्यः
- ii) Importance of 'वैराग्य'
वैराग्याचे महत्त्व
- iii) Importance of 'पत्नी' in Raghuvamasa.
रघुवंशातील 'पत्नीचे महत्त्व'.

प्रश्न 4) Answer in 16 - 20 lines (any one) [8]

16 - 20 शब्दात उत्तर लिहा. (कोणत्याही एकाचे)

- i) Define सुभाषित and explain any two सुभाषित's from the lesson 'सुभाषितानि'
'सुभाषितानि' या पाठातील कोणतीही दोन सुभाषिते 'सुभाषिते म्हणजे काय?' हे सांगून स्पष्ट करा.
- ii) Write a summary of 'प्राचीनशास्त्रपरिचयः द्वितीयो भाग'
'प्राचीनशास्त्रपरिचयः द्वितीयो भागः' या पाठाचा सारांश लिहा.



Total No. of Questions : 4]

SEAT No.

P-697

[Total No. of Pages : 2

[5315]-234

S.Y. B.Sc (Semester - II)
ARABIC FUNCTIONAL
(2013 Pattern)

Maximum Marks : 40]

[Time : 2 Hours

Instructions to candidates :

- 1) *Attempt all questions.*
- 2) *Figures to the right indicate full marks.*

1. Translate into English Urdu Marathi any two of the following [10]

Passages پ;

(الف) الْحَمْدُ ثَابِتٌ لِلَّهِ . الْعَمَلُ ضَرُورِيٌّ لِلْعَالَمِ . أَلَا سِتَادُ جَالِسٌ
عَلَى الْكُرْسِيِّ . الْعِلْمُ نِعْمَةٌ لِّإِنْسَانٍ . أَنَا مَشْغُولٌ بِالْقِرَاءَةِ .
وَهُوَ مَشْغُولٌ فِي اللَّعِبِ . هُوَ وَاقِفٌ عَلَى الْاَرْضِ أَنَا مُسْلِمٌ
وَهُوَ الْيَضَا مُسْلِمٌ .

(ب) مَا فِي الرَّسْمِ يَا عَزِيزُ؟ فِي الرَّسْمِ قَفْصٌ وَفِي
القَفْصِ طَائِرٌ . هُوَ جَمِيلٌ . ذَلِكَ القِطُّ كَبِيرٌ .
ذَلِكَ الطَّائِرُ غَرَابٌ . وَهُوَ أَسْوَدٌ . الْعِلْمُ
مُفِيدٌ . ذَلِكَ الْكِتَابُ عَرَبِيٌّ . أَنَا مَشْغُولٌ .
بِالْقِرَاءَةِ . وَهُوَ مَشْغُولٌ بِاللَّعِبِ .

P.T.O.

(ج) قى هز الرسم أصيص وفي ذالك الأصيص غرض.
على ذالك الغرس ورق. الأ دب واجب. هزا
جيد بالقراءة وذالك جيد في اللب. القرآن
كتاب. العلم مفيد. ذالك الكتاب عربي. هذا
الفار صغير. ذالك القط كبير.

2. Translate and Explain any five of the following verses : [10]

- | | | | |
|-------------------------------|-------|-----------------------------|-----|
| دُنْيَاكُمْ حَبِيبَةٌ | _____ | بِحُسْنِهَا وَالطَّيْبَةِ | (١) |
| لَا كِنَّهَا غَدَارَةٌ | _____ | خَدَاعَةٌ. غَرَارَةٌ | (٢) |
| عَزِيزُهَا دَلِيلٌ | _____ | كَثِيرُهَا قَلِيلٌ | (٣) |
| يَشْتَقِي الْبَهَا الْكَبِيبُ | _____ | وَيَتَعَبُ الْأَدِيبُ | (٤) |
| شَرُّ الْمَقَالِ الْكَذِبُ | _____ | خَيْرُ الْخِصَالِ الْأَدَبُ | (٥) |
| الْبُحْلُ عَيْبٌ فَاضِحٌ | _____ | وَالْجُودُ سِتْرٌ صَالِحٌ | (٦) |
| الْعَقْلُ قَاضٍ عَادِلٌ | _____ | وَالْعُجْبُ دَاءٌ قَاتِلٌ | (٧) |

