Total No. of Questions : 4]

SEAT No. :

PA-2159

[Total No. of Pages : 3

[5901]-201
S.Y. B.Sc.
MATHEMATICS
MT - 241 : Linear Algebra
(CBCS 2019 Pattern) (Semester - IV) (Regular) (24111)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

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

Q1) Attempt any five of the following: **[5]**

a) Find the solution set of the linear equation $5x-4y=7.$

b) Determine whether $W=\{(x,y,z)/x+y+z=1\}$ is a subspace of $\mathbb{R}^3$, justify.

c) Define basis of vector space V.

d) Is the set $W=\{(1,1,3),(2,2,6)\}$ linearly dependent? Justify.

e) Determine a basis for the row space of the matrix $A=\begin{bmatrix}1 & 5\\ 3 & 15\end{bmatrix}$.

f) Use matrix multiplication to find the reflection of (–1, 3) about the *x*-axis.

g) Define Linear Isomorphism.

Q2) a) Attempt any one of the following: **[5]**

i) If $S=\{v_1,v_2,...,v_n\}$ is a basis for the vector space V, then prove that any vector $v\in V$ can be uniquely expressed as a linear combination of the basis vectors.

ii) Prove that a non-empty subset W of a vector space V is a subspace of V if and only if $\alpha w_1+\beta w_2\in W,$ for any scalars α,β and $w_1,w_2\in W.$

P.T.O.

b) Attempt any one of the following: **[5]**

i) Apply Gauss-Jordan method to solve the system of equations

$$x + y + z = 9$$
$$2x - 3y + 4z = 13$$
$$3x + 4y + 5z = 40$$

ii) Reduce the matrix

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 4 & -3 \\ 3 & 6 & -5 \end{bmatrix}$$ to row echelon form.

Q3) a) Attempt any one of the following: **[5]**

i) Let V be n-dimensional vector space $(n \geq 1)$, then prove that any linearly independent subset of V with *n* elements is a basis.

ii) If A and B are two matrices of order $m \times n$, then prove that rank (A+B) $\leq$ rank (A) + rank (B).

b) Attempt any one of the following: **[5]**

i) Find the rank and nullity of the matrix A given by

$$A = \begin{bmatrix} 1 & -1 & 3 \\ 5 & -4 & -4 \\ 7 & -6 & 2 \end{bmatrix}$$

ii) Define co-ordinate vector and find the co-ordinate vector of the vector V = (4, 5) relative to the basis $S = \{(2,1),(-1,1)\}$.

Q4) a) Attempt any one of the following: **[5]**

i) Define Kernal of a linear transformation and if $T: V \to W$ is linear transformation, then prove that Kernal of T is a subspace of V.

ii) Let V is a Finite dimensonal vector space and $T: V \to V$ is linear transformation. Prove that T is injective if and only if ker(T) = $\{0\}$.

b) Attempt any one of the following: **[5]**

i) Find domain, codomain of T_2 o T_1 and compute $(T_2 \text{ o } T_1)(x, y)$ if $T_1(x, y) = (2x, -3y, x + y)$, $T_2(x, y, z) = (x, -y, x + y)$.

ii) Find the standard matrix for the linear transfrmation $T: \mathbb{R}^3 \to \mathbb{R}^4$ defined by $T(x, y, z) = (3x - 4y + z,\ x + y - z,\ x + 2y + 3z)$.

Total No. of Questions : 5]

SEAT No. : ____

PA-2160

[Total No. of Pages : 3

[5901]-202

S.Y. B.Sc. (Regular)

MATHEMATICS

MT - 242(A) : Vector Calculus

(2019 CBCS Pattern) (Semester - IV) (24112A)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

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

Q1) Attempt any Five of the following: **[5]**

a) If $\bar{f}(t) = (t^2+1)\bar{i} + (4t-3)\bar{j} + 2t^2\bar{k}$, then find $\lim_{t\to 2} \bar{f}(t)$.

b) If $\bar{r}(t) = \cos 2t\,\bar{i} + 3\sin 2t\,\bar{j}$ is the position of a particle in the *xy* - plane at time '*t*', then find the velocity vector at $t = 0$.

c) If $\phi(x, y, z) = xy + yz + xz$, then find $|\nabla\phi|$ at the point (1, 1, 1).

d) Find $\bar{k}$ - component of curl $\bar{F}$ for the vector field $\bar{F} = (y\sin x)\bar{i} + (x\sin y)\bar{j}$ on the plane.

e) Give parametrization of the cone $z = \sqrt{x^2 + y^2}$, $0 \le z \le 1$.

f) Evaluate $\int_c xds$, where c is the curve $x = t$, $y = t^2$, $0 \le t \le 2$.

g) State Divergence Theorem in three dimensions.

P.T.O.

Q2) a) Attempt any one of the following: **[5]**

i) If $\bar{u}(t)$ and $\bar{v}(t)$ are differentiable vector functions of '*t*' then prove that $\frac{d}{dt}\left[\bar{u}(t)\times\bar{v}(t)\right]=\bar{u}(t)\times\frac{d}{dt}\bar{v}(t)+\frac{d}{dt}\bar{u}(t)\times\bar{v}(t)$.

ii) If $\bar{r}(t)$ is a differentiable vector function of 't' and length of $\bar{r}(t)$ is constant then show that $\bar{r}(t)\cdot\frac{d}{dt}\bar{r}(t)=0$.

b) Attempt any one of the following: **[5]**

i) Find the work done by the force, $\bar{F}=xy\,\bar{i}+y\,\bar{j}-yz\,\bar{k}$, along a curve, $\bar{r}(t)=t\bar{i}+t^2\bar{j}+t\bar{k}$, in moving an object from the point $t = 0$ to $t = 1$.

ii) Find unit tangent vector $\bar{T}$, principal normal vector $\bar{N}$ and curvature k for the curve in space $\bar{r}(t)=3\sin t\,\bar{i}+3\cos t\,\bar{j}+4t\,\bar{k}$.

Q3) a) Attempt any one of the following: **[5]**

i) State Green's Theorem in Normal Form and use it to find the outward flux for the vector field $\bar{F}=\left(y^2-x^2\right)\bar{i}+\left(y^2+x^2\right)\bar{j}$, where *c* is the triangle bounded by $y = 0$, $x = 3$ and $y = x$.

ii) Let $\bar{F}$ be a vector field and C be any closed curve in a region D. Prove that the vector field $\bar{F}$ is conservative if and only if $\oint_c \bar{F}\cdot d\bar{r}=0$.

b) Attempt any one of the following: **[5]**

i) Show that the differential form in the integral is exact and evaluate the integral $\int_{(0,0,0)}^{(1,2,3)} 2xy\,dx + \left(x^2 - z^2\right)dy - 2yz\,dz$.

ii) Use parametrization to find the flux of $\overline{F} = yz\,\overline{i} + x\,\overline{j} - z^2\,\overline{k}$ outward through the parabolic cylinder $y = x^2,\ 0 \le x \le 1,\ 0 \le z \le 4$.

Q4) a) Attempt any one of the following: **[5]**

i) Define surface integral of a scalar function and evaluate $\iint_s y\,d\sigma$, where *s* is the portion of the cylinder $x^2 + y^2 = 3$ that lies between $z = 0$ and $z = 6$.

ii) Define divergence of a vector function $\overline{F}$ and determine whether the vector function, $\overline{F} = x^3\,\overline{i} + x^2 y\,\overline{j} + x^2 z\,\overline{k}$ is solenoidal.

b) Attempt any one of the following: **[5]**

i) Using Stoke's Theorem, evaluate $\iint_s \nabla \times \overline{F} \cdot \overline{n}\,ds$ for the vector field $\overline{F} = y\,\overline{i} - x\,\overline{j}$, over the hemisphere, $S: x^2 + y^2 + z^2 = 9,\ z \ge 0$.

ii) Use the Divergence Theorem to evaluate $\iint_s \overline{F} \cdot \overline{n}\,d\sigma$, where $\overline{F} = x^2\,\overline{i} + y^2\,\overline{j} + z^2\,\overline{k}$ over the cube cut from the first octant by the planes $x = 1$, $y = 1$, $z = 1$.

Total No. of Questions : 4]

SEAT No. : ____

PA-2161

[Total No. of Pages : 3

[5901]-203
S.Y. B.Sc. (Regular)
MATHEMATICS
MT - 242(B) : Dynamical Systems
(2019 CBCS Pattern) (Semester - IV) (24112B)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

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

Q1) Attempt any Five of the following: **[5]**

a) State whether the system $X' = AX$ is a source? Where $A = \begin{bmatrix} 0 & 1 \\ -2 & 3 \end{bmatrix}$.

b) Determine the eigen values of the matrix A, where $A = \begin{bmatrix} 3 & 0 & 0 \\ -2 & 7 & 0 \\ 4 & 8 & 1 \end{bmatrix}$.

c) Find the equillibrium points of the system $x'(t) = x^2 - 2x$.

d) Write the following second order differential equation as the system of first order linear differential equation:

$$LC\,x''(t) + RC\,x'(t) + x(t) = V(t)$$

Where L, R and C are nonzero constants.

e) For the system of differential equation $X' = AX$ determine the nature of the equillibrium point where trace of A is 3 and determinant of A is 3.

f) State the condition for which an equilibrium point at $x = a$ for the system $x' = f(x)$ is sink, source or node?

g) Find the straight line solutions of $X' = \begin{bmatrix} 2 & 0 \\ 0 & -1 \end{bmatrix} X$.

P.T.O.

Q2) a) Attempt any one of the following: **[5]**

i) Suppose $V = (V_1, V_2)$ and $W = (W_1, W_2)$. Then show that V and W are linearly independent if and only if $\det\begin{pmatrix} V_1 & W_1 \\ V_2 & W_2 \end{pmatrix} \neq 0$.

ii) Prove that a square matrix A is invertible if and only if $\lambda = 0$ is not an eigenvalue of A.

b) Attempt any one of the following: **[5]**

i) Find the eigenvalues of the matrix $A = \begin{bmatrix} 4 & 0 & 1 \\ -2 & 1 & 0 \\ -2 & 0 & 1 \end{bmatrix}$. Also find the eigenvector corresponding to the largest eigenvalue.

ii) Determine whether the matrix $A = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$ diagonalizable? If yes, find the matrix P that diagonalizes A.

Q3) a) Attempt any one of the following: **[5]**

i) Let V_o be an eigenvector for the matrix A associated with the eigenvalue λ. Then show that the function $X(t) = e^{\lambda t} V_o$ is a solution of the system $X' = AX$.

ii) Let A be a 2 × 2 matrix with eigenvalues λ_1 and λ_2. Show that the trace of A is $\lambda_1 + \lambda_2$ and determinant of A is $\lambda_1 \lambda_2$.

b) Attempt any one of the following: **[5]**

i) Find the general solution of the linear system $X' = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix} X$.

ii) If the matrix $A = \begin{bmatrix} 1 & 3 \\ 1 & -1 \end{bmatrix}$ has an eigenvalues –2, 2 and the corresponding eigenvectors $\begin{bmatrix} -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 3 \\ 1 \end{bmatrix}$ respectively then find the stable and unstable line of the system $X' = AX$.

Q4) a) Attempt any one of the following: **[5]**

i) Prove that $\alpha \cdot e^{\lambda_1 t} \begin{bmatrix} 1 \\ 0 \end{bmatrix} + \beta e^{\lambda_2 t} \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ is the general solution of $X' = AX$ where $A = \begin{bmatrix} \lambda_1 & 0 \\ 0 & \lambda_2 \end{bmatrix}$.

ii) If $V \in \mathbb{R}^n$ is an eigenvector of matrix A associated to the eigenvalue λ then show that V is also an eigenvector of exp(A) associated to e^{λ}.

b) Attempt any one of the following: **[5]**

i) Find the matrix T that puts the matrix $A = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$ into canonical form.

ii) Find the exponential of the matrix tA, where $A = \begin{bmatrix} 4 & 1 \\ 0 & 4 \end{bmatrix}$.

