[6054]-101
S.Y.B.Sc. (Regular)
MATHEMATICS
MT - 231 : Calculus of Several Variables
(2019 Pattern) (Credit system) (Semester - III) (Paper -I) (23111)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
  1)   All questions are compulsory.
  2)   Figures to the right indicate full marks.

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

  a)   Evaluate $f(3,2)$, if $f(x,y) = x \, ln \, (y^2{-}x)$

  b)   show that

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

   does not exist.

  c)   If $f(x,y) = 4 - x^2 - 2y^2$, find $f_x(1,1)$

  d)   Define wave equation.

  e)   Find the critical points of a function $f(x,y) = y^2{-}x^2$.

  f)   Find $\int_0^5 f(x,y)\,\mathrm{d}x$, if $f(x,y) = 12x^2y^3$.

  g)   Find the Jacobian of the transformation $x = 5u{-}v, \ y = u + 3v$.

Q2) a)   Attempt any ONE of the following.   **[5]**

  i)   Define function of two variables, domain and range of function of two variables. Find the domain and range of $f(x,y) = \sqrt{9 - x^2 - y^2}$

ii) Define two dimensional Laplace equation and harmonic functions. Show that the function $u\ (x,y) = e^x \sin y$ is a solution of laplace equation.

b) Attempt any one of the following. [5]

i) Determine the set of points at which the function $f\ (x,y,z) = \arcsin (x^2+y^2+z^2)$ is continuous.

ii) If $z = f\ (x,y) = x^2+3xy-y^2$ and x changes from 2 to 2.05 and y changes from 3 to 2.96, compare the values of increment Δz and the differential dz.

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

i) Suppose that $z = f(x,y)$ is a differentiable function of x and y, where $x = g(t)$ and $y = h(t)$ are both differentiable functions of t. Then show that z is a differentiable function of t and

$$\frac{dz}{dt} = \frac{\partial z}{\partial x}\frac{dx}{dt} + \frac{\partial z}{\partial y}\frac{dy}{dt}.$$

ii) If $f(x,y)$ is a homogeneous function of degree n and $f(x,y)$ has continuous second - order partial derivatives, then show that

$$x\frac{\partial f}{\partial x} + y\frac{\partial f}{\partial y} = n\ f(x,y).$$

b) Attempt any one of the following. [5]

i) Find the shortest distance from the point $(1,0,-2)$ to the plane $x + 2y + z = 4$, using second derivative test for a function of two variables.

ii) Find the extreme values of the function $f(x,y) = x^2+2y^2$ on the circle $x^2+y^2 = 1$ using the method of lagrange multipliers.

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

    i)   State fubini's theorem for double integral. Show that if

    $f(x,y) = g(x) h(y)$ and R = [a,b]×[c,d], then

$$\iint_R f(x,y)\, dA = \int_a^b g(x)dx \int_c^d h(y)dy.$$

    ii)   State the formula to change rectangular coordinates to polar coordinates in a double integral. Hence evaluate $\iint_R (3x+4y^2)dA$,where R is the region in the upper half plane bounded by the circles $x^2+ y^2=1$ and $x^2+y^2=4$.

  b)   Attempt any one of the following.   [5]

    i)   Sketch the region of integration and change the order of integration $\int_0^1 \int_0^y f(x,y)dx\, dy.$

    ii)   Evaluate $\int_0^1 \int_x^{2x} \int_0^y 2x\, yz\, dz\, dy\, dx.$

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S.Y.B.Sc. (Regular)
MATHEMATICS
MT - 232 (A) : Numerical Methods and its Applications
(2019 Pattern) (Credit System) (Semester - III) (23112A) (Paper - II)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:
1) All questions are compulsory.
2) Figures to the right indicate full marks

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

a) Evaluate $\Delta(a^{2x})$ take h = 1

b) Evaluate $\int_{0}^{1} x^2 dx$ by Trapezoidal rule take h = 0.5.

c) Write Runge - Kutta second order formula for $\dfrac{dy}{dx} = f(x, y), y(x_0) = y_0$.

d) Write the for $y_1^{(n+1)}$ in Modified Euler's method.

e) Define Absolute error.

f) Find the first approximation x_1 to the root of $x^3 - 18 = 0$ by Newton - Raphson method with $x_0 = 2.5$

g) Simplify $E^2(5x)$ take h=1 where E is shift operator.

