Total No. of Questions : 4]

SEAT No. :

P728

[Total No. of Pages : 2

[4817]-1051
S.Y. B.Sc.
MATHEMATICS
MT - 211 : Multivariable Calculus-I
(2013 Pattern) (Semester-I) (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) At what point the function $f(x, y, z) = \dfrac{1}{|y| + |z|}$ is continuous?

b) Write the limit definition of partial derivative $\dfrac{\partial f}{\partial y}$ at (x_0, y_0, z_0). Use this to find $\dfrac{\partial f}{\partial y}$ at $(-1, 0, 3)$ for $f(x, y, z) = -2xy^2 + yz^2$.

c) Show that $u = f(x^2y)$; where f is differentiable function of x and y satisfies $x\dfrac{\partial u}{\partial x} = 2y\dfrac{\partial u}{\partial y}$.

d) Find the direction in which $f(x, y) = \dfrac{x^2}{2} + \dfrac{y^2}{2}$ increase most rapidly at point $(1, 1)$.

e) Write down necessary condition for extremum of a function of two variables.

f) State Taylor's formula for function of two variables.

g) Sketch the region of integration $\int_0^{\pi}\int_0^{\sin x} f(x, y)dy\,dx$.

P.T.O.

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

a) If $f(x, y)$ and its partial derivatives f_x, f_y, f_{xy}, f_{yx} are defined throughout an open region containing a point (a, b) and are all continuous at (a, b) then prove that $f_{xy}(a, b) = f_{yx}(a, b)$.

b) Find approximate value of $\sqrt{\frac{4.01}{24.99}}$ by using differentials.

c) Show that $\frac{\partial z}{\partial u} + \frac{\partial z}{\partial v} = \frac{u - v}{u^2 + v^2}$ if $z = \tan^{-1}\left(\frac{x}{y}\right); x = u + v,\ y = u - v$.

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

a) Suppose $f(x, y)$ is a real valued function defined on a neighbourhood of (x_0, y_0). If $f(x, y)$ is differentiable at (x_0, y_0) then prove that $f_x(x_0, y_0)$ and $f_y(x_0, y_0)$ both exists and $f(x, y)$ is continuous at (x_0, y_0).

b) By using definition of simultaneous limit, show that

$$\lim_{(x, y)\to(0, 0)} \frac{3x^2 - y^2 + 5}{x^2 + y^2 + 2} = \frac{5}{2}.$$

c) Find the extreme values of function $x^2 + y^2 + z^2$ subject to the condition $ax + by + cz = p$.

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

a) i) Evaluate $\int_0^{2\pi}\int_0^{1}\int_r^{\sqrt{2-r^2}} r\, dz dr d\theta$.

ii) Evaluate $\int_0^{\pi}\int_x^{\pi} \frac{\sin y}{y}\, dy\, dx$, by changing order of integration.

b) i) Evaluate $\int_0^{4}\int_{x=\frac{y}{2}}^{\frac{y}{2}+1} \frac{2x - y}{2}\, dx\, dy$ by applying the transformation

$$u = \frac{2x - y}{2}, v = \frac{y}{2}.$$

ii) Evaluate $\iint_R f(x, y) dA$ where R is the region in the first quadrant bounded by the lines $y = x$, $y = 2x$, $x = 1$, $x = 2$ and $f(x, y) = \frac{x}{y}$.

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Total No. of Questions : 4]

SEAT No. :

P729

[Total No. of Pages : 4

[4817]-1052
S.Y. B.Sc.
MATHEMATICS
MT - 212(A) : Discrete Mathematics
(2013 Pattern) (Semester-I) (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) What is the truth value of $(p \to q) \wedge (\sim p)$ if p and q has truth values F and T respectively?

b) Translate into symbolic form "All girls in college are clever".

c) Define argument and valid argument.

d) Find the number of 4-digit even numbers with digits 1, 2, 3, 4, 5.

e) In a group of 15 boys there are 7 boy-scouts. In how many ways can 12 boys be selected so as to include exactly 6 boy-scouts?

f) State the Inclusion-Exclusion principle for three sets.

g) How many words can be formed from the letters of the word DAUGHTER so that vowels always come together?

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

a) Determine whether $[(p \to q) \wedge (q \to r)] \to (p \to r)$ is tautology.

b) Find the truth value of i) $\forall x \in S, P(x)$ ii) $\forall x \in S, Q(x)$ where

$P(x) : x^3 < 30, Q(x) : x^3 < 25$ and $S = \{1, 2, 3\}$.

c) In how many ways 4 different mathematics books, 6 different physics books and 2 different chemistry books can be arranged so that the books in each subject must all stand together?

P.T.O.

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

a) Prove or disprove the following by counter example

i) The sum of three consecutive odd integers is divisible by 6.

ii) The sum of three consecutive even integers is divisible by 6.

b) Prove that $|S_1 \times S_2 \times \cdots\cdots \times S_n| = |S_1| \cdot |S_2| \cdots |S_n|$ for $n \geq 2$ where S_1, S_2, ---S_n are non-empty finite sets.

c) In a survey, 2000 people were asked whether they read India Today or Business Times. It was found that 1200 read India Today, 900 read Business Times and 400 read both. Find how many read at least one magazine and how many read neither.

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

a) i) Test the validity of the following argument. If I study, I learn. If I don't study, I have a good time. Therefore either I learn or I have a good time.

ii) Define Predicate. Find the truth values of Q(1, 3), Q(3, 1), R(3, 4, 5) and R(1, 2, 3) if Q(x, y): $x + 3y = 10$ and $R(x, y, z) : x^2 + y^2 = z^2$.

b) i) In a computer laboratory out of 6 computers, 2 have arithmetic unit, 5 have magnetic disk memory, 3 have graphic display, 2 have both arithmetic unit and magnetic disk memory, 3 have both magnetic disk memory and graphic display, 1 has both arithmetic unit and graphic display, 1 has arithmetic unit, magnetic disk memory and graphic display. How many have at least one specification?

ii) How many 7-digit numbers are there such that the digits are distinct integers taken from the set S = {1, 2, ...9} and such that the integers 5 and 6 do not appear consecutively in either order?

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Total No. of Questions : 4]

P729

[4817]-1052
S.Y. B.Sc.
MATHEMATICS
MT - 212(B) : Laplace Transforms and Fourier Series
(2013 Pattern) (Semester-I) (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 $\mathrm{L}\{6\sin 2t - 5\cos t\}$.

b) Prove that $\overline{|n+1} = n\overline{|n}, n > 0$.

c) Define unit step function.

d) Find $\mathrm{L}^{-1}\left\{\dfrac{1}{s^2 - 2s + 5}\right\}$.

e) If $\mathrm{L}\{f(t)\} = s^2\, e^s$ then find $\mathrm{L}\{f(4t)\}$.

f) Find $\mathrm{L}^{-1}\left\{\dfrac{3s-8}{s^2 - 16}\right\}$.

g) Solve the differential equation $y' - y = 0,\ y(0) = 1$ by using Laplace Transform.

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

a) If $\mathrm{L}\{f(t)\} = \phi(s)$ and for any real constant a, $g(t) = \begin{cases} 0 & \text{if } t < a \\ f(t-a) & \text{if } t > a \end{cases}$

then prove that $\mathrm{L}\{g(t)\} = e^{-as}\phi(s)$.

b) If $L^{-1}\{\phi(s)\} = f(t)$ then prove that

$$L^{-1}\left\{\frac{d^n}{ds^n}\phi(s)\right\} = (-1)^n t^n f(t).$$

c) Show that $\int_0^\infty t\, e^{-3t} \sin t\, dt = \frac{3}{50}$.

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

a) Find $L^{-1}\left\{\frac{s^2}{(s-1)^4}\right\}$.

b) Find Laplace Transform of

$$f(t) = \begin{cases} \cos t, & 0 < t < \pi \\ \sin t, & t > \pi \end{cases}.$$

c) Solve the differential equation

$$y''(t) + 2y'(t) + 5y(t) = e^{-t} \sin t,\ y(0) = 0,\ y'(0) = 1,$$

by using Laplace Transform.

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

a) State and prove convolution theorem.

Hence find $L^{-1}\left\{\frac{s^2}{(s^2+4)^2}\right\}$.

b) Define Fourier Series.

Find the Fourier series for the function

$$f(x) = \begin{cases} \pi + x, & -\pi \le x \le 0 \\ \pi - x, & 0 \le x \le \pi \end{cases}.$$

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Total No. of Questions : 4]

SEAT No. :

P730

[Total No. of Pages : 2

[4817]-1053
S. Y. B. Sc.
PHYSICS
PH-211: Mathematical Methods in Physics
(Paper-I) (2013 Pattern) (Semester-I)(New)

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.***
4) ***Use of log table and calculator is allowed.***

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

a) Determine the value of 'P' such that, $\vec{A} = \vec{i} + P\vec{j} + 2\vec{k}$ and $\vec{B} = 2\vec{i} - 3\vec{j} - 3\vec{k}$ are perpendicular to each other.

b) Find the degree and order of differential equation,

$$\sqrt{3\frac{d^3y}{dx^3}} + 6x^2\frac{dy}{dx} + \cos x = 0$$

c) If $\phi(x, y, z) = 3x^2y - 4y^3z^3$, Find $\nabla^2\phi$ at point (1,1,1)

d) State polar and exponential form of complex number.

e) Define conservative and non-conservative fields.

f) Find the divergence of vector field,

$\vec{F} = xyz\,\vec{i} + 4xy^2\,\vec{j} - xyz^2\,\vec{k}$ at point (2,1,3).

g) If $z = \sqrt{3} + 5\,\vec{i}$, Find complex conjugate of z and product $z\bar{z}$.

h) Find the projection of $\vec{A} = \vec{i} - 2\,\vec{j} + \vec{k}$ over the vector $\vec{B} = 4\vec{i} - 4\,\vec{j} + 7\vec{k}$.

i) Prove that $\cos h\,(i\theta) = \cos\theta$.

j) Find the area of parallelogram whose adjacent sides are $2\vec{i} - 2\vec{j} + 3\vec{k}$ and $2\vec{i} + 2\vec{j} - 4\vec{k}$.

P.T.O.

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

a) Check the singularity of the point $x=1$ for the differential equation $(1-x^2)y''-2xy'+k(k+1)y=0$. Here k is constant.

b) If $y=e^{-i(wt-kx)}$, then show that $\frac{\partial^2 y}{\partial t^2}=\frac{w^2}{k^2}\frac{\partial^2 y}{\partial x^2}$.

c) Obtain the quadratic equation in z, if it's roots are $(3\pm 4i)$.

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

a) Show that the vector $\vec{P}=2\vec{i}+\vec{j}-4\vec{k}$ and $\vec{Q}=3\vec{i}-2\vec{j}+\vec{k}$ lies at right angle in the plane.

b) Using total differentiation, find the approximate value of $\sqrt{(2.99)^2+(3.99)^2}$.

c) Show that $\vec{V}=(y^2+2xz^2)\vec{i}+(2xy-z)\vec{j}+(2x^2z+y+2z)\vec{k}$ is irrotational.