Total No. of Questions : 5]

SEAT No. :

PA-2162

[Total No. of Pages : 2

[5901]-204
S.Y. B.Sc.
PHYSICS
Phy - 241 : Oscillations, Waves and Sound
(2019 Pattern) (Semester - IV) (CBCS) (Paper - I) (24121)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***
4) ***Use of calculator is allowed.***
5) ***Figures to the right indicate full marks.***

Q1) Solve any five of the following : **[5]**

a) Define linear simple harmonic motion.

b) The equation for critically damped motion is given in the form

$5\left(\frac{d^2x}{dt^2}\right)+\mathrm{R}\left(\frac{dx}{dt}\right)+20x=0,$ determine the value of R.

c) What is meant by resonance?

d) Define intensity of a wave.

e) What is violet shift?

f) The intensities of two sounds are 1.2×10^{-9} W/m^2 and 5×10^{-10} W/m^2 respectively. Determine their relative loudness in Decibels.

Q2) a) Set up differential equation for damped electrical oscillations and hence obtain an expression for the frequency of oscillations. **[6]**

OR

Derive the condition for amplitude resonance and obtain amplitude at resonance.

b) Define angular simple harmonic motion. Obtain an expression for period of oscillation and frequency of oscillations. **[4]**

P.T.O.

Q3) a) Obtain an expression for velocity of longitudinal waves propagating through a medium of density ρ and bulk modulus of elasticity K. **[6]**

OR

Show that the Doppler effect is sound is assymetric.

b) A capacitor of 0.4 μF, an inductor of 80 mH and a resistor of 400 ohm are joined in series. Can be electrical circuit be oscillatory? **[4]**

Q4) a) Give an analytical treatment for composition of two SHMS perpendicular to each other and having their frequencies in the ratio 1:2. Discuss the cases when phase difference is zero and π/2 radians. **[6]**

OR

Using a power resonance curve, establish the relation between the band width and quality factor.

b) A train with the whistle approaches a station at a speed of 30 m/s. The frequency of whistling sound from the engine is 900 Hz. Determine the apparent change in the frequency of sound as heard by the listner standing on the platform of the station. Assume that the air is at rest and speed of sound is 330 m/s. **[4]**

Q5) Write short notes on any four of the following : **[10]**

a) Stable equilibrium

b) Log decrement

c) Forced Oscillations

d) Seismic waves

e) Longitudinal waves

f) Reverberation

□□□

Total No. of Questions : 5]

SEAT No. :

PA-2163

[Total No. of Pages : 2

[5901]-205

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

PHYSICS

PHY-242 : Optics (Paper - II)

(2019 Pattern) (CBCS) (24122)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***
4) ***Use of calculator is allowed.***
5) ***Figures to the right indicate full marks.***

Q1) Solve any five of the following : **[5]**

A) What do you mean by cardinal points?

B) What is chromatic aberration?

C) What is an eyepiece?

D) Define grating element?

E) State Law of Malus.

F) What do you understand by the term polarization of light?

Q2) A) Prove that for a combination of two thin lenses of focal lengths f_1 and f_2 separated by a distance X, the focal length of the combination is given by $\frac{1}{f}=\frac{1}{f_1}+\frac{1}{f_2}-\frac{X}{f_1 f_2}$ **[6]**

OR

A) Explain the stoke's treatment of the phase change on reflection of light. **[6]**

B) Explain construction and working of compound microscope. **[4]**

P.T.O.

Q3) A) Explain Brewster's law and describe how it can be used to produce the plane polarized light. **[6]**

OR

A) Obtain the condition $2\ \mu t \cos\gamma = m\lambda$ for destructive interference in the reflected system of rays from a thin film. **[6]**

B) A converging lens of focal length 6.25 cm is sued as a magnifying glass. If the near point of the observer is 25 cm from the eye and the lens is held close to the eye, calculate i) the distance of the object from the lens and (ii) the angular magnification. **[4]**

Q4) A) What are nodal points and nodal planes? Describe how you would determine the nodal points in a thick lens. **[6]**

OR

A) Give the theory of plane transmission grating. Discuss the conditions under which principal maxima will occur. **[6]**

B) Unpolarized light falls on two polarizing sheets placed one on top of other. What must be the angle between the characteristics directions of the sheet if intensity of transmitted light is $¼^{th}$ intensity of the incident beam? **[4]**

Q5) Write short notes on any FOUR of the following. **[10]**

A) Write a note on Coma Aberration.

B) Write a note on the any two methods to reduce spherical aberration.

C) Write a note on construction of Ramsden's eyepiece.

D) Write a note on Fraunhoffer's Diffraction.

E) Write a note on constructive interference.

F) Write a note on Polaroid.

Total No. of Questions : 5]

SEAT No. : ____

PA-2164

[Total No. of Pages : 2

[5901]-206

S.Y. B.Sc (Regular)

CH - 401 : PHYSICAL AND ANALYTICAL CHEMISTRY

(2019 Pattern) (Semester - IV) (CBCS) (24131)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Questions number 2 to 5 carry equal marks.***
4) ***Use of calculators and log. table are allowed.***
5) ***Figures to the right indicate full marks.***

Q1) **Solve any five of the following :** **[5]**

a) What is mean by phase?

b) Define ideal solutions.

c) The transmittance of solution of a substance was found to be 80%. Calculate absorbance.

d) If the length of conductivity cell is 1.72 cm and area of cross section of the cell is 4.5 cm^2, Calculate cell constant of the cell.

e) What is demineralized water?

f) Define critical solution temperature.

Q2) **A) Attempt any two of the following :** **[6]**

i) Write Gibbs phase rule and explain different terms involved in it.

ii) What are Azeotropes? Give its example.

iii) What do you mean by equivalent conductance at infinite diluation?

B) Discuss the construction and working of simple colorimeter. **[4]**

P.T.O.

Q3) **A) Attempt any Two of the following :** **[6]**

i) Explain purification of water by ion exchange chromatography.

ii) What is triple point of water? Draw the phase diagram of water.

iii) Explain the term 'upper consulate temperature' and 'lower consulate temperature' with suitable example.

B) Attempt the following : **[4]**

i) The resistance of the 0.02N KCL solution at 25°C is 400 ohm. Calculate the conductance of the solution.

ii) Calculate the motar absorptivity of 1.8×10^{-5} M solution having 0.35 absorbance when placed in the cell of 1.5 cm path length.

Q4) **A) Attempt any Two of the following :** **[6]**

i) What is monovariant, bivariant and non-variant system?

ii) Define chromatography. Explain the principle of coloumn chromatography.

iii) Discuss with the help of neat diagram the effect of temperature on solubilities of phenol in water.

B) The equivalent conductance of infinite dilution for KCl, $NaNO_3$ and NaCl are 130.1, 105.2 and 109.0 Mhos cm^2 respectively. Calculate the equivalent conductance at infinite diluation for KNO_3. **[4]**

Q5) **Write short notes on any four of the following :** **[10]**

a) Phase diagram of sulphur system.

b) Henry's law with any three applications.

c) Conductometric titration of strong acid and strong base.

d) Photovoltaic cell.

e) Size exclusion chromatography.

f) Cation exchange resins.

❄ ❄ ❄

Total No. of Questions : 5]

SEAT No. : ____

PA-2165

[Total No. of Pages : 3

[5901] - 207

S.Y. B.Sc.

CHEMISTRY (Regular)

CH - 402 : Inorganic and Organic Chemistry

(2019 Pattern) (CBCS) (Semester - IV) (24132)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***
4) ***Atomic number of Cu = 29, Fe = 26.***

Q1) Solve **any Five** of the following : **[5]**

a) Which complexes are diamagnetic?

b) Define outer orbital complexes.

c) Define CFSE.

d) What is Rosenmund reduction?

e) What are carboxylic acids? Write general formula of aliphatic acid.

f) Give any one method for preparation of aniline.

Q2) a) Attempt the following **(any Two)** : **[6]**

i) Explain ionization isomerism with suitable example.

ii) Calculate the CFSE for d^7 ion in high and low spin octahedral field.

iii) Explain Ligand isomerism with suitable example.

b) Attempt the following : **[4]**

i) Draw the cis 1, 2 dimethyl cyclohexane, Discuss their stability.

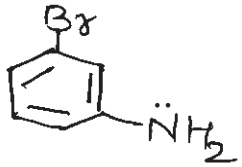
ii) Draw chair conformation of cyclohexane indicating axial and equitorial hydrogen atoms.

P.T.O.

Q3) a) Attempt the following **(any Two)** : **[6]**

i) Give the IUPAC names of the following compounds.

1) $CH_3 - CH_2 - CH_2 - NH_2$.

2) 

3) 

ii) Explain Perkin condensation.

iii) Explain Reformatsky Reaction.

b) Attempt the following : **[4]**

i) Draw the crystal field splitting for octahedral complexes.

ii) Calculate the magnetic moment of d^9 ion.

Q4) a) Attempt the following **(any Two)** : **[6]**

i) Assumptions of CFT.

ii) Explain Hell-Volhard Zelinsky reaction.

iii) Explain Wittig reaction.

b) Write note on spectrochemical series. **[4]**

Q5) Attempt **<u>any Four</u>** of the following : **[10]**

a) Calculate CFSE of $K_4[Fe(CN)_6]$.

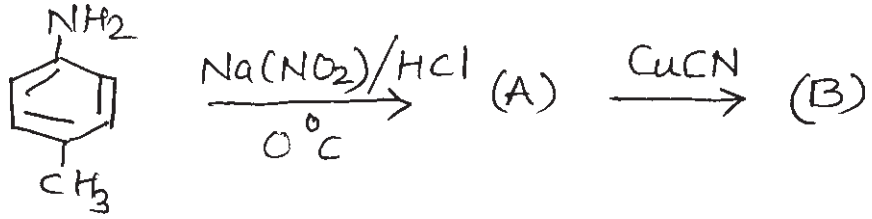
b) Give the limitations of CFT.

c) Explain locking conformation.

d) Identify the Product 'A' and 'B' & rewrite the reaction.

$$CH_3MgI + O=C=O \xrightarrow[0^\circ C]{\text{dry ether}} (A) \xrightarrow{HCl} (B).$$

e) Predict the products



f) Explain the bonding, structure and magnetic properties of $[Cu(CN)_4]^{2-}$ ion.

Total No. of Questions : 5]

SEAT No. : ____

PA-2166

[Total No. of Pages : 2

[5901]-208

S.Y.B.Sc.

BOTANY

BO-241 : Plant Anatomy and Embryology

(CBCS 2019 Pattern) (Semester - IV) (Regular) (Paper - I) (24141)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Questions 2 to Questions 5 carry equal marks.***
4) ***Figures to the right indicate full marks.***
5) ***Draw neat labelled diagrams wherever necessary.***

Q1) Attempt any five of the following. **[5]**

a) What is embryology?

b) Write elements of xylem.

c) Give any two applications of plant anotomy in plant physiology.

d) What is anatomy?

e) What is bitegmic ovule?

f) What is monosporic embryo sac?

Q2) a) Describe various types of glandular hairs. **[6]**

b) Explain bisporic embryo sac. **[4]**

Q3) a) Explain the process of anomalous secondary growth in Dracaena stem. **[6]**

b) Write significance of double fertilization. **[4]**

Q4) a) Explain the types and functions of tapetum. **[6]**

b) Explain the process of normal secondary growth in Dicot stem. **[4]**

P.T.O.

Q5) Write short notes on <u>any four</u> of the following. **[10]**

a) Inextensibility.

b) Monocot embryo.

c) Cellular endosperm.

d) Lenticels.

e) Structure and functions of phloem.

f) Anatropous ovule.