Q2) a)   Attempt any ONE of the following.   [5]

      i)   Write the rules for round - off the number to significant figure.

      ii)   Explain Euler's method to solve $\dfrac{dy}{dx} = f(x, y)$ with $y(x_0) = y_0$

  b)   Attempt any ONE of the following   [5]

      i)   Find $\sqrt[3]{13}$ by Newton - Raphson method (Two iterations) with $x_0 = 2.5$

      ii)   Find log 3.7 using Lagrange's interpolation formula

x	3	3.5	4
$\log x$	1.09861	1.25277	1.3863

Q3) a) Attempt any ONE of the following   [5]

      i)   Explain Taylor's series method to solve initial value problem

      ii)   Derive the formula for $\dfrac{dy}{dx}$ at $x = x_0$ in terms of Δ.

  b)   Attempt any ONE of the following.   [5]

      i)   Find y when $x = 1$ by Runge -Kutta fourth order method given that

$$\frac{dy}{dx} = \frac{y-x}{y+x}, \ y(0) = 1, \ h = 1$$

      ii)   Find the root of $xe^x - 2 = 0$ between 0.5 and 1 by Regula-Falsi method (Two iterations).

Q4) a) Attempt any ONE of the following. [5]

      i)   Explain bisection method to find approximate root of $f(x) = 0$.

      ii)   Derive Lagrange's interpolation formula.

  b) Attempt any ONE of the following. [5]

      i)   Evaluate $\int_{4}^{5.2} \log_e x \, dx$ by Simpson's $\dfrac{3}{8}$ rule with $h = 0.2$

      ii)   Find y (0.1) using Runge - Kutta second order method given that

           $\dfrac{dy}{dx} = x + y$ with y (0) = 1, h = 0.1

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S.Y. B.Sc.

PHYSICS - I

PHY - 231 : Mathematical Methods in Physics

(2019 Pattern) (CBCS) (Semester - III) (Paper - I) (23121)

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

Instructions to the candidates:

 1) *Question 1 is compulsory.*
 2) **Solve any three questions from Q2 to Q5.**
 3) **Questions 2 to 5 carry equal marks.**
 4) **Figures to the right indicate full marks.**
 5) *Use of calculator is allowed.*

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

 a) If $z = x + iy$, then what is modulus of Z?

 b) Define partial differentiation equation.

 c) Find the total differential of the function, $F = f(x,y) = 2xy^2$.

 d) State law of polygon of vectors.

 e) If $\dfrac{d^2y}{dt^2} + w^2 y = F_0 \sin qt$ then write its degree and order.

 f) State theorems of differentiation.

Q2) Answer the following :

 a) i) If $z = r(\cos\theta + i\sin\theta)$ is a polar form of a complex number, then
    obtain the exporiential form of a complex number. **[3]**

  ii) Find area of a triangle having vertices at P(1,3,2), Q(2, –1, 1),
    R(–1, 2, 3). **[3]**

<div align="center">OR</div>

 a) What is a scalar triple product and vector triple product. Show that the
  scalar triple product represents the volume of a parallelopiped. **[6]**

b) Find the possible percentage error in computing the parallel resistance r of three resistances r_1, r_2, r_3 from the formula $\dfrac{1}{r} = \dfrac{1}{r_1} + \dfrac{1}{r_2} + \dfrac{1}{r_3}$ if r_1, r_2, r_3 are each in error by 1.4%. **[4]**

Q3) Answer the following question :

a) i) Define the gradient of a scalar field, the divergence of a vector field and a solenoidal vector field. **[3]**

ii) Find the work done in the moving an object along a vector $\vec{r} = 6\vec{i} + 3\vec{j} + 4\vec{k}$, if applied force is $\vec{F} = 4\vec{i} + 3\vec{j} - 3\vec{k}$. **[3]**

OR

a) If $F = f(x,y) = x^3 y - e^{xy}$, show that $F_{yx} = F_{xy}$, Also find F_{xx}, F_{yy}, F_{yyy} and F_{yxx}. **[6]**

b) Determine different values of the fifth root of $1 + i\sqrt{3}$. **[4]**

Q4) Answer the following questions :

a) i) If $\vec{a}, \vec{b}, \vec{c}$ be three vectors such that $\vec{a} + \vec{b} + \vec{c} = 0$, prove that $\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$. **[3]**

ii) Show that $\vec{F} = (y^2 + 2xz^2)\hat{i} + (2xy - z)\hat{j} + (2x^2 z - y + 2z)\vec{k}$ is irrotational. **[3]**