Q4) A) Attempt (a) or (b) of the following:

a) i) Prove that, $|\vec{A}\times\vec{B}|^2+|\vec{A}\cdot\vec{B}|^2=A^2B^2$. **[4]**

ii) Explain how will you determine $x=\infty$ is an irregular singular point of the second order differential equation. **[4]**

b) i) Show that the vector field, **[4]**

$\vec{V}=(3x+y)\vec{i}+(3y-z)\vec{j}+(x-6z)\vec{k}$ is solenoidal.

ii) The resistance R of a uniform wire of length (l) is given by $R=\frac{6l}{\pi r^2}$.

Here 6 is the specific resistance. If error in the measurement of length and radius(r) of wire are 2% and 3% respectively, find the maximum possible percentage error in resistance. **[4]**

B) Attempt (a) or (b) of the following:

a) If $z=\frac{1+i\sqrt{3}}{2}$, obtain z^3. **[2]**

b) Determine the curl of the vector field **[2]**

$\vec{V}=x^2y\,\vec{i}+x^2yz\,\vec{j}-3yz^2\vec{k}$ at point (1,2,3).

Total No. of Questions : 4]

SEAT No. :

P731

[Total No. of Pages : 4

[4817] - 1054
S.Y.B.Sc.
PHYSICS
PH-212(A): Electronics
(2013 Pattern) (Semester - I) (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 calculators and log tables are allowed.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Symbols have their usual meanings.***

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

a) State Thevenin's theorem.

b) Find the resistance of a aluminium wire 100 m long and having a cross-sectional area of 1.04 mm^2, if its resistivity is 2.7 x $10^{-8}\ \Omega$m.

c) Define dc load line.

d) For transistor, α=0.99. Find the value of β.

e) What do you mean by transistor biasing?

f) Define CMRR.

g) What is negative feedback?

h) Define line regulation.

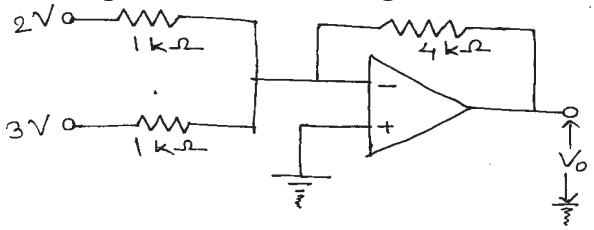
i) Draw symbol of NAND gate. Write its truth table.

j) Convert the decimal number $(29)_{10}$ into its equivalent binary number.

Q2) Attempt any two of the following:

a) Explain with circuit diagram the input and output characteristics of common emitter configuration of a transistor. **[5]**

b) Find the output of the following circuit. **[5]**

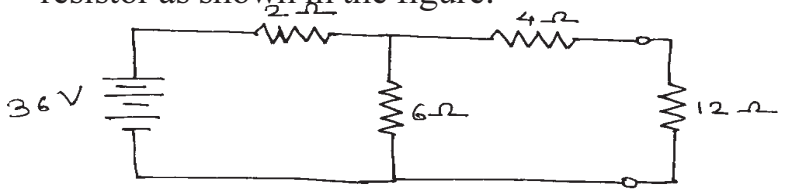


c) With neat circuit diagram, explain action of capacitor filter. **[5]**

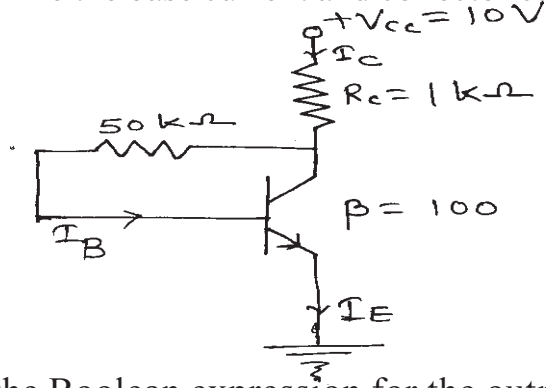
P.T.O.

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

a) Using Norton's theorem, calculate the current flowing through 12 Ω resistor as shown in the figure. **[5]**



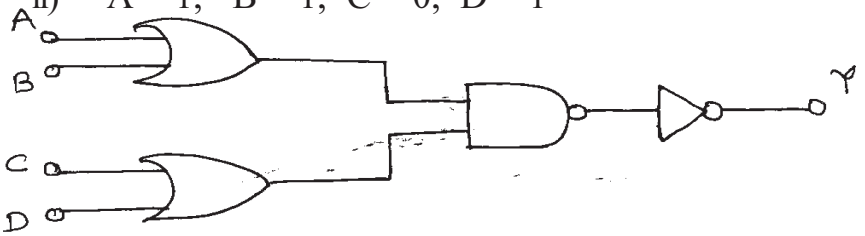
b) Figure shows a silicon transistor biased by feedback resistor method. Determine the base current and collector current if V_{BE}=0.7V. **[5]**



c) Find the Boolean expression for the output of given logic diagram. Evaluate it when. **[5]**

i) A = 0, B = 1, C = 1, D = 1

ii) A = 1, B = 1, C = 0, D = 1



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

1) i) Describe voltage divider bias method. **[4]**

ii) Explain working of transistor series voltage regulator. State its advantages. **[4]**

2) i) Explain with circuit diagram op-amp as an adder. **[4]**

ii) State De-morgan's second theorem. Write truth table and logic diagram for the same. **[4]**

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

i) Distinguish between half-wave and full wave rectifier. **[2]**

ii) If the d.c. output voltage is 7V with no load attached to power supply decreases to 5V at full load, find the percentage voltage regulation. **[2]**

Total No. of Questions : 4]

P731

[4817] - 1054
S.Y.B.Sc.
PHYSICS
PH-212 (B): Instrumentation
(2013 Pattern) (Semester - I) (Paper - II)

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

Instructions to the candidates:

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

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

a) Define atmospheric pressure.

b) State the principle of resistive transducer.

c) State any one type of graphic recorder.

d) Define linearity.

e) Define open loop gain of Op-Amp.

f) What do you mean by contilever beam?

g) What do you mean by vacuum?

h) Draw thermistor characterstic of PTC and NTC thermistor.

i) Draw pin diagram of IC 741.

j) Define reproducibility.

Q2) Attempt <u>any two</u> of the following:

a) Explain active low pass filter with circuit diagram. **[5]**

b) Explain principle and working of radiation pyrometer with suitable diagram. **[5]**

c) Write a short note on thermal element as a first-order system of measurement. **[5]**

Q3) Attempt any two of the following:

a) A capacitive transducer uses two quartz diaphragms of area 750 mm^2 separated by a distance 3 mm. A pressure of 900 kN/m^2 when applied to top diaphragm produces a deflection of 0.6 mm. The capacitance is 370 pF when no pressure is applied to the diaphragm. Find the value of capacitance after application of pressure of 900 kN/m^2. **[5]**

b) A non inverting amplifier has input resistance of 5.5kΩ and feed back resistor of 55kΩ If the input voltage is 0.6 volt, what is the output voltage of the Op-Amp. **[5]**

c) The resistance of platinum wire is 6 ohm at 0ºC and 7.2 ohm at 100ºC. Calculate the temperature coefficient of resistance α. **[5]**

Q4) a) Attempt any one of the following:

1) i) Describe with circuit diagram, an Op-Amp as a integrator. **[4]**

ii) Explain the constructional features of linear and rotary potentiometer. **[4]**

2) i) Describe with circuit diagram, X-Ychart recoder. **[4]**

ii) Explain the concept of virtual ground in Op-Amp. **[4]**

b) Attempt any one of the following:

i) A manufacturer calibrates a temperature gauge of 100ºC range with $\pm$ 0.5°C. If it is used for temperature measurement of 50ºC, what will be the probable minimum and maximum value of temperature shown by gauge? **[2]**

ii) State the principle used in elastic transducer. Give any two types of elastic elements for pressure measurement. **[2]**

Total No. of Questions : 6]

SEAT No. :

P732

[Total No. of Pages : 2

[4817]-1055
S.Y. B.Sc.
CHEMISTRY
CH-211: Physical and Analytical Chemistry
(2013 Pattern) (Paper-I) (Semester-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) ***Answers to both sections should be written in separate answer books.***

SECTION-I

Q1) Answer the following: **[5]**

a) Define the term molecularity of reaction.

b) Write the rate equation for the reaction $A+2B \rightarrow$ Product.

c) What is partition coefficient?

d) State Einstein's law of photochemical equivalence.

e) Explain the term photosensitization.

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

i) Discuss ' pseudomolecular reaction' with examples.

ii) Define the term quantum yield. Distinguish between thermal and photochemical reaction.

iii) What is first order reaction? Show that half life period of first order reaction is indepedent of initial concentration of reactant.

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

i) What is photolysis? Explain with suitable examples.

ii) Define the term rate of reaction. State the factors affecting the rate of reaction.

iii) Explain the working of photocell with suitable diagram.

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

a) The distribution coefficient of iodine and carbon disulphide is 0.0017. One litre of aqueous solution containing 1 gm of iodine is shaken with 100 ml of carbondisulphide till equilibrium is reached. Find the amount of iodine extracted in carbon disulphide.

P.T.O.

b) When a substance 'A' was exposed to light, 0.002 moles of it reacted in 1204 seconds. In the same 'A' absorbed 2.0 $x10^6$ photons of light per second. Calculate the quantum yield of the reaction. [Given: Avogadro's number =6.023 $x10^{23}$ molecules]

c) Half life of certain first order reaction is 80 min. How long will it take for the reaction to 80% completed?

SECTION-II

Q4) Answer the following: **[5]**

a) What is sampling?

b) Determine the correct number of significant figures in 0.0058 kg and 4.5690 gm.

c) Which is group reagent for III B group?

d) Define common ion effect.

e) How is Tollen's reagent prepared?

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

i) Discuss removal of phosphate using ferric chloride method.

ii) Describe the carius method for estimation of hologens in an organic compound.

iii) How is ketone detected and confirmed? Write general chemical reactions.

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

i) Discuss the applications of chemical analysis.

ii) Define the term accuracy. Give different methods of expressing it.

iii) Explain the use of yellow ammonium sulphide in inorganic qualitative analysis.

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

a) A series of bromide samples are analysed and the result's are obtained as follows. 23.20, 23.37, 23.16 and 23.27. Calculate mean deviation and standard deviation.

b) 0.156 gm of an organic compound gave on combustion 0.528 gm of CO_2 and 0.108 gm of H_2O. Find the percentage of carbon and hydrogen in the compound.

c) Calculate the solubility of sparingly soluble salt of AB in water. [Given K_{sp} for AB = 1.75 x 10^{-5}].

Total No. of Questions : 6]

SEAT No. :

P733

[Total No. of Pages : 3

[4817]-1056
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) ***Answer of the two sections should be written on separate answer books.***
2) ***All questions are compulsory.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION-I

(Organic Chemistry)

Q1) Answer the following: **[5]**

a) Draw the geometrical structure for cis 1, 2-dimethyl - cyclohexane.

b) Benzaldehyde doesnot undergo Aldol condensation. Explain.

c) How many optical isomers are possible for 2, 3-dibromopentane.

d) Define Markovnikov's rule with example.

e) Explain the terms 'Threo' with suitable example.