3. Answer in Arabic any five of the following : [10]

- (١) مَنْ أَنْتَ ؟
- (٢) كَيْفَ الزَّهْرُ ؟
- (٣) هَلْ أَنْتَ صَغِيرٌ ؟
- (٤) أَيُّ حَيَوَانٍ طَوِيلٌ ؟
- (٥) أَيْنَ السَّمَكُ ؟
- (٦) كَيْفَ الْقَطُّ ؟
- (٧) مَنْ أَنْتَ ؟

4. Write the letter in Arabic to your mother; [10]

اُكْتُبِ الرِّسَالَةَ إِلَى أُمِّكَ



Total No. of Questions :4]

SEAT No. :

[Total No. of Pages :2

P698

[5315]-235

S. Y. B. Sc. (Vocational)

BIOTECHNOLOGY

VOC. Biotech-221- Plant and Animal Tissue Culture

(2013 Pattern) (Semester-II) (paper I)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer each of the following in 1-2 lines

[10]

- a) What are growth hormones? state their role in PTC.
- b) Define: Callus culture.
- c) Enlist different macro nutrients in MS medium.
- d) State the role of 70% alcohol in PTC.
- e) What is embryo culture? Enlist important steps involved in embryo culture.
- f) Define: Primary cell culture.
- g) State the role of trypsin in ATC.
- h) Name any two important media used in ATC.
- i) What are stem cells?
- j) Give any two important methods of cell Separation.

Q2) Write short notes on any two of the following.

[10]

- a) Trypsinisation in ATC.
- b) Protoplast culture.
- c) Cell banks.

P.T.O.

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

- a) What is cell line? Explain any two methods of cell line characterisation.
- b) Importance of Aseptic techniques in PTC.
- c) ‘Applications of PTC in plant propagation: Explain the importance.

Q4) What is organ culture? Explain various methods of organ culture with suitable diagram. **[10]**

OR

Explain various stages of micropropagation in PTC.



Total No. of Questions :4]

SEAT No. :

[Total No. of Pages :2

P699

[5315]-236

S. Y. B. Sc.

INDUSTRIAL CHEMISTRY (Vocational)
221: Unit Processes in Organic Chemical Industries
(2013 - Pattern) (Semester - II) (paper I)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Write balanced chemical equations with necessary conditions for the following Synthesis. **[16]**

- a) Benzene - Dodecyl benzene.
- b) Cellulose - Cellulose acetate.
- c) Toluene - Benzoic acid.
- d) Benzene - Nitrobenzene.
- e) Acetic acid - Chloroacetic acid.
- f) Chlorobenzene - Aniline
- g) Ethyl benzene - Styrene.
- h) Benzene - Chlorobenzene.

Q2) Attempt any two of the following.

[8]

- a) Explain friedel - crafts acylation.
- b) How is acetylene obtained from vinyl ester?
- c) Describe catalytic hydrogenation.

P.T.O.

Q3) Answer any two of the following. **[8]**

- a) Write a note on Ozonolysis.
- b) What is Oxidation? Describe the role of KMnO_4 as an oxidising agent.
- c) Discuss types of esterification processes.

Q4) What is reduction? Define reducing agent. Describe two example of reduction using a metal and acid. **[8]**

OR

What is sulphonation? How is sulphonation of benzene carried out? Explain with the mechanism involved.



Total No. of Questions :4]

SEAT No. :

P700

[5315]-237

[Total No. of Pages :2

S. Y. B. Sc. (Vocational - I)
PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION -I
Colour Photography and Digital Photography
(2013 Pattern) (Semester-II) (Paper - III)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer the following in short.

[16]

- a) Why is white balance important in digital photography?
- b) Which tool in image processing software is used for selecting a specific area or colour?
- c) Explain two important features of a CCD sensor.
- d) What is dynamic range of a digital sensor?
- e) Draw a histogram of a properly exposed image. Discuss the diagram you have drawn.
- f) Explain the source of 'noise' in a digital sensor.
- g) What is 'crop factor?' How dose it affect the image qualities?
- h) How is '18% grey' important for a photographer?