✡ ✡ ✡

Total No. of Questions : 5]

SEAT No. : ____

PA-2167

[Total No. of Pages : 2

[5901]-209

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

BOTANY

BO-242 : Plant Biotechnology (Paper - II)

(2019 Pattern) (CBCS) (24142)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***
4) ***Figures to the right indicate full marks.***
5) ***Draw neat labelled diagrams wherever necessary.***

Q1) Attempt any five of the following : **[5]**

a) What is microbial remediation?

b) Define Biotechnology.

c) What is biofuel?

d) Define plant tissue culture.

e) What is explant?

f) Enlist any two industrial product of biotechnology.

Q2) a) Describe the applications of micropropagation. **[6]**

b) Explain concept of Biogas. **[4]**

Q3) a) Explain applications of genetic engineering with respect to insect pest resistance. **[6]**

b) Write techniques of sterilization. **[4]**

P.T.O.

Q4) a) Describe the concept of genomics. **[6]**

b) Write importance of SCP. **[4]**

Q5) Write short notes on <u>any four</u> of the following : **[10]**

a) Applications of biotechnology

b) Bioremediation

c) Applications of haploid production

d) Importance of protein in diet

e) Restriction enzymes

f) Database

Total No. of Questions : 5]

SEAT No. : ____

PA-2168

[Total No. of Pages : 2

[5901]- 210
S.Y. B.Sc. (Regular)
ZOOLOGY
ZO-241 : Animal Diversity - IV
(CBCS 2019 Pattern) (Semester - IV) (Paper- I) (24151)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5]**

a) Write any two examples of class Reptilia.

b) Write any two examples of class Mammalia.

c) Give any one example of Fruit eating beak.

d) Give any one example of raptorial feet.

e) Write any one habit of Rat.

f) Write name of any one digestive gland of Rat.

Q2) a) Describe salient features of class Reptilia. **[6]**

OR

Describe in brief flight adaptation in birds.

b) Describe the structure of ear of Rat. **[4]**

Q3) a) Describe the alimentary canal of Rat. **[6]**

OR

Describe the male reproductive system of Rat.

b) Describe the salient features of class mammalia. **[4]**

P.T.O.

Q4) a) Sketch and label internal structure of heart of Rat. **[6]**

OR

Sketch and label dorsal view of brain of Rat.

b) Write in brief about egg laying mammals. **[4]**

Q5) Write short notes on <u>any four</u> of the following. **[10]**

a) Cobra snake

b) Sexual dimorphism in Rat.

c) Gaseous exchange in the lungs of Rat.

d) Functions of brain in Rat.

e) Systematic position of Rat.

f) Salient Features of class Aves.

Total No. of Questions : 5]

SEAT No. : ____

PA-2169

[Total No. of Pages : 2

[5901]-211

S.Y. B.Sc.

ZOOLOGY

ZO-242 : Applied Zoology-II

(2019 CBCS Pattern) (Semester-IV) (Paper-II) (24152) (Regular)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q. 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any FIVE of the following: **[5]**

a) Define Apiculture.

b) Give biological name of Rock bee.

c) What is fish manure?

d) Give biological name of Rohu.

e) Define Swarming.

f) What is Royal Jelly.

Q2) a) What is fisheries? Describe types of fisheries. **[6]**

OR

Describe life cycle of Honey bee.

b) Explain wag-tail Dance. **[4]**

Q3) a) Describe dirision of labour in worker bee **[6]**

OR

Describe Gill net and cast net

b) Describe Bee veil and Smoker **[4]**

P.T.O.

Q4) a) Give uses of Honey and Wax **[6]**

OR

Give uses of fish flour and fish meal

b) Give Habit and habitat of catta **[4]**

Q5) Write short notes on any four of the following. **[10]**

a) Machwa craft

b) Honey extractor

c) Nosema disease

d) Harvesting methods of Harpodon

e) Chilling in fisheries.

f) Wax moth as a pest

❖ ❖ ❖

Total No. of Questions : 5]

SEAT No. : ____

PA-2170

[Total No. of Pages : 2

[5901]-212
S.Y. B.Sc
GEOLOGY (Paper - I)
GL - 221 : Global Tectonics and Geodynamics of the Lithosphere
(2019 Pattern) (Semester - IV) (24161)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Question number, 2 to 5 carry equal marks.***

Q1) **Answer the following questions in 2-3 lines : (Any 5)** **[5]**

a) Define - Continental and Oceanic Crust.

b) Define - Oceanic ridges.

c) Give any two differences between the views of Airy & Pratt.

d) Define - Craton.

e) Give that composition of Mesosphere.

f) Give any two direct sources of information about the Earth's interior.

Q2) **Answer the following :**

a) Describe Low-Velocity Zone. Draw a neat labeled diagram of velocity of seismic waves in the earth versus depth. **[6]**

b) Explain Seismic discontinuities with neat labeled diagram. **[4]**

Q3) **Answer the following :**

a) Explain the various evidences for continental drift. **[6]**

b) Explain Wilson's Cycle. **[4]**

P.T.O.

Q4) **Answer the following :**

a) Explain the direct and indirect sources of information about the Earth's interior. **[6]**

b) Explain the Pratt Hypothesis. **[4]**

Q5) **Write short notes on <u>any four</u> of the following :** **[10]**

a) Mantle of the Earth.

b) Geotherm.

c) Lithosphere.

d) Dharwar Craton.

e) The Pandyan Mobile Belt.

f) Rift Valley.

❄ ❄ ❄

Total No. of Questions : 5]

SEAT No. : [ ]

PA-2171

[Total No. of Pages : 2

[5901]-213

S.Y.B.Sc (Geology)

GL-222 ENVIRONMENTAL GEOLOGY AND GEOGENIC DISASTERS

(2019 Pattern) (Semester - IV) (24162)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Q. 1 is compulsory.***
2) ***Solve any Three questions from Q.2 to Q.5.***
3) ***Q. - 2 to Q - 5 carry equal marks.***

Q1) **Answer in 2-3 sentences (<u>any Five</u>)** : **[5]**

a) What are non-renewable resources?

b) State the underground sources of water.

c) Define non-point source pollutants.

d) What are non-biodegradable pollutants?

e) What caused dental fluorosis?

f) What is the cause of temporary hardness of water?

Q2) **Answer the following:**

a) Explain the effects of Global warning on human life. **[6]**

b) Explain magnitude of an Earthquake. **[4]**

Q3) **Answer the following:**

a) Explain excess flow as a cause of Floods. **[6]**

b) What are Volcanic hazards. **[4]**

P.T.O.

Q4) **Answer the following:**

a) Explain types of Drought. **[6]**

b) Describe 'Fall' type of Landslide. **[4]**

Q5) **Answer <u>any Four</u> of the following** : **[10]**

a) Describe 'acid rain'.

b) Explain causes of Minamata diesease.

c) Explain Alkalinity of water.

d) Explain industrial waste as a cause of water pollution.

e) Describe 'Nitrogen cycle'

Total No. of Questions : 4]

SEAT No. : ____

PA-2172

[Total No. of Pages :3

[5901]-214

S.Y. B.Sc. (Regular)

STATISTICS

ST-241 : Tests of Significance and Statistical Methods

(2019 CBCS Pattern) (Semester-IV) (Paper-I) (24171)

Time : 2 Hours] ***[Max. Marks : 35***

Instruction to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of Statistical tables and calculator is allowed.***

Q1) Attempt each of the following.

A) In each of the following cases, choose the correct alternative. **[1 each]**

a) If a false null hypothesis gets rejected, then.

i) A correct decision has been made

ii) Type I error has occurred

iii) The efficiency of the test has increased

iv) Type II error has occurred

b) Which of the following is always true for the partial correlation co-efficient $r_{Y X_1 \cdot X_2}$?

i) $0 < r_{Y X_1 \cdot X_2} < 1$ ii) $-1 < r_{Y X_1 \cdot X_2} < 0$

iii) $-1 < r_{Y X_1 \cdot X_2} < 1$ iv) $r_{Y X_1 \cdot X_2} \geq 1$

c) A Net Reproductive Rate (N.R.R) greater than 1 indicates that

i) The population will remain stable

ii) The population will go on increasing

iii) The population will double over a certain period of time

iv) The population will go on decreasing

P.T.O.

B) In each of the following, state whether the given statement is true or false.

[1 each]

a) Standard Error of a statistic is the variance of its sampling distribution.

b) For a single server queuing model with average arrival rate λ, average service rate μ, and exponentially distributed inter-arrival and service times, the queue will be finite if $\lambda > \mu$.

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

a) For a trivariate data, define the matrix of correlation coefficients, *R*. Also state the condition of consistency for the given total correlation coefficients. Hence verify if the values $r_{12}=r_{23}=0.7$, $r_{13}= -0.4$ are consistent.

b) Describe the test procedure for testing the null hypothesis $H_0 : P_1=P_2$ against the alternative hypothesis : $H_1 : P_1 \neq P_2$ where P_1 and P_2 are the proportions of units possessing a certain characteristic for the populations from which the two independent samples have been drawn.

c) The railway station of a certain city has a single ticket counter. During rush hours, customers arrive at the rate of 10 per hour while the average number of customers that can be served is 12 per hour. Find the following.

i) Probability that the ticket counter is idle

ii) Expected number customers in the queue

iii) Expected waiting time in the queue

iv) Probability that at any given point in time there will be 3 customers in the system.

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

a) Explain in brief the following terms with reference to the *M / M / 1 : FIFO / ∞ /∞* queuing model.

i) Utilization Ratio

ii) Customer

iii) Time spent in system

iv) Queue discipline

v) Calling population

b) Explain in brief the following terms.

i) Statistic

ii) Type I error

iii) Sampling distribution

iv) Critical region

v) P-value

c) Describe the test procedure for testing the null hypothesis $H_0 : \mu = \mu_0$ against the alternative hypothesis: $H_1 : \mu < \mu_0$ where μ is the population average of a certain characteristic being measured. Assume that the population variance is known.

Q4) Attempt any one of the following.

a) i) Define and explain the computation of Gross Reproduction Rate (G.R.R) and Net Reproduction Rate (N.R.R). Also explain the demographic interpretations of both. **[5]**

ii) Observations taken at multiple places independently in 2 cities, on the levels of carbon monoxide in relation to ambient concentration in parts per million gave the following results.

City	*No. of observations*	*Sample Means*
A	120	22.63
B	150	24.64

The values of population standard deviations for City A and City B are 2.4 and 2.05 respectively. Using the given information. construct the 95% confidence interval for difference between the population average carbon monoxide levels. Hence conclude whether it can be said that these two population averages can be considered as equal. **[5]**

b) i) Derive the equation of least squares regression of Y on X_1 and X_2. **[7]**

ii) Use the information below to calculate the Crude Death Rate (C.D.R). **[3]**

Age Group	0-10	20-40	20-40	40-60	Above 60
Population (P_i)	1000	1600	3500	1000	750
No. of Deaths (D_i)	15	10	28	10	40

❖ ❖ ❖

Total No. of Questions : 4]

SEAT No. :

PA-2173

[Total No. of Pages : 3

[5901]-215
S.Y. B.Sc. (Regular)
STATISTICS
ST-242 : Sampling Distributions and Exact Tests
(CBCS 2019 Pattern) (Semester - IV) (Paper - II) (24172)

Time : 2 Hours] *[Max. Marks : 35*

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.***

Q1) Attempt each of the following:

A) In each of the following cases choose the correct alternative: **[1 each]**

a) Assume that X_1, X_2 and X_3 are i.i.d exponential variates with mean 4 then distribution of $X_1+X_2+X_3$ is

i) $G\left(3,\frac{1}{4}\right)$ ii) G(3, 4)

iii) $G\left(\frac{1}{4},3\right)$ iv) G(4, 3)

b) If a random variable has chi-square distribution with variance 4 then it's m.g.f. is _____

i) $(1-2t)^{-1}$ ii) $(1-2t)^{-2}$

iii) $(1-t)^{-1}$ iv) $(1-t)^{-2}$

c) If $X \rightarrow F(n, n)$ then mode of the distribution is _____.

i) $\frac{n+2}{n-2}$ ii) $\frac{n-2}{n+2}$

iii) $\frac{n(n+2)}{n-2}$ iv) $\frac{n-2}{n(n+2)}$

P.T.O.