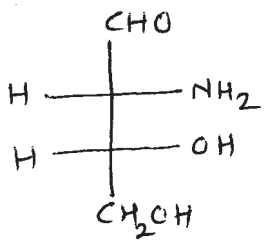
Q2) a) Attempt Any Two of the following: **[6]**

i) What is SN^1 reaction? Discuss the mechanism of SN^1 reaction with suitable example.

ii) Draw the conformation of t-butyl cyclohexane. Explain why is t-butyl group in t-butyl - cyclohexane locked in equatorial position.

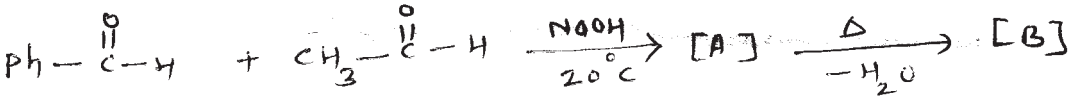
P.T.O.

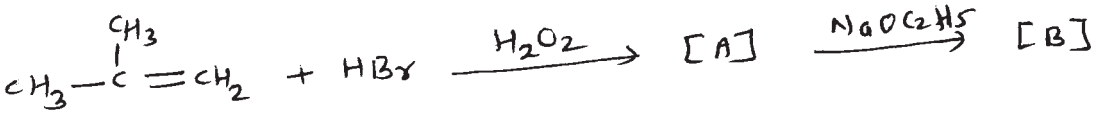
iii) What is configuration? Assign 'R' and 'S' configuration to the following molecule.



b) Assign (A) and (B) of the following reactions (Any Two): **[4]**

i) 

ii) 

iii) 

Q3) Attempt Any Two of the following: **[5]**

a) Explain the term "Angle strain". Give its effect on stability of cycloalkane.

b) 2-bromobutane on heating with $NaOC_2H_5$ gives 2-butene major product. Explain.

c) Draw the conformation of cyclohexane. Explain their stability.

SECTION-II

(Inorganic Chemistry)

Q4) Answer in one sentence: **[5]**

a) What is cast iron.

b) Define the term corrosion.

c) Name any two important ores of aluminium.

d) What is calcination.

e) Give the composition of stainless steel.

Q5) a) Attempt Any Two of the following: **[6]**

i) What is passivity? Explain electrochemical passivity.

ii) Explain manufacture of wrought iron by puddling process.

iii) What is roasting? Mention different types of roasting.

b) Attempt Any Two of the following: **[4]**

i) Describe manufacture of aluminium by Baeyer's process.

ii) Explain concentration of ore by magnetic separation method.

iii) Write a note on L.D. process.

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

a) Explain electro-chemical corrosion.

b) Write a note on Aluminothermic process.

c) Draw outline diagram of Blast furnace.

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Total No. of Questions :4]

SEAT No. :

P734

[Total No. of Pages :2

[4817]-1057
S.Y.B.Sc.
BOTANY -I
BO-211: Taxonomy of Angiosperms and Plant Community
(2013 Pattern) (Paper - I) (Semester - I)

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

Instructions to the candidates:

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

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

a) What is plant systematics?

b) Give an example of artificial system of classification.

c) What is flora?

d) Enlist two examples of sources of data from anatomy.

e) What is ICBN?

f) Give the botanical name and economic importance of plant from Rubiaceae.

g) What is e-herbarium?

h) Define hydrophytes.

i) What is autecology?

j) Give floral formula of Amaryllidaceae.

P.T.O.

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

a) Write the merits and limitations of Bentham and Hooker's system of classification.

b) Describe the monograph?

c) Describe the internal adaptations in xerophytes.

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

a) Morphology as source of data for systematics.

b) Nomina conservanda.

c) Advantages of herbarium.

Q4) Give distinguishing characters, floral formula and floral diagram of family Solanaceae andAnnonaceae. **[10]**

OR

What is binomial nomenclature? How generic names and specific epithets are coined?

EEE

Total No. of Questions :4]

SEAT No. :

P735

[Total No. of Pages :2

[4817]-1058
S.Y.B.Sc.
BOTANY - II
BO-212: Plant Physiology
(2013 Pattern) (Paper - II) (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) ***Draw neat labelled diagrams wherever necessary.***

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

a) Give any two applications of plant physiology.

b) Define plasmolysis.

c) What is passive absorption of water?

d) Enlist any two theories for explaining ascent of sap.

e) Define plant growth.

f) Enlist types of transpiration.

g) Define Exudation.

h) What is Denitrification?

i) Enlist any two types of seed dormancy.

j) What is Ascent of sap?

P.T.O.

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

a) Explain nonsymbiotic Nitrogen fixation in plants.

b) Describe external factors affecting rate of transpiration.

c) Give practical applications of cytokinins.

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

a) Nitrification.

b) Methods to break seed dormancy.

c) Guttation.

Q4) Define Vernalization. Explain the mechanism of Vernalization. Add a note on its applications. **[10]**

OR

What is imbibition? Describe the mechanism of imbibition. Add a note on its significance.

EEE

Total No. of Questions : 4]

SEAT No. :

P736

[Total No. of Pages : 2

[4817]-1059
S.Y. B.Sc.
ZOOLOGY
ZY-211: Animal Systematics and Diversity-III
(2013 Pattern) (Semester-I) (Paper-I) (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) Write any two distinguishing characters of class cephalopoda.

b) Give two examples of class Asteroidea.

c) What is zoaea larva?

d) What is hermimetabolous development?

e) What is detorsion?

f) What is the function of pedicellariae?

g) What is the function of pyloric caecae?

h) Mention the function of dermal branchiae.

i) Write two characters of phylum mollusca.

j) What is mullerian mimicry?

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

a) Shell modifications in Gastropoda.

b) Brachiolaria larva.

c) Harmful insects.

P.T.O.

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

a) Write distinguishing characters of class Arachnida.

b) Sketch and label-chewing and lapping type of mouthparts.

c) Describe autotomy and regeneration in starfish.

Q4) Describe water vascular system of starfish and give its function. **[10]**

OR

Give general characters of phylum echinodermata and distinguishing characters of class ophiuroidea.

Total No. of Questions : 4]

SEAT No. :

P737

[Total No. of Pages : 2

[4817]-1060
S.Y. B.Sc.
ZOOLOGY-II
ZY - 212 : Applied Zoology-I
(Fisheries and Agricultural Pests and their Control)
(2013 Pattern) (Semester-I) (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 brackish water fishery?

b) Write the biological name of Pearl oyster.

c) Mention any two household pests.

d) Define fishing gear.

e) Mention any two uses of Fish Flour.

f) Define Pest.

g) Write the biological name of Jowar stem borer.

h) Give the names of equipments used for Harpodon harvesting.

i) Write any two damages caused by Aphids.

j) Define IPM.

P.T.O.

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

a) Salting and drying techniques in fish preservation.

b) Cast net.

c) Rats and crabs as non-insect pests.

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

a) Describe in brief cyanogas pump as a plant protection appliance.

b) Give a brief account of chemical pest control methods with the help of suitable examples.

c) Describe harvesting methods of Mackerel.

Q4) Describe Marks of identification, nature of damage and control measures of mango stem borer and red cotton bug. **[10]**

OR

Describe the habit, habitat and culture methods of Labeo rohita and Macrobrachium rosenbergii.

●●●●●

Total No. of Questions :4]

SEAT No. :

P738

[Total No. of Pages :2

[4817]-1061
S.Y.B.Sc.
GEOLOGY
GL-211: Mineralogy
(2013 Pattern) (Paper - I) (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) Name any two felspars belonging to Plagioclase series.

b) What is foreign overgrowth?

c) Define ordinary ray of light.

d) What is Anisotropism?

e) What is Nesosilicate structure?

f) State the silicate structure of olivine mineral.

g) Define hemihedral form.

h) Give the gem varieties of corundum.

i) State the name of a mineral with a cyclosilicate structure.

j) Give the chemical composition of Orthoclase felspar.

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

a) Twinning in Orthorhombic system.

b) Extinction position in minerals.

c) Various types of external imperfections in crystals.

P.T.O.

Q3) Answer the following (any 2): **[10]**

a) Causes of Twinning.

b) Silicate structure, chemical composition and physical property of Olivine group.

c) Main attributes of gemstone.

Q4) Give the crystallographic axis, elements of symmetry and forms present with indices of cubic system. (Types Pyrite and Tetrahedrite) **[10]**

OR

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

EEE

Total No. of Questions :4]

SEAT No. :

P739

[Total No. of Pages :2

[4817]-1062
S.Y.B.Sc.
GEOLOGY
GL-212: Structural Geology
(2013 Pattern) (Paper - II) (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) ***Draw neat labelled diagrams wherever necessary.***

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

a) True and apparent thickness of beds.

b) Disharmonic folds.

c) Normal faults.

d) Unconformity.

e) Uses of Brunton compass.

f) Inlier.

g) Strike and dip of a planar feature.

h) Anticline.

i) Non-tectonic structures.

j) plunge and rake of a linear feature.

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

a) Structural landforms associated with inclined beds.

b) Sheeting joints.

c) Recognition of folds by direct observation and plotting attitude of beds.

P.T.O.

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

a) Determination of top of bed using igneous structures.

b) Geometrical classification of Joints.

c) Doubly plunging anticline and syncline.

Q4) Describe the terms associated with faults. Write a note on relative movements along faults. Explain genetic classification of faults. **[10]**

OR

Describe the parts of a fold. Explain the difference between plunging and non-plunging folds. Add a not on doubly plunging anticline. **[10]**

EEE

Total No. of Questions : 4]

SEAT No. :

P740

[Total No. of Pages : 4

[4817]-1063
S.Y.B.Sc.
STATISTICS
ST-211: Discrete Probability Distributions, Time Series and R Software
(Semester-I) (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) ***Use of calculator and statistical tables is allowed.***
4) ***Symbols and abbreviations have their usual meaning.***

Q1) Attempt each of the following:

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

i) If $(X_1, X_2, X_3) \to \text{MD}(3, \frac{1}{3}, \frac{1}{3}, \frac{1}{3})$ then the correlation coefficient between X_1 and X_2 is

A) 0 B) $\frac{1}{2}$ C) $-\frac{1}{2}$ D) -1

ii) If the time series values change at a constant rate over a long period of time then its trend is represented by

A) Linear trend B) Parabolic trend

C) Exponential trend D) None of these

iii) If $X \to B(n, p)$ and $X_T \to B(n, p)$ truncated to the left at $x=0$ then

A) $E(X) > E(X_T)$ B) $E(X) < E(X_T)$

C) $E(X) = E(X_T)$ D) $E(X) \geq E(X_T)$

P.T.O.

