

Total No. of Questions : 4]

SEAT No. :

P411

[Total No. of Pages : 2

[5115] - 101
S.Y. B.Sc. (Semester - I)
MATHEMATICS
MT - 211 : Multivariable Calculus - I
(2013 Pattern) (Paper - I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt any five of the following:

[10]

- a) Find Jacobian $\frac{\partial(x, y)}{\partial(u, v)}$ Where $u = x + 2y$ and $v = x - y$.
- b) Find $\frac{\partial z}{\partial x}$, if the equation $pz - \ln z = x + y$ defines z as a function of x and y and its partial derivate exists.
- c) Find critical points of function
 $f(x, y) = 3x^2(y - 1) + y^2(y - 3) + 1$.
- d) Find two directions in which the derivatives of the function $f(x, y) = x^2 + y^2$ at the point $(1, 1)$ equal to zero.
- e) Define differentiability of two variable function at a point.
- f) Find an equation for the level curve of the function $f(x, y) = 16 - x^2 - y^2$ that passes through the point $(2\sqrt{2}, \sqrt{2})$.
- g) Write Maclaurin's expansion for function of two variables.

Q2) Attempt any two of the following:

[10]

- a) Prove that if $f(x, y)$ is continuous function at point (x_0, y_0) then $f(x, y_0)$ is continuous function at $x = x_0$ and $f(x_0, y)$ is continuous function at $y = y_0$; where $f(x, y_0)$ and $f(x_0, y)$ being continuous functions of one variable.

P.T.O.

b) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{x+y} e^z dz dy dx$.

c) If $u(x, y) = \frac{x^2 + y^2}{x + y}$ then show that $\left(\frac{\partial u}{\partial x} - \frac{\partial u}{\partial y} \right)^2 = 4 \left[1 - \frac{\partial u}{\partial x} - \frac{\partial u}{\partial y} \right]$

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

- a) State and prove Taylor's formula for function of two variables.
- b) Evaluate $\iint_R (x^2 + y^2) dx dy$, where R is the region in XY-plane bounded by $y = x^2$, $x = 2$, $y = 1$.
- c) Prove that if $f(x, y)$ is a function of two variables x and y such that $f_x(a, b)$ and $f_y(a, b)$ exists, and one of the first partial derivative $f_x(x, y)$, $f_y(x, y)$ is continuous at (a, b) then $f(x, y)$ is differentiable at (a, b) .

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

- a) i) Use the transformation $u = 3x + 2y, v = x + 4y$ to evaluate the integral $\iint_R (3x^2 + 14xy + 8y^2) dx dy$ for the region R in the first quadrant bounded by the lines $y = -\left(\frac{3}{2}\right)x + 1$, $y = -\left(\frac{3}{2}\right)x + 3$, $y = -\left(\frac{1}{4}\right)x$ and $y = -\left(\frac{1}{4}\right)x + 1$.
- ii) Find approximate value of $\sqrt{\frac{16.01}{25.01}}$ by using differentials.
- b) i) Change the order of integration $\int_0^a \left(\int_{mx}^{nx} f(xy) dy \right) dx$.
- ii) Find the extreme values of the function.
 $f(x, y) = x^2 - 2x + y^2 - 4y$.



Total No. of Questions : 4]

SEAT No. :

P412

[Total No. of Pages : 4

[5115] - 102
S.Y. B.Sc. (Semester - I)
MATHEMATICS
MT-212 (A) Discrete Mathematics
(2013 Pattern) (Paper - II (A))

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) Write contrapositive of 'If $2+3 = 5$ then logic is easy'.
- b) What is truth value of $\sim [p \vee (p \rightarrow q)]$ if truth values of p & q are F and T respectively?
- c) Prove that $\sim (\sim p) \equiv p$
- d) How many three-digit numbers are there, with distinct digits, with each digit odd.
- e) Define tautology. Give one example.
- f) Find the number of permutations of the letters in the word. 'MATHEMATICS'.
- g) How many ways are there to pick 5 players basket ball team from 10 possible players, if the weakest and strongest players must be on the team.

Q2) Attempt any two of the following.

[10]

- a) Prove that $(p \rightarrow r) \wedge (q \rightarrow r) \equiv (p \vee q) \rightarrow r$.
- b) A Bakery sells 4 types of items A, B, C, D. How many different combinations of 8 items can we buy?
- c) How many different five letter sequences can be made using the letters A, B, C, D with repetition such that the sequences does not include the word BAD?

P.T.O.

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

- a) Test the validity of the following argument. If it rains then I carry an umbrella. If it shines then I do not need a sweater. Either it rains or it shines. I do need a sweater, Hence I carry an umbrella.
- b) Three digit numbers are formed by using the digits 1, 2, 3, 4. Find how many of them are there, when repetition of digits is not permitted but contains the digit 3.
- c) Show that every odd integer is the difference of two squares by using method of direct proof.

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

- a)
 - i) Translate into symbolic form
 - a) All Juniors are clever.
 - b) For all $x \in \mathbb{Z}$, $x^2 + 1 = 0$
 - ii) If s_1, s_2, \dots, s_n are non-empty sets then prove that
$$|s_1 \times s_2 \times \dots \times s_n| = |s_1| \cdot |s_2| \cdot \dots \cdot |s_n|.$$
- b) Out of 100 cups of coffee 54 are too hot, 32 are too cold, 28 are too bitter, 17 are too hot and too bitter, 9 are too cold and too bitter. Find how many cups are just right.



Total No. of Questions : 4]

P412

[5115] - 102
S.Y. B.Sc. (Semester - I)
MATHEMATICS
MT- 212 (B) Laplace Transform and Fourier Series
(2013 Pattern) (Paper - II (B))

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) Find $L\{2t^4 + 3t^3 - 3t\}$
- b) Solve $(D+1)y = 0$, given that $y(0)=1$.
- c) Define Dirac-delta function.
- d) Assuming that $\sqrt{n+1} = n\sqrt{n}$ holds for all n , find $\sqrt{-\frac{1}{2}}$
- e) Find $L^{-1}\left\{\frac{4}{3s-1}\right\}$
- f) Define fourier series expansion in $[-\pi, \pi]$
- g) Find $L^{-1}\left\{\frac{s-4}{s^2-4}\right\}$

Q2) Attempt any two of the following.

[10]

- a) If $L\{f(t)\} = \phi(s)$, then prove that $L\{t^n f(t)\} = (-1)^n \frac{d^n}{ds^n}[\phi(s)]$, where n is a positive integer.

b) If $L^{-1}\{\phi(s)\} = f(t)$, then prove that $L^{-1}\{\phi(as)\} = \frac{1}{a} f\left(\frac{t}{a}\right)$,

c) Evaluate: $\int_0^{\infty} e^{-2t} \frac{\sinh t}{t} dt$

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

a) If $f(t)$ is a continuous function for all $t \geq 0$ and exponential order as $t \rightarrow \infty$ and $f^{-1}(t)$ is sectionally continuous for all $t \geq 0$ then prove that

$$L\{f^{-1}(t)\} = SL\{f(t)\} - f(0).$$

b) Solve the differential equation $y'' + 3y' + 2y = t$, given that $y(0) = 1$ and $y'(0) = -1$.

c) Find $L^{-1}\left\{\frac{2s + 5}{s^2 + 4s + 13}\right\}$

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

a) A function $f(x)$ is defined on $[-\pi, \pi]$ as

$$f(x) = \begin{cases} 0 & ; & \text{if } -\pi \leq x < 0 \\ 1 & ; & \text{if } 0 \leq x \leq \pi \end{cases}$$

Find fourier series of $f(x)$.

b) i) By using convolution theorem,

$$\text{Find } L^{-1}\left\{\frac{s^2}{(s^2 + a^2)^2}\right\}$$

ii) Find inverse Laplace transform of

$$\frac{1}{(s+1)^2(s^2+1)}.$$



Total No. of Questions : 4]

SEAT No. :

P413

[Total No. of Pages : 3

[5115] - 103
S.Y. B.Sc. (Semester - I)
PHYSICS
Mathematical Methods in Physics
(2013 Pattern) (Paper - I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt all of the following:

[10]

- a) State Demoivre's theorem.
- b) If $z = -i\pi$ is the complex no. Find modulus of z.
- c) Represent The complex no. $z = -3 - 2i$ on Argand diagram.
- d) State the order and degree of differential equation.

$$\frac{d^2x}{dx^2} + 2x + 5y = 0.$$

- e) State the condition for exact differential if.
 $dF = M(x,y) dx + N(x,y) dy.$
- f) State the condition for co-planarity of three vectors.
- g) Prove that $\vec{A} = y^2 z^3 \hat{i} - xz^3 \hat{j} + x^2 y \hat{k}$ is solenoidal.
- h) Define divergence of a vector field.
- i) If $\phi(x, y, z) = 3x^2 z + 2y$, Determine $\nabla \phi$.
- j) What do you mean by linear diff. equation.

Q2) Attempt any two of the following.

[10]

- a) Show that $\nabla \times (\phi \vec{A}) = \phi (\nabla \times \vec{A}) + (\nabla \phi) \times \vec{A}$

P.T.O.

- b) Determine the different values of fourth root of $z = 1 + \sqrt{3}i$
- c) The resistance (R) of the wire of length 'e' and radius 'r' is given by

$$R = \rho \frac{l}{\pi r^2}$$

Where ρ is specific resistance. If the errors in the measurement of 'l' and 'r' are 1.5% and 2.5% respectively find maximum possible relative and percentage errors in the measurement of R.

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

- a) Using the total differential find the approximate value of

$$\sqrt{(2.98)^2 + (4.02)^2}$$

- b) If $\phi(x, y, z) = x^3y + y^2z^2 + zx^3$ determine $\bar{\nabla}\phi$ at the point (1, 2, 3).
- c) Check the singularities of point $x = 0$ and $x = +1$ of the Legendre differential equation. $(1-x^2)y'' - 2xy' + l(l+1)y = 0$.

Q4) a) Attempt (a) or (b) of the following. **[8]**

- a) i) Find the position and nature of stationary points for the following function $f(x) = x^3 - 3x^2 + 3x$.
- ii) Obtain the quadratic equation in z, if the roots are $(1+2i)$ and $(1-2i)$.

OR

- b) i) If $\bar{v} = xyz\hat{i} - 3xy^2z\hat{j} + 2xy^2z\hat{k}$

Find the value of $\text{div } \bar{v}$ at the point (2, 3, 4).

- ii) Find the volume of parallelepiped whose three edges are

$$\hat{i} + 2\hat{j}, 3\hat{j} + 4\hat{k} \text{ and } 6\hat{i} + 2\hat{k}.$$

b) Attempt any one of the following.