OR

Determine the directional derivative of $Q = 4xz - 3xy^2 + zy^2 x$ at $(1, -1, 2)$ in the direction of $(\vec{i} - 2\vec{j} + \vec{k})$. **[6]**

b) Decide the degree and order of the differential equations. **[4]**

i) $\dfrac{d^2 y}{dx^2} + \sqrt{\dfrac{dy}{dx}} + y = 0$

ii) $\dfrac{d^3 y}{dx^3} + \sqrt[3]{\left(\dfrac{dy}{dx}\right)^2} + y^2 = 0$

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

a) If $F = f(x,y)$, write the equation for total differential and necessary condition for exact differential.

b) Determine the values of x and y, if $x + iy = (1 + i\sqrt{3})^4$.

c) If $u = x^2 + y^2$, where $x = at^2$, $y = 2at$ find $\dfrac{du}{dt}$ using chain rule.

d) Define and explain the terms :

   i)   field

   ii) scalar field

   iii) vector field

e) What is ordinary differential equation? State any three differential equations.

f) $x + iy = \dfrac{1 + 2i}{1 - 4i}$, determine x and y.

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S.Y. B.Sc. (Semester - III)
PHYSICS
PHY-232(A) : Electronics
(2019 Pattern) (CBCS) (Paper - IIA) (23122A)

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

Instructions to the candidates:

1) *Question 1 is compulsory.*

2) *Solve any 3 questions from Q2 to Q5.*

3) *Questions 2 to 5 carry equal marks.*

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

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

Q1) Solve any <u>Five</u> of the following : **[5]**

a) State Thevenin's theorem.

b) Draw the symbol of UJT.

c) Define Q-point (operating point) of transistor.

d) What is Barkhausen criterion of oscillation?

e) Calculate the gain of an inverting amplifier. The value of input resistance is $10k\Omega$ and that of feedback resistance is $100\ k\Omega$.

f) Convert $(4BAC)_{16}$ to $(?)_2$.

Q2) Answer the following :

a) Draw input, output and transfer characteristics curves of CE configuration of transistor. Hence define the terms - **[6]**

i) Input resistance

ii) Active region

iii) Saturation region

<p style="text-align:center">OR</p>

a) Define transistor biasing? Describe 'voltage divider bias' method. **[6]**

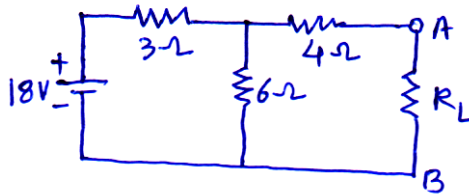b) State and prove De-Morgan's theorems. **[4]**

Q3) Answer the following :

  a) Draw circuit diagram of inverting amplifier. Hence obtain equation for the gain.   **[6]**

<div align="center">OR</div>

  a) Define feedback. Obtain equation of gain of amplifier with negative feedback.   **[6]**

  b) For the given circuit, calculate the value of R_L for which the power dissipated in it would be maximum.   **[4]**
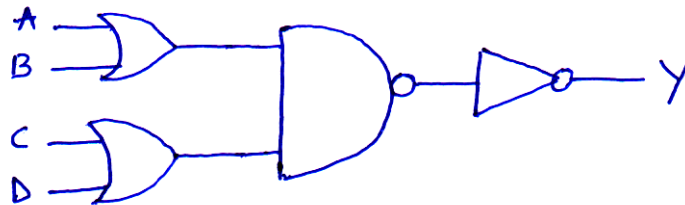

Q4) Answer the following :

  a) Explain the construction and working of UJT.   **[6]**

<div align="center">OR</div>

  a) Explain with circuit diagram op-amp as an Adder.   **[6]**

  b) Find the Boolean expression for the output of following figure. Evaluate it when, A= 0, B = 1, C = 1, D = 0   **[4]**

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

  a) Current Divider circuit.

  b) Current gain factors α and β.

  c) Transistor as a switch.

  d) Concept of virtual ground

  e) AND GATE

  f) Ideal characteristics of op-Amp.