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

i) Negative binomial distribution is negatively skewed.

ii) Seasonal variations are associated with business cycle.

iii) A random sample of size 10 can be obtained from B(7,0.4) distribution using command >rbinom(10,7,0.4).

c) State the additive property of negative binomial distribution. **[1]**

d) Mention the component which is predominant in the time series of prices of residential constructions. **[1]**

e) Give one real life situation where multinomial distribution is applicable. **[1]**

f) State the probability mass function(p.m.f) of binomial distribution truncated to the left at value zero. **[1]**

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

a) Let $\underline{X} = (X_1, X_2, ..., X_k) \rightarrow MD(n, p_1, p_2, ..., p_k)$ .State the moment generating function (m.g.f) of $\underline{X}$ and hence find $Cov(X_i, X_j), i \neq j.$

b) Describe the method of moving averages for the estimation of trend and discuss its merits.

c) Give the output of the following:

i) > x=seq(2,26,4)

> x

ii) > x=c(3,5)

> z=rep(x,2)

> z

iii) > x=c(20,14,23,32,10)

> x[2:4]

iv) > x=c(35,42,28,64,16)

> sort(x)

v) > x=c(6,4,4,8,6)

> sum(x)

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

a) Let X have a poisson distribution with parameter *m*. If the distribution is truncated to the left at X=0, find the p.m.f. of the resulting distribution and its mean.

b) Obtain m.g.f. and cumulant generating function (c.g.f.) of NB(k,p) distribution. Hence find its mean.

c) Compute quarterly seasonal indices by the method of simple averages from the following data:

year	Sales(in lacs of Rs.)			
	Quarter I	Quarter II	Quarter III	QuarterIV
2010	42	51	47	45
2011	46	56	52	48
2012	48	55	52	50
2013	51	59	55	53

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

a) i) Give the output of the following: **[2]**

```
> x=c(5,2,6)

> y=c(2,2,4)

> d=data.frame(x,y)

> d
```

ii) If $\underline{X} = (X_1, X_2, X_3, X_4) \rightarrow MD(n, p_1, p_2, p_3, p_4)$ then obtain the conditional distribution of X_1 given $X_1 + X_2 = r, r = 0,1,2,.....,n.$ **[3]**

iii) Describe the procedure of exponential smoothing. Explain how the smoothing constant is chosen for exponential smoothing. **[5]**

b) i) Let $\underline{X} = (X_1, X_2, X_3) \rightarrow MD(6, \frac{1}{4}, \frac{1}{2}, \frac{1}{4})$. **[6]**

Find(A) $P(X_1 = 2, X_2 = 3, X_3 = 1)$,

(B) $P(X_2 + X_3 = 2)$,

(C) $P(X_1 = 1 \mid X_2 = 2)$.

ii) Write a note on autoregressive model AR(1). **[4]**

Total No. of Questions : 4]

SEAT No. :

P741

[Total No. of Pages : 3

[4817]-1064
S.Y. B.Sc.
STATISTICS
ST-212: Continuous Probability Distributions
(2013 Pattern) (Semester-I) (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 meanings.***

Q1) Attempt each of the following:

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

i) If F(x) is distribution function (d.f.) of a continuous random variable (r.v.) X and $x_1 < x_2$ then

1) $F(x_1) < F(x_2)$ 2) $F(x_1) \leq F(x_2)$

3) $F(x_1) > F(x_2)$ 4) $F(x_1) \geq F(x_2)$

ii) If $X \sim N(5,1)$ then μ_5 of X is

1) 5 2) 5^2

3) 0 4) 1

iii) If X_1, X_2, X_3 are independent and identically distributed exponential variates with mean 4 then $X_1+X_2+X_3$ follows

1) $G(3, \frac{1}{4})$ 2) G (3, 4)

3) $G(\frac{1}{4}, 3)$ 4) G (4, 3)

b) State whether each of the following statements is True or False. **[1 each]**

i) If $M_{X,Y}(t_1, t_2)$ is a moment generating function (m. g. f.) of bivariate continuous r. v. (X, Y) then $M_{X+Y}(t)=M_{X,Y}(t, t)$.

ii) If $X \sim N(\mu, \sigma^2)$ then maximum value of its probability density function (p. d. f.) is $\frac{1}{\sqrt{2\pi}}$.

iii) If $X \sim U$ [a,b] then mean=median=mode.

P.T.O.

c) State lack of memory property of exponential distribution. **[1]**

d) Let X be a continuous r.v. with p.d.f. $f(x)$. State the p.d.f. of Y=g(x), where $g(\bullet)$ is strictly monotonic function of X. **[1]**

e) Define (r, s)th ordered raw moment of bivariate continuous r.v. (X, Y). **[1]**

f) If $X \sim G(2, 4)$, find mode of X. **[1]**

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

a) If $X \sim N(\mu, \sigma^2)$ then show that $\mu_{2r} = \dfrac{(2r)!\sigma^{2r}}{2^r \cdot r!}$, $r = 1, 2,$------

b) If X is a continuous random variable with probability distribution

$f(x) = 6x(1-x),\ 0 < x < 1$

$= 0$, otherwise

Find: i) Arithmetic mean of X,

ii) Harmonic mean of X,

iii) Median of X.

c) The joint probability distribution of r.vs X and Y is

$$f(x, y) = \frac{3}{2} y^2,\ 0 \le x \le 2, 0 \le y \le 1$$

$= 0$, otherwise.

Find : i) $P(X \le Y)$

ii) Conditional distribution of Y given X = x.

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

a) A two dimensional continuous r.v. (X, Y) has the joint probability distribution

$$f(x, y) = k(3x^2 + xy),\ x \in [0,1], y \in [0,2]$$

$= 0$, otherwise.

Find: i) k

ii) E (XY).

b) Let $X \sim N(\mu, \sigma^2)$. Find median of X.

c) Let $X \sim G\ (\alpha, \lambda)$. Find the expression for rthorder raw moments of X. Hence, find mean and variance of X.

Q4) Attempt any one of the following:

a) i) If X is a r.v. with distribution function **[5]**

$$F(x)=\begin{cases}0 & , \quad x<-1\\ \dfrac{x+1}{2} & , \quad -1\le x<1\\ 1 & , \quad x\ge 1\end{cases}$$

Find: A) P(0.5 < X < 2)

B) $P\left(\frac{1}{2}<X<\frac{3}{4}\middle| X>\frac{1}{4}\right)$

C) Probability density function of X.

ii) A normal r.v. X has probability distribution **[5]**

$$f(x)=c.e^{-\frac{1}{8}(x^2-12x+36)},\ c>0,-\infty<x<\infty$$
$$=0 \quad , \text{ otherwise.}$$

Find: A) c

B) Mean and variance of X

C) P(X > 9)

b) i) If X has probability distribution

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

then show that $Y=-\frac{1}{\alpha}\log(1-X)$, $\alpha>0$ has an exponential distribution with parameter α. **[4]**

ii) If X is a continuous r.v. with p.d.f. $f(x)$ and cumulative distribution function F(X) then show that $Y=F(X)\sim U[0,1]$. **[3]**

iii) If $X\sim U[-a,a]$, find the value of a such that $P[|X|>1]=\frac{6}{7}$. **[3]**

Total No. of Questions : 4]

SEAT No. :

P742

[Total No. of Pages : 2

[4817]-1065
S.Y. B.Sc.
GEOGRAPHY
Gg - 211 : Geography of Resources-I
(2013 Pattern) (Semester-I) (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) Define the term resource.

b) What is meant by biotic resource?

c) Write any two examples of biotic non-renewable resources.

d) Define the term Potential resource.

e) Write any two uses of forest resource.

f) Give any two environmental significance of forest.

g) What do you mean by deforestration?

h) Give any two remedial measures for forest conservation.

i) What is meant by water resource?

j) Define the term water conservation.

k) Give any two uses of water resource.

l) Write any two methods of conservation of land resource.

m) Give any two agricultural effects on land resource.

P.T.O.

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

a) Importance of study of resources.

b) Abiotic renewable resources.

c) Effects of deforestation.

d) Importance of land resource.

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

a) Describe the components of resources.

b) Explain the importance of abiotic non-renewable resources.

c) Explain the causes of deforestation.

d) Describe the different sources of water.

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

a) Describe the various methods of conservation of water resource.

b) Explain the uses of land resource in detail.

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Total No. of Questions : 4]

SEAT No. :

P743

[Total No. of Pages : 2

[4817]-1066
S.Y. B.Sc.
GEOGRAPHY
Gg-212: Watershed Management-I
(2013 Pattern) (Semester-I) (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.

b) Write any benefits of watershed management.

c) What is watershed delineation?

d) What is meant by stream length ratio?

e) What is stream order?

f) What do you mean by drainage density?

g) Define hydrological cycle.

h) What is meant by water budget?

i) Define transpiration.

j) Define interception.

k) What is meant by runoff?

l) Write any two processes of soil erosion due to water.

m) What is land capability classification?

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

a) Problems in watershed management.

b) Land use in watershed.

c) Evapotranspiration.

d) Need of land capability classification.

P.T.O.

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

a) Describe the relief aspect of drainage basin.

b) Describe the ground water flow.

c) Explain the processes of soil erosion due to wind.

d) Describe the criteria used for land capability classification.

Q4) Answer the following question in 200 words (any one): **[10]**

a) Explain the principles of watershed management.

b) Describe the physical characteristics of soil.

Total No. of Questions : 4]

SEAT No. :

P744

[Total No. of Pages : 2

[4817]-1067
S.Y.B.Sc.
MICROBIOLOGY
MB-211: Bacterial Systematics and Physiology
(Paper-I) (2013 Pattern) (Semester-I)(Theory)

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

Instructions to candidates:

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

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

a) Define: Fermentation.

b) Define: cofactor.

c) Define: Tm.

d) Different species in the same genus have dissimilar characters.(T/F).

e) NADH oxidation in ETC yields.....ATP.

f) Amylase belongs to .....class of enzyme as per IUB.

g) As per IUB enzymes are classified into ..... classes.

h) Write the formula for % G+C content.

i) Two organisms with 95% DNA homology can said to be .....

i) Similar ii) Closely related

iii) Distantly related iv) None of the above.

j) Draw the structure of Fructose.

P.T.O.

Q2) Write short notes on **[10]**

a) Oxidative phosphorylation.

b) Taxonomy based on cell-wall composition.

c) Induced-fit hypothesis.

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

a) Describe Autoradiography.

b) Schematic representation of Emp path way with energetics.

c) Comment on , “Ribozymes”.

Q4) Describe HMP path way with structures and it’s significance. **[10]**

OR

Describe Nomenclature and classification of enzymes as per IUB upto class level.

◀▶◀▶◀▶

Total No. of Questions : 4]

SEAT No. :

P745

[Total No. of Pages : 2

[4817]-1068
S.Y. B.Sc.
MICROBIOLOGY
MB-212:Industrial and Soil Microbiology
(2013 Pattern) (Semester-I) (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 wherever necessary.***

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

a) Define symbiosis.

b) Define Batch fermentation.

c) Name any two micro organisms used for preparation of biocontrol agents.

d) Name any two cellulose degrading bacteria.

e) With suitable example define precursors in fermentation media.

f) _____medium is used for isolation of phosphate solubilizing bacteria.

g) Define master culture.

h) _____ is a example of dual fermentation.

i) Ethyl alcohol ii) Penicillin

ii) Acetic acid iv) All of the above

i) Enlist different methods used in primary screening for isolation of industrially important microorganisms.

j) What is role of Impellers in fermenter.