[2]

i) Show that $(\overline{A \times B}) \cdot (\overline{A \times B}) = A^2 B^2 - (\overline{A \cdot B})^2$

ii) Find the sum and difference of complex no.

$$z_1 = 2+3i, z_2 = 5-2i.$$



Total No. of Questions : 4]

SEAT No. :

P414

[Total No. of Pages : 5

[5115] - 104
S.Y. B.Sc. (Semester - I)
PHYSICS (Paper - II)
PH - 212 (A): Electronics
(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.*
- 3) Draw neat diagram wherever necessary.*
- 4) Use of log tables and calculators is allowed.*

Q1) Attempt all of the following:

- a) State Maximum power transfer theorem. [1]
- b) For transistor if $\beta = 200$, find value of α . [1]
- c) What are the different configurations of a transistor? Which one is more preferred. [1]
- d) Define D.C. load line. [1]
- e) Define closed loop gain of an op-amp. [1]
- f) Calculate the gain of inverting amplifier when the input resistance at inverting terminal is $10K\Omega$ and feedback resistor is $2K\Omega$. [1]
- g) What is negative feedback? [1]
- h) Draw block diagram of regulated power supply. [1]
- i) Convert $(110111101001)_2$ into equivalent hexadecimal number. [1]
- j) Draw symbol and truth table of AND gate. [1]

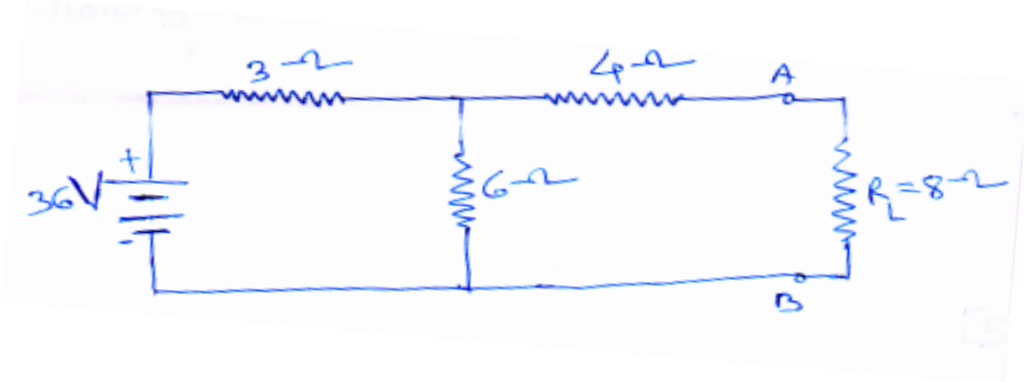
P.T.O.

Q2) Attempt any two of the following:

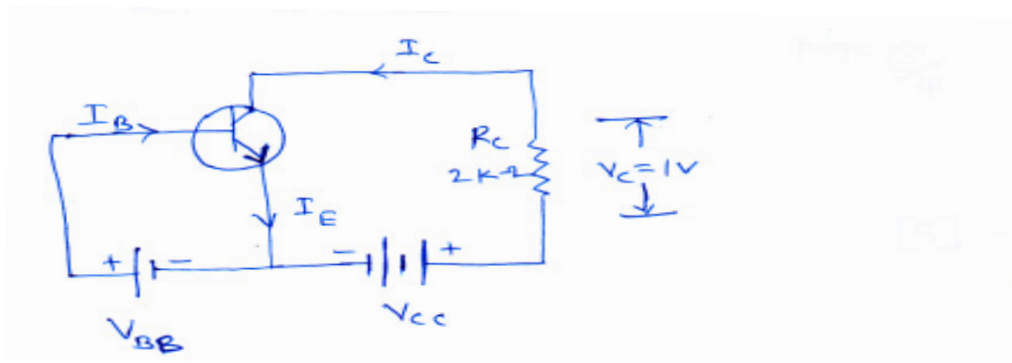
- Describe use of UJT as a relaxation Oscillator. [5]
- Explain with circuit diagram of inverting amplifier. [5]
- Draw the circuit diagram of bridge rectifier and explain it's working with input and output wave forms. State any two advantages of bridge rectifier. [5]

Q3) Attempt any two of the following:

- Using Thevenin's theorem, determine the current flowing through R_L of the network shown in following circuit. [5]



- For a transistor shown in following circuit, the voltage drop across $2K\Omega$ collector resistance is 1V. If $\beta=100$, find the base current. [5]



- Simplify following equation and then draw logic diagram. [5]

$$Y = A \overline{B} C + A \overline{B} \overline{C} + B$$

Q4) a) Attempt (i) or (ii) of the following:

- i)
 - 1) What is transistor biasing? Describe voltage divider bias method in detail. **[4]**
 - 2) Discuss the phase shift Oscillator with circuit diagram using IC 741. **[4]**
- ii)
 - 1) Calculate the gain of non-inverting amplifier when input resistance at inverting terminal is $100\text{K}\Omega$ and feedback resistance is $100\text{K}\Omega$. If the feedback resistance is doubled, what is the change in the voltage gain? **[4]**
 - 2) What is logic gate? Explain NAND, NOR & EX-OR gate with symbols and truth tables. **[4]**

b) Attempt any one of the following:

- i) Explain the concept of virtual ground in op-amp. **[2]**
- ii) If the d.c. output voltage is 300V with no load attached to power supply but decreases to 230V at full load. Find the percentage of voltage regulation. **[2]**



Total No. of Questions : 4]

[5115] - 104
S.Y. B.Sc. (Semester - I)
PHYSICS (Paper - II)
PH-212 (B): Instrumentation
(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.*
- 3) Draw neat diagram wherever necessary.*
- 4) Use of log tables and calculator is allowed.*

Q1) Attempt all of the following:

[10]

- a) What is a load cell?
- b) Define pressure. Give its SI unit.
- c) What do you mean by cantilever beam?
- d) Draw circuit symbol of op-amp.
- e) Define precision.
- f) State any one type of analog recorder.
- g) What do you mean by vacuum?
- h) Define CMRR.
- i) When input voltage of an instrument changes from 10V to 12V, the corresponding output voltage changes from 50 to 60V. What will be the sensitivity of the instrument?
- j) What is linearity?

Q2) Attempt any two of the following.

- a) Describe with circuit diagram an op-amp as a integrator.

[5]

- b) Explain U - tube manometer in detail. Derive the second-order relationship between input and output parameters. [5]
- c) Explain principle and working of radiation pyrometer. State their applications. [5]

Q3) Attempt any two of the following:

- a) When a pressure is applied for a membrane type diaphragm of radius 5 cm and thickness 0.15 cm shows maximum deflection at centre 0.05cm. Find pressure acting on it. Given Young's modulus = 12×10^{11} N/m²[5]
- b) A non inverting amplifier has input resistance of 5.5K Ω and feedback resistance of 55K Ω . If the input voltage is 0.6 Volt, what is output of op-amp? [5]
- c) A Resistance temperature detector has temperature coefficient 0.0042/ $^{\circ}$ C and resistance 100 Ω at 0 $^{\circ}$ C. Find the resistance at -160 $^{\circ}$ C. [5]

Q4) a) Attempt any one of the following:

- i) 1) Explain the concept of virtual ground in op-amp. [4]
2) Describe flat plate diaphragm. [4]
- ii) 1) With suitable diagram describe Galvanometer type recorder. [4]
2) Explain working of optical Pyrometer as selective radiation pyrometer. [4]
- b) Attempt any one of the following:
- i) What do you mean by transducer? [2]
- ii) A manufacturer calibrates a temperature gauge of 100 $^{\circ}$ C Range with $\pm 5^{\circ}$ C. If it is used for temperature measurement of 50 $^{\circ}$ C. What will be the probable minimum and maximum value of temperature shown by gauge? [2]



Total No. of Questions : 6]

SEAT No. :

P415

[Total No. of Pages : 3

[5115] - 105
S.Y. B.Sc. (Semester - I)
CHEMISTRY
CH-211: Physical and Analytical Chemistry
(2013 Pattern) (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 side indicate full marks.*
- 4) Use of calculator is allowed.*
- 5) Answer to the both sections should be written in separate answer books.*

SECTION - I

Q1) Answer the following:

[5]

- a) What is mean by zero reading?
- b) Write the rate law equation for the reaction,
 $2A+B \longrightarrow \text{Product.}$
- c) Define photolysis.
- d) State Grotthus-Draper's law.
- e) Give the applications of distribution law.

Q2) a) Attempt any two of the following.

[6]

- i) Explain the characteristics of second order reaction.
- ii) What is chemical actinometer? Explain in brief uranyl oxalate actinometer.
- iii) What is first order reaction? Show that the half life period is independent of the initial concentration of the reactant.

P.T.O.

- b) Attempt any two of the following. [4]
- Explain the term fluorescence.
 - Explain the term chemiluminescence.
 - Define the terms order and molecularity of the reaction.

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

- The rate of first order reaction is 3.2×10^{-3} per second at 25°C . Find the time required to complete 60% of the reaction.
- In the photochemical reaction 3.2×10^{17} photons are absorbed per second. After 1000 seconds of irradiation 6×10^{-5} moles of product is formed. Calculate the quantum yield of the reaction.
- Calculate the amount of acid extracted from one litre of aqueous solution containing 50gm of an acid. on extracting with 200 ml of ether in a single lot. (Given: Partition coefficient of acid in water is 5.5)

SECTION - II

Q4) Answer the following. [5]

- Define quantitative analysis.
- Find the proper number of significant figure in 0.882 and 1.002.
- Which is group reagent for V group.?
- Why conc. HCl cannot be used in place of dilute HCl as a group reagent for group I?
- How will you determine the percentage of oxygen in an organic compound?

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

- Discuss the effect of NH_4OH in presence of NH_4Cl in inorganic qualitative analysis.

- ii) Explain sodium fusion test for detection of nitrogen and sulphur in an organic compound.
- iii) How is empirical formula determined? Give relation between molecular formula and empirical formula.

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

- i) How are samples of solid obtained?
- ii) Explain the terms relative error and absolute error.
- iii) How are cations of group II classified into II A and II B?

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

- a) Following weights were obtained by a person on repeating the same experiment four times i.e. 15.3, 17.6, 16.8. and 15.9 gm. Calculate mean deviation and standard deviation.
- b) In Liebig's method 0.643 gm of an organic compound gave 0.652 gm of carbon dioxide. Calculate percentage of carbon in a compound.
- c) A solution is 0.01 M in copper ion. What should be the concentration of sulphide ion to just cause the precipitation of CuS ?

(Given: K_{sp} for $\text{CuS} = 8.5 \times 10^{-45}$)



Total No. of Questions : 6]

SEAT No. :

P416

[Total No. of Pages : 3

[5115] - 106

S.Y. B.Sc.

CHEMISTRY

**CH - 212: Organic and Inorganic Chemistry
(2013 Pattern) (Semester - I) (Paper - II)**

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

- 1) Answers to the two sections should be written on separate answer books.*
- 2) All questions are compulsory.*
- 3) Figures to the right side indicate full marks.*
- 4) Neat diagram must be drawn wherever necessary.*

SECTION - I

(Organic Chemistry)

Q1) Answer the following:

[5]

- a) What is optical isomerism?
- b) Explain, electrophiles with example.
- c) Draw geometrical isomers for cis 1, 4- dimethyl cyclohexane.
- d) Explain the term - 'Angle strain'.
- e) 2 - bromopentane reacts with alcoholic KOH and gives 2 - pentene as a major product, explain.

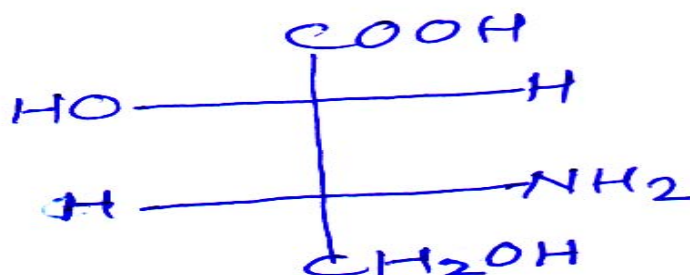
Q2) a) Attempt any two of the following:

[6]

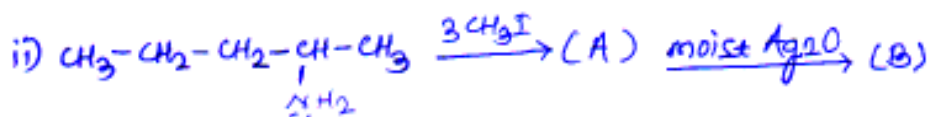
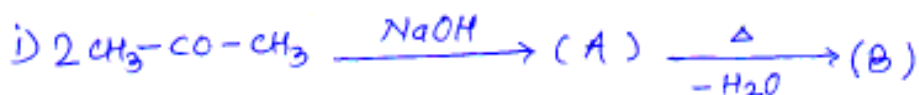
- i) What is SN¹ reaction? Discuss the stereochemistry of SN¹ reaction.
- ii) Draw all possible conformers of cyclohexane? Explain, why chair form is more stable than boat form?