B) In each of the following, state whether the given statement is true or false. **[1 each]**

a) If a random variable follows t-distribution with 2 degree of freedom then mean deviation about mean is $\sqrt{2}$

b) In a paired t test, observations in two samples are independent of each other.

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

a) Let $\bar{X}$ and S^2 be the mean and variance of a random sample of sizes 25 from N(3, 100) distribution. Evaluate $P(0 < \bar{X} < 6, 55.2 < S^2 < 145.6)$

b) Derive mode of F-distribution with n_1, n_2 degrees freedom.

c) Suppose the sweets are sold in packages of fixed weight of the contents. The producer of the packages is interested in testing that average weight of contents in packages in 1 kg. Hence a random sample of 12 packages is drawn and their contents found (in kg) as follows:

1.05, 1.01, 1.04, 0.98, 0.96, 1.01, 0.97, 0.99, 0.98, 0.95, 0.97, 0.95.

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

a) Suppose $X_1 \to G(\alpha, \lambda_1), X_2 \to G(\alpha, \lambda_2)$ and X_1 and X_2 are two independent variable. Show that $U = X_1 + X_2$ and $V = \frac{X_1}{X_1 + X_2}$ are independent.

b) If Y follows χ^2 distribution with 16 degrees of freedom then find

i) $P[Y \leq 20.465]$

ii) $P[11.152 \leq Y \leq 26.296]$

c) If a random variable X follows t-distribution with n degree of freedom then find the distribution of random variable X^2?

Q4) Attempt any one of the following:

a) i) Let $X \sim N(\mu, \sigma^2)$ where μ is known. Explain the test procedure for testing $H_0 : \sigma^2 = \sigma_0^2$ against $H_1 : \sigma^2 \neq \sigma_0^2$ in detail. **[5]**

ii) Two random samples drawn from two normal populations are given below:

Sample I : 20, 16, 26, 27, 23, 22, 18, 24, 25, 19.

Sample II : 17, 23, 32, 25, 22, 24, 28, 31, 33, 20, 22.

Test whether the two populations have the same variance : Use 2% l.o.s. **[5]**

b) i) Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and their weights (in kg) are found as follows:

50, 49, 52, 44, 45, 48, 46, 45, 49, 45

Test whether the average weight of a bag is 50kg? Also construct 99% confidence interval for mean weight of bag. **[5]**

ii) Define chi-square variate with n-degree of freedom, also find it's mean and variance. **[5]**

Total No. of Questions : 5]

SEAT No. : ____

PA-2174

[Total No. of Pages : 2

[5901]-216
S.Y. B.Sc.
GEOGRAPHY
Gg - 241 : Environmental Geography - II
(2019 Pattern) (CBCS) (Semester - IV) (Paper - I) (24181)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt any three questions form Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***
4) ***Use of map stencil is allowed.***

Q1) Answer the following questions in 20 words (Any Five) : **[5]**

a) Define 'Environmental Impact Assessment'.

b) Write the name of any two principles in environmental planning.

c) What is mean by deforestation?

d) What is the aim of United Nations Environment Programme (UNEP)?

e) When did the stockholm conference take place?

f) Write any two benefits of EIA.

Q2) a) Answer the following questions in 100 words (Any Two) : **[6]**

i) Describe the aspects of environmental management.

ii) Define the water conservation with it's importance.

iii) Explain the various methods of energy conservation.

b) Answer the following questions in 150 words (Any One) : **[4]**

i) Explain the Adhoc method of Environment Impact Assessment.

ii) Write the objectives and need of forest conservation act-1980.

P.T.O.

Q3) a) Answer the following questions in 100 words (Any Two) : **[6]**

i) Explain the Kyoto protocol.

ii) Explain the purpose of EIA.

iii) Describe the importance of study of environmental geography.

b) Answer the following questions in 150 words (Any One) : **[4]**

i) Explain the objectives and need of environmental planning and management.

ii) Describe the sustainable development summit, New York-2015.

Q4) a) Answer the following questions in 100 words (Any Two) : **[6]**

i) Which steps are used for Environment Impact Assessment?

ii) Discuss the role of NGO in environmental conservation.

iii) Describe Environmental Protection Act-1986.

b) Answer the following questions in 150 words (Any One) : **[4]**

i) Write the scope of Environment Impact Assessment.

ii) Explain the major programme for environmental protection conservation in India.

Q5) Write short notes on the following (Any Four) : **[10]**

a) Delphi method.

b) Tiger conservation programme in India.

c) Wildlife protection act-1972.

d) Ganga action plan.

e) Nature of Environment Impact Assessment.

f) Earth Summit-1992.

□□□

Total No. of Questions : 5]

SEAT No. :

PA-2175

[Total No. of Pages : 2

[5901]-217
S.Y. B.Sc. (Regular)
GEOGRAPHY
GG - 242 : Geography of Maharashtra-(Human)-II
(2019 Pattern) (Semester-IV) (CBCS) (Paper-II) (24182)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Attempt any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***
4) ***Use of map stencil is allowed.***

Q1) Answer the following questions in 20 words (Any 5): **[5]**

a) Write any two types of highways in Maharashtra.

b) Name any two major religions in Maharashtra.

c) State the difference between food crop and cash crop.

d) Write the full form of MIDC.

e) Name any two famous IT companies in Maharashtra.

f) What is interstate migration?

Q2) a) Answer the following questions in 100 words (Any 2) **[6]**

i) Describe the geographical requirement for rice crop.

ii) Explain the causes of urban to urban migration in Maharashtra.

iii) Describe the importance of agro-based industries in Maharashtra.

b) Answer the following question in 150 words (Any 1): **[4]**

i) Write the prospects of cotton industry of Maharashtra.

ii) Describe the significance of road transportation in the development of Maharashtra.

Q3) a) Answer the following questions in 100 words (Any 2) **[6]**

i) Write the characteristics of population growth in Maharashtra.

ii) Explain the distribution of Onion crop in Maharashtra.

iii) Give the influence of electronic media on the society.

b) Answer the following question in 150 words (Any 1): **[4]**

i) Give an account of water transportation in Maharashtra.

ii) Explain the importance of print media in the development of Maharashtra.

P.T.O.

Q4) a) Answer the following questions in 100 words (Any 2) **[6]**

i) Write the distribution of Bajra crop in Maharashtra.

ii) What are different types of Migration?

iii) Give importance of Express Highway of Maharashtra.

b) Answer the following question in 150 words (Any 1): **[4]**

i) Describe major problems of agriculture in Maharashtra.

ii) Write advantages and disadvantages of air transportation in Maharashtra.

Q5) Write short notes on the following (Any 4): **[10]**

a) Major transportation projects in Maharashtra.

b) Future of wine industry in Maharashtra.

c) Spatial distribution of religions in Maharashtra.

d) Rural to rural migration in Maharashtra.

e) Problems of grape farmers in Maharashtra.

f) Major social media platforms and their importance.

Total No. of Questions : 5]

SEAT No. :

PA-2176

[Total No. of Pages :2

[5901]-218

S.Y. B.Sc. (Regular)

MICROBIOLOGY

MB-241 : Bacterial Genetics

(2019 Pattern) (CBCS) (Semester-IV) (Paper-I) (24191)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5]**

a) Define transversion mutation.

b) Draw structure of uracil

c) _____ is a dominant form of DNA present in cell.

d) Triplet of bases forms a codon (T/F)

e) What is suppressor mutation?

f) In _____replication, the new helix will be composed of an original DNA strand as well as a newly synthesized strand.

Q2) a) Describe the following any three **[6]**

i) Draw structure of polynucleotide.

ii) Role of DNA polymerase I

iii) What are base analogues? Give two examples.

iv) What is plasmid amplification?

b) Diagrammatically represent theta model of DNA replication **[4]**

Q3) a) Explain the following any three. **[6]**

i) Initiation in DNA replication.

ii) Mechanism of silent mutation.

iii) Describe concept of genetic code

iv) Types of plasmid

b) Diagrammatically describe Griffiths experiment **[4]**

P.T.O.

Q4) a) Discuss the following any three **[6]**

i) What are six basic rules of DNA replication?

ii) Explain the action of HNO_2 as mutagenic agent.

iii) What is plasmid curing?

iv) What are conditional Lethal mutations?

b) Explain in short Fraenkel Conrat and Singer experiment? **[4]**

Q5) Write short notes on any four of the following. **[10]**

a) Avery Macleod experiment

b) Concept of Nucleotide & Nucleoside

c) Conservative mode of DNA replication

d) Termination of Translation

e) Fluctuation test

f) Intercalating agents

❖ ❖ ❖

Total No. of Questions : 5]

SEAT No. :

PA-2177

[Total No. of Pages : 2

[5901]-219
S.Y. B.Sc. (Regular)
MICROBIOLOGY
MB - 242 : Air, Water & Soil Microbiology
(2019 Pattern) (CBCS) (Semester - IV) (Paper - II) (24192)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q. 5.***
3) ***Questions from 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5]**

a) Define : 'Droplet'

b) Name any two 'Actinomycetes' present in the soil.

c) Enlist two bacteria involved in ammonification.

d) _____ is the water located in soil pore spaces and in the fractures of rock farmations.

e) Define 'Biofertilizer'.

f) As per MPCB, fresh water of A II category should not contain coliforms greater than _____ /100ml.

i) 50

ii) 500

iii) 5000

iv) 10,000

Q2) a) Describe the following (Any three) **[6]**

i) Sedimentation and coagulation steps of water purification.

ii) Role of Fungal microflora of the rhizosphere.

iii) The process of composting of organic matter.

iv) Importance of 'Arbuscular mycorrhizal Fungi'

b) Diagramatically describe the 'Carbon cycle'. **[4]**

P.T.O.

Q3) a) Explain the following (any three) **[6]**

i) Important characteristics of indicators of fecal pollution of water.

ii) The method of air sanitation using UV radiation.

iii) 'Sieve sampler' far sampling of the air.

iv) Functions of the 'Humus'.

b) Describe bacteriological standards of potable water as per WHO guidelines. **[4]**

Q4) a) Discuss the following (any three) **[6]**

i) Active monitoring of the air.

ii) The process of 'Nitrification'

iii) ISI specifications of Bioinoculant.

iv) 'Parasitism and predation'

b) Explain the confirmatory test far bacteriological analysis of water. **[4]**

Q5) Answer the following (any four) **[10]**

a) Write any five bacterial water borne diseases with their causative agents.

b) Diagramatically describe 'slow sand filters'.

c) What are different categories of biocontrol agents. Give example of each category.

d) Justify - 'Bifiobacterium' in drinking water is considered as recent Fecal pollution of water.

e) Write short note on : Air borne viral infections.

f) Production of cyanobacterial biofertilizer, with respect to-

i) Medium used

ii) Inoculum added

iii) Dose of superphosphate

iv) control of insect-pest attack

Total No. of Questions : 5]

SEAT No. : ____

PA-2178

[Total No. of Pages : 2

[5901]-220

S.Y. B.Sc.

NANOSCIENCE AND NANOTECHNOLOGY

NS 241 : Organic and Polymer Science of Nanomaterials

(2019 Pattern) (Paper - I) (Semester - IV) (24261)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***
4) ***Draw neat and labelled diagram wherever necessary.***
5) ***Figures to the right indicate full marks.***

Q1) Attempt any FIVE of the following : **[5]**

a) Define the term 'Polymer'.

b) Define 'Nanocomposites'.

c) What is graphene?

d) What are 'Homochain' and 'Heterochain'?

e) Define 'Number average molecular Weight (mn) of polymer.

f) Define the term 'Bio polymer'.