Q2) Attempt any two of the following.

[8]

- a) Draw a suitable diagram and explain the 'luminosity curve' of a normal human eye.
- b) Explain how the black body radiation curve is useful in defining the colour temperature of a light source.
- c) Describe the world without colours.

P.T.O.

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

- a) Use of filters in photography.
- b) Psychological impact of colours.
- c) Use of layer mask in image processing.

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

- a) Draw a diagram and discuss the spectral response of a normal human eye. Hence explain how human beings see colours.
- b) Draw a suitable diagram and explain the construction of a typical sensor used in a digital camera. Explain the purpose of each 'layer' and component of the sensor. Discuss the sequence of events taking place when the sensor is exposed to a 'scene'.



Total No. of Questions :4]

SEAT No. :

P701

[5315]-238

[Total No. of Pages :2

S.Y.B. Sc. (Vocational)

ELECTRONIC EQUIPMENT MAINTENANCE

**VOC- EEM - 221: Troubleshooting Electronic Equipment - B
(2013 Pattern) (Semester-II) (Paper - I)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer the following.

- a) Give name of any two SMD packages. [1]
- b) State the three states of tri - state logic IC. [1]
- c) State the precaution for handling digital ICS. [1]
- d) State the advantage of SMD over through hole type device. [1]
- e) State the type of regulators. [2]
- f) State the procedure for testing counter ICS. [2]
- g) State the advantages of fixed three pin regulator. [2]
- h) State the features of surface mount technology. [2]

Q2) Answer any two of the following.

- a) Explain the procedure of troubleshooting high voltage power supply. [4]
- b) Discuss the steps in repairing SMPS. [4]
- c) Write a note on 'Fault Diagnosis chart' of oscilloscope. [4]

Q3) Answer any two of the following.

- a) Explain with block diagram the working of cordless telephone. [4]
- b) Discuss the troubleshooting procedure of cordless telephone. [4]
- c) Discuss the typical faults and their troubleshooting in Digital still camera. [4]

P.T.O.

Q4) Answer the following.

- a) Write a short note on 'Mobile phone'. [6]
- b) Explain the faults and their remedies in Mobile phone. [6]

OR

Q4) Answer the following.

- a) Discuss the procedure of testing decoder. [4]
- b) Explain with neat diagram the operation of logic probe and pulser. [4]
- c) Explain with neat diagram the working of logic comparator. [4]



Total No. of Questions : 4]

SEAT No. :

P1731

[Total No. of Pages : 2

[5315]-239

S.Y.B.Sc. (Vocational)

COMPUTER HARDWARE & NETWORK ADMINISTRATION

Microprocessor & Interfacing Techniques

(2013 Pattern) (Paper - I) (Semester - II)

Time : 2 hours]

[Max. Marks : 40

Instructions to the candidates:

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

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

- i) What is a MIDI?
- ii) List various controllers that are located on the motherboard.
- iii) State any two features of Android.
- iv) List various input and output devices available for modern PC.

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

- i) What is Multimedia PC? State minimum requirement for it?
- ii) What is function of display adapter?
- iii) What is OS? List various OS available.
- iv) What is wi-fi? State applications of wi-fi.

Q2) Attempt any two of the following: **[2 × 4 = 8]**

- a) What is BIOS? Explain the important functions of BIOS.
- b) Write a note on storage devices and their techniques.
- c) Explain the concept of speech recognition in brief

P.T.O.

Q3) Attempt any two of the following: **[2 × 4 = 8]**

- a) What is Green PC? Explain the concept of thick and thin configuration.
- b) What are the different types of Printers? Explain in brief the advantages and disadvantage of any one.
- c) What is Bluetooth? Explain features and application of Bluetooth.

Q4) Attempt any two of the following: **[2 × 6 = 12]**

- a) What is function of ADD ON cards? List various ADD ON cards available for interface. Explain in brief features of any one.
- b) State the advantages of serial communication system. Explain in brief asynchronous and synchronous communication protocol.
- c) What is Network? State advantages of Network. Explain features of LAN.