P.T.O.

- iii) What is configuration? Assign 'R' and 'S' configuration to the following molecule.



- b) Assign (A) and (B) of the following reactions (any two): [4]



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

- Explain, Pinacol - Pinacolone rearrangement with suitable example.
- Draw Newman projection formula for methyl cyclohexane; comment on their stability.
- Discuss the Mechanism of addition of HBr to 1-butene in presence of peroxide.

SECTION - II

(Inorganic Chemistry)

- Q4) Answer the following: [5]

- Define the term roasting.
- Give the names of two ores of Iron.
- Name the metal used for tinning.
- What is wrought iron?
- What is passivity?

- Q5) a)** Attempt any two of the following: **[6]**
- i) Explain with the help of neat diagram and chemical reactions of L.D. process.
 - ii) Explain with suitable diagram, refining of aluminium by Hoopes process.
 - iii) Explain the mechanism of corrosion.
- b)** Attempt any two of the following: **[4]**
- i) Distinguish between ore and mineral.
 - ii) Write short note on Froth floatation process.
 - iii) What are the merits and demerits of Bessemer process.

- Q6)** Answer any two of the following: **[5]**
- a) Define corrosion. Give any two methods of prevention of corrosion of metal.
 - b) Explain basic Bessemer process.
 - c) What is concentration of ore? Explain magnetic separation method for concentration of ore.



Total No. of Questions : 4]

SEAT No. :

P417

[Total No. of Pages : 2

[5115] - 107
S.Y. B.Sc.
BOTANY (Paper - I)
Taxonomy of Angiosperms and Plant Community
(2013 Pattern) (Semester - 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 Taxonomy.
- b) Write an example of Artificial system of plant classification.
- c) What is Flora?
- d) Write a source of morphological data used in plant systematics.
- e) Mention type of Fruit in family Amaryllidaceae.
- f) What is e - herbarium?
- g) Define Hydrophytes.
- h) What is ecology?
- i) What is Polypetalae?
- j) Write any one principle of ICBN.

Q2) Answer any two of the following.

[10]

- a) Give the merits and limitations of Englex and prantl's system of classification.
- b) Describe the Pyramid of biomass.
- c) Comment on the role of embryological data used in plant systematics.

P.T.O.

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

- a) Fruit of family Annonaceae.
- b) Concept of database in taxonomy.
- c) Coining of generic name.

Q4) Give distinguishing characters, floral formula, floral diagram and economic importance of family Rubiaceae. **[10]**

OR

What are Xerophytes? Describe external and internal ecological adaptations xerophytes. **[10]**



Total No. of Questions : 4]

SEAT No. :

P418

[Total No. of Pages : 2

[5115] - 108
S.Y. B.Sc.
BOTANY (Paper - II)
BO- 212: Plant Physiology
(2013 Pattern) (Semester - 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) Give any two applications of plant physiology in Agriculture.
- b) Define water potential.
- c) Write any two applications of photo periodisms.
- d) Who proposed transpiration pull theory?
- e) Role of water in any two physiological process.
- f) What is physical seed dormancy?
- g) Enlist any two instruments used for measurement of plant growth.
- h) Define plant physiology.
- i) Who proposed Non osmotic absorption water theory?
- j) What are day neutral plants?

Q2) Answer any two of the following.

[10]

- a) Importance of diffusion in plants.
- b) Write practical applications of cytokinins.
- c) Explain capillary force theory for ascent of sap.

P.T.O.

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

- a) Vernalization.
- b) Metabolic changes taking place during seed germination.
- c) Types of solutions.

Q4) What is biological nitrogen fixation? Explain symbiotic nitrogen fixation. [10]

OR

What is transpiration? Enlist types of transpiration and add a note on factors affecting rate of transpiration. **[10]**



Total No. of Questions : 4]

SEAT No. :

P419

[Total No. of Pages : 2

[5115] - 109
S.Y. B.Sc. (Semester - I)
ZOOLOGY (Paper - I)
Animal Systematic and Diversity - III
(2013 Pattern) (Revised)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following:

[10]

- a) What are the functions of water vascular system?
- b) Write any two distinguishing characters of class Insecta.
- c) What is megalopa?
- d) What is holometabolous developement?
- e) Mention any two economic importances of Mollusca.
- f) Enlist any two types of pedicellariae in Echinodermata.
- g) What is the functions of Tied mann's bodies?
- h) Write any two characters of phylum Echinodermata.
- i) Enlist any two names of useful insects.
- j) Give any two examples of class Holothuria.

Q2) Write short notes on (Any Two)

[10]

- a) Torsion in Mollusca.
- b) Bipinnaria larva.
- c) Protective mimicry.

P.T.O.

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

- a) Write distinguishing characters of class Gastropoda.
- b) Sketch and label-Piercing and sucking type of Mouth parts.
- c) Describe the gonads in starfish.

Q4) Give an account of digestive system of starfish and add a note on food and feeding mechanism. **[10]**

OR

Give general characters of phylum Mollusca and distinguishing characters of class cephalopoda. **[10]**



Total No. of Questions : 4]

SEAT No. :

P420

[Total No. of Pages : 2

[5115] - 110
S.Y. BSc. (Semester - I)
ZOOLOGY - II
ZY -212: Applied Zoology -I
(Fisheries and Agricultural Pests and Their Control)
(2013 Pattern) (Paper - II) (Revised)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Attempt the following:

[10]

- a) What is Fresh water fishery?
- b) Mention the names of any two stored grain pests.
- c) What is the long form of IPM?
- d) What is mechanical pest control?
- e) What is fish meal?
- f) What is composite fish culture.
- g) Mention any two hazards of pesticides on agroecosystem.
- h) Write the name of equipment used for harvesting Bombay duck.
- i) Write any two damages caused by rice weevil.
- j) What is stocking pond?

Q2) Write short notes on (Any Two)

[10]

- a) Chilling and canning techniques in fish preservation.
- b) Describe the harvesting method of mackerel.
- c) Birds and squirrel as Non insect pests.

P.T.O.

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

- a) Describe in brief knapsack sprayer.
- b) Sketch and label-cast Net.
- c) Describe in brief Biological control.

Q4) Describe marks of identification, nature of damage and control measures of pulse beetle and Brinjat fruit borer. **[10]**

OR

Describe Habits, habitat and culture methods of catla catla and Macrobrachium rosenbergii (Giant Prawn) **[10]**



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

P421

[5115]-111

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

GEOLOGY

GL-211 : Mineralogy (Paper - I)

(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.*
- 3) *Neat diagrams must be drawn wherever necessary.*

Q1) Answer the following questions in 2/3 lines.

[10]

- a) Describe the silicate structure of quartz.
- b) Define hemihedral form with example.
- c) What are crystalline minerals?
- d) Name the gem varieties of quartz (silica) group.
- e) What is optic axis?
- f) What is a twin plane?
- g) What is the base unit of all silicate minerals? What is the charge on it?
- h) Name three minerals exhibiting pleochroism under the microscope.
- i) What are biaxial minerals?
- j) Name minerals from hexagonal system.

Q2) Write notes on (any 2)

[10]

- a) Various types of external imperfections in crystals.
- b) Compare elements of symmetry of Hexagonal system, type calcite, type quartz & type tourmaline.
- c) Optical properties of feldspathoid mineral (any one)

P.T.O.

Q3) Write notes on (any 2)

[10]

- a) Main attributes of gemstones.
- b) Classification of twins.
- c) Various types of extinction.

Q4) Describe the structure, mineral composition physical and optical properties and paragenesis of olivine group of minerals. **[10]**

OR

Describe the structure, mineral composition, physical and optical properties and paragenesis of orthopyroxene group of minerals.



Total No. of Questions : 4]

SEAT No. :

[Total No. of Pages : 2

P422

[5115]-112

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

GEOLOGY

GL-212 : Structural Geology

(2013 Pattern) (Paper - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates :

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

Q1) Answer the following questions.

[10]

- a) Define strike - slip fault.
- b) Define isoclinal fold.
- c) Define strike of a bed.
- d) Define angular unconformity.
- e) Define joints.
- f) Define 'Foot wall' of fault.
- g) Define dome.
- h) Define syncline.
- i) What is outline?
- j) Define structural Geology.

Q2) Write notes on (any two) :

[10]

- a) Non-conformity and disconformity.
- b) Normal and reverse fault.
- c) Recumbent and fan folds.

P.T.O.

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

- a) Genetic classification of joints.
- b) Write a note on significance of Brunton compass.
- c) Write a note on significance cross bedding in identifying the top of the bed.

Q4) Define fold. Explain with suitable example, recognition of folds by plotting attitude of beds on map. **[10]**

OR

What are primary structures? Describe how ripple marks help in determining the top of the bed.



Total No. of Questions : 4]

SEAT No. :

P423

[Total No. of Pages : 3

[5115]-113

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

STATISTICS

ST-211 : Discrete Probability Distributions, Time Series and
R-Software

(2013 Pattern) (Paper - I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates :

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific 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]
- a) Moving averages remove the cyclic variations if
 - i) the period is even
 - ii) the period is odd
 - iii) the period is same as that of cycle
 - iv) the averages are weighted
 - b) To draw a random sample of size 10 from Poisson distribution with parameter $m = 4$, the R command is :
 - i) `dpois (10, 4)`
 - ii) `Dpois (10, 4)`
 - iii) `rpois (10, 4)`
 - iv) `Rpois (10, 4)`
 - c) The value of multiple correlation coefficient $R_{1,23}$ where $(X_1, X_2, X_3) \rightarrow MD (10, 0.2, 0.5, 0.3)$ is
 - i) 1
 - ii) -1
 - iii) 0
 - iv) 0.5

P.T.O.

- B) State whether each of the following statements is true or false : [1 each]
- Mean of truncated binomial distribution with parameters n and p , truncated at zero is $np(1 - q^n)$.
 - Period of seasonal variation is less than the period of cyclic variation.
 - Mean of negative binomial distribution is negative.
- C) State the normal equations for fitting AR(I) model to time series data.[1]
- D) State one real life situation where negative binomial distribution is applicable. [1]
- E) State the R command to repeat the observation 4, six time. [1]
- F) Find $P(X>0)$ for truncated Poisson distribution, truncated at zero whose parameter $m = 4.5$. [1]

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

- Give the output of the following :
 - $s_1 = c(1, 5, 6); s_2 = c(3, 4, 8); s_1 + s_2$
 - $x = c(180, 189, 140); x[-2]$
 - $x = 2 : 7; 2 * x$
 - $x = c(140, 141, 140, 160, 180); unique(x)$
 - $x = seq(1, 10, 2); length(x)$
- Define multinomial distribution. State one real life example and derive its moment generating function m.g.f.
- Write a note on ratio to moving average method for estimation of seasonal variations.

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

- Find the probability that a person tossing three unbiased coins will get either all heads or all tails for the second time on the fifth toss.
- Define truncated Poisson distribution, truncated at zero. Derive its mean.
- Explain the method of exponential smoothing in time series analysis.