Q2) a) Attempt any one of the following : **[6]**

i) Explain in detail the classification of polymer.

ii) Give the application of 'Carbon nanotubes'.

b) What is nanofillers? Explain classification of Nanofillers. **[4]**

Q3) a) Attempt any one of the following : **[6]**

i) Explain mechanism of free radical.

ii) Explain 'Electrochemical polymerisation'.

b) Explain the methods for synthesis of conducting polymer. **[4]**

P.T.O.

Q4) a) Attempt any <u>one</u> of the following : **[6]**

i) Explain in detail cataionic polymerization.

ii) Explain 'solution polymerisation' and 'suspension polymerisation'.

b) Explain Growth mechanism of carbon nanotubes. **[4]**

Q5) Write short notes on <u>any four</u> of the following : **[10]**

a) Polymer

b) Liquid crystalline polymerisation

c) Emulsion polymerisation

d) Application of graphene

e) Carbon nanotubes

f) Addition polymerisation

Total No. of Questions : 5]

SEAT No. :

PA-2179

[Total No. of Pages : 2

[5901]-221

S.Y. B.Sc.(Regular)

NANOSCIENCE AND NANOTECHNOLOGY

NS - 242 : Advanced Techniques for Characterization of Nanomaterials

(2019 Pattern) (Paper-II) (Semesters-IV) (Credit System) (24262)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***
4) ***Draw neat & labeled diagram wherever necessary.***
5) ***Figures to the right indicate full marks.***

Q1) Attempt any five of the following: **[5]**

a) What is the principle of FESEM?

b) Enlist the parts of EDAX system.

c) State the principle of DSC analysis.

d) What is mean by DC SQUIDS?

e) Give any two advantages of Fluorescence microscopy.

f) What is the use of lock in amplifier in VSM?

Q2) a) Attempt any One of the following: **[6]**

i) Explain Transmission Electron microscopy with proper diagram.

ii) With neat labeled diagram explain Fluoresence microscopy.

b) Write down the applications of SEM. **[4]**

Q3) a) Attempt any One of the following: **[6]**

i) Draw the diagram of confocal microscopy. Also give applications of confocal microscopy.

ii) Define dimpling process. Give the advantages & disadvantages of TEM.

b) Explain selected Area Electron Diffraction method. **[4]**

P.T.O.

Q4) a) Attempt any One of the following: **[6]**

i) With neat labeled diagram explain ESEM. Also give applications of ESEM.

ii) Explain the sample preparation for TEM.

b) Explain bright field imaging method. **[4]**

Q5) Write a short notes on any four of the following: **[10]**

a) Ion milling process.

b) Types of SQUIDS.

c) Applications of DSC analysis.

d) Principle of VSM.

e) Elastic & Inelastic interaction.

f) Principle of confocal microscopy.

Total No. of Questions : 5]

SEAT No. : ____

PA-2180

[Total No. of Pages : 2

[5901]-222

S.Y. B.Sc. (Regular)

ELECTRONIC SCIENCE

EL - 241 : Analog Circuit Design

(CBCS 2019 Pattern) (Semester - IV) (Paper - I) (24221)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any Five of the following: **[5]**

a) What is an amplifier?

b) Define thermal runaway.

c) State bark hausen criteria for sustain oscillation.

d) What is the need of multistage amplifier?

e) Write a classification of power Amplifiers.

f) What is conversion efficiency of class A power amplifier with inductive load?

Q2) Answer the following:

a) i) Calculate overall gain in dB, If first stage has gain 7 and second stage gain 25. **[2]**

ii) What is heat sink? Why it is used? State its types. **[4]**

b) Explain with neat diagram. Wein bridge oscillator. **[4]**

P.T.O.

Q3) Answer the following:

a) i) What is Audio amplifier? List the applications of audio amplifier. **[2]**

ii) Draw the circuit diagram of integrator. Using OP-AMP and write its expression for output voltage. **[4]**

b) Show that collector efficiency of class B push-pull amplifier is 78.5%. **[4]**

Q4) Answer the following:

a) i) In an amplifier with gain 50 a positive feedback applied through a B network = 0.005. Calculate the gain of amplifier after feedback. **[2]**

ii) Explain with block diagram public address system. **[4]**

b) Calculate the frequency of phase shift oscillator for the resistor of 1MΩ and capacitor 68PF. **[4]**

Q5) Attempt any Four of the following: **[10]**

a) Write a note on dc load line.

b) Differentiate between positive feedback & negative feedback amplifier.

c) Calculate coupling capacitor for designing of single stage RC coupled amplifier if cut off frequency is 1kHz and resistance R = 100Ω.

d) Explain cross-over distortion.

e) Give the advantages of active filter.

f) The turns ratio of transformer is 10 : 1. If the load of 8Ω Loudspeaker is connected across the secondary. Calculate the effective resistance seen into primary coil.

Total No. of Questions : 5]

SEAT No. :

PA-2181

[Total No. of Pages : 2

[5901]-223
S.Y. B.Sc. (Regular)
EL - 242 : ELECTRONIC SCIENCE
Microcontroller & Python Programming
(2019 Pattern) (Semester - IV) (CBCS) (Paper - II)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q. 1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any FIVE of the following : **[5]**

a) Which are two main function used in Arduino program?

b) Define python module.

c) What is microcontroller?

d) What is use of continuous statement in python?

e) List the arithmetic operators used in Arduino.

f) "Python is a case sensitive Programming Language" Comment.

Q2) Answer the following :

a) i) List any four application of python language. **[2]**

ii) Draw the architecture of the microcontroller used in Arduino. Explain ALU block in detail. **[4]**

b) Explain while statement in python with example. **[4]**

Q3) Answer the following :

a) i) What is a List in python? **[2]**

ii) What is variable in Python? State the rules for naming the variable in python. **[4]**

b) Write Arduino code for controlling the intensity of LED by sending PWM signal using analog Write() function. **[4]**

P.T.O.

Q4) Answer the following :

a) i) List the bitwise operator in Arduino. **[2]**

ii) Explain LED blinking using Arduino with python programming, write a python code for LED blinking. **[4]**

b) Explain different types of constant in Arduino. **[4]**

Q5) Attempt any FOUR of the following : **[10]**

a) What is the use of serial. print() function in Arduino?

b) Write a short note on Switch-case statement in Arduino.

c) List the python operators used in python programming.

d) What are the advantages of user defined functions in python?

e) Write a short note on string in python.

f) Write a python code for subtraction of two numbers.

Total No. of Questions : 5]

SEAT No. :

PA-2182

[Total No. of Pages : 2

[5901]- 224
S.Y. B.Sc.
PSYCHOLOGY
Health Psychology (Paper- I)
(2019 Pattern New) (Credit System) (Semester - IV) (Regular) (24201)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following. **[5]**

a) Who developed the bio-psychosocial model.

b) Define Eustress

c) Define catastrophic thinking.

d) What is the meaning of human virtues?

e) Define well being

f) Define optimism.

Q2) a) Explain the emotion focused coping pattern. **[6]**

OR

Describe the health protective behaviors.

b) Categorize the various health enhancing behavior. **[4]**

Q3) a) Discuss the types, causes and treatment of diabetes as a Chronic Illness. **[6]**

OR

Explain the role of resilience in health & wellbeing.

b) Analyze the Cognitiel component of health. **[4]**

P.T.O.

Q4) a) Explain in details problem focused coping pattern. **[6]**

OR

Describe in brief the role of life satisfaction to health.

b) Examine the sources of stress. **[4]**

Q5) Write short notes on any four of the following. **[10]**

a) Blood Pressure

b) Types of Stress

c) Illness management

d) Goals of health psychology

e) Nature of coping

f) Happiness & health

Total No. of Questions : 5]

SEAT No. :

PA-2183

[Total No. of Pages : 2

[5901]-225

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

PSYCHOLOGY

Psychological Testing and Applications

(2019 Pattern) (New) (Paper - II) (24202)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Que.2 to Que. 5.***
3) ***Que.2 to Que.5 corry equal marks.***

Q1) Solve any five of the following : **[5]**

a) Define aptitude.

b) What is projective techniques.

c) Define mental health.

d) Define personality.

e) What is neuro psychology?

f) Define adjustment.

Q2) a) How MMPI is used as a personality assessment tool. **[6]**

OR

Explain any two types of psychological tests used for assessment of abnormal behavior & mental health.

b) Analyse the concepts in intelligence testing. **[4]**

Q3) a) Describe any two types of tests which assess the family adjustment with their psychometric properties. **[6]**

OR

Explain the eight subscales of DAT with Psychometric properties.

b) Examine the various aspects of adjustment. **[4]**

P.T.O.

Q4) a) Illustrate any two types of projective tests. **[6]**

OR

Describe any one type of Intelligence test with psychometric properties.

b) What are the goals of neuro psychological assessments. **[4]**

Q5) Write short notes on any four of the following : **[10]**

a) GATB.

b) Components of mental health.

c) Application of BDI.

d) Application of marital adjustment test.

e) Uses of work motivation assessment.

f) Importance of value assessment.

▽▽▽▽

Total No. of Questions : 5]

SEAT No. :

PA-2184

[Total No. of Pages : 2

[5901]-226

S.Y. B.Sc.

ENVIRONMENTAL SCIENCE

EVS - 241 : Biological Diversity & its Conservation

(2019 Pattern) (Semester-IV) (Paper-I) (24241)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q2 to Q5.***
3) ***Questions from 2 to 5 carries equal marks.***

Q1) Solve any five of the following: **[5]**

a) Define Biological Diversity.

b) What is Endemism?

c) Define Ecosystem.

d) What is IUCN?

e) What is CBD?

f) What do you mean by CITES?

Q2) a) Explain - importance of Ecosystem in maintaining ecological balance. **[6]**

b) Explain - India as a mega-diversity country. **[4]**

Q3) a) Describe Darwins theory of Evolution. **[6]**

b) Write note on Global climate change. **[4]**

Q4) a) Write in detail of in-situ Biodiversity conservation methods with examples. **[6]**

b) Write short note on silent valley movement. **[4]**

P.T.O.

Q5) Write short note on any four of the following: **[10]**

a) Levels of Biological diversity.

b) Myer's Hot-spots.

c) NBSAP.

d) Transgenic organisms.

e) Explain centers of diversity.

f) Write four classifications of Ecosystem.

Total No. of Questions : 5]

SEAT No. :

PA-2185

[Total No. of Pages : 2

[5901]-227

S.Y. B.Sc. (Environmental Science) (Regular)

EVS - 242 : ENVIRONMENTAL POLLUTION CONTROL TECHNOLOGY

(2019 Pattern) (Semester - IV) (Paper - II) (24242) (Credit System)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three question from Q.2 to Q.5.***
3) ***Question from 2 to 5 carries equal marks.***

Q1) Solve any five of the following: **[5]**

a) What is meant by stack gas monitoring.

b) Define soil carbon flux.

c) Give examples of Bio-Fertilizers.

d) Define the term Noise Pollution.

e) Enlist any 2 characteristics of Hazardous waste.

f) What is meant by Mechanical volume and size reduction.

Q2) a) Write a short note on Secondary Treatment of waste water with respect to Activated sludge process. **[6]**

b) Write short note on - Soil Sampling Techniques. **[4]**

P.T.O.

Q3) a) Write short note on Bio-medical Waste Management. **[6]**

b) Explain in detail various Noise Control Techniques used. **[4]**

Q4) a) Explain in detail various Solid Waste disposal/Management options. **[6]**

b) Biological Pest Management. **[4]**

Q5) Write Short note on any four of the following: **[10]**

a) Control of Noise Pollution at Source.

b) Bio-Fertilizers and Bio-Pesticides.

c) Phytoremediation of contaminated site.

d) Organic Farming.

e) Oxidation Pond.

f) Plume Behaviour.