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

a) Describe the role of microorganisms in composting.

b) Describe the process of inoculum development in fermentation process.

c) Describe the process of lignin biodegradation. Enlist different microorganisms involved in lignin biodegradation.

P.T.O.

Q3) Write short notes on <u>any two</u>: **[10]**

a) Carbon sources in fermentation media.

b) Nitrogen cycle.

c) Neutralism.

Q4) Describe the control & monitoring of pH & temp. in fermentation process. **[10]**

OR

Describe the large scale production of cyanobacterial biofertilizer with respect to

a) Production

b) Formulation

Total No. of Questions :4]

SEAT No. :

P746

[Total No. of Pages :2

[4817]-1069
S.Y.B.Sc.
PSYCHOLOGY
EP-211: Psychology of Adjustment
(New 2013 Pattern) (Paper - I) (Semester - I)

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

Instructions to the candidates:

1) ***Attempt all questions.***
2) ***Neat figures and diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***

Q1) Answer in one to four sentences: **[16]**

a) State the personal characteristics for choosing a career.

b) What is sexual harassment?

c) What is homogamy?

d) What is adjustment?

e) State job characteristics?

f) What is endogamy?

g) State obsessive-compulsive disorder (OCD).

h) What is unemployment?

Q2) Attempt any two of the following in 8/10 sentences: **[8]**

a) Explain the alternatives to marriage.

b) Discuss paranoid personality disorder.

c) Explain job stress.

P.T.O.

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

a) Freud's structure of personality.

b) Divorce.

c) Using psychological tests for career decisions.

Q4) Explain in detail the roots of happiness. **[8]**

OR

What is abnormal behavior? Explain the criteria of abnormal behavior.

EEE

Total No. of Questions :4]

SEAT No. :

P747

[Total No. of Pages :2

[4817]-1070
S.Y.B.Sc.
PSYCHOLOGY
EP-212: Experimental Psychology and Research Methodology
(2013 Pattern) (New) (Paper - II) (Semester - I)

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

Instructions to the candidates:

1) ***Attempt all questions.***
2) ***Neat figures and diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***

Q1) Answer in one to four sentences: **[16]**

a) What is conditioning?

b) What is reinforcement?

c) State the types of conditioning.

d) Define thinking.

e) Define problem solving.

f) What is mental image?

g) Define hypothesis.

h) State the types of questionnaire.

Q2) Attempt any two of the following in 8 /10 sentences: **[8]**

a) Write in short types of research.

b) Explain classical conditioning.

c) Characteristics of questionnaire.

P.T.O.

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

a) Abstraction.

b) Generalization.

c) Determinants of thinking.

Q4) Define conditioning? Explain the phenomenon of conditioning. **[8]**

OR

Define interview. Explain the types of interview.

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Total No. of Questions : 4]

SEAT No. :

P748

[Total No. of Pages : 2

[4817]-1073
S.Y. B.Sc.
ELECTRONIC SCIENCE
EL-211:Anolag Circuit Design
(2013 Pattern) (Semester-I) (Paper-I) (New Course)

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

Instructions to the candidates:

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

Q1) Attempt all of the following:

a) What is voltage amplifier? **[1]**

b) Define thermal runaway. **[1]**

c) State the total phase shift in positive feedback loop. **[1]**

d) What is low pass filter? **[1]**

e) "Transformer coupling has poor frequency response". Comment. **[2]**

f) "Advantage of non-inverting active filters is that they can be easily cascaded". Comment. **[2]**

g) The a.c. power output of class A power amplifier is 2 watt. If the collector efficiency is 50%. Find the dc power input. **[2]**

h) Find the cut-off frequency of high pass filter, for R=10kΩ and C=0.1 μF. **[2]**

Q2) Attempt any two of the following:

a) Explain in detail the designing steps for design of single stage class A amplifier. **[4]**

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

c) Draw and explain the circuit diagram of differentiator circuit. Derive the expression for its output. **[4]**

P.T.O.

Q3) Attempt any two of the following:

a) State different coupling methods. Explain direct coupled amplifier in detail. **[4]**

b) What is positive feedback? Derive the expression for gain of it. **[4]**

c) Explain the need of constant current source in a differential amplifier. Discuss its effect on CMRR. **[4]**

Q4) Attempt the following:

a) Explain with circuit diagram working of class B push pull amplifier. Draw the circuit diagram of complementary symmetry class B push pull amplifier. **[6]**

b) With a neat circuit diagram, explain the working of RC phase shift oscillator state its advantages and disadvantages. **[6]**

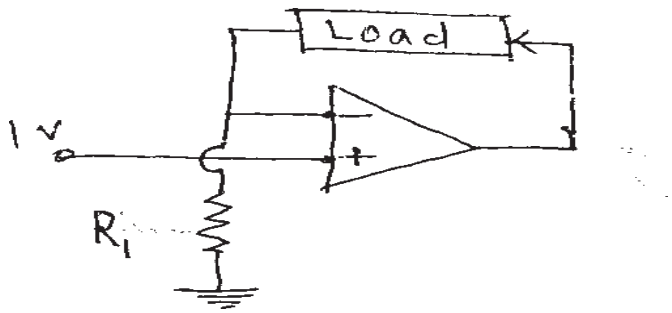
OR

Q4) Attempt the following:

a) In the Hartley oscillator L_1=1000 μH, L_2=100 μH and the capacitor C=20pF. Calculate the frequency of oscillation. **[4]**

b) A power transistor dissipates 5W. If the junction temperature is 90°C and thermal resistance 8°C/W. Calculate the maximum ambient temperature at which it can be operated. **[4]**

c) Design a voltage to current converter to give 1mA current for 1 volt input voltage. **[4]**



Total No. of Questions : 4]

SEAT No. :

P749

[Total No. of Pages : 2

[4817]-1074
S.Y. B.Sc.
ELECTRONIC SCIENCE
EL - 212 : Digital Circuit Design
(2013 Pattern) (Semester-I) (Paper-II) (New Course)

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

Instructions to the candidates:

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

Q1) Attempt All of the following:

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

b) State the feature of gray code. **[1]**

c) List any two applications of DAC. **[1]**

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

e) "Design of sequential circuits with T-Flip Flop is simpler compared to JK-Flip Flop". Comment. **[2]**

f) "Quantization error in an ADC can be reduced". Comment. **[2]**

g) Draw the state diagram and state table of MOD-3 counter. **[2]**

h) Converts the following gray codes to binary.

i) 10010 ii) 11100 **[2]**

Q2) Attempt Any Two of the following:

a) Draw block diagram of digital clock and explain minutes counter in detail. **[4]**

b) Design MOD-5 ripple up counter using JK-Flip-Flops. **[4]**

c) Draw block diagram and explain successive approximation type ADC. **[4]**

P.T.O.

Q3) Attempt Any Two of the following:

a) Explain the working of 4 bit weighted resistive network type DAC. Give the expression for its output voltage. **[4]**

b) Explain with logic diagram 3 bit up-down counter giving timming diagram. **[4]**

c) Write a short note on electromechanical relay. **[4]**

Q4) Attempt all of the following:

a) Design 4:2 priority encoder and draw its logic diagram. **[6]**

b) Explain with logic diagram MOD-6 asynchronous counter using JK Flip-Flop. Give its timming diagram. **[6]**

OR

Attempt all of the following:

a) Find the output voltages of 5 bit R-2R ladder network for the following digital inputs. **[4]**

i) 10101 ii) 11110

[Given: 0 = 0 volt, 1 = 10 volt].

b) For 4-bit simultaneous ADC has reference voltage of 8 volt. Determine: **[4]**

i) Increment between voltage to the comparator.

ii) How many comparator does it have?

c) Design full adder using K-map. **[4]**

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Total No. of Questions :4]

SEAT No. :

P750

[Total No. of Pages :2

[4817]-1075
S.Y.B.Sc.
DEFENCE AND STRATEGIC STUDIES
DS-101: Study of Conflicts and Peace
(2013 Pattern) (Paper - I) (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.***

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

a) Define conflict.

b) Define cultural Identity.

c) Define self Determination.

d) Define Ethnicity.

e) What do mean by clash of civilization?

f) Define Insurgency.

g) Define nation sate.

h) Define Cross Border Terrorism.

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

a) Describe historical background of war studies.

b) Explain scope of peace studies.

c) Write a note on nationalism.

d) Explain methods of peaceful settlement.

P.T.O.

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

a) Discuss problems of disarmament.

b) Analyses challenges to India's internal security.

c) Discuss causes of conflict within state.

d) Analyses challenges to Human security in India.

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

a) Discuss relations between war and politics.

b) Describe approaches to the study of conflict studies.

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Total No. of Questions : 4]

SEAT No. :

P751

[Total No. of Pages : 2

[4817]-1076
S.Y.B.Sc.
DEFENCE AND STRATEGIC STUDIES
DS-102: Military Geography
(Paper-II) (2013 Pattern) (Semester-I)(New Course)

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

Instructions to the candidates:

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

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

a) Define "Tactics".

b) What do you understand by ship of Desert?

c) State the ideal period for High Altitude warfare.

d) What was the strategy of Shivaji?

e) Write any two examples of "Man made disasters".

f) Define "Strategy".

g) What are the means of transportation for Jungle warfare?

h) State the meaning of "Military Geography".

Q2) Answer in 8 or 10 sentences (Any Two): **[8]**

a) Explain the grand strategy of Shivaji.

b) Write in brief types of Natural Disasters.

c) Explain the concept of Logistics.

P.T.O.

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

a) Characteristics of plain warfare.

b) Indias strategy during Indo-Pak war of 1971

c) Concept of Tactics.

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

a) Explain the various resources of Logistics.

b) How war affects on environment? Explain with examples.

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Total No. of Questions : 4]

SEAT No. :

P752

[Total No. of Pages : 2

[4817]-1077
S.Y. B.Sc.
DEFENCE AND STRATEGIC STUDIES
DS-103:Contemporary Strategy
(2013 Pattern) (Semester-I) (Paper-III)

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

Instructions to the candidates:

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

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

a) Define strategy.

b) What is meant by contemporary strategy?

c) Define WAR

d) Introduce operation SHAKTI

e) What is Aerospace defence?

f) What is meant by Amphibious force?

g) What is meant by defence in depth?

h) Differentiate between conventional and nuclear weapon.

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

a) Explain the relevance of nuclear deterrence in contemporary world.

b) Explain the Causes of war.

c) Why war is to be prevented?

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

a) Land strategy

b) Naval strategy

c) Air strategy

P.T.O.

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

a) Discuss the theory of Nuclear deterrence.

b) How science and Technology contribute to National Security Strategy. Explain.