Q4) Attempt any one of the following :

- a) i) If $(X_1, X_2, X_3) \rightarrow MD(n, p_1, p_2, p_3)$, derive conditional probability distribution of X_1 given $X_2 = r$. [5]
- ii) State the components of a time series. Write a note on any one of them.
- b) i) Fit a straight line to the following time series for estimating secular trend. [5]

Year	2009	2010	2011	2012	2013
Sales ('000 Rs.)	40	64	86	88	90

- ii) State Poisson approximation to negative binomial distribution. [2]
- iii) State the merits and demerits of simple average method for measuring seasonal variations. [3]



Total No. of Questions : 4]

SEAT No. :

P424

[Total No. of Pages : 3

[5115]-114

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

STATISTICS

ST-212 : Continuous Probability Distributions

(2013 Pattern) (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 moment generating function (m.g.f.) of a random variable (r.v.) X is $M_X(t)$ then m.g.f. of $Y = aX$ where a is any constant is

- 1) $M_X(at)$
- 2) $aM_X(t)$
- 3) $e^a M_X(t)$
- 4) $M_X(t/a)$

ii) If X and Y are i.i.d. $N(0,1)$ variables then the probability distribution of $X-Y$ is

- 1) $N(2, 2)$
- 2) $N(0, 2)$
- 3) $N(0, 1)$
- 4) $N\left(0, \frac{1}{2}\right)$

iii) If $X \rightarrow U(a, b)$ then the probability distribution of $Y = \frac{X-a}{b-a}$ is

- 1) $U(a, b)$
- 2) $U(0, b)$
- 3) $U\left(\frac{a}{b-a}, \frac{b}{b-a}\right)$
- 4) $U(0, 1)$

P.T.O.

- b) State whether each of the following statements is True or False. [1 each]
- A continuous r.v. takes some specific values in an interval.
 - if $X \rightarrow G(\alpha = 4, \lambda = 1)$ then the probability density function (p.d.f.) of X is the same as that of exponential distribution with A.M.4.
 - If (X, Y) is a continuous bivariate r.v. then the conditional expectation of Y given $X = x$ is a function of x .
- c) Define the marginal probability distribution of X if (X, Y) is a continuous bivariate r.v. with joint p.d.f. $f(x, y)$. [1]
- d) State the additive property of normal distribution. [1]
- e) Define Harmonic Mean of a continuous r.v. [1]
- f) Find $P\left(X \leq \frac{1}{3}\right)$ if the p.d.f. of a r.v. X is $f(x) = \begin{cases} 2x, & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$. [1]

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

- If X is a continuous r.v. with p.d.f. $f(x)$, derive the p.d.f. of
 - X^2
 - $|X|$
- If $X \rightarrow \text{Exp}(\alpha)$, state and prove the lack of memory property of X . Interpret the result.
- Let $X \rightarrow G(3, 1)$, $Y \rightarrow G(4, 1)$. Let X and Y be independent. Find $P(3X + 4Y > 2)$.

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

- Let $X \rightarrow N(\mu, \sigma^2)$. Derive the expressions for the first and the second quartiles Q_1 and Q_2 of X .
- The joint p.d.f. of a continuous bivariate r.v. (X, Y) is given by

$$f(x, y) = \begin{cases} x + y, & 0 \leq x \leq 1, \quad 0 \leq y \leq 1 \\ 0, & \text{otherwise} \end{cases}$$

Find i) $P\left(Y \leq \frac{1}{2}\right)$, ii) $E(X)$

- c) A continuous r.v. X has distribution function $F(x) = \begin{cases} 0 & , \quad x < 4 \\ 1 - \frac{16}{x^2} & , \quad x \geq 4 \end{cases}$

Find

- i) the p.d.f. of X ,
- ii) $P(2 < X < 6)$

Q4) Attempt any one of the following :

- a)
 - i) Let $X \rightarrow U(0,1)$. Find $P(X > 0.4 \mid X \leq 0.65)$. [3]
 - ii) Let (X, Y) be a continuous bivariate r.v. Define m.g.f. of (X, Y) . Hence derive the condition for independence of X and Y . [4]
 - iii) If m.g.f. of a r.v. X is $e^{\frac{1}{2}t + 4t^2}$ identify the probability distribution of X . Also write its A.M. and mode. [3]
- b)
 - i) Let $X \rightarrow N(\mu, \sigma^2)$. If 7% of the observations on X are less than 35 and 10% greater than 60, find the value of μ and σ^2 . [6]
 - ii) If the joint p.d.f. of (X, Y) is $f(x, y) = \begin{cases} 6(x-y), & 0 \leq y \leq x \leq 1 \\ 0, & \text{otherwise} \end{cases}$ [4]

- find the
- 1) marginal p.d.f. of X ,
 - 2) conditional p.d.f. of Y given $X = x$.



Total No. of Questions : 4]

SEAT No. :

P425

[Total No. of Pages : 2

[5115]-115

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

GEOGRAPHY

Gg-211 : Geography of Resources - I

(2013 Pattern) (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 to three sentences each (Any Ten) : **[10]**

- a) What is meant by Potential resources?
- b) Which are the two components of resources?
- c) Name any two abiotic non-renewable resources.
- d) What is meant by flow resources?
- e) Name any two industries based on forest resources.
- f) Write any two causes of deforestation.
- g) Name any two artificial sources of water for agriculture.
- h) What are the advantages of water transportation?
- i) Give any two examples of land degradation due to agricultural activity.
- j) What are the various uses of land resources.
- k) Give any two uses of abiotic renewable resources.
- l) Name any four commercial substances gathered from forests.
- m) Name any two methods of conservation of land resources.

P.T.O.

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

- a) Importance of study of resources.
- b) Effects of deforestation on environment.
- c) Uses of water resource in various industries.
- d) Land degradation due to mining.

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

- a) Describe the components of human resources.
- b) Explain the importance of biotic non-renewable resources.
- c) What are the different methods of water conservation in agricultural sector?
- d) Explain the causes of land degradation due to agricultural activity.

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

- a) Explain the importance of biotic and abiotic renewable resources.
- b) Describe the various methods of conservation of forest resources.



Total No. of Questions :4]

SEAT No. :

P426

[Total No. of Pages : 2

[5115]-116

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

GEOGRAPHY

212 : Watershed Management

(2013 Pattern) (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 to three sentences each (any ten):**[10]**

- a) Define watershed Management.
- b) Write any two principles of watershed management.
- c) Write any two problems in watershed management.
- d) What is watershed delinedtion?
- e) What do you mean by stream order?
- f) What do you mean by bifurcation ratio?
- g) What is interception?
- h) What is infiltration?
- i) What is surface runoff?
- j) What is precipitation?

P.T.O.

- k) Define evapotranspiration.
- l) Write any two processes of soil erosion due to wind.
- m) Write any two methods of land capability classification.

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

- a) Objectives of watershed management.
- b) Run off characteristics.
- c) Water budget.
- d) Criteria for land capability classification.

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

- a) Describe the need of watershed management.
- b) Explain the linear aspects of watershed.
- c) Explain hydrological cycle.
- d) Describe the hydrological characteristics of soil.

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

- a) Explain the process of soil erosion by water.
- b) Explain the need for land capability classification.



Total No. of Questions :4]

SEAT No. :

P427

[Total No. of Pages : 2

[5115]-117

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

MICROBIOLOGY

MB - 211: Bacterial Systematics & Physiology

(2013 Pattern) (Theory 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) Define metalloenzymes.
- b) What are high energy compounds?
- c) State true or false -
 - i) Fermentation and Respiration process yields equal energy.
 - ii) Ligases require energy input to carry out reactions.
- d) Define Ribozymes.
- e) Give the formula to calculate mol % G + C.
- f) Enlist any 2 methods of DNA hybridisation.
- g) What is the role of enzymes belonging to Hydrolase class?
- h) Draw the structure of '6 phosphogluconate'.
- i) Citrate Synthetase belongs to _____ Class of enzyme.

P.T.O.

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

- a) Schematic representation of Glyoxylate bypass with role of key enzymes.
- b) Significance of 16s rRNA in bacterial classification.
- c) Enlist rules of enzyme classification as per IUB.

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

- a) Describe the effect of substrate concentration on enzyme activity.
- b) What are radioisotopes? Describe role of phosphor imaging in study of metabolic pathways.
- c) What is substrate level phosphorylation? Give two examples of it.

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

- a) Describe Homolactic & Heterolactic pathways for lactic acid fermentation.
- b) What is chemotaxonomy? Justify : cell wall composition of bacteria helps in it's classification.



Total No. of Questions : 4]

SEAT No. :

P428

[Total No. of Pages : 2

[5115]-118

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

MICROBIOLOGY

MB - 212 :Industrial and Soil Microbiology

(2013 Pattern) (Theory) (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 diagrams and sketches wherever necessary.*

Q1) Answer the following :

[10]

- a) Enlist any two bacterial biocontrol agents.
- b) Enlist any two important characters of industrially important strain.
- c) Write any one physical antifoam agent used in fermentation process.
- d) What is dual fermentation? Give any one example.
- e) Write the name of enzymes involved in cellulose degradation.
- f) What is significance of VAM Fungi?
- g) Define : Predation as a microbial interaction.
- h) What is a role of sulphate reducing bacteria in sulphur cycle?
- i) State whether true / false - Alcohol fermentation is a continuous type of fermentation.
- j) State whether true / false - acclimatization of inoculum is necessary in fermentation industry.

P.T.O.

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

- a) Describe the principle and methods of primary screening.
- b) Describe the role of buffers in fermentation process.
- c) Describe the role of rhizosphere microflora in soil.

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

- a) What are microbial interactions. Describe commensalism in detail.
- b) Describe control and monitoring of temperature in fermentation process.
- c) What are biofertilisers? Describe large scale production of bacterial biofertiliser.

Q4) a) Describe different Carbon sources used in fermentation media preparation. **[10]**

OR

- b) What is biogeochemical cycle. Describe Nitrogen cycle in detail.



Total No. of Questions :4]

SEAT No. :

P429

[Total No. of Pages : 2

[5115]-119

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

PSYCHOLOGY (Paper -I)

Psychology of Adjustment

(2013 Pattern)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

Q1) Answer in two or four sentences :

[16]

- a) Define adjustment.
- b) What is DSM?
- c) Define job stress.
- d) Define the concept of marriage.
- e) What is happiness?
- f) Define family life cycle.
- g) What is behaviourism?
- h) State various alternatives to marriage.

P.T.O.

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

- a) Describe various roots of happiness.
- b) Explain marital adjustment across the family life cycle.
- c) Discuss various coping strategies of occupational hazards.

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

- a) Criteria of abnormal behaviour.
- b) Divorce.
- c) Psychoanalytical approach of adjustment.

Q4) Define personality disorder. Explain the types of personality disorder. **[8]**

OR

Explain Holland's career & development model.



Total No. of Questions :4]

SEAT No. :

P430

[Total No. of Pages : 2

[5115]-120

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

PSYCHOLOGY

Experimental Psychology and Research Methodology

(2013 Pattern) (Paper - II)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

Q1) Answer in two or four sentences

[16]

- a) What is reinforcement?
- b) Define hypothesis.
- c) What is problem solving?
- d) What is conditioning?
- e) Define thinking.
- f) What is mental image?
- g) State the types of questionnaire.
- h) What is discrimination.

P.T.O.

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

- a) Explain the validity in research.
- b) Describe instrumental conditioning.
- c) Explain generalization in thinking.

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

- a) Positive reinforcement..
- b) Insight in problem solving.
- c) Types of observation.

Q4) Define interview. Explain the types of interview. **[8]**

OR

What is research? Explain the types of research.