Total No. of Questions :4]

SEAT No. :

P702

[5315]-240

[Total No. of Pages :2

S. Y. B. Sc.

**SEED TECHNOLOGY (Vocational)
Vegetable Seed Production
(2013 Pattern) (Semester - II) (paper - I)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Attempt the following:

[10]

- a) What is sexual reproduction?
- b) Define self incompatibility.
- c) Give the types of hybridization.
- d) Write any two applications of population improvement.
- e) Give the diagrammatic representation for classifying the vegetable crops based on growing season in vegetable crops.
- f) What is isolation distance for foundation seed production in OKra?
- g) Which type of nursery bed is required for growing onion seedlings?
- h) Define seed drying.
- i) What is CMS?
- j) Write any two objectives of vegetable seed production.

Q2) Attempt any two of the following:

[10]

- a) Explain any two vegetative methods of reproduction in vegetable crops.
- b) Discuss genetic male sterility in detail.
- c) Write the objectives of hybridization techniques in vegetable crops.

P.T.O.

Q3) Write notes on any two.

[10]

- a) Bulk method.
- b) Progeny selection.
- c) Classification of vegetable crops based on plant parts used for consumption.

Q4) Answer any one of the following.

[10]

- a) Give an account of seed production in okra with reference to kind requirement, isolation, nursery management, cultural practices, roughing, plant protection, harvesting, seed extraction, drying and storage.

OR

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



Total No. of Questions :4]

SEAT No. :

P703

[5315]-241

[Total No. of Pages :2

S.Y.B. Sc.

INDUSTRIAL MICROBIOLOGY (Vocational)

VOC- IND-MIC- 221: Fermentation Processes and Downstream Processing

(2013 Pattern) (Semester-II) (Paper - I)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates :

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

Q1) Answer each sub-question in one or two lines; Fill in the blanks; State whether the statement is true or false. **[10]**

- a) Define Downstream Processing.
- b) The cell disruption is important step in isolation of extracellular enzyme.(True/False).
- c) Distillation can be used to separate a soluble solid from a solution.(True/False).
- d) Write structure of citric acid.
- e) Name any two microbes used as bioinoculant with respect to their plant growth promoting feature.
- f) The Production of L-glutamic acid by *C. glutamicum* is maximal at a critical ___ concentration, which is suboptimal for growth.
- g) State any two primary metabolites produced by microbes and obtained by fermentation process.
- h) Name any two chemicals which are used in precipitation of fermentation product.
- i) What is rennet?
- j) Disadvantages of extraction process.

P.T.O.

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

- a) Write flow chart for glutamate production.
- b) Explain Vitamin B12 production.
- c) How Chromatography is used in product recovery?

Q3) Write short notes on any two of the following. **[10]**

- a) Vinegar production.
- b) Precipitation method in fermentation.
- c) Product polishing.

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

- a) Discuss a typical process of bioinoculant production using flow chart. How is quality control employed in bioinoculant production?
- b) Describe the filtration as product recovery process in fermentation.



Total No. of Questions :4]

P704

SEAT No. :

[Total No. of Pages : 2

[5315]-242

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

INDUSTRIAL CHEMISTRY

Voc-222 : Industrial Pollution

(2013 Pattern) (Semester-II) (Paper - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following.

[16]

- a) Define night soil.
- b) Describe the term 'atmosphere'.
- c) What are trickling filters?
- d) Describe lagooning.
- e) Explain the term 'Electrodialysis'.
- f) Name two green house gases.
- g) Name the chemical constituents of London smog.
- h) Write two ill effects of NO_x .

Q2) Attempt any two of the following.

[8]

- a) Write a note on "Dairy wastes".
- b) Discuss radiation pollution.
- c) Distinguish between BOD and COD.

P.T.O.

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

- a) Thermal precipitator.
- b) Reverse Osmosis
- c) Photochemical smog.

Q4) Explain aerobic and anaerobic digestion process in sludge treatment. [8]

OR

Explain the source, hazardous effects of co pollution on human health. [8]



Total No. of Questions :4]

SEAT No. :

P705

[Total No. of Pages :2

[5315]-243

S.Y.B.Sc.