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S.Y. B.Sc. (Semester - III)
PHYSICS
PHY-232(B) : Instrumentation
(2019 Pattern) (CBCS) (Paper - II) (23122B)

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

Instructions to the candidates:

1) *Question 1 is compulsory.*
2) *Solve any 3 questions from Q2 to Q5.*
3) *Question 2 to 5 carry equal marks.*
4) *Use of calculator is allowed.*
5) *Figures to the right indicate full marks.*

Q1) Solve any <u>Five</u> of the following : **[5]**

a) What is linearity?

b) State seebeck effect.

c) What is a cantilevel beam?

d) State four units of pressure.

e) What are dynamic characteristics?

f) What is gain of an amplifier in non-inverting mode?

Q2) Answer the following questions.

a) What is a thermistor? Explain what is NTC and PTC. State apllications of thermistors. **[6]**

OR

a) Explain principle and working of bimetallic thermometers. State their applications. **[6]**

b) Write working principle of a platinum resistance thermometer. **[4]**

Resistance of the planium wire of a platinum resistance thermometer at ice point is 6Ω and at steam point 6.93Ω. When platinum wire is heated in bath, its resistance is found to be 6.795Ω. Calculate the temperature of the bath.

Q3) Answer the following questions :

a) Write a note on 'Thermal element as first order system of measurement'.
[6]

OR

a) i) What are static characteristics of a typical measurement system? Explain what do you understand by accuracy and precision. [3]

ii) Write a note on liquid filled thermometer. [3]

b) Define sensitivity of an instrument. When input voltage of an instrument changes from 10V to 12V, the corresponding output voltage changes from 50V to 60V. What will be the sensitivity of the instrument? [4]

Q4) Answer the following questions :

a) Explain different types of classification of transducers. [6]

OR

a) i) With the help of a neat diagram, explain working of a voltage to current converter. [4]

ii) Define acquisition time and droprate. [2]

b) Calculate the gain of non-inverting amplifier when input resistance at inverting terminal is 20 kΩ and feedback resistance is 200kΩ. If feedback resistance is doubled, what is the change in voltage gain. [4]

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

a) Hysteresis

b) Buffer amplifier

c) Temperature scales

d) Linear Potentiometer

e) Bonded Strain Gauge

f) Low pass filter

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S.Y.B.Sc. (Regular)
CHEMISTRY
CH - 301 : Physical and Analytical Chemistry
(2019 Pattern) (CBCS) (Semester - III) (Paper - I) (23131)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
　　1)　Q.1 is compulsory.
　　2)　Solve any three questions from Q.2 to 5.
　　3)　Questions 2 to 5 carry equal marks.
　　4)　Use of logtables and calculator allowed.

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

　　a)　Define adsorbent.

　　b)　Define the term precision.

　　c)　Which is the best Indicator for weak acid strong base titration?

　　d)　What is rate constant?

　　e)　What is a standard solution?

　　f)　Define energy of activation.

Q2) a)　Write any two of the following.   **[6]**

　　　i)　What is accuracy? Explain the methods of expressing accuracy.

　　　ii)　What are redox indicators? Explain with suitable example.

　　　iii)　Define zero reading, infinite reading and Half life period.

　　b)　Derive mathematical expression for first order reaction.   **[4]**

Q3) a)　Write any two of the following.   **[6]**

　　　i)　Differentiate between physiosorption and chemisorption.

　　　ii)　What is complexometric titration? Explain with EDTA as complexing agent.

　　　iii)　Explain the characteristics of second order reaction.

　　b)　The time for 50% completion of a first order reaction is 30 minutes. Calculate the time required for 80% completion of the reaction.   **[4]**

Q4) a) Write any two of the following. **[6]**

   i) What is a second order reaction? Derive equation for second order with equal initial concentration.

   ii) Explain the terms

   1) End point

   2) Equivalence point

   3) Neutralization point.

   iii) What is catalyst? Explain the surface phenomenon of catalysis with different steps involved in it.

   b) Calculate the pH of 0.1N acetic acid solution.

   (Given : $Ka = 1.75 \times 10^{-5}$) **[4]**

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

   a) Explain Freundlich Adsorption Isotherm.

   b) What are the causes of operational and personal errors?

   c) What is oxidation number? Calculate the oxidation state of Mn in $KMnO_4$.

   d) Define primary substance? What requirements should be fulfilled by primary substance?

   e) Explain the neutralisation curve for weak acid and strong base titration.

   f) What are the determinate errors? Give classification of determinate errors.