Total No. of Questions : 4]

SEAT No. :

P753

[Total No. of Pages : 2

[4817]-1078
S.Y. B.Sc.
ENVIRONMENTAL SCIENCE
EVS - 201 : Ecology & Ecosystem
(2013 Pattern) (Semester-I) (Paper-I) (New)

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

Instructions to the candidates:

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

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

a) Define: Ecosystem and write one example.

b) State the difference between Potential and Realised Mortality.

c) Define: Ecological niche.

d) Enlist the basic types of Ecological succession.

e) What is climax community?

f) Write the difference between GPP & NPP.

g) Give examples of Grazing food chain.

h) Define: Population ecology.

i) What is nutrient budget?

j) What does Ecological pyramid of Biomass & Number depict?

P.T.O.

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

a) Ecotone and Edge effect.

b) Food web and ecosystem stability.

c) Nitrogen cycle with diagram.

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

a) Describe in detail productivity of an ecosystem.

b) Discuss any five population characteristics.

c) Explain ecosystem nutrient cycling models.

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

a) Explain Ecological succession with respect to causes, trends and mechanism.

b) Describe functions and deficiency syndromes of any 5 micronutrients.

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Total No. of Questions : 4]

SEAT No. :

P754

[Total No. of Pages : 2

[4817]-1079
S.Y. B.Sc.
ENVIRONMENTAL SCIENCE
EVS - 202 : Natural Resources, Energy & Their Management
(New Course 2013 Pattern) (Semester-I) (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 in 1-2 lines: **[10]**

a) What is 'Potentially Renewable Resource'.

b) Define 'JFM'.

c) Give the meaning of 'Sustainable Agriculture'.

d) What is meant by 'second growth forest'.

e) Define 'watershed'.

f) What is 'Ex-situ conservation'.

g) What are 'Conventional Energy Resources'.

h) Define 'Bioenergy'.

i) What is 'Rain water Harvesting'.

j) Explain the term 'Salinisation'.

P.T.O.

Q2) Write short note on Any Two of the following: **[10]**

a) Energy crisis.

b) Forest Resource.

c) Soil Conservation Methods.

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

a) What is grassland? Give its Ecological significance.

b) Give the classification of Energy Resources.

c) Explain the concept of watershed management in detail.

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

a) What is Resource? Give the details of Resource classification.

b) What is Sustainable Agriculture? Give an account of Traditional and Modern agriculture system.

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Total No. of Questions :4]

SEAT No. :

P755

[Total No. of Pages :6

[4817]-1080
S.Y.B.Sc.
ENGLISH
Optional English
(2013 Pattern) (Revised 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.***

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

i) According to essay The sun, the planets and the stars, if martians existed, how would they be more advanced than us?

ii) State how the pre-Christian attitude to disease is constrasted with that of the scientist.

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) How has development in the science of medicine helped civilisation?

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

i) Why is the television a unique medium according to Jerzy Kosinki?

ii) What is the central idea of the poem 'Purdah-I'?

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

i) What is author's attitude towards television in 'TV As a Babysitter'?

ii) What is the theme of the poem 'A Psalm of Life'?

P.T.O.

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

a) Complete the sentences with appropriate words chosen from those in brackets.

i) The little child is frightened of thunder and _____. (lightning, lightening)

ii) The director's decision to resign was _____ for the institute. (momentary, momentous)

b) Match the words from 'A' with their antonyms in 'B'.

A		B	
i)	bend	1)	minor
ii)	exclude	2)	failure
iii)	lend	3)	straighten
iv)	major	4)	include
v)	success	5)	borrow

c) Differentiate between the following pairs of words and make sentences:

i) Credible, creditable

ii) alternate, alternative

d) Choose the right combinations of the words:

i) hardly nothing / practically nothing.

ii) equitable rights / equal rights.

e) Pick out the word that is the closest antonym of the underlined word.

i) refute -- praise, negate, accept.

ii) dormant - forgotten, active, latent.

f) Add prefixes and suffixes to the words in the brackets and rewrite the sentences:

i) The pain has become _____. (tolerable)

ii) You are _____ about how to get to the station, aren't you? (clue)

Q4) Attempt the following (any ten): **[10]**

a) Raghav _____ (wait) at the airport when you reach Delhi tomorrow. (Use the correct form of the verb given in the bracket)

b) My brother is a famous artist. He _____ (paint) many beautiful pictures, but his most famous painting is a portrait of Indira Gandhi. Which he _____ (paint) in 1980. (Use the correct form of the verb given in the bracket).

c) Farid found the house locked, so he waited outside for his friend. (Change into a simple sentence)

d) If you have a healthy diet, you will be able to fight infections (Change into compound sentence)

e) The nurses decorated the ward with flowers and baloons to make it look bright and cheerful. (Change into complex sentence).

f) I can not help you. (Change into affirmative sentence).

g) Could you water the plants, please? (Change into imperative sentence).

h) The house looks beautiful. (Change into exclamatory sentence begining with 'how').

i) The dogs have not been fed today. (Change into active voice).

j) The office is giving us a house loan. (Change into passive voice).

k) The officer asked the passenger if she had anything to declare. (Change into direct speech).

l) Niti said to Shobha, "sorry for losing your bracelet". (Change into indirect speech).

EEE

Total No. of Questions :4]

P755

[4817]-1080
S.Y.B.Sc.
ENGLISH
Optional English
(2013 Pattern) (Old 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.***

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

i) What interesting information about the stars do you get from the lesson 'The sun, the planets and the stars'?

ii) Explain why Haldane thinks that the scientific point of view has definite advantages for civilisation.

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

i) What is the difference between a planet and a star?

ii) Explain two ways in which science affect the average man or woman.

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

i) Ultimately, is television a good babysitter? Support your answer with examples from the text 'TV as a Babysitter'.

ii) Draw a character sketch of Rosemary Fell.

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

i) Bring out the humour in the photographer's explanation of what he had done with regard to the features of Leacock.

ii) What is Rosemary's reaction when philip refers to the lady as 'astonishingly pretty'?

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

a) Complete the sentences with an appropriate words chosen from those in brackets.

i) Nothing can _____ the fact that she is my best friend. (altar, alter)

ii) Have you seen the new _____ shop? (Stationary, stationery)

b) Match the words from 'A' with their synonyms in 'B'.

'A'		'B'	
i)	yearly	1)	basic
ii)	loving	2)	compulsory
iii)	elementary	3)	annually
iv)	futile	4)	affectionate
v)	mandatory	5)	useless

c) Differentiate between the following pairs of words and make sentences:

i) effect, affect

ii) fair, fare

d) Choose the right combinations of the words:

i) renew a contract / re-sign a contract.

ii) opposite statement / contradictory statement.

e) Pick out the word that is the closest antonym of the underlined words:

i) <u>amicable</u> - negative, surprisingly, unfriendly.

ii) <u>ambiguity</u> - guilt, clarity, liveliness.

f) Add prefixes and suffixes to the words in the brackets and rewrite the sentences:

i) We helped the people _____ town after the earthquake. (build)

ii) Could you _____ the child's shoe laces, please? (tie)

Q4) Attempt the following (any ten): **[10]**

a) Computers _____ (store) large amounts of data. (Use the correct form of the verb given in the bracket)

b) Kalidas _____ (be) a great poet. He _____ (live) 2000 years ago. (Use the correct form of the verb given in the bracket).

c) Although the water was far too dirty, Sheela did not complain. (Change into a simple sentence)

d) Even though we missed the bus, we got to office on time. (Change into compound sentence)

e) He promised to help his sister with her daughter's wedding expenses. (Change into a complex sentence)

f) Is the water cool? (Change into declarative sentence)

g) He is too busy to spare the time. (Remove 'too' and rewrite the sentence)

h) Hamid cycles to college everyday. (Change into interrogative sentence)

i) The hunter killed the tiger. (Change into passive voice)

j) The documentary on the white tiger is being made by the films division. (Change into active voice)

k) Shah said that his mother would leave the next day. (Change into direct speech)

l) The nurse said the patient, "Has the pain become worse?"

EEE

Total No. of Questions : 3]

SEAT No. :

P756

[Total No. of Pages : 1

[4817] - 1081

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

मराठी (MARATHI)

पाठ्यपुस्तक : विज्ञानसृष्टी (मराठी विज्ञान साहित्य)

(2013 पॅटर्न)

वेळ : 2 तास] *[एकूण गुण : 40*

सूचना:ह्न *1) सर्व प्रश्न सोडविणे आवश्यक आहेत.*

2) उजवीकडील अंक पूर्ण गुण दर्शवितात.

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

अ) अणुसंशोधनातील भारताचे स्थान

ब) आजच्या युवती व सामाजिक जाणिवा

क) दुष्काळ : समस्या व उपाय

प्रश्न 2) पुढीलपैकी एका प्रश्नाचे उत्तर 300 शब्दापर्यंत लिहा. **[15]**

पर्यावरणाचा समतोल ढासळण्यामागील कारणांचा आढावा लेखक राजेंद्र शेंडे यांनी कसा घेतला आहे ते 'पर्यावरण आणि मानवी जीवन' या लेखाच्या आधारे स्पष्ट करा.

किंवा

'खेळ आणि गारूडी' या कथेचा परामर्श घ्या.

प्रश्न 3) टिपा लिहा. (कोणत्याही तीन) : **[15]**

अ) आरोग्य क्षेत्र व नॅनो तंत्रज्ञान

ब) आधुनिक समाज आणि अंधश्रद्धा

क) अंतराळ क्षेत्रातील स्ववलंबी भारत

ड) 'पहाड' कथेतील पहाडाचे वर्णन

इ) विज्ञान साहित्याचे स्वरूप

फ) सौंदर्यवृद्धीतील शस्त्रक्रिया

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Total No. of Questions : 3]

SEAT No. :

P757

[Total No. of Pages : 3

[4817]-1082
S.Y.Bsc. (Semester - I)
हिंदी (HINDI)
(2013 पॅटर्न) (General)

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

समय : 2 घंटे] *[पूर्णांक : 40*

सूचनाएँ : 1) सभी प्रश्न अनिवार्य हैं।
2) दाहिनी ओर लिखे अंक के पूर्णांक हैं।

प्रश्न 1) अ) निम्नलिखित में से किन्हीं छह वाक्यों को शुद्ध करके फिर से लिखिए। **[6]**

i) राम आ रही है।

ii) सीता जा रहा है।

iii) मैं भगवान का दर्शन करने मंदिर जा रहा हूँ।

iv) मेरा आशीर्वाद तुम्हारे साथ रहेगा।

v) वह मकान गली के अंदर है।

vi) अचानक वर्षा प्रारंभ हो गया।

vii) मेरे चाचा की तीन लड़कियाँ हैं।

viii) मेरेकू कॉलेज जाना है।

P.T.O.

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

The human race knows only about 1.8 million living organisms of the estimated 10-50 million that exist on our planet. We are familiar with only a few of them which are around us. One may find a wide variety of plant and animal life which we are yet unaware of. Some of these organisms are very big while some are too small. In between these two, exist millions of diverse forms of plants and animals which differ from each other in shape, size, colour, appearance and ways of life.