BIOTECHNOLOGY (Vocational-II)

Voc. Biotech-222 : Immunology and Medical Microbiology

(2013 Pattern) (Semester-II) (Paper - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer each of the following in 1-2 lines:

[10]

- a) What is immunity?
- b) What is the difference between immunogenicity and antigenicity?
- c) Name the primary lymphoid organs.
- d) What are haptens?
- e) Name the predominant antibody type produced in primary immune response.
- f) What are toxoids?
- g) Enlist any two autoimmune diseases.
- h) What is the role of mast cells in hypersensitivity?
- i) Give the etiological agent of syphilis?
- j) What is dermatomycosis?

Q2) Write short note on any two of the following.

[10]

- a) Ig A
- b) Meningitis
- c) Primary immune response.

P.T.O.

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

- a) Describe type I hypersensitivity.
- b) Explain any two types of vaccines in detail.
- c) Describe polio disease in detail.

Q4) Explain humoral immune response in detail. **[10]**

OR

Describe typhoid with respect to etiological agent, characterization, morphology, preventive measures and control.



Total No. of Questions :4]

SEAT No. :

P706

[Total No. of Pages :2

[5315]-244

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

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION
Principles & Applications of Analog and Digital Communications
(Semester-II) (Paper - IV)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following questions.

- a) State whether the following statements are TRUE or FALSE. Justify your answers. **[2]**
 - i) Examples of transceivers include televisions, fax machines, cellular telephones, and computer modems.
 - ii) Most of the signals and waveforms that we discuss and analyze are expressed in the time domain whereas in telecommunication we discuss and analyze signals in the frequency domain as well.
- b) Comment on the following statements. **[4]**
 - i) mQAM and mPSK are normally used in old days MODEMs for high data transfer rate, where m denotes number of symbols.
 - ii) According to fourier analysis, complex signals and distorted sine waves are made up of a fundamental sine wave and numerous harmonic signals.
- c) Attempt the following. **[6]**
 - i) For a PAM transmission of a voice signal with $f_m = 3$ kHz, calculate the transmission bandwidth B_T , if the width of each pulse, $\tau = 0.1T_s$ and the sampling frequency $f_s = 8$ kHz.
 - ii) Give range of frequency and bandwidth for
 - a) Voice signal for telephony.
 - b) Music signal.
 - c) TV signal (Picture).
 - d) Digital data using MODEM (old system).

P.T.O.

Total No. of Questions :4]

P707

SEAT No. :

[Total No. of Pages : 2

[5315]-245

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

ELECTRONIC EQUIPMENT MAINTENANCE

VOC-EEM-222: Audio, Video & Office Equipment-B

(2013 Pattern) (Semester-II) (Paper - II)

Time :2Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following.

- a) Keyboard of PC can be replaced by mouse today comment. [1]
- b) What is multimedia computer? [1]
- c) What is OHP? Where is it used? [1]
- d) Write at least two I/P device to multimedia computer. [1]
- e) What is EPBAX? Give its relevance today. [2]
- f) Compare Desktop with Laptop Computer. [2]
- g) What is light pen? Where it is used? [2]
- h) Explain the role of ROM in PC . [2]

Q2) Attempt any two of the following:

- a) With neat diagram explain the working principle of LCD projector. [4]
- b) Explain the working principle of large screen display. [4]
- c) How to rectify/correct the common faults in PC. [4]

P.T.O.

Q3) Answer any two of the following.

- a) What are the types of mouse? How it works? [4]
- b) What is bar code ? Give its application. How to read bar code? [4]
- c) Give the technical specifications of PG computer Laptop with Desktop. [4]

- Q4)**
- a) Explain in details the working principle of slide projector. [6]
 - b) Explain with neat diagram Photocopying machine. [6]

OR

- a) What is motherboard? Draw its block diagram .Explain the functions of different blocks in it. [6]
- b) Explain in details the working principle & touch screen. Give its application. [6]



Total No. of Questions : 4]

SEAT No. :

P3996

[Total No. of Pages : 2

[5315]-246

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

COMPUTER HARDWARE & NETWORK ADMINISTRATION

Computer System Management - II (Paper - II)

(2013 Pattern)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

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

- i) What is Wi-Fi?
- ii) State advantages of flash memories.
- iii) What is tablet PC?
- iv) What is function of RAM?

b) Attempt the following: [4 × 2 = 8]

- i) What is device driver?
- ii) State any two advantages of upgrading PC.
- iii) State any two features of iPhone.
- iv) What is Mainframe?