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S.Y. B.Sc.

CHEMISTRY

CH-302: Inorganic and Organic Chemistry

(2019 Pattern) (CBCS) (Semester - III) (23132) (Paper - II)

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

Instructions to the candidates :

    1)   *Q.1 is compulsory.*

    2)   *Solve any three questions from Q.2 to Q.5.*

    3)   *Questions 2 to 5 carry equal marks.*

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

Q1)   **Solve any <u>five</u> of the following :**   **[5]**

    a)   State L.C.A.O. principle.

    b)   What is the bond order of He_2 Molecule?

    c)   Define ligand.

    d)   State Huckel's rule of aromaticity.

    e)   Draw the structure of Benzyne.

    f)   What is hydrogen bonding?

Q2)   a)   **Attempt any <u>two</u> of the following :**   **[6]**

        i)   Give the assumptions of MOT.

        ii)   Draw energy level diagram for B_2 molecule and calculate bond order.

        iii)   What is electrophilic substitution reaction? Explain nitration of benzene.

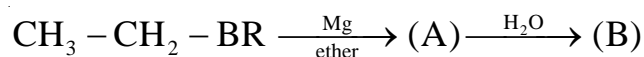b) **Attempt the following :** [4]

    i)   Name the types of equilibrium constants.

    ii)   State the effective atomic number rule.

Q3) a) **Attempt any <u>two</u> of the following :** [6]

    i)   Explain the formation of carbon molecule on the basis of MOT.

    ii)   Explain Sandmeyer reaction with suitable example.

    iii) What is lucas reagent? How will you distinguish primary, secondary and tertiary alcohol.

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

    i)   Identify product 'A' and 'B'

$$CH_3 - CH_2 - BR \xrightarrow[\text{ether}]{Mg} (A) \xrightarrow{H_2O} (B)$$

    ii)   Explain primary valency and secondary valency.

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

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

    ii)   What is stabilisation energy and bond order of Li_2 molecule?

    iii) Give any two methods for preparation of phenol.

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

    i)   Give molecular orbital configuration of O_2 molecule and calculate bond order.

    ii)   Identify products 'A' and 'B'

$$\xrightarrow[\text{Pyridine}]{SOCl_2} (A) \xrightarrow{KCN} (B)$$
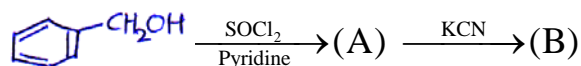
Q5) **Attempt any <u>four</u> of the following :** [10]

a) Sketch the σ MO formed from the combination of 'S and 'P' atomic orbitals.

b) Give the molecular formula of the following coordination compounds.

   i) Pentacarbonyl iron(o)

   ii) Lithium tetrahydrido aluminate (III)

   iii) hexaamine iron (III)

c) Explain Kolbe Synthesis.

d) What are alcohols? Give the classification of alcohols.

e) Write note on Williamson's Synthesis.

f) Explain sulphonation of benzene.

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S.Y.B.Sc. (Regular)
BOTANY
BO - 232 : Plant Physiology
(CBCS 2019 Pattern) (Semester - III) (Paper - II) (23142)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
1) *Question1 is compulsory.*
2) *Attempt any three questions from Q.2 to Q.5.*
3) *Question 2 to question 5 carry equal marks.*
4) *Figures to right indicate full marks.*
5) *Draw neat labelled diagrams wherever necessary.*

Q1) Attempt <u>any five</u> of the following.   **[5]**

   a)   Explain any two applications of plant physiology.

   b)   Enlist any two internal factors affecting rate of water absorption.

   c)   Define ascent of sap.

   d)   What are antitranspirants?

   e)   Define biofertilizer.

   f)   What is physiological dormancy?

Q2) a)   Define transpiration. Explain opening and closing of stomata with K^+ pump theory.   **[6]**

     b)   Explain methods to break seed dormancy.   **[4]**

Q3) a)   Define N_2 fixation. Explain the symbiotic N_2 fixation in plants.   **[6]**

     b)   Explain passive absorption of water.   **[4]**

Q4) a)   What is vernalization