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

''वह अवश्य ही रो – रोकर प्राण दे देगा, और मैं चाहता भी हूँ कि वह मेरी गोद में आ जाय और मैं दोनो को हमेशा के लिए मिला दूँ ।''

अथवा

''यद्यपि आप में से बहुत से लड़के और लड़कियाँ पिछले कई वर्षों की अवधि में कक्षा में नहीं पधारे और न आप ने परीक्षा में ही भाग लिया, पर डिग्रियाँ सबको दी जा रही हैं ।''

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

''मुझको बहुत उन्होंने माना,
फिर भी क्या पूरा पहचाना?
मैंने मुख्य उसी को जाना,
जो वे मन में लाते ।''

अथवा

''चढ़ रही थी धूप
गर्मियों के दिन
दिवा का तमतमाता रूप ।''

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

i) रामधारी सिंह 'दिनकर' ने संस्कृति और सभ्यता की पहचान किस प्रकार कराई है ?

ii) डॉ. यतीश अग्रवाल ने 'दिल का दौरा और 'एनजाइना' के संदर्भ में कौन – से उपाय बताए हैं ?

iii) मानव जीवन पर शोर से क्या परिणाम होता है ?

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

i) कवि पंत किस प्रकार का सुख चाहते हैं ?

ii) 'इतिहास का न्याय' कविता का भावार्थ स्पष्ट कीजिए ।

iii) कवि 'बच्चन' ने अपनी मनोव्यथा का चित्रण किस प्रकार किया है ?

Total No. of Questions : 4]

SEAT No. :

P758

[Total No. of Pages : 2

[4817] - 1083

S.Y. Bsc.

SANSKRIT (Semester - I)

गीर्वाणभारती (Gīrvanabhāratī)

(2013 Pattern)

Time : 2 Hours] [Max. Marks : 40

Instructions to the candidates:

1) *All questions are compulsory.*

सूचना:- *सर्व प्रश्न अनिवार्य आहेत.*

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

उजवीकडील अंक पूर्ण गुण दर्शवितात.

Q1) Write short answers in 2-4 lines on the following questions **[16]**

पुढील प्रश्नांची 2-4 ओळीत उत्तरे लिहा.

a) From which upanisad **सत्यकामजाबालकथा** is taken?

सत्यकामजाबालकथा कोणत्या ग्रंथातून घेतली आहे?

b) Which are the ways to gain the knowledge according to **सत्यकामजाबालकथा**?

सत्यकामजाबालकथेनुसार ज्ञान मिळवण्याचे मार्ग कोणते?

c) State the meaning of '**अर्थो हि कन्या परकीय एव**'

'**अर्थो हि कन्या परकीय एव**' या वाक्याचा अर्थ लिहा.

d) What is meant by **अर्चनभक्ती** in which texts it has stated?

अर्चनभक्ती म्हणजे काय? ती कोणत्या पाठात सांगितली आहे.

e) Who is the author of **उपदेशप्रबन्ध** and which **वृत्त** is used in this lesson.

उपदेशप्रबन्धाचा कर्ता कोण आणि या पाठात कोणते वृत्त योजिले आहे.

f) Explain the meaning of '**भजेदवस्थोचितां वृत्तिम**'

'**भजेदवस्थोचितां वृत्तिम्**' स्पष्ट करा.

P.T.O.

g) Explain धुर्यः कार्ये नियोक्तव्यः।

स्पष्ट करा धुर्यः कार्ये नियोक्तव्यः।

h) How many verses are inculded in the original text of उपदेशप्रबन्ध?

उपदेशप्रबंधाच्या मूळ ग्रंथात किती श्लोक समाविष्ट आहेत.

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

संक्षिप्त टीपा लिहा (कोणत्याही दोन)

a) Style of ब्राह्मणग्रंथ ब्राह्मणग्रंथांची शैली

b) काश्यपमुनिः

c) कालिदासः

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

a) भक्तिप्रकाराः

b) शंङ्कराचार्यः

c) क्षमिणा पुरूषेण भवितव्यम्

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

a) Critically appriciate च्यवनभार्गवकथा च्यवनभार्गवकथेचे रसग्रहण करा

b) Evaluate the lesson 'छायाग्राहिसत्त्वम' in modern aspect.

'छायाग्रहिसत्वम्' या पाठाचे आधुनिक संदर्भात मूल्यमापन करा.

Total No. of Questions : 4]

SEAT No. :

P761

[Total No. of Pages : 2

[4817]-1086
S.Y. B.Sc. (Vocational)
INDUSTRIAL CHEMISTRY
VOC - IND - INCH - 211 : Utilities, Unit Operations and Process Instrumentation
(2013 Pattern) (Semester-I) (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 should be drawn wherever necessary.***

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

a) Convert 137°C into °F.

b) Convert 950 mm of Hg into atm. pressure.

c) What is bound and unbound water?

d) Define primary nucleation.

e) What is the SI unit of density?

f) Write the expression for Reynold number.

g) State the principle involved in piezoelectric pressure device.

h) What are the disadvantages of hard water if used in boilers?

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

a) With the help of neat diagram explain the working of thermionic ionization gauge.

b) Write a short note on fractional distillation.

c) Distinguish between temporary and permanent hardness.

P.T.O.

Q3) Answer Any Two of the following: **[8]**

a) Write a short note on spray driers.

b) State the principle and advantages of an inclined manometer.

c) Explain the working of ultrasonic flow meter.

Q4) State and explain various types of electronic pressure devices. **[8]**

OR

What is the difference between evaporation and distillation? Discuss how evaporation is an important step in industrial process.

●●●●●

Total No. of Questions : 4]

SEAT No. :

P762

[Total No. of Pages : 2

[4817]-1087
S.Y. B.Sc. (Vocational)
BIOTECHNOLOGY-I
VOC. Biotech. - 211 : Cell and Molecular Biology Microbial Genetics
(2013 Pattern) (Semester-I) (Paper-I)

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: cell differentiation.

b) Give any two functions of cell membrane.

c) State the role of ECM.

d) What is differential centrifugation?

e) Name any two secondary messengers involved in cell signaling.

f) Define: Transcription factor.

g) What are intrors?

h) Give the role of 'ρ' factor in termination of transcription.

i) Why post translational modification of protein is essential?

j) What are functions of different histone proteins?

P.T.O.

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

a) Gap junctions.

b) Active Vs passive transport.

c) Eukaryotic genome structure.

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

a) What is DNA repair mechanism? Explain with suitable example.

b) Explain the structure and function of golgi bodies.

c) Explain with suitable example: 'C' value paradox.

Q4) Describe in detail the process of cell differentiation. **[10]**

OR

What is post transcriptional modification of mRNA? Explain diagrammatically.

●●●●●

Total No. of Questions : 4]

SEAT No. :

P1267

[Total No. of Pages : 2

[4817]-1088

S. Y. B. Sc. (Vocational)

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION

VOC-PAVOC-PAVP-211:Still Photography, Processing & Printing

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

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) Answer the following in short. **[16]**

a) The guide number of a flash light is 56. If your subject is at 10 feet from the light. What aperture you will set?

b) How is a skylight filter useful in photography?

c) Define the term 'Flash synchronization'.

d) Draw a diagram and explain the vignetting effect.

e) Two macro lenses of 100 mm focal length each are specified as 1:2 and 1:4 respectively. Which lens produces larger magnification? Why?

f) Explain why white balance setting is important in digital photography?

g) Explain the term: Filter factor.

h) What is center-weighted metering pattern? What are its advantages over the other metering patterns?

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

a) Draw a diagram and explain the term 'angle of view of a lens. Distinguish between a normal lens, tele-photo lens and a wide angle lens using this diagram.

b) Explain the terms key light, fill light and back light with reference to a standard three point lighting setup.

c) Discuss the precautions you would take while shooting for architecture of a building.

P.T.O.

Q3) Write short notes on ANY TWO of the following: **[8]**

a) Use of a polarizer filter in photography.

b) Artificial light sources used in photography.

c) Zoom lens.

Q4) Attempt ANY TWO of the following: **[8]**

a) Discuss why is artificial light useful in photography. Give suitable examples for supporting your answer.

b) Draw a labeled diagram of typical flash curve. Explain the various terms associated with a flash light with the help of this curve.

Total No. of Questions : 4]

SEAT No. :

P763

[Total No. of Pages : 2

[4817]-1089

S.Y. B.Sc. (Vocational)

ELECTRONIC EQUIPMENT MAINTENANCE (EEM)

VOC - EEM - 211 : Troubleshooting Electronic Equipment

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

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

Instructions to the candidates:

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

Q1) Answer the following:

a) State common faults in semiconductor devices. **[1]**

b) List the types of variable capacitors. **[1]**

c) What type of cleaner is used for servicing of a potentiometer? **[1]**

d) State the types of failure in Metal film Resistor. **[1]**

e) Explain the temperature sensitive test. **[2]**

f) Lsit the names of fault finding aids. **[2]**

g) What are the basic steps involved in troubleshooting of electronic equipment? **[2]**

h) List the possible causes of faults in Mica capacitor. **[2]**

Q2) Answer Any Two of the following:

a) Write a note on Nature of faults. **[4]**

b) Explain the steps involved in fault location procedure. **[4]**

c) Discuss various meaning of grounding system in Electronic Equipment. **[4]**

P.T.O.

Q3) Answer Any Two of the following:

a) State the types of fixed resistor, faults in these resistors & possible causes of faults. **[4]**

b) List different types of test and measuring instruments used for testing capacitors. **[4]**

c) What is thermister? State the names of materials used for construction of thermisters & their applications. Explain the procedure of testing the thermister. **[4]**

Q4) a) Discuss in detail the procedure adopted for testing of diodes. **[6]**

b) State different types of field effect transistor and explain the procedure involved in testing of field effect transistors. **[6]**

OR

a) Discuss the possible faults and the possible causes of failure in thyristors. **[4]**

b) State and explain the causes of equipment failures. **[4]**

c) Explain the terms: **[4]**

Block Diagram,

Wiring Diagram,

Printed circuit board,

Circuit Diagram.

●●●●●

Total No. of Questions : 4]

SEAT No. :

P764

[Total No. of Pages : 2

[4817]-1090

S.Y. B.Sc. (Vocational)

COMPUTER HARDWARE & NETWORK ADMINISTRATION

Microprocessor & Interfacing Techniques-I

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

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 Data bus?

ii) State different type of ports available in a computer.

iii) What is function of RAM?

iv) List different temperature sensors available.

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

i) What do you mean by Quad core processor?

ii) List Non Intel processors available in market.

iii) What is interrupt?

iv) What is importance of cache memory?

P.T.O.

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

a) What are main features of core i 3 processors?

b) With a neat diagram explain keyboard interface with microprocessor.

c) Write a short note on DRAM.

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

a) State features PCI BUS architecture.

b) Explain working of any one type of ADC.

c) Write a note on Minimum and Maximum mode of 8086 processor.

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

a) What is microprocessor? Explain features and specifications of 8086 processor.

b) State different types of DAC. Explain working of any one type of DAC.

c) What is software? Write a note on computer based design and development tools.

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Total No. of Questions : 4]

SEAT No. :

P765

[Total No. of Pages : 2

[4817]-1091
S.Y. B.Sc. (Vocational)
SEED TECHNOLOGY
VOC - SETE - 211 : Hybrid Seed Production
(2013 Pattern) (Semester-I) (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) Define variety.

b) Give the types of placentation.

c) What is emasculation?

d) Define genetic male sterility.

e) What is roughing?

f) What do you mean by stigma receptivity?

g) Define self incompatibility.

h) Give the types of apomixis.

i) Write the isolation distance required for Jowar hybrids.

j) What is isolation?