Q2) Attempt any two of the following: [2 × 4 = 8]

- a) List various Network devices and explain their function in brief.
- b) Write a short note on PC assembly procedure
- c) Explain in brief installation procedure of printer.

P.T.O

Q3) Attempt any two of the following:

[2 × 4 = 8]

- a) Write a note on maintenance and disposal of storage media.
- b) Write a note on LAN.
- c) What is BlackBerry? Explain features available in BlackBerry.

Q4) Attempt any two of the following:

[2 × 6 = 12]

- a) List various hardware components of a desktop system. Explain the need of upgrading PC.
- b) What is client-server? List various network devices. Explain any two devices in brief.
- c) What is software? List various types of software. Explain installation procedure of any one in brief.



Total No. of Questions :4]
P708

SEAT No. :
[Total No. of Pages : 2

[5315]-247
S.Y.B.Sc.(Vocational)
SEED TECHNOLOGY
Seed Quality Control
(Semester-II) (Paper - II)

Time :2Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following.

[10×1=10]

- a) Write any one concept of seed quality.
- b) Define foundation seed.
- c) Name any two seed certification agencies.
- d) Write any two objectives of field inspection.
- e) What are off type plants?
- f) Define control legislation.
- g) Write any two duties of seed inspector.
- h) Who is responsible for establishment of central seed committee?
- i) Draw any two walking patterns in field inspection.
- j) Define isolation distance.

Q2) Attempt any two of the following:

[2×5=10]

- a) Describe standards for seed certification.
- b) Comment on seed certification agencies and its organization.
- c) Explain the powers of seed inspector.

P.T.O.

Q3) Write notes on (Any two).

[2×5=10]

- a) Seed legislation in India.
- b) Central seed testing laboratory.
- c) Specific crop standards.

Q4) Give an account of Biofertilizers, Biopesticides and pheromones.

[10]

OR

Explain in detail the methods of field inspection with suitable example.

.



Total No. of Questions :4]

P709

SEAT No. :

[Total No. of Pages : 2

[5315]-248

S.Y.B.Sc.

INDUSTRIAL MICROBIOLOGY (Vocational)
VOC-IND-MIC-222:Quality Assurance for Industrial
Fermentation Products
(2013 Pattern) (Semester-II) (Paper - II)

Time :2Hours]

[Max. Marks : 40

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks*
- 4) *Draw Neat labeled diagrams wherever necessary.*
- 5) *Use of scientific calculators is allowed.*

Q1) Answer each sub-question in one or two lines.

[10]

- a) What is potency of drug?
- b) In membrane filtration use membrane filters having a nominal pore size not greater than_____.
- c) Define 'Quality Assurance' according to ISO 9000.
- d) List the QA tests recommended for Streptomycin.
- e) Test organism *Pseudomonas aeruginosa* is grown in _____ medium.
- f) Seventh edition of Indian pharmacopoeia is published by _____.
- g) Comment on 'Growth promotion test'.
- h) The neutralizing agent used against interfering iodine is _____.
- i) State the full form of FDA.
- j) List the constituents of Fluid A .

P.T.O.

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

- a) Describe the concept of 'Monograph' using a suitable example.
- b) Why QA is considered a managerial tool?
- c) Justify 'determining undue toxicity of a product is important'.

Q3) Write a short notes on any two of the following. **[10]**

- a) Soyabean -casein digest medium.
- b) BP
- c) Quality control.

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

- a) How to determine microbial load of Penicillin?
- b) Discuss the in vitro and in vivo tests for pyrogens.



Total No. of Questions :4]

SEAT No. :

P710

[5315]-249

[Total No. of Pages : 2

S.Y.B.Sc.