Total No. of Questions : 4]

SEAT No. :

PA-2186

[Total No. of Pages : 2

[5901]-228
S.Y. B.Sc. (Regular)
DEFENCE & STRATEGIC STUDIES
DS 401: International Security
(2019 Pattern) (Semester - IV)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

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

Q1) Define the following questions : **[5 × 1 = 5]**

a) What is National Interest?

b) What is a Nation-State?

c) Define Neutrality.

d) What is National Power.

e) Define Regionalism.

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

a) Collective Security.

b) International Law.

c) Non-Alignment.

P.T.O.

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

a) Explain the Common Security.

b) Explain the International Law Nature and Scope.

c) State the conceptual Framework of Global and Regional Environment.

Q4) Answer in details (any one) : **[10]**

a) Describe the significance of Disarmament and Arms Control in maintaining Peace in the Global and Regional sphere.

b) Explain the problems of world peace and security.

Total No. of Questions : 4]

SEAT No. : ____

PA-2187

[Total No. of Pages :1

[5901]-229

S.Y. B.Sc. (Regular)

DEFENCE AND STRATEGIC STUDIES

DS 402 : Defence Economics

(2019 CBCS Pattern) (Semester-IV) (24232)

Time : 2 Hours] ***[Max. Marks : 35***

Instruction to the candidates:

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

Q1) Define the following questions. **[5×1=5]**

a) Define the Concept of Budget.

b) Define the Concept of Planning.

c) Define the Concept of Defence

d) What is Development?

e) Define the Concept of Defence Management.

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

a) Defence Management & Armed Forces

b) DPSU

c) Defence budget

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

a) Explain the role of the Private Sector in Indian Defence.

b) Explain the Parlimentary Budget of India.

c) State the Types of Budget.

Q4) Answer in details (any one) **[10]**

a) Explain in detail the Defence and Development.

b) Explain in detail the Nature and Scope of Defence Management.

c) Explain in detail the role of Leadership in Defence Management.

Total No. of Questions : 4]

SEAT No. :

PA-2188

[Total No. of Pages : 1

[5901]-230
S.Y. B.Sc. (Regular)
DEFENCE AND STRATEGIC STUDIES
DS - 403 : Defence Journalism
(2019 Pattern) (CBCS) (Semester - IV) (24233)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

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

Q1) Define the following questions **[5×1=5]**

a) Define Media.
b) Define Journalism.
c) Define Conflict Management.
d) Define Security.
e) Define Defence Journalism.

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

a) Media
b) Defence Journalism
c) Defence & Media

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

a) Explain the Essential knowledge for a Defence Journalist.
b) State the Current Trends in Defence Journalism.
c) Explain the Role of Defence Journalism in International Security Studies.

Q4) Answer in details (any one) **[10]**

a) Discuss in detail the Problems, Prospects and Limitations faced by the Defence Journalists.
b) Discuss in detail the Role of Defence Journalism in National Security Studies.

Total No. of Questions : 3]

SEAT No. :

PA-2189

[Total No. of Pages : 1

[5901]-231
S.Y. B.Sc. (Regular)
ENGLISH
Ability Enhancement Compulsory Course
(2019 Pattern) (Semester - IV) (Credit System) (24321)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

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

Q1) Attempt any one of the following in about 150-200 words : **[15]**

a) What 'painful' thought has begun to come into the narrator's mind and what solution did he find to it in the story 'My Lost Dollar'.

b) What 'Promises' the speaker is talking about in the poem 'Stopping by Woods on a snowy Evening?

Q2) Attempt any two of the following in about 50-80 words : **[10]**

a) Draft a notice for first year students informing them about a guest lecture on the occasion of 'Swami Vivekanand Jayanti'.

b) Write a note on content writing.

c) Prepare an agenda on 'Annual Cultural fest' to be organised in your college.

Q3) Attempt any two of the following in about 50-80 words : **[10]**

a) Write a short note on 'Team work and leadership skills'.

b) Explain 'Attitude is everything'.

c) Prepare a SWOT analysis of yourself as a candidate for an interview.

✷ ✷ ✷

Total No. of Questions : 3] **SEAT No. :**

PA-2190 **[Total No. of Pages : 1**

[5901]-232
S. Y. B.Sc.
मराठी (MARATHI) (Regular)
पाठयपुस्तक : मराठी कथा दर्शन (Theory)
(2019 Pattern) (Semester - IV) (24331) (AECC-IVB) (CBCS)

वेळ : 2 तास] *[एकूण गुण : 35*

सूचना :– 1) सर्व प्रश्न सोडविणे आवश्यक आहेत.

2) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्रश्न 1) खालीलपैकी कोणत्याही एका विषयावर 300 शब्दांत निबंध लिहा. **[10]**

अ) कोरोना : एक जागतिक महामारी.

ब) भ्रष्टाचार हाच शिष्टाचार.

क) आजची प्रसारमाध्यमे.

प्रश्न 2) खालीलपैकी तीन प्रश्नांची उत्तरे 100 शब्दांत लिहा. **[15]**

अ) 'कांचन मृग' या कथेतील व्याधाची व्यक्तिरेखा स्पष्ट करा.

ब) 'अथेन्सचा प्लेग' ही विज्ञान कथा भविष्यातील जीवनाचा वेध घेते स्पष्ट करा.

क) सदानंद व यंत्रमानव यांच्यातील संवादाचे स्वरूप 'एका यंत्र–मानवाच्या मनाचा शोध' या कथेच्या आधारे स्पष्ट करा.

ड) 'पुढल्या हाका' या कथेतील विनयची शस्त्रास्त्र विरोधी भूमिका थोडक्यात विशद करा.

ई) '15 ऑगस्ट 1947' या कथेतील रामराव पाटील व रझाकार यांच्यातील संघर्ष चित्रित करा.

प्रश्न 3) खालीलपैकी एका प्रश्नाचे उत्तर 300 शब्दांत लिहा. **[10]**

अ) 'लिंपण' या कथेतील दलित जीवनातील वेदनांचा परामर्श घ्या.

ब) शेतकरी जीवनाची करूण कहाणी 'ओझ' या कथेच्या आधारे स्पष्ट करा.

❄ ❄ ❄

Total No. of Questions : 3]

SEAT No. :

PA-2191

[Total No. of Pages : 1

[5901]-233

S.Y.B.Sc. (Regular)

AECC - IV C : हिंदी

हिंदी काव्य तथा कहानी साहित्य

(2019 Pattern) (CBCS) (Semester - IV) (24341)

पाठ्यपुस्तक : साहित्य संगम – संपा. प्रो डॉ. सदानंद भोसले

वेळ : 2 घंटे] *[पूर्णांक : 35*

सूचनाएँ :– 1) सभी प्रश्न अनिवार्य हैं।

2) दाहिनी ओर लिखे अंक प्रश्नों के पूर्णांक हैं।

प्रश्न 1) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए: **[15]**

i) रानी लक्ष्मीबाई की वीरता का चित्रण किस प्रकार हुआ है?

ii) 'मधुशाला' कविता में सांप्रदायिक एकता का संदेश किस प्रकार दिया है?

iii) 'गीत फरोश' कविता के माध्यम से कवि क्या संदेश देना चाहते हैं?

iv) 'रोटी और संसद' कविता के आशय को अपने शब्दों में लिखिए।

v) 'भूख' कविता के माध्यम से किस प्रकार जीवन संघर्ष को व्यक्त किया है?

प्रश्न 2) निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर लिखिए: **[15]**

i) 'पत्नी' कहानी की कथावस्तु संक्षेप में लिखिए।

ii) 'बेटा' कहानी के उद्देश्य को स्पष्ट कीजिए।

iii) 'शर्त' कहानी में चित्रित जातिगत विषमता पर प्रकाश डालिए।

iv) लेखक अशोक जमनानी को कहानी लेखन की प्रेरणा किस प्रकार मिली?

v) 'ईश्वर का द्वंद्व' कहानी का सारांश अपने शब्दों में लिखिए।

प्रश्न 3) निम्नलिखित में से किसी एक प्रश्न का उत्तर लिखिए : **[5]**

i) 'भूख' कविता की मुल संवेदना को स्पष्ट कीजिए।

ii) कालिन्दीचरण का चरित्र–चित्रण कीजिए।

OOOO

Total No. of Questions : 4]

SEAT No. :

PA-2192

[Total No. of Pages : 2

[5901]-234

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

AECC-II E LANGUAGE - SANSKRIT

(Girvana Bhārati)

गीर्वाणभारती (निवडक संस्कृत वेचे)

(2019 Pattern) (24351) (Credit System)

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

*सूचना :– 1) **All questions are compulsory.***
सर्व प्रश्न अनिवार्य आहेत.

*2) **Figures to the right indicate full marks.***
उजवीकडील अंक पूर्ण गुण दर्शवितात.

Q1) Write an answer in 2-4 lines on the following questions. **[16]**

पुढील प्रश्नांची दोन ते चार ओळीत उत्तरे लिहा.

i) From which original text **उपदेशप्रबन्धः** has taken?
उपदेशप्रबन्धः हा पाठ कोणत्या मूळ ग्रंथातून घेतला आहे.

ii) State the names of **आस्तिक दर्शन**'s?
आस्तिक दर्शनांची नावे लिहा.

iii) Which is the root in word '**गणित**'?
'गणित' शब्दातील मूळ धातू कोणता.

iv) Who is the author of Rāmāyana?
रामायणाचा रचयिता कोण?

v) What is the meaning of **सिंहिका**?
सिंहिका म्हणजे काय?

vi) State any two types of **भक्ती**.
भक्तीचे कोणतेही दोन प्रकार लिहा.

vii) Fill in the Blank **जनापवादाद् भजेद् –।**
गाळलेली जागा भरा जनापवादाद् भजेद् –।

viii) Fill in the Blank **सेयो ..... सुदुर्वारः।**
रिक्त जागा भरा सेयो ..... सुदुर्वारः।

P.T.O.

Q2) Write short notes (any two) : **[8]**

टीपा लिहा (कोणत्याही दोन) :

i) **ज्योतिषशास्त्रम्**

ii) **विमानप्रकारा:**

iii) **वास्तुशास्त्रम्**

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

टीपा लिहा. (कोणत्याही दोन) :

i) **छायाग्राहि**

ii) **मानसपूजा**

iii) **श्रयेन्महान्तं महत्त्वाय**

Q4) Write the Summary of the lesson. **[8]**

प्राचीनशास्त्र परिचय: (प्रथमो भाग:)

प्राचीनशास्त्र परिचय: (प्रथमो भाग:) या पाठाचा सारांश लिहा.

OR/**किंवा**

Explain the lines **न वहेद् गर्वं बुधो मनसा** and **विनयात् संसाधयेत् कार्यम्**

न वहेद् गर्वं बुधो मनसा व विनयात् संसाधयेत् कार्यम् या दोन ओळी स्पष्ट करा.

▽▽▽▽

Total No. of Questions : 4 **SEAT No.**

PA-2193 **Total No. of Pages : 3**

[5901]-235

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

AECC-IV D LANGUAGE-ARBIC FUNCTIONAL

(2019 Pattern)(CBCS) (24371) (Regular)

Total Marks : 35] ***[Time : 2 Hours***

Instructions to candidates :

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

Q.1 Translate into English / Urdu / Marathi any Two of the following Passages: **[10]**

(الف) هٰذا جَمَلُ ۔ ذَالِکَ کَلْبٌ ۔ ذَالِکَ فَرَسٌ ۔ هٰذا کِتَابٌ۔ اَنَا وَلَدٌ ۔ اَنْتَ وَلَدٌ۔ أنا کبیرٌ۔ اَنَتْ صَغِیرٌ ۔ اَلْقُرآنُ کِتابٌ۔اَلْکِتَابُ عَرَبّئی۔ اَلْعِلمُ مُفِیدٌ۔

(ب) اَلا سِلَامُ دِینٌ ۔ اَلاَ دَبُ وَا جِبٌ اَلدّ رُسُ سَهُلٌ ۔ اَلجَمَلُ طَوِئیلٌ۔ اَلبَیتُ جَمِیلٌ ۔ اَلزّهُرُ صَغِیرٌ۔ اَلشّجَرُ کَبِیرٌ ۔ اَللّعِبُ ضَرُوُرِیٌّ۔ اَ لحَمُدُ ثاَ بِتٌ لِلّٰهِ۔ اَلقُرُآنُ هِدَایَةٌ۔ لِلاِلنسانِ ۔ اَلْعَمَلُ ضَرورِیٌّ لِلعَالِمِ۔

P.T.O.