P.T.O.

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

a) Give an account of compact area approach.

b) Describe in detail gametocides.

c) Give the significance of apomixis.

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

a) Structure of stamen.

b) Cytoplasmic male sterility.

c) Commercial utilization of heterosis.

Q4) Give detail procedure for hybrid seed production in Arachis hypogea. **[10]**

OR

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

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Total No. of Questions : 4]

SEAT No. :

P766

[Total No. of Pages : 2

[4817]-1092
S.Y. B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
VOC - IND - MIC - 211 :Bioreactors - Designs and Operation
(2013 Pattern) (Theory) (Semester-I) (Paper-I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***All questions carry equal marks.***
4) ***Draw neat 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-off-line sensors.

b) State whether the following statements are TRUE or FALSE

The minimum amount of chromium is needed to resist corrosion will depend on the corres ponding agent in a particular environment.

c) Foam is formed when high carbohydrate containing media are used during fermentation.

d) Define - Del factor

e) State any two disadvantages of continuous sterilization over batch sterilization.

f) The largest practical diameter of the glass fermenter is _____ cm.

g) Name any two methods used for measurement of microbial biomass in fermenter.

h) Name any two types of spargers.

i) Name any two chemical substances which are used as antifoam agents in fermentation.

j) Define - continuous culture.

P.T.O.

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

a) What is an impeller? Explain different types of impellers.

b) Explain role of del factor in designing sterilization process.

c) Draw CSTR explain fed-batch mode of fermentation.

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

a) Explain mechanism of tubular bioreactor.

b) Explain various techniques used for measurement of microbial biomass.

c) Explain concept of critical parameters and its role in fermentation with suitable example.

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

a) What is cell immobilization process? Explain any three types of bioreators in detail used for immobilization of cells.

b) Explain measurement and control of dissolved oxygen in fermentation process.

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Total No. of Questions : 4]

SEAT No. :

P767

[Total No. of Pages : 2

[4817]-1093
S.Y. B.Sc. (Vocational)
INDUSTRIAL CHEMISTRY
VOC-IND-INCH-212: Inorganic Process Industries
(2013 Pattern) (Semester-I) (Paper-II)

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

Instructions to the candidates:

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

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

a) What is annealing?

b) Define clinker.

c) Give classification of refractories.

d) Write two properties of ceramics.

e) What do you understand by stress corrosion?

f) Give the uses of aluminium alloys.

g) Write two applications of enamels.

h) What is the constitution of safety glasses?

Q2) Answer any Two of the following. **[8]**

a) Discuss the important chemical properties of glass.

b) Write a short note on ferromagnetic materials.

c) Describe wet process for manufacturing of portland cement.

P.T.O.

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

a) Write a short note on special type of refractories.

b) What are the methods for prevention of corrosion?

c) Discuss types of bronze alloys and write their applications.

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

OR

Discuss the construction and working of Rotary Kiln with chemical reactions taking place in different zones.

Total No. of Questions : 4]

SEAT No. :

P768

[Total No. of Pages : 2

[4817]-1094
S.Y. B.Sc. (Vocational)
BIOTECHNOLOGY
VOC-Biotech.-212: Recombinant DNA Technology
(2013 Pattern) (Semester-I) (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) Mention any two NIH guidelines in RDT.

b) Give the role of terminal deoxynucleotidyl transferase in RDT.

c) Give an example of blunt and cutter with its recognition sequence.

d) Name two cloning vectors based on E.coli. plasmids.

e) Name two methods for transformation of non-bactirial cells.

f) Name the selectable markers present in YAC vector.

g) Name two molecules used for non radioactive labelling of nucleic acids.

h) Give any two applications of PCR.

i) Name the two methods for DNA sequencing.

j) What is structural genomics.

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

a) PCR

b) Proteomics

c) Site-directed mutagenesis.

P.T.O.

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

a) Discuss the important applications of RDT.

b) Describe any one method of DNA sequencing.

c) Explain the method of In vitro packaging for introducing recombinant phage DNA into bacterial cells.

Q4) With the help of neat labelled diagrams explain the techniques of Southern and Western hybridization. **[10]**

OR

Describe in detail cloning vectors based on bacteriophage.

Total No. of Questions : 4]

SEAT No. :

P1268

[Total No. of Pages : 2

[4817]-1095

S. Y. B. Sc. (Vocational)

PHOTOGRAPHY AND AUDIO-VISUAL PRODUCTION

VOC-PAVP-212: Fundamentals of Acoustics and Sound for Media

(Semester - I) (Paper - II) (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) Mention four basic requirements of an auditorium. **[2]**

b) What is audio delayer? **[2]**

c) Define Reverberation time. **[2]**

d) Draw a neat labeled basic crossover network. **[2]**

e) What is a microphone? Mention any two types of special microphones. **[2]**

Q2) 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 1 kHz. Loudspeaker resistance is 8Ω. **[5]**

b) State five characteristics of loudspeakers and explain them in brief. **[5]**

c) Explain the concept of resistance, inductance and capacitance in acoustical system with the help of suitable examples. **[5]**

P.T.O.

Q3) Attempt ANY TWO of the following:

a) Calculate the reverberation time for an auditorium of 1000 cubic meters having total absorption equal to 230 sabine. **[5]**

b) 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]**

c) Using neat labeled diagram, explain the functioning of bass reflex enclosure with port using suitable circuit. **[5]**

Q4) Attempt ANY TWO of the following:

a) Draw a neat labeled block diagram to explain the construction and working of a magnetic sound recording system. **[5]**

b) With the help of a neat sketch, explain the functioning of a moving coil cone type loudspeaker. Explain why it is called direct radiating type loudspeaker. **[5]**

c) 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]**

Total No. of Questions : 4]

SEAT No. :

P769

[Total No. of Pages : 2

[4817]-1096
S.Y. B.Sc. (Vocational)
ELECTRONIC EQUIPMENT MAINTENANCE
VOC-EEM-212: Audio, Video and Office Equipment-A
(2013 Pattern) (Semester-I) (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 log table and calculator is allowed.***

Q1) Answer the following:

a) State two differences between AM and FM. **[1]**

b) What is blu-ray disc? **[1]**

c) State the function of CRT. **[1]**

d) State the factors on which the speed of tape transport depends. **[1]**

e) State the need of AC bias in a tape recorder. **[2]**

f) State the principle of interlace scanning. **[2]**

g) State the use of sync pulse in TV system. **[2]**

h) State advantages of DVD over CD. **[2]**

Q2) Answer any Two of the following. **[8]**

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

b) Explain with block diagram the working of tape recorder.

c) Write a note on 'vestigial side band'.

P.T.O.

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

a) Draw a neat block diagram of video monitor.

b) What is digital television? State its advantages over analog TV.

c) Write a note on 'Home theater system'.

Q4) Answer the following. **[12]**

a) What is CCTV? Draw its block diagram and explain its working.

b) Explain with neat block diagram the working of PA system.

OR

Answer the following:

a) Draw the block diagram of LCD TV and explain its working.

b) Explain with neat block diagram the recording and replay mechanism of CD player.

Total No. of Questions : 4]

SEAT No. :

P770

[Total No. of Pages : 2

[4817]-1097

S.Y. B.Sc. (Vocational)

COMPUTER HARDWARE & NETWORK ADMINISTRATION

Computer System Administration-I

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

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 x 1 = 4]**

i) List various electronic equipments used in trouble shooting by Hardware approach?

ii) What is Corrosion?

iii) Write two ways in which beeps can be used to identity problem.

iv) List diagnostic software you know.

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

i) What is effect of electro static discharge? How to prevent it?

ii) How will you prevent your PC from the power line problems?

iii) State any two motherboard related problems.

iv) List various components on mother board.

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

a) Explain the effect of heat and cold, as contributors to system failures?

b) Describe the safety precautions you would take while troubleshooting and repairing a PC.

c) Discuss various startup and run problems with PC.

P.T.O.

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

a) Explain in brief the preventive maintenance of UPS and Power supply of a PC.

b) What do you mean by repair generated failure?

c) Write a note on Display problems.

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

a) What do you mean by preventive maintenance? What are software preventive methods?

b) Explain keyboard and mouse problems and the measures for their troubleshooting.

c) What are causes for incidents and disaster? What is importance of recovery plan?

Total No. of Questions : 4]

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P771

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[4817]-1098
S.Y. B.Sc. (Vocational)
SEED TECHNOLOGY
VOC-SETE-212:Seed Testing
(2013 Pattern) (Semester-I) (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]**

a) What is certification sample?

b) What is seed testing?

c) Give the importance of central seed testing laboratory.

d) What is ISTA?

e) Define germination.

f) Enlist methods of moisture testing.

g) Give any one principle of seed vigour testing.

h) Enlist types of seed sampling.

i) Define inert matter component of physical purity analysis.

j) What is reporting of results?

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

a) Describe general procedure for seed vigour testing.

b) Explain air oven method of moisture testing.

c) Describe in brief physical purity analysis.

P.T.O.

Q3) Write note on (any two). **[10]**

a) Seed sampling.

b) Role of international seed testing association.

c) Staffing in relation to seed testing laboratory.

Q4) Explain in detail mixing & dividing samples. **[10]**

OR

Describe in detail any two methods used for seed germination testing.

Total No. of Questions : 4]

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P772

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[4817]-1099
S.Y. B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
VOC-IND-MIC-212: Screening & Process Optimization
(2013 Pattern) (Semester-I) (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) ***All questions carry equal marks.***
4) ***Draw neat labeled diagrams wherever necessary.***
5) ***Use of scientific calculators is allowed.***

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

a) What does term by-product means in fermentation.

b) Name any two exhaust gases produced during fermentation.

c) Define: Revertant mutant

d) What is an auxotrophic mutant strain?

e) Mention any two desirable characteristics of strain to be used for industrial production.

f) _____ is used for glutamic acid fermentation is auxotrophic mutant.

g) List any two ingredients used to as Nitrogen source in a fermentation medium.

h) List the parameters to be scaled up in a fermentation process.

i) _____method is widely used for long term preservation of bacteria in vials.

j) What do you mean by Feedback Regulation?

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

a) Elaborate on the importance of development of Inoculum build -up and describe the different steps involved in Inoculum build -up with help of a flow chart.

b) What is the importance of preservation and maintenance of Industrial important organisms? Describe any two methods of preservation of Industrial important organisms.

c) Write a short note on methods of detection and isolation of Auxotrophic mutants for strain improvement procedure.

P.T.O.

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

a) Describe the methodology to isolate auxotrophic mutants that do not produce end products that exert feedback regulation (Inhibition/ Repression).

b) How does Secondary Screening help in providing information required for setting up a new fermentation?

c) Explain the objectives of scale up with respect to different parameters.

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

a) Describe the process of media optimization using Plackett-Burman Design.

b) What are the methodologies used in targeted screening.