MATHEMATICS

**MT - 222(B) : Numerical Methods and It's Applications
(2013 Pattern) (Semester - II) (Paper - II) (811B2)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of non programmable scientific calculator is allowed.*

Q1) Attempt any five of the following:

[10]

- a) Three approximate values of the number $\frac{2}{3}$ are given as 0.3, 0.33 and 0.34. Which of these three is the best approximation?
- b) Round-off the following numbers to four significant figures.
3.3465827, 15.235387, 5.37582, 0.00457328
- c) Derive Newton-Raphson formula to find square root of a given number C.
- d) State newton's formula for general interpolation with divided difference.
- e) Prove that $\nabla \equiv 1 - E^{-1}$.
- f) Evaluate $\left(\frac{\Delta}{E}\right)^2 x^3$ where interval of differencing being 1.
- g) Given that $\frac{dy}{dx} = -2y$, $y(0)=1$. Find $y(0.2)$ by Euler's method. (Take $h=0.2$. Perform one iteration).

P.T.O.

Q2) Attempt any Two of the following: [10]

- a) Prove that the n^{th} forward difference of a polynomial of degree n in x is constant when the values of independent variable are at equal intervals.
- b) Find the root of the equation $x^2 - 2x - 1 = 0$ between $x = 1$ and $x = 3$ by using false position method.
(Perform 4 iterations)
- c) Find the number of students who obtained less than 45 marks from the following data.

Marks	30-40	40-50	50-60	60-70	70-80
Number of students	31	42	51	35	31

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

- a) State and prove newton's formula for backward interpolation.
- b) Given that $\log 100=2$, $\log 101=2.0043$, $\log 103=2.0128$, $\log 104=2.0170$. Find $\log 102$.
- c) Find the best linear fit to the following data points:

x	1	2	3	4	5
y	3	4	5	6	8

Q4) Attempt any One of the following: [10]

- a) i) State general quadrature formula and hence derive Trapezoidal rule for numerical integration.
- ii) Given that $\frac{dy}{dx} = x + y$, $y(1)=0$, obtain Taylor's series for $y(x)$ and compute $y(1.2)$ correct upto four decimal places.
- b) i) Evaluate $\int_1^3 \frac{1}{x} dx$ by simpson's $\frac{1}{3}^{\text{rd}}$ rule.
Take $h=0.25$.
- ii) By using Runge-kutta method of fourth order find $y(1)$ if $\frac{dy}{dx} = \frac{x^2 + y^2}{10}$, $y(0) = 1$ Take $h=1$

✓ ✓ ✓

Total No. of Questions : 4]

SEAT No.

P-711

[Total No. of Pages : 2

[5315]-250

**S.Y. B.Sc (Semester - II)
URDU General (Paper-II)
(2013 Pattern)**

maximum Marks : 40]

[Time : 2 Hours

Instructions to candidates :

- 1) *Attempt all questions.*
- 2) *Figures to the left indicate full marks.*

نوٹ:- تمام سوالات کے جوابات لازمی ہیں۔

خوشخطی کا لحاظ رکھیں۔

[10]

سوال نمبر ۱:- منشی پریم چند کی افسانہ نگاری کا مختصر جائزہ لیجئے۔

یا

منشی پریم چند کی حالات زندگی بیان کیجئے۔

[10]

سوال نمبر ۲:- افسانہ کے آغاز پر روشنی ڈالیں۔

یا

افسانے کے اجزائے ترکیبی بتائیے۔

[10]

سوال نمبر ۳:- کسی دو کرداروں کا تجزیہ کیجئے۔

۳۔ الوپی دین ۴۔ عباسی

۱۔ شری کنٹھ ۲۔ آمندی

P.T.O.

[10]

سوال نمبر ۴:- نیچے دئے گئے سائنٹفک اصطلاحات میں سے کوئی دس کا اردو میں ترجمہ کیجئے۔

1. Conduction
2. Boiling Point
3. Irregular reflection
4. Nuclear force
5. Solar Eclips
6. Biomass
7. Radiation
8. Micro organism
9. Density
10. Atomic weight
11. pesticide
12. Voltage
13. Components