(ج) اَلاُستَاذُ جَالِسٌ عَلىَ الكُرسِيّ۔ اَلوَلَدُ وَاقِفٌ عَلَى الاَرُضِ ۔

اَ لُقَلَمُ لَازِمٌ لِلكِتابَةِ ۔ وَالكِتابُ لَازمٌ لِلقِرَاءَ ةِ۔ اَلعِلمُ نِعُمَةٌ

لِلاالنُسانِ اَلدّرَسُ سَهُلٌ لِلوَلَدِ۔

Q.2 Translate and Explain the following Poem ‘‘عيدُالفِطْرِ’’ in Urdu/ ENg/ Marathi : **[10]**

عِيدُ الفِطْر ـــــــ يَومَ اَلْبِسرّ

نَخْتِمُ فِيهِ ـــــــ صَومَ اَلشّهرِ۔

نلْبَسُ فَرَ حاً ـــــــ حُللَ اَلْبِشْرِ

نَرْ تَعُ نَلْهُو ـــــــ نَلْعَبُ نجَرِىُ

نُسْعِدُفِيهِ ـــــــ أ هْلَ اَلْعُسْرِ

وَنُجَنِّبُهُمْ ـــــــ مَسَّ اَلضُّرّ۔

قَدْ عَوّدَنَا ـــــــ دِينُ الْبِسّرِ

اَنْ نَمْسَهَحُمْ ـــــــ بِيَدِ الْيُسْرِ۔

مَرَحىً مَرَحىً ـــــــ مُسْدِىُ اَلْخَيْرِ

كُنْ مِعْوانًا ـــــــ للئمُضْطَرّ

وَارْحَمْ تَغْنَمْ ـــــــ خَيْرَ الاَجْسرِ

عِيْدُ الفِطْرِ ـــــــ عِيدُ الْبِسّرِ

Q.3 Answer the following in Arabic only **:** **[10]**

1) كَيْفَ الَزّهرُ ؟

2) اَيْنَ الزّهْرُ ؟

3) هَلْ هٰذَا كِتابٌ ؟

4) مَنْ هٰذا ؟

5) مَا ذَالكَ ؟

Q.4 Write the Arabic Term of Week days: "اَيّامُ الاَسبُورُعِ" **[5]**

✔ ✔ ✔ ✔

Total No. of Questions : 5]

SEAT No. : ____

PA-2194

[Total No. of Pages :2

[5901]-236
S.Y. B.Sc. (Vocational)
COMPUTER HARDWARE AND NETWORK ADMINISTRATION
CHNA-331 : Network Fundamentals (Paper - III)
(CBCS) (2019 Pattern) (Semester - IV) (24871)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Q.1 is compulsory.***
2) ***Solve any three questions form Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any five of the following: **[5 × 1 = 5]**

a) Define Internet.

b) Write uses of fiber optic cable.

c) Write short note on computer network.

d) Write uses of HTTP protocols.

e) What is repeater?

f) Write advantages of peer-to-peer network.

Q2) a) i) What are the functions of FTP? **[2]**

ii) What are the different types protocols. **[4]**

b) What is the difference between VTP cable and STP cable? **[4]**

Q3) a) i) What is the description of Google drive? **[2]**

ii) What are the advantages of windows 2008 server. **[4]**

b) Explain different types of servers in networking. **[4]**

P.T.O.

Q4) a) i) Explain intranet in short & it's advantages. **[2]**

ii) Explain the following terms **[4]**

1) Router

2) Bridge

b) Explain peer-to-peer network **[4]**

Q5) Attempt any four of the following: **[10]**

a) Write benefits & uses of network.

b) Explain transmission media in networking.

c) Write short note on LAN and WAN.

d) Define Concept

i) Bus topologies

ii) Web services

e) What is OSI model?

f) Write short note on sky drive.

◆◆◆

Total No. of Questions : 5]

SEAT No. :

PA-2195

[Total No. of Pages : 2

[5901]-237

S.Y. B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

CHNA-332 : Micro Processor & Interfacing -II

(2019 Pattern) (CBCS) (Paper-IV) (Semesters-IV) (24872)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any five of the following: **[5×1=5]**

a) What is the function of card reader?

b) List different types of controller used in PC.

c) Write fullform of MIDI.

d) List different output devices.

e) What is mother board?

f) State two features of windows 8.

Q2) a) i) What is storage capacity of commonly used CD and DVD? **[2]**

ii) What is BIOS? Explain functions of BIOS. **[4]**

b) Write short note on remote desktop sharing tools. **[4]**

Q3) a) i) State any two features of upgrading PC. **[2]**

ii) What is multimedia PC? State minimum requirement for multimedia PC. **[4]**

b) Explain the concept of Thin PC & Thick PC. **[4]**

P.T.O.

Q4) a) i) What is Wi-Fi? State applications of Wi-Fi. **[2]**

ii) Compare Asynchronous and synchronous serial communication protocol **[4]**

b) What is Scanner? List different types of scanner write advantages & disadvantages of anyone. **[4]**

Q5) Write short note on any four of the following: **[10]**

a) Green PC

b) Storage devices

c) Display adapters

d) Computer networks

e) Android operating system

f) RFID technology

Total No. of Questions : 5]

SEAT No. : ____

PA-2196

[Total No. of Pages : 2

[5901]-238
S.Y. B.Sc
VOCATIONAL BIOTECHNOLOGY
VBT - 221 : Genetic Engineering (Paper - III)
(2019 Pattern) (Semester - IV) (24571) (CBCS)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5***
3) ***Q.2 to Q.5 carry equal marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

Q1) **Solve any five of the following :** **[5]**

a) Define recombinant DNA.

b) Name any two selectable markers of BAC vector.

c) Give the full form of RT - PCR.

d) Define shuttle vectors.

e) Name the chemical method of DNA sequencing.

f) On what basis do DNA fragments get separated in agarose gel electrophoresis?

Q2) **Answer any two of the following :** **[6]**

a) i) Give any three properties of an ideal vector.

ii) Explain the concept of antisense RNA technology.

iii) Explain the role of dimethyl sulphate, piperidine and hydrazine in Maxam Gilbert method of DNA sequencing.

b) Answer any one of the following : **[4]**

i) Describe the process of transformation of bacterial cells using calcium chloride treatment.

ii) Explain any 2 DNA modifying enzymes in detail.

P.T.O.

Q3) **Answer any one of the following :** **[6]**

a) i) Explain pBR322 vector in detail.

ii) Describe the basic steps involved in gene cloning.

iii) Explain the Sanger's method of DNA sequencing.

b) Answer any one of the following : **[4]**

i) Describe the procedure of southern blotting technique.

ii) Explain the nomenclature of restriction endonucleases in detail.

Q4) **Answer any two of the following :** **[6]**

a) i) What are nucleases? Explain any two differences between exonucleases and endonucleases.

ii) Give any 3 features of plasmid vectors.

iii) Explain the steps involved in synthesis of recombinant insulin.

b) Answer any one of the following : **[4]**

i) Explain the steps involved in PCR.

ii) Diagrammatically describe any one non-radioactive labelling method in detail.

Q5) **Write short notes on <u>any four</u> of the following :** **[10]**

a) Role of Taq polymerase in PCR.

b) Cloning vectors.

c) Role of APS and luciferase in pyrosequencing method.

d) Applications of Western blotting.

e) Cry protein.

f) Role of restriction endonucleases and DNA ligases in r-DNA technology.

❄ ❄ ❄

Total No. of Questions : 5]

SEAT No. :

PA-2197

[Total No. of Pages : 2

[5901]-239

S.Y. B.Sc. (Vocational)

BIOTECHNOLOGY

VBT - 222 : Bioinformatics

(2019 Pattern) (CBCS) (Semester-IV) (24572)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***
4) ***Draw diagram wherever necessary.***

Q1) Solve any five of the following: **[5]**

a) What is prosite.

b) What are scoring matrices?

c) What is pfan?

d) Define paralogues.

e) Name any one protein database.

f) Give full form of BLAST.

Q2) a) Answer the following (Any two): **[6]**

i) What are structural databases.

ii) Explain in detail History and scope of Bioinformatics.

iii) What are derived Databases?

b) Answer the following (Any one): **[4]**

i) Comment on Servers using NAR database.

ii) Explain in detail BLOSUM series.

Q3) a) Answer the following (Any two): **[6]**

i) Explain in detail matrices for proteins.

ii) Comment on Eukaryotic Genome database.

iii) Explain in detail keyword based Entrez.

b) Answer the following (any one): **[4]**

i) Explain BMC Bioinformatics.

ii) Explain in detail basic concept of sequence identity.

P.T.O.

Q4) a) Answer the following (Any two): **[6]**

i) Explain in detail 'PLOS'.

ii) Explain in detail SWISS- Prot.

iii) Discuss in detail identification patterns in given sequences.

b) Answer the following (Any one): **[4]**

i) Discuss in detail methods of deriving secondary data.

ii) What are Bibliographic databases. Give their applications in study of Bioinformatics.

Q5) Write short notes on the following: **[10]**

a) Organisations of data

b) SCOP

c) Z-Score

d) Tr EMBL

e) PubMed

Total No. of Questions : 5]

SEAT No. :

PA-2198

[Total No. of Pages : 2

[5901]-240

S.Y. B.Sc. (Vocational)

SEED TECHNOLOGY

ST2.4 : Vegetable Seed Production (Paper-III)

(24891) (2019 Pattern) (Semester - IV) (CBCS) (2 Credits)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q. 1 is compulsory.***
2) ***Solve any three questions from Que.2 to Que.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following: **[5]**

a) What is Plant Breeding?

b) Define kitchen type.

c) Define isolation distance.

d) Enlist the types of Selection.

e) Give the botanical name of Bitter guard.

f) Enlist the pest and diseases in Brinjal.

Q2) a) Write the procedure of Hybrid seed production in Okra. **[6]**

b) Explain the Progeny Selection. **[4]**

Q3) a) Describe the Procedure for Pedigree selection in vegetable crops. **[6]**

b) Explain the advantages and disadvantages of hybridization. **[4]**

Q4) a) Write the Seed Extraction Method, Harvesting and Seed Drying in Tomato. **[6]**

b) Write down the procedure for Flat Seed Bed. **[4]**

P.T.O.

Q5) Write short notes on any four of the following: **[10]**

a) Truck Garden

b) Objectives of population improvement.

c) Vegetable farming for seed production.

d) Cultural practices in Onion.

e) Objectives of Vegetable Seed Production.

f) Explain pure line selection.

Total No. of Questions : 5]

SEAT No. :

PA-2199

[Total No. of Pages : 2

[5901]-241

S.Y. B.Sc. (Vocational)

SEED TECHNOLOGY

ST-2.S : Seed Quality Control

(CBCS 2019 Pattern) (Semesters-IV) (2 Credits) (24882) (Paper - IV)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any five of the following: **[5]**

a) Define seed certification.

b) Define seed quality.

c) Define Biofertilizer.

d) Define control legislation.

e) Write any two penalties of offender.

f) Write any two statutory bodies in India.

Q2) a) Write the procedure of seed certification. **[6]**

b) Explain specific crop standards. **[4]**

Q3) a) Explain in detail State Seed Certification agency. **[6]**

b) Explain Green Manures & Trap crop. **[4]**

Q4) a) Seed certification agencies. **[6]**

b) Objective of field inspection. **[4]**

P.T.O.