Total No. of Questions :4]

SEAT No. :

P431

[Total No. of Pages : 3

[5115]-123

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

ELECTRONIC SCIENCE

EL - 211 : Analog Circuit Design

(2013 Pattern) (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 non-programmable calculator is allowed.*

Q1) Answer all of the following.

- a) Classify the amplifiers on the basis of operating point (Q). [1]
- b) Define power amplifier. [1]
- c) What is an oscillator? [1]
- d) Define the term feedback fraction (β) in amplifier. [1]
- e) "Collector efficiency of class A amplifier with transformed coupled is greater than class A amplifier with resistive load". Comment. [2]
- f) "Constant current bias circuit is advantageous than emitter bias" in differential amplifier". Comment. [2]
- g) Calculate the cut-off frequency of low pass filter using $R = 1 \text{ k}\Omega$ and $C = 0.01 \mu\text{F}$. [2]
- h) Calculate the maximum collector current in transistor amplifier with $V_{cc} = 10\text{V}$, $R_c = 1\text{k}\Omega$, $R_E = 4 \text{ k}\Omega$. [2]

P.T.O.

Q2) Answer any two of the following.

- a) How a.c. load line is constructed from a.c. equivalent circuit of a transistor amplifier? [4]
- b) Draw the schematic diagram and explain the working of Wein Bridge oscillator. [4]
- c) Draw and explain the circuit diagram of differentiator using OPAMP. Derive the expression for an output voltage of it. [4]

Q3) Answer any two of the following.

- a) Show that collector efficiency of class B push pull power amplifier is 78.5 %. [4]
- b) Explain – ve feedback in amplifier? Obtain the expression of gain of it. [4]
- c) Draw the circuit diagram for current to voltage converter with op-amp. Derive an expression for output. [4]

Q4) Answer all of the following.

- a) State the Barkhausen criterion to get sustained oscillations. Explain the design of Hartley oscillator. [6]
- b) Explain direct coupled transistor amplifier. State its advantages and disadvantages on the performance of an amplifier. [6]

OR

Answer all of the following.

- a) Find the gain of instrumentation amplifier with three OPAMP using $R_3 = 3R_G$ and $R_1 = R_2$ [4]

- b) A Power transistor working in class A operation, is driven by 12 volt power supply. The load is connected at the collector of value of 12Ω . If the a.c. output power is 3 watt, find the collector efficiency and power rating of transistor. **[4]**
- c) For CE amplifier, use $V_{cc} = 15 \text{ V}$, $V_{BE} = 0.7\text{V}$, $R_1 = 2\text{k}\Omega$, $R_2 = 1\text{k}\Omega$, $R_c = 2\text{k}\Omega$, $R_E = 1\text{k}\Omega$. Draw d.c. load line and obtain the position of 'Q' Point. **[4]**



Total No. of Questions :4]

SEAT No. :

P432

[Total No. of Pages : 2

[5115]-124

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

ELECTRONIC SCIENCE

EL - 212 : Digital Circuit Design

(2013 Pattern) (Paper -II)

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

Q1) Answer all of the following :

- a) What is minterm? [1]
- b) Define state diagram. [1]
- c) What is accuracy in DAC? [1]
- d) Determine total delay in an 8 bit 7491A Shift register. If $T = 10 \mu s$. [1]
- e) "Gray codes are used in shaft encoders" comment. [2]
- f) "Counter never resets in a tracking type ADC" __ Comment. [2]
- g) Determine load voltage in an electromechanical relay. If $I_L = 10 A$, Supply voltage = 12 V and voltage drop across contacts is 2v. [2]
- h) Give any two advantages of K - Map over boolean algebra. [2]

P.T.O.

Q2) Answer any two of the following.

- a) Explain 4 - bit shift register as a ring counter. [4]
- b) Write a short note on totalizer. [4]
- c) With a neat diagram explain the working of a dual slope ADC. [4]

Q3) Answer any two of the following.

- a) What is modulo - n - Counter? Explain MOD - 5 Counter with logic diagram. [4]
- b) Write a note on two digit bank token display system. [4]
- c) Explain in brief the construction of electromechanical relay. [4]

Q4) Answer all of the following.

- a) Design and implement 3-bit even parity generator using K- Map. Draw logic diagram of the output. [6]
- b) Design MOD-10 Counter using J.K Flip -flops. Draw its timing diagram. [6]

OR

- a) What are the output voltages caused by each bit in a 4 - bit ladder? also calculate full swing voltage. Given $V_{ref}=10v$ [4]
- b) Calculate average conversion time for a 10 bit counter type ADC using 1 MHz Clock. [4]
- c) Design 1 - bit magnitude comparator using K-Map. Draw logic diagram of output. [4]



Total No. of Questions :4]

SEAT No. :

P433

[Total No. of Pages : 2

[5115]-125

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

DEFENCE AND STRATEGIC STUDIES

DS - 101 : Study of Conflict and Peace

(2013 Pattern) (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) Define peace studies
- b) Write any two problems of disarmament
- c) Define cultural integration
- d) What do you mean by ethnic conflict?
- e) What do you mean by self determination?
- f) Write any two role of cultural conflict in war
- g) Define nationalism
- h) State the meaning of world order

P.T.O.

Q2) Answer in 8 to 10 sentences (Any Two)

[2 × 4 = 8]

- a) Discuss historical evolution of conflict studies
- b) Describe nature of peace studies in contemporary world order
- c) Describe methods of peaceful settlement of disputes

Q3) Write short notes on (Any two)

[2 × 4 = 8]

- a) Characteristics of state
- b) Conflict and communication
- c) Conflict management

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

[1 × 8 = 8]

- a) Explain relationship between war and politics
- b) Discuss approaches to the study of conflict and peace



Total No. of Questions :4]

SEAT No. :

P434

[Total No. of Pages : 2

[5115]-126

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

DEFENCE AND STRATEGIC STUDIES

DS. No - 102 : Military Geography

(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) Answer in 2 or 4 sentences each.

[16]

- a) Define military geography
- b) What is the basic grand strategy of a country 'during peacetime?
- c) What do you understand by "Ship of desert"?
- d) State the Resources of logistics
- e) What do you mean by Disaster?
- f) State any two tactical problems of plain wastase
- g) Define "civil defence"
- h) State the meaning of tactics

P.T.O.

Q2) Answer in 8 to 10 sentences (Any Two)

[2 × 4 = 8]

- a) Write in brief "Utility of military geography"
- b) Explain the concept of "Strategy"
- c) Write in short Nuclear wastase"

Q3) Write short notes on (Any two)

[2 × 4 = 8]

- a) Types of Disaster
- b) Characteristics of jungle wastase
- c) Example of tactics

Q4) Answer in 16 to 20 sentences (any one)

[1 × 8 = 8]

- a) How " war" affecting on Environment?
- b) Highlight on tactical & logistics problems of high altitude wastase.



Total No. of Questions :4]

SEAT No. :

P435

[Total No. of Pages : 2

[5115]-127

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

DEFENCE AND STRATEGIC STUDIES

DS. No. - 103 : Contemporary Strategy

(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) Answer in 2 or 4 sentences each.

[16]

- 1) What do you mean by C.B.M.?
- 2) How you would like to define "strategy".
- 3) Define " National Security".
- 4) State the meaning of " Aerospace Strategy".
- 5) What do you mean by components of National security strategy?
- 6) State the example of use of Nuclear bomb during World War-II.
- 7) Define "War".
- 8) What do you mean by "Nuclear strategy"?

P.T.O.

Q2) Answers in 8 to 10 sentences. (Any two) [8]

- 1) Explain in brief Nuclear Strategy of India.
- 2) Write in brief "causes of war".
- 3) Explain in short formulation of strategies.

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

- 1) Nuclear Deterrence
- 2) Strategic Thinking
- 3) Military Power ÷ As a component of National Security Strategy

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

- 1) Explain in detail Economic power as a component of National security strategy.
- 2) Write a note on Nuclear strategy of Pakistan.



Total No. of Questions :4]

SEAT No. :

P436

[Total No. of Pages : 2

[5115]-128

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

ENVIRONMENTAL SCIENCE

ENV - 201 : Ecology and Ecosystem

(2013 Pattern) (Paper - I)

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) Attempt the following in 1-2 lines each :

[10]

- a) Define 'Fecundity'
- b) Give example of 'Grazing food chain'.
- c) What is 'Ecological Spectrum'?
- d) Enlist 'any four nutrients' in Nutrient cycling.
- e) What is 'Carrying Capacity'?
- f) Define 'Biome'.
- g) What is Habitat?
- h) Enlist 'types of succession'.
- i) What is 'Species diversity'?
- j) What is 'Survivorship curve'?

P.T.O.

Q2) Write a short note on ANY TWO of the following : **[10]**

- a) Ecosystem structure and function
- b) Ecological pyramids
- c) Ecotone

Q3) Answer ANY TWO questions from the following : **[10]**

- a) Explain the characteristics of population.
- b) 'Ecology is applied science', Justify.
- c) Explain the impact of Human on biological cycle.

Q4) Attempt ANY ONE of the following : **[10]**

- a) What is succession? Explain mechanism of succession in detail.
- b) What is community? Explain the community characteristics in detail.



Total No. of Questions :4]

SEAT No. :

P437

[Total No. of Pages : 2

[5115]-129

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

ENVIRONMENTAL SCIENCE (Paper - II)

**EVS - 202 : Natural Resources, Energy & their Management
(2013 Pattern)**

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) Attempt the following in 1-2 lines each :

[10]

- a) Write any two objectives of forest management.
- b) Mention any two methods of soil conservation.
- c) What is meant by assimilative capacity of earth?
- d) Write full form for 'JFM'.
- e) What is meant by 'Wind farm'?
- f) How resources act as waste sink?
- g) What is meant by 'Natural Resource'?
- h) Write any two objectives of energy management.
- i) What is principle behind tidal energy production?
- j) What are the reasons behind water crisis?

P.T.O.

Q2) Write a short note on ANY TWO of the following : **[10]**

- a) Sustainable Agriculture
- b) Wildlife Resources
- c) Geothermal Energy

Q3) Answer ANY TWO questions from the following : **[10]**

- a) What are the negative outcomes of green revolution?
- b) Discuss the various causes of soil erosion.
- c) Which are various ways of bioenergy production?

Q4) Attempt ANY ONE of the following : **[10]**

- a) What are conventional energy resources? Discuss any two of them in detail with reference to need and environmental problems.
- b) What is meant by water scarcity? Discuss any two methods of water conservation.



Total No. of Questions :4]

SEAT No. :

P438

[Total No. of Pages : 8

[5115]-130

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

ENGLISH (Optional)

(2013 Pattern) (Revised)

Text : Literary Vistas

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) Explain the theme of the lesson 'The sun, the planets and the stars.'
- ii) How has development in the science of medicine helped civilization?

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

- i) Why is Saturn said to be a world in the making?
- ii) Explain why Haldane thinks that the scientific point of view has definite advantages for civilization.

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

- i) Is television a good babysitter? Support your answer with examples.
- ii) Life changes for a girl, once she starts wearing the purdah. How does the poem build this idea?

P.T.O.

- b) Attempt any one of the following in about 100 words : [5]
- i) What is Jerzy Kosinski's attitude towards television?
 - ii) How will life become meaningful according to H.W. Longfellow in 'A Psalm of Life' ?