Q5) Write short notes on any four of the following: **[10]**

a) Types of seed legislation.

b) Organization of seed certification.

c) Power of seed inspector.

d) Breeder seed and Foundation seed.

e) Concept of seed quality control.

f) Explain central seed committee.

Total No. of Questions : 5]

SEAT No. : ____

PA-2200

[Total No. of Pages : 2

[5901] - 242

S.Y. B.Sc. (Vocational)

INDUSTRIAL MICROBIOLOGY

IMB-221 : Microbial Fermentation and Down-stream Processing (Paper - III)

(2019 Pattern) (CBCS) (Semester - IV) (24821)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates :

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve **any Five** of the following : **[5]**

a) What is meant by 'Salting in of protein'?

b) What is downstream processing?

c) What is Dialysis?

d) What is the principle of sedimentation?

e) During acetic acid production _____ serves as a seed culture.

f) pH required for the production of Penicillin is _____.

P.T.O.

Q2) a) Attempt **any Three** of the following : **[6]**

i) Explain in brief principle & working of Ion Exchange chromatography.

ii) Draw the flow chart for Vitamin B12.

iii) Which technique can be used for separation of product from fermentation broth.

iv) Draw a well-labelled diagram of Gel-permeation Chromatography Column.

b) Write a short note on SCP. **[4]**

Q3) a) Attempt **any Three** of the following : **[6]**

i) Draw a flowchart for Penicillin production.

ii) Write a short note on Solvent precipitation.

iii) Draw a well labelled diagram for Rotary vaccum filter.

iv) What is membrane filtration?

b) Write a short note on Cell disruption. **[4]**

Q4) a) Attempt **any Three** of the following : **[6]**

i) Assuming your product is extracellular draw a downstream processing chart with appropriate reasoning.

ii) What is distillation? Where is it used in downstream processing?

iii) What is MALDI?

iv) Write a short note on centrifugation.

b) Draw a flow chart for cheese production. **[4]**

Q5) Write short notes on any four of the following : **[10]**

a) Sedimentation of proteins.

b) Bioinoculants.

c) Formulation of products.

d) Packaging and sales of product.

e) Liquid extraction of product.

f) FTIR.

Total No. of Questions : 5]

SEAT No. :

PA-2201

[Total No. of Pages : 2

[5901]-243

S.Y. B.Sc. (Vocational)

INDUSTRIAL MICROBIOLOGY

IMB -222 : Quality Assurance in Industrial Products

(2019 Pattern) (CBCS) (Semesters-IV) (Paper - IV) (24822)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Solve any five of the following: **[5]**

a) Enlist the test microorganisms used in sterility test.

b) Define Quality control.

c) Discuss peculiarity of fluid thiogly colate medium.

d) Define allergen.

e) Explain the concept of shelf life of a product.

f) Explain the role of WHO in pharmaceutical standards.

Q2) a) Attempt any three of the following: **[6]**

i) Discuss the importance of ISO.

ii) Describe the method of performing bioassay of amino acids.

iii) Describe in-vitro tests of pyrogenic substances.

iv) Discuss about the shelf life of single cell protein.

b) Write the significance of good manufacturing practices. **[4]**

Q3) a) Attempt any three of the following: **[6]**

i) Explain the concept of FDA and its significance.

ii) Which quality assurance tests are to be performed for testing quality of tooth paste?

iii) Draw neat and labelled flow diagram for the process of toxicity testing of a product.

iv) Enlist quality assurance tests recommended for testing quality of milk product.

b) Explain the concept of AGMARK and discuss its necessity. **[4]**

P.T.O.

Q4) a) Answer any three of the following: **[6]**

i) Describe the role of FPO.

ii) Explain the significance of pharma copeia.

iii) Explain the importance of sterility testing of vitamin B12.

iv) Elucidate the process of sterility testing.

b) Explain the concept of IP and discuss its necessity. **[4]**

Q5) Write short notes on any four of the following: **[10]**

a) USP

b) CGMP

c) ISI

d) Carcinogenicity testing of cosmetics.

e) Shelf life of phosphate solubilizers.

f) Monographs.

Total No. of Questions : 5]

SEAT No. : [ ]

PA-2202

[Total No. of Pages : 2

[5901]-244

S.Y. B.Sc. (Vocational) (Electronic Equipment Maintenance)

VOC - EEM - 241 : BASIC LEVEL MAINTENANCE OF HOME AND COMMUNITY EQUIPMENT

(2019 CBCS - Pattern) (Semester - IV) (Paper - III) (Regular) (24821)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.No.2 to 5 carry equal marks.***

Q1) Attempt any five of the following: **[5]**

a) What is submercible pump?

b) Why water treatment plant is necessary?

c) What is hydraulic elevator?

d) What is generator?

e) Which type of motor is used in washing machine?

f) What are the types of solar plants?

Q2) a) Answer the following: **[6]**

i) Describe the working principle of water pump.

ii) Describe the efficient use of microcontrollers in water pumps.

b) Draw the functional block diagram of water treatment plant. Explain its working in brief. **[4]**

P.T.O.

Q3) a) Answer the following: **[6]**

i) Explain with block diagram the working principle of washing machine.

ii) Describe the efficient and failure-safe operation of washing machine.

b) Draw the functional block diagram of Elevator. Using it explain its working principle. **[4]**

Q4) a) Answer the following: **[6]**

i) What are the types of generators? Explain the working principle of any one of them.

ii) Give at least two common faults with generator. Also explain the trouble shooting procedure for them.

b) Draw the functional block diagram of solar plant. Explain its working. **[4]**

Q5) Solve any <u>four</u> of the following: **[10]**

a) Explain in brief the routine maintenance of water pump.

b) Write a note on different chemicals used in water treatment plant.

c) Give one common fault with washing machine. How to trouble shoot it.

d) Give a brief account of recent developments in elevator.

e) Explain in brief the role of microcontrollers in generators.

f) Give two application areas of small solar plant.

Total No. of Questions : 5]

SEAT No. : ____

PA-2203

[Total No. of Pages : 2

[5901]-245

S.Y. B.Sc. (Vocational)

ELECTRONIC EQUIPMENT MAINTENANCE

VOC - EEM - 242 : Computer Based Electronic Equipment Design

(2019 CBCS Pattern) (Semester - IV) (Paper - IV) (Regular) (24812)

Time : 2 Hours] ***[Max. Marks : 35***

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Q.2 to Q.5 carry equal marks.***

Q1) Attempt any five of the following: **[5]**

a) Name the tool used for real-time data analysis.

b) What is LAN?

c) Give the acronym used for PIP?

d) What is matplotlib?

e) What is ECG machine?

f) List any two applications of BMP 280 Sensor.

Q2) Answer the following:

a) i) What is spectrophotometer used for? **[2]**

ii) Write a short note on essential elements of python programming. **[4]**

b) Write in short the disadvantages of arduino programming. **[4]**

P.T.O.

Q3) Answer the following:

a) i) What is Arduino? **[2]**

ii) Explain in short the steps in installation of Matplotlib. **[4]**

b) How you can draw a pie chart using matplotlib? **[4]**

Q4) Answer the following:

a) i) What are the major features of XBee radio devices? **[2]**

ii) Write a short note on Ultrasonic Sensor. **[4]**

b) Explain Ethernet devices. **[4]**

Q5) Write a short note on <u>any four</u> of the following: **[10]**

a) DTA.

b) BMP 180 pressure sensor.

c) Wireless Communication.

d) Data transmission & reception over ethernet.

e) Python.

f) Graphics functions used with matplotlib.

✈ ✈ ✈

Total No. of Questions : 5]

SEAT No. :

PA-2204

[Total No. of Pages : 4

[5901]-246

S.Y. B.A./B.Sc./B.Com./B.C.A. (Science) (Computer Science)

ENVIRONMENTAL SCIENCE

AECC-III : Environmental Awareness / Environmental Studies

(2019 Pattern) (Semester - IV) (24361)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Solve any three questions from Question No. 2 to Questions No. 5.***
3) ***Question No. 2 to Question No. 5 carry equal marks.***

Q1) **Attempt any five of the following :**

a) When is World Environmental Day Celebrated? **[1]**

b) Define the term : Environment. **[1]**

c) What is Noise? **[1]**

d) Name any two National parks in India. **[1]**

e) When did Environmental Protection Act came into existence? **[1]**

f) Define the concept of Water Pollution. **[1]**

Q2) **Answer the following :**

a) What are Natural Disasters? Write in short about any two Natural disasters. **[6]**

b) Write in short about importance of Environmental studies. **[4]**

Q3) **Answer the following :**

a) What are Water Resources? Write in brief about importance of water. **[6]**

b) What are the Benefits of Rainwater harvesting? **[4]**

P.T.O.

Q4) **Answer the following :**

a) Explain the Benefits & Problems occur due to dams. **[6]**

b) What is the difference between National parks and Wildlife sanctuaries? **[4]**

Q5) **Write a short notes on Any Four of the following :**

a) Deforestation **[2½]**

b) Greenhouse Effect **[2½]**

c) Food Chain and Food Web **[2½]**

d) Forest Resources and its Benefits **[2½]**

e) Ozone Depletion **[2½]**

f) Bhopal Gas Tragedy **[2½]**

⌘⌘⌘

Total No. of Questions : 5]

PA-2204

[5901]-246

S.Y. B.A./B.Sc./B.Com./B.C.A. (Science) (Computer Science)

ENVIRONMENTAL SCIENCE

AECC-III : Environmental Awareness / Environmental Studies

(2019 Pattern) (Semester - IV) (24361)

(मराठी रूपांतर)

वेळ : 2 तास] *[एकूण गुण : 35*

सूचना :

1) प्रश्न क्र. 1 अनिवार्य आहे.

2) प्रश्न क्र. 2 ते 5 मध्ये कोणतेही तीन प्रश्न सोडवा.

3) प्रश्न क्र. 2 ते 5 यांना समान गुण आहेत.

प्रश्न 1) खालीलपैकी कोणतेही पाच प्रश्न सोडवा :

अ) जागतिक पर्यावरण दिन कधी साजरा केला जातो? **[1]**

ब) व्याख्या लिहा : पर्यावरण **[1]**

क) ध्वनी म्हणजे काय? (Noise) **[1]**

ड) कोणत्याही दोन भारतातील राष्ट्रीय उद्यान्यांची नावे लिहा. **[1]**

इ) पर्यावरण सुरक्षा कायदा केव्हा अस्तित्वात आला? **[1]**

फ) जल प्रदूषण म्हणजे काय? **[1]**

प्रश्न 2) खालील प्रश्नाचे उत्तरे द्या :

अ) नैसर्गिक आपत्ती म्हणजे काय? कोणत्याही दोन नैसर्गिक आपत्तींची उदाहरणे द्या. **[6]**

ब) पर्यावरण अभ्यासाचे महत्त्व थोडक्यात लिहा. **[4]**

प्रश्न 3) खालील प्रश्नाचे उत्तरे द्या :

अ) जलस्त्रोत म्हणजे काय? पाण्याचे महत्त्व थोडक्यात लिहा. **[6]**

ब) पावसाचे पाणी साठवण्याचे फायदे लिहा. **[4]**

प्रश्न 4) खालील प्रश्नाचे उत्तरे द्या :

अ) धरणांचे फायदे आणि समस्या लिहा. **[6]**

ब) फरक स्पष्ट करा – राष्ट्रीय उद्याने आणि वन्यजीव अभयारण्ये. **[4]**

प्रश्न 5) थोडक्यात टिपा लिहा (कोणत्याही चार) :

अ) जंगलतोड **[2½]**

ब) हरितगृह परिणाम (Greenhouse Effect) **[2½]**

क) अन्नसाखळी आणि अन्नजाळे **[2½]**

ड) वन संसाधने आणि त्याचे फायदे **[2½]**

इ) ओझोन कमी होणे **[2½]**

फ) भोपाल वायू दुर्घटना **[2½]**

⌘⌘⌘