Q3) Attempt the following (any five) [10]

- a) Complete the sentences with an appropriate word chosen from those in brackets.
- i) The little child is frightened of thunder and _____.
(lightening / lightning)
 - ii) This is a _____ point. So we have to discuss it. (moot / mute)
- b) Combine words from A and B to form commonly used collocations.
- | | A | B |
|------|----------|------------|
| i) | grant | identity |
| ii) | foster | code |
| iii) | dress | permission |
| iv) | cultural | parents |
- c) Choose the right combinations of words
- i) speak fluent English / speak easy English
 - ii) background knowledge / earlier knowledge.
- d) Differentiate between the following pairs of words and make sentences.
- i) fair, fare
 - ii) alternate, alternative

- e) Pick out the closest antonym of the underlined word.
- i) Ambiguity : clarity, guilt, liveliness
 - ii) Diffident : Confident, difficult, tolerant
- f) Add prefixes and suffixes to the words in brackets and rewrite the sentences.
- i) No, that answer is _____ (correct)
 - ii) She always wants to move ! she is _____ (rest)

Q4) Attempt the following (any ten)

[10]

- a) The Prime Minister of india _____ (arrive) in Mumbai next week.
(Use the correct form of the verb given in the bracket)
- b) Rajesh _____ (drink) a litre of milk every day.
(Use the correct form of the verb given in the bracket)
- c) Being ill, he didn't attend the party.
(Turn into compound sentence)
- d) Alka ran all the way, but she got home late.
(change into a complex sentence)
- e) You work fast (change into a imperative sentence)
- f) I cannot help you. (change into an affirmative sentence)
- g) What an exciting trip we had! (change into a declarative sentence)
- h) They will do the work. (change the voice)

- i) Is the water cold? (change into a declarative sentence)
- j) Someone might have left the door open last night.
(change into passive voice)
- k) Hasan said, ' I am returning to Nagpur next Sunday'.
(change into reported speech)
- l) The officer asked the passenger if she had anything to declare.
(change into direct speech)



Total No. of Questions :4]

P438

[5115]-130

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

ENGLISH (Optional)

(2013 Pattern) (Old)

Textbook : Literary Vistas

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) How does C. Jones describe the planets that exist in our solar system?
- ii) Explain why Haldane thinks that the scientific point of view has definite advantages for civilization?

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

- i) What is the difference between a planet and a star?
- ii) What are the important causes which help civilized humans to live longer than uncivilized ones?

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

- i) Explain the significance of the title 'A cup of Tea'.
- ii) How does 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) How does Rosemary react to Philip's admiration of Miss Smith?
 - ii) Bring out the humour in the photographer's explanation of what he had done with regard to the features of the narrator.

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

- a) Complete the following sentences with an appropriate word chosen from those in brackets.
- i) Nothing can _____ the fact that she is my best friend (altar, alter)
 - ii) The little child is afraid of thunder and _____ (lightning, lightening)
- b) Combine words from A and B to form commonly used collocation.
- | A | B |
|--------------|--------|
| i) open | dream |
| ii) screen | course |
| iii) fulfill | a film |
| iv) crash | minded |
- c) Choose the right combinations of words.
- i) Renew a contract/ resign a contract
 - ii) Background knowledge / Earlier knowledge
- d) Differentiate between the following pairs of words and make sentences.
- i) fair, fare
 - ii) effect, affect

- e) Pick out the closest antonym of the underlined words.
- i) consent : resent, permit, forbid
 - ii) ambiguity : guilt, clarity, tolerant
- f) Add suffixes or prefixes to the words in the bracket to form meaningful sentence.
- i) No, that answer is _____ (correct)
 - ii) The best thing about her is her _____ (kind)

Q4) Attempt any ten of the following :

[10]

- a) Kalidas _____ (be) a great poet. He lived 2000 years ago.
(Use correct form of the verb given in the bracket)
- b) The Chief Minister of Maharashtra _____ (arrive) in Pune next week.
(Use correct form of the verb given in the bracket)
- c) If you don't like pink saree, you can take the white one.
(change into the compound sentence)
- d) The farmer finished his work in the field and went home.
(change into simple sentence)
- e) It was not dark even at seven in the evening.
(change into complex sentence)
- f) The house looks beautiful.
(change into exclamatory sentence)

g) What an exciting trip we had!

(change into declarative sentence)

h) The film division is making a documentary on the white tigers.

(change into passive voice)

i) Could you water the plants please?

(change into imperative sentence)

j) Hasan said, "I am returning to Nagpur next Saturday".

(change into reported speech)

k) The moon can be seen through the clouds.

(change into a negative sentence)

l) It is too hot to go out.

(remove 'too')



Total No. of Questions : 3]

SEAT No. :

P439

[Total No. of Pages : 2

[5115]-131

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

मराठी

(MARATHI) (Theory)

(2013 पॅटर्न)

पाठ्यपुस्तक : विज्ञानसृष्टी (मराठी विज्ञान साहित्य)

वेळ : 2 तास]

[एकूण गुण : 40

- सूचना :- 1) सर्व प्रश्न सोडविणे आवश्यक आहेत.
2) उजवीकडील अंक संपूर्ण गुण दर्शवितात.

प्रश्न 1) खालीलपैकी कोणत्याही एका विषयावर 400 शब्दांत निबंध लिहा. [10]

- अ) माझा आवडता शास्त्रज्ञ
ब) महिलांची असुरक्षितता
क) आधुनिक शेती : काळाची गरज

प्रश्न 2) खालीलपैकी एका प्रश्नाचे उत्तर 300 शब्दांपर्यंत लिहा. [15]

पहाडापर्यंत पोहोचताना प्रामाला कोणकोणते अनुभव आले. ते सविस्तर लिहा.

किंवा

नॅनोटेक्नॉलॉजीच्या विकासाचे कोण कोणते टप्पे अच्युत गाडबोले यांनी सांगितले आहेत. ते लिहा.

P.T.O.

प्रश्न 3) टिपा लिहा. (कोणत्याही - 3)

[15]

- अ) विज्ञान साहित्याची वैशिष्ट्ये
- ब) वैज्ञानिक दृष्टिकोण भारतात न रूजण्याची कारणे
- क) सी. एन. आर. राव यांचे वैज्ञानिक संशोधन
- ड) पर्यावरणाची संकल्पना
- इ) संग्रामसिंह शिक्केसरदेसाई
- फ) केसांच्या समस्यांसाठी शस्त्रक्रिया



Total No. of Questions : 3]

SEAT No. :

P440

[Total No. of Pages : 3

[5115] - 132

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

हिंदी (HINDI)

नया पाठ्यक्रम

(2013 Pattern) (General)

पाठ्यपुस्तकें :- 1) भारती गद्य- संग्रह संपादक 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 में से किन्हीं छह वाक्यों का शुद्ध करके फिर से लिखिए ।

[6]

- i) उसने एक धागे का स्वेटर बना।
- ii) पेड़ के ऊपर बंदर बैठा है।
- iii) ताजी गाय का दुध दो।
- iv) मेरेकू घर जाना है।
- v) माताजी आ रही है।
- vi) उसने भगवान का दर्शन किया।
- vi) सौ की नोट फटी है।
- viii) मेरे चाचा की दो लड़कियाँ हैं।

आ) निम्नलिखित अँग्रेजी अनुच्छेद का हिंदी में अनुवाद कीजिए। [6]

The stability of a particular ecosystem depends on its diversity. One of the basic principles of ecology is interdependence. The more interdependence in an ecosystem, the greater chances that it will be able to compensate for changes imposed on it.

Different kinds of living organisms continuously interact with biotic as well as abiotic components. The interactions bring interdependence.

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

“ गुस्सा करना मनुष्य की प्रकृति है, लोभ में पड़ना उसका स्वभाव है, ईर्ष्या, मोह, राग, द्वेष और कामवासना – ये सब – के – सब प्रकृति के गुण हैं।”

अथवा

“मैं इंसान को जितना प्यार करता हूँ, उतनी ही घृणा उससे पाता हूँ। सभी मनुष्य यही चाहते हैं कि जीते – जी उन्हें मेरा मुँह न देखना पड़े।

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

“सुख –दुख के मधुर मिलन से,

यह जीवन हो परिपूरन।

फिर घन में ओझल हो शशि,

फिर शशि में ओझल हो घन।”

अथवा

विश्व करेगा मेरा आदर

हाथ बढ़ाकर, शीश नवाकर,

पर न खुलेंगे नेत्र प्रतीक्षा में जो रहते थे मतवाले।

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

[10]

- i) दिनकर ने संस्कृति और सभ्यता की पहचान किस प्रकार कराई है?
- ii) रवींद्रनाथ त्यागी ने आज की पीढ़ी के जीवन और शिक्षा पद्धति पर किस प्रकार व्यंग्य किया है?
- iii) बढ़ते शोर का गहराता संकट आज चिंता का विषय किस प्रकार बना है?

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

[10]

- i) यशोधरा की मनोदशा का वर्णन कवि ने किस प्रकार किया है?
- ii) 'तोड़ती पत्थर' कविता का भावार्थ स्पष्ट कीजिए।
- iii) 'इतिहास का न्याय' कविता द्वारा कवि कौन - सा संदेश देता है?



Total No. of Questions : 4]

SEAT No. :

P441

[Total No. of Pages : 3

[5115]-133

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

SANSKRIT

Geervānbhārati

गीर्वाणभारती

(2013 Pattern)

Time : 2 Hours]

[Max. Marks : 40

Q.1) Write short answers of the following questions (2 - 4 lines)

[16]

पुढील : प्रश्नांची 2 - 4 ओळीत उत्तरे लिहा.

i) What is the meaning of the word upanisad and which lesson hastakan from upanisad in your text?

उपनिषद् शब्दाचा अर्थ काय व तुमच्या पुस्तकातील कोणता पाठ उपनिषदातून घेतला आहे?

ii) State the names of any four प्राचीन - उपनिषद्.

चार प्राचीन उपनिषदांची नावे लिहा.

iii) What is ब्रह्मचर्य?

ब्रह्मचर्य म्हणजे काय?

iv) Which are the nine types of bhakti?

भक्तीचे नऊ प्रकार कोणते?

v) What did jabāla say to satyakama regarding gotra?

जाबालाने सत्यकामाला त्याच्या गोत्रविषयी काय सांगितले?

P.T.O.

vi) Who is the adviser of ज्योतिष्मान् पाद?

ज्योतिष्मान् पादाच्या उपदेशकर्ता कोण?

vii) How many kand's of रामायणा & which are they!

रामायणाची किती व कोणती काण्डे आहेत.

viii) Who is the author of शतोपदेशप्रबन्धः।

शतोपदेशप्रबन्धाचा रचयिता कोण?

Q.2) Write short note on any two of the following in 8-10 lines.

[8]

पुढीलपैकी कोणत्याही दोहोंवर 8-10 ओळीत संक्षिप्त टीपा लिहा.

i) Jābālā जाबाला

ii) Upanishad. उपनिषद.

iii) Satyakam. सत्यकाम

Q.3) Write short note on any two of the following in 8-10 lines.

[8]

पुढीलपैकी कोणत्याही दोहोंवर 8-10 ओळीत संक्षिप्त टीपा लिहा.

i) Shivamānaspooja.

शिवमानसपूजा

ii) Simhikā.

सिंहिका.

iii) Upadeshaprabandh.

उपदेशप्रबन्ध.

Q4.) Answer any one of the following in 16-20 lines.

[8]

पुढीलपैकी कोणत्याही एका प्रश्नांचे 16-20 ओळीत उत्तर लिहा.

i) Critically appreciate 'सेयं याति शकुन्तला पतिगृहम्'

'सेयं याति शकुन्तला पतिगृहम्' चे रसग्रहण करा.

ii) Write the summery of 'छायाग्राहिसत्त्वम्.'

'छायाग्राहिसत्त्वम्' पाठाचा सारांश लिहा.



[5115]-134

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

FUNCTIONAL - ARABIC

(2013 - Pattern)

Time : 2 Hours]

[Max. Marks :40

Q. I. Define with Examples any TWO of the following Topics:- (10)

- ① الحروف القمرية - الأعراب -
- ②
- ③ المبتدأ والخبر - أسماء الإشارة -
- ④

Q. 2. Translate into English any five of (10) the following Sentences:

- ① هُوَ ذَاهِبٌ إِلَى بَيْتِ صَدِيقِهِ -
- ② أَلْبَيْتُ جَالِسَةٌ عَلَى الْكُرْسِيِّ -
- ③ هَلْ مَدَدْتَ يَدَكَ مُخْلَقَةً -
- ④ هِيَ مَشْغُوكَةٌ فِي مَكْتَبِهَا -
- ⑤ مَكْتَبُهُ لِعَيْدٍ مِنْ بَيْتِهِ -
- ⑥ وَالِدِي عَامِلٌ فِي غُرْفَتِهِ -
- ⑦ هَذِهِ الْمَدْرَسَةُ جَيِّدَةٌ -
- ⑧ عَلِيٌّ رَاجِعٌ مَعَ فَاطِمَةَ مِنَ السُّوقِ -

Q.3. Translate into Arabic any five of the following sentences: (10)

- ① He is going to his House.
- ② In the fridge there is an Apple.
- ③ On the window there is a curtain.
- ④ No, his college is closed.
- ⑤ The chair is comfortable.
- ⑥ This Bus is coming from the College.
- ⑦ The new teacher is a tall man.
- ⑧ My brother is going to the School.

Q.4. Write in Arabic any ten of the (10) following Terminologies:-

- ① Planet. ② Voltage. ③ Soft. ④ Gas.
- ⑤ Degree. ⑥ Axis. ⑦ Heat. ⑧ Pole.
- ⑨ Motion ⑩ Orbit. ⑪ Science. ⑫ Atom.
- ⑬ Liquid. ⑭ Physics. ⑮ Computer. ⑯ Zone.



[5115]-135

S.Y.B.SC (Semester - I)

URDU GENERAL PAPER - II (UR G2)

(2013 - Pattern)

Time : 2 Hours]

[Max. Marks :40

ہدایات: (۱) تمام سوالات لازمی ہیں۔

(۲) بائیں جانب درج نمبرات مارکس ہیں۔

(10) سوال نمبر 1: علامہ اقبال کی حیات و شخصیات پر مختصر نوٹ لکھئے۔

یا

کلام اقبال کی خصوصیات بیان کیجئے۔

(10) سوال نمبر 2: بانگ درا کی مقبولیت کے اسباب بیان کیجئے۔

یا

اردو نظم نگاری کی تاریخ پر مختصر نوٹ لکھئے۔

(10) سوال نمبر 3: کسی ایک نظم کا مرکزی خیال بیان کرتے ہوئے تشریح کیجئے۔

۱۔ ہمالہ ۲۔ نیا سوال ۳۔ چاند

(10) سوال نمبر 4: کوئی پانچ اشعار کی تشریح کیجئے۔

- ۱۔ ایک جلاوہ تھا کلیم طور سینا کے لیے
۲۔ کیا بد نصیب ہوں میں گھر کو ترس رہا ہوں
۳۔ میری قدرت میں جو ہوتا تو نہ اختر بنتا
۴۔ جو میری ہستی کا مقصد ہے مجھے معلوم ہے
۵۔ میرے ویرانے سے کوسوں دور ہے تیرا وطن
۶۔ پتھر کی مورتوں میں سمجھا ہے تو خدا ہے
۷۔ شکتی بھی شانتی بھی بھکتوں کے گیت میں ہیں
- تو تجلی ہے سراپا چشم بیٹا کے لیے
ساتھی تو ہے وطن میں، میں قید میں پڑا ہوں
قیر دریا میں چمکتا ہوا گوہر بنتا
یہ چمک وہ ہے جبیں جس سے تیری محروم ہے
ہے مگر دریائے دل تیری کشش سے موہزن
خاک وطن کا مجھ کو ہر زرہ دیتا ہے
دھرتی کے باسیوں کی مکتی پریت میں ہے

Total No. of Questions :4]

SEAT No. :

P444

[Total No. of Pages : 2

[5115]-136

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

INDUSTRIAL CHEMISTRY

211 : Utilities, Unit Operations & Process Instrumentation

(2013 Pattern) (Vocational) (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 questions

[16]

- a) Convert - 20°C into fahrenheit.
- b) Write the formulae of compounds which cause permanent hardness in water.
- c) Convert 1162 torr into Psi.
- d) State peltier effect.
- e) What is drying?
- f) Write any four uses of steam.
- g) Write the expression for Reynold number.
- h) What is extractive distillation?

P.T.O.

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

- a) Describe tray dryer system.
- b) What is the role of thermocouples in temperature measurement?
- c) Define temporary hardness of water? How it can be removed from water sample?

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

- a) Describe the fractional distillation process with neat diagram.
- b) Explain the advantages of an inclined manometer,
- c) Describe the working of pirani gauge.

Q4) Sketch and explain the various types of vacuum pressure devices **[8]**

OR

Explain with the help of neat diagram principle and working of a magnetic flow meter.



Total No. of Questions :4]

SEAT No. :

P445

[Total No. of Pages : 2

[5115]-137

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

BIOTECHNOLOGY

**Voc. Biotech - 211 : Cell and Molecular Biology and Microbial Genetics
(2013 Pattern) (Paper - I)**

Time : 2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

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

[10]

- a) Define : Transformation
- b) What are SINES?
- c) State the role of topoisomerase enzyme in DNA replications.
- d) What are chromatin fibers?
- e) Enlist the enzymes involved in sos repair.
- f) What are integrin proteins?
- g) State the RPM at which chloroplast will settle during cell fractionation
- h) Enlist the structural components of endoplasmic reticulum.
- i) What is exocytosis?

P.T.O.

j) Give the role of golgi complex in cell

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

- a) Chromosome structure
- b) Cell fractionation
- c) Site specific recombination.

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

- a) Explain the process of transformation in Gram positive organisms.
- b) What is cell signaling? Explain cell signaling with 'G' protein coupled receptors.
- c) Explain the process of active transport with Na^+ / K^+ ion channel.

Q4) Give an detail account of adherance junction. **[10]**

OR

Describe the process of transcription in prokaryotes.



Total No. of Questions : 4]

SEAT No. :

P446

[Total No. of Pages : 2

[5115] - 138

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

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION

Still Photography Processing & Printing

(2013 Pattern)

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 All of the following.

[16]

- a) What is the circle of least confusion? What is its significance for a photographic image?
- b) Draw a diagram and explain the 'angle of view' of a camera lens.
- c) State the law of transmission and absorption. How is it useful in photography?
- d) What is flash synchronization? Does it apply to strobe lights?
- e) Explain the difference between 'daylight' and 'skylight'.
- f) Compare 'Photoshop' and 'Light room' as image processing software.
- g) What is a format? Classify formats according to their sizes.
- h) The guide number of a flash light is 56, what does it mean?

Q2) Attempt any two of the following.

[8]

- a) Draw a suitable diagram and explain how the depth of focus depends on various factors.
- b) What is a polarizing filter? What is its use in photography?
- c) What are the lighting controls usually used in a studio?

P.T.O.

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

- a) Write a note on 'zoom' lenses.
- b) Discuss the advantages and disadvantages of an electronic flash.
- c) Draw a sketch and discuss what rules of composition you would follow to shoot a sunrise.

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

- a) Draw a typical flash curve and explain various terms associated with it. How do these terms apply to an electronic flash?
- b) Draw a suitable lighting plan and explain the three light set up used in studio lighting. Explain all the terms used in details.



Total No. of Questions : 4]

SEAT No. :

P447

[Total No. of Pages : 2

[5115] - 139

S.Y. B.Sc. (Vocational) (Semester - I)
ELECTRONIC EQUIPMENT MAINTENANCE
Troubleshooting Electronic Equipment - A
(2013 Pattern) (Paper - I)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

Q1) Answer the following.

- a) Define - Passive component. [1]
- b) State the importance of circuit drawing and diagram. [1]
- c) State the tools required for Dis - assembly work. [1]
- d) State the effect of inappropriate operating conditions on equipment failure. [1]
- e) Explain the use of Instruction manual. [2]
- f) State name of any four test & measuring instruments. [2]
- g) Discuss some situation where repairs should not be attempted. [2]
- h) State the factors on which resistance of resistor depends. [2]

Q2) Answer any two of the following.

- a) Explain the causes of equipment failure. [4]
- b) Explain the importance of service manual. [4]
- c) State the characteristics parameters of Operational Amplifier. [4]

P.T.O.

Q3) Answer any two of the following.

- a) Explain the causes of failure in semiconductor devices. [4]
- b) Explain the procedure of testing of Diode and bipolar transistor. [4]
- c) Explain the procedure of testing of fixed and variable capacitor. [4]

Q4) Answer the following.

- a) Discuss the common faults in fixed and variable resistor. [6]
- b) Explain the procedure of servicing of potentiometer, LDR and thermistor. [6]

OR

- a) Discuss the method of Inductance measurement. State the procedure of testing of Inductor. [6]
- b) What is thyristor? Explain the procedure for testing of thyristor. [6]



Total No. of Questions : 4]

SEAT No. :

P448

[Total No. of Pages : 2

[5115] - 140

S.Y. B.Sc. (Vocational) (Semester - I)
COMPUTER HARDWARE & NETWORK
ADMINISTRATION
Microprocessor & Interfacing Techniques
(2013 Pattern) (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) a) Attempt the following: [4 × 1 = 4]

- i) Define term transducer.
- ii) Which function of the DOS INT 21H is used to accept a character from Keyboard?
- iii) List various Intel processors.
- iv) What is a Microprocessor?

b) Attempt the following: [4 × 2 = 8]

- i) State any two features of 8086 processor.
- ii) How many keys can be interfaced in 4 × 4 matrix keyboard?
- iii) What do you mean by Quad Core processor?
- iv) What is the function of cache memory?

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

- a) Write a short note on sensors.
- b) What is DAC? Explain specifications of DAC.
- c) Write a note on Minimum and Maximum mode of 8086 processor.

P.T.O.

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

- a) List non Intel processors and explain features of any one non Intel processor.
- b) What is the function of RAM? What is DRAM?
- c) Write a short note on DMA.

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

- a) What is the function of programmable parallel port? With a neat diagram explain keyboard interface with microprocessor.
- b) What is function of BUS? List various BUS Architectures you know. Explain features of any one.
- c) What is ADC? List various types of ADC. Explain working of any one type of ADC.



Total No. of Questions : 4]

SEAT No. :

P449

[Total No. of Pages : 2

[5115] - 141

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

SEED TECHNOLOGY

Hybrid Seed Production

(2013 Pattern) (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 and labelled diagrams wherever necessary.*

Q1) Attempt the following:

[10 × 1 = 10]

- a) What is apomixis?
- b) Write the isolation distance required for cotton hybrid seed production.
- c) Enlist the types of variety.
- d) What is gametocides?
- e) Define emasculation.
- f) What do you mean by planting ratio?
- g) Define male sterility.
- h) What is isolation distance?
- i) Define heterosis.
- j) Define self incompatibility.

Q2) Attempt any two of the following:

[2 × 5 = 10]

- a) Describe in brief roughing & pollen shedders.
- b) Give the uses of genetic male sterility.
- c) Explain the kinds of self incompatibility.

P.T.O.

Q3) Write notes on (any two)

[2 × 5 = 10]

- a) Cytoplasmic - genetic male sterility.
- b) Cohesion & adhesion.
- c) Genetic basis of inbreeding depression.

Q4) Explain detail procedure for hybrid seed production in groundnut.

[10]

OR

Describe in detail the procedure for hybrid seed production in maize.



Total No. of Questions : 4]

SEAT No. :

P450

[Total No. of Pages : 2

[5115] - 142

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

INDUSTRIAL MICROBIOLOGY

Voc-Ind-Mic-211: Bioreactors- Designs and Operation

(2013 Pattern) (Paper - I) (Theory)

Time :2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

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

- a) Define-On-line sensors.
- b) Name two types of spargers.
- c) _____ are used to retard the vortex formation in the fermenter.
- d) State two major reasons for using stainless steel for fermenter construction.
- e) Foaming is formed when high _____ containing media are used during fermentation.
- f) The batch fermentation is referred to as partially closed system type. (true/false)
- g) What is Sterilization in place (SIP?)
- h) Name different type of seals used in sealing of glass-glass, metal-glass, or metal-metal surfaces of the fermenter.
- i) How are vitamins sterilized for use in fermentation media?
- j) The largest practical diameter of the glass fermenter is _____ cm.

P.T.O.

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

- a) Explain method of Sterilization of air.
- b) How is foam sensing and control done?
- c) Write short note on-off-line data acquisition and analysis.

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

- a) Explain measurement and control of pH in fermentation.
- b) With suitable examples, explain why exit-gas analysis is important in monitoring of a fermentation process.
- c) What is the 'Del Factor'? Explain its relevance to design of sterilization processes.

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

- a) What is cell immobilization process? Explain any three types of bioreactors in detail used for immobilization of cells.
- b) Compare the profiles of continuous and batch fermentation processes for biomass production. Draw the profiles for both types of processes.



Total No. of Questions : 4]

SEAT No. :

P451

[Total No. of Pages : 2

[5115] - 143

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

INDUSTRIAL CHEMISTRY

Inorganic Process Industries

(2013 Pattern) (Paper - II)

Time :2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

Q1) Answer the following.

[16]

- a) What is the constitution of soda-lime glass?
- b) Describe ferromagnetic ceramics.
- c) What do you understand by retractoriness?
- d) What are the types of ceramics?
- e) Describe quick setting cement.
- f) What are the raw materials used in manufacture of cement?
- g) What is the role of glazing in white wares?
- h) Write the uses of laminated glass.

Q2) Answer any two of the following.

[8]

- a) Write a short note on photosensitive glass.
- b) Describe galvanic corrosion.
- c) What is the role of retarders in cement industry?

P.T.O.

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

- a) Describe different types of ceramics based on reduction in porosity.
- b) Write a short note on Rotary kiln.
- c) Explain mechanism of wet corrosion.

Q4) Describe the manufacture of glass by tank furnace. **[8]**

OR

Describe manufacturing of cement by dry process with special reference to chemical reactions taking place in different zones.



Total No. of Questions : 4]

SEAT No. :

P452

[Total No. of Pages : 2

[5115] - 144

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

BIO-TECHNOLOGY - II

Voc-Biotech - 212: Recombinant DNA Technology

(2013 Pattern) (Paper - II)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

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

[10]

- a) Define gene cloning.
- b) Give an example of restriction enzyme with its recognition sequence.
- c) What is gene library?
- d) Give the role of alkaline phosphatase in RDT.
- e) Define cloning vectors.
- f) Name two salt used for making bacterial cells competent.
- g) Give the role of cosmids.
- h) Define genomics.
- i) Why is sanger's DNA sequencing method called chain termination method.
- j) Enlist the component involved in PCR technique.

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

[10]

- a) PCR
- b) transformation.
- c) Proteomics.

P.T.O.

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

- a) Describe in brief maxam and gilbert's DNA sequencing method.
- b) Explain any one method for site-directed mutagenesis.
- c) Give the important applications of RDT.

Q4) Describe in detail any two methods for screening and selection of recombinants. **[10]**

OR

Describe pBR322 vector. Explain the method for screening of PBR322 recombinants.



Total No. of Questions : 4]

SEAT No. :

P453

[Total No. of Pages : 2

[5115] - 145

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

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION

Fundamentals of Acoustics and Sound for Media

(2013 Pattern)

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 ALL of the following.

- a) Define: Decibel [2]
- b) Explain in brief any two characteristics of a microphone. [2]
- c) Find the wavelength of sound of 1000 Hz presuming its velocity to be 344 m/s. [2]
- d) Calculate the reverberation time for an auditorium of 1000 cubic meters having total absorption equal to 230 Sabine. [2]
- e) Calculate power gain in dB if input power of 200 mW gives output power of 2 W. [2]

Q2) Attempt ANY TWO of the following.

- a) State five characteristics of loudspeakers and explain them in brief. [5]
- b) With the help of a neat labelled diagram, explain the working of a basic crossover network. [5]
- c) With the help of a neat sketch, explain the functioning of a crystal microphone. Explain why ceramic crystal is more suitable than Rochelle salt crystal. [5]

P.T.O.

Q3) Attempt ANY TWO of the following.

- a) Sound intensity at 1 meter from a loudspeaker is 400 mW/m^2 . The audio power fed to the loudspeaker is 10 W. Calculate the efficiency of the loudspeaker. [5]
- b) With the help of a neat labelled block diagram, explain the construction and working of a PA system. [5]
- c) Draw a neat labelled block diagram to explain the construction and working of a magnetic sound recording system. [5]

Q4) Attempt ANY TWO of the following.

- a) Design a crossover network to give 12 dB per octave attenuation for tweeter and woofer for critical frequency of 1000 Hz. Loudspeaker resistance is 16Ω . [5]
- b) With the help of a neat sketch, explain the functioning of a horn type loudspeaker. Explain why it is more efficient than moving coil cone type loudspeaker. [5]
- c) Write short note on synthetic reverberation. [5]



Total No. of Questions : 4]

SEAT No. :

P454

[Total No. of Pages : 2

[5115] - 146

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

ELECTRONIC EQUIPMENT MAINTENANCE

Voc - EEM - 212 Audio Video Office Equipment - A

(2013 Pattern) (Paper - II)

Time :2 Hours]

[Max. Marks :40

Instructions to the candidates:

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

Q1) Attempt all of the following.

- a) Give the frequency range of AM receiver. [1]
- b) List the types of scanning methods you known. [1]
- c) How to increase relative speed of tape. [1]
- d) State the advantages of MP3 player. [1]
- e) List the frequency of transmission of various FM channels in pune. [2]
- f) Give the meaning of BW, VSB, SSB - SC, DSB-SC. [2]
- g) State the function of RF tuner. [2]
- h) Give the important features of flat screen monitor. [2]

Q2) Attempt any two of following.

- a) Compare the features of flat panel TV with that of conventional TV. [4]
- b) What do you mean by high fidelity? List the requirements of high fidelity home music system. [4]
- c) Write a note on BIU-ray technology. State the advantage of same over DVD. [4]

P.T.O.

Q3) Attempt any two of the following.

- a) What is set top box? Where it is used? [4]
- b) Discuss the working principle of liquid crystal display. State the applications of LCD display. [4]
- c) What are the elements of CCTV? Discuss its use in different fields with the purpose of installing CCTV. [4]

- Q4)**
- a) Explain the working of a public address system with the help of a block diagram. [6]
 - b) Explain the recording and replay process in tape recorder with neat labeled diagram. [6]

OR

- a) Draw a simplified neat labeled diagram of a Black/white TV receiver. List important parts of it & explain the working of each block in brief. [6]
- b) With a neat labeled block diagram explain the working of AM/FM receiver. [6]



Total No. of Questions : 4]

SEAT No. :

P455

[Total No. of Pages : 2

[5115] - 147

S.Y. B.Sc. (Vocational) (Semester - I)
COMPUTER HARDWARE & NETWORK
ADMINISTRATION
Computer System Management
(2013 Pattern) (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) a) Attempt the following: [4 × 1 = 4]

- i) What is SMPS?
- ii) List various diagnostic software tools you know.
- iii) What is motherboard?
- iv) What would be the effect of RAM failure during Booting process?

b) Attempt the following: [4 × 2 = 8]

- i) What are ill effects of high power magnetic field near PC?
- ii) List various ports available in modern PC.
- iii) What is the function of ROM?
- iv) What do you mean by preventive maintenance?

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

- a) What is noise? What are effects of noise on a computer system?
- b) Write a short note on repair generated failure.
- c) In what different ways can a printer malfunction? How will you overcome them?

P.T.O.

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

- a) Explain in brief the preventive measures for disk drive failure.
- b) State and explain general rules for troubleshooting of computer.
- c) Explain backup and recovery procedures.

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

- a) Explain the effect of heat, dust and cold, as contributors to system failures?
- b) What are the preventive measures for display unit of PC? List various display adaptors and explain problems related to them.
- c) Explain keyboard and mouse problems and the measures for their troubleshooting.



Total No. of Questions : 4]

SEAT No. :

P456

[Total No. of Pages : 2

[5115] - 148
S.Y. B.Sc. (Vocational) (Semester - I)
SEED TECHNOLOGY
Seed Testing
(2013 Pattern) (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 and labeled diagrams wherever necessary.*

Q1) Attempt the following:

[10 × 1 = 10]

- a) Define seed vigour.
- b) What is moisture testing?
- c) What is heterogeneity test?
- d) Define seedling evaluation.
- e) Define official sample.
- f) What is seed testing?
- g) Give any one general principle of sampling.
- h) Name the methods employed in testing of seed germination.
- i) Define other crop seed component of physical purity analysis.
- j) Give any one role of official seed analysts.

Q2) Attempt any two of the following:

[2 × 5 = 10]

- a) Give the principle of seed vigour testing.
- b) Describe in detail ODV test.
- c) Give an account of moisture meter.

P.T.O.

Q3) Write note on (any two):

[2 × 5 = 10]

- a) Role of state seed testing laboratory.
- b) General principles of seed sampling.
- c) Procedure of registration of samples.

Q4) What is seed germination? Give objectives of germination testing.

[10]

OR

Give an account of heterogeneity test.



Total No. of Questions : 4]

SEAT No. :

P457

[Total No. of Pages : 2

[5115] - 149

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

INDUSTRIAL MICROBIOLOGY

VOC-IND-MIC-212: Screening and Process Optimization

(2013 Pattern) (Paper - II) (Theory)

Time : 2 Hours]

[Max. Marks : 40

Instructions to the candidates:

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

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

[10]

- a) Enlist two methods used for long term preservation of metabolically active cells.
- b) What is the role of culture collections.
- c) What is protoplast fusion?
- d) Enlist any two carbon sources used in fermentation industry.
- e) Define 'Inducers'.
- f) What is metagenomics?
- g) Name two industrially important fungi.
- h) What is response surface methodology?
- i) What is primary screening?
- j) Enlist the types of reactors being used in fermentation processes.

Q2) Answer any two of the following:

[10]

- a) Discuss genotype based targeted screening.
- b) Describe the role of Del factor in designing medium sterilization process.
- c) Explain various modes of feedback regulation.

P.T.O.

Q3) Write a short note on any two of the following.

[10]

- a) Fermentation medium.
- b) Strain improvement.
- c) First order reaction.

Q4) Answer any one of the following.

[10]

- a) Discuss the necessity of scale-up with the help of suitable examples.
- b) Justify 'Homoserine auxotrophic mutant can overproduce lysine amino acid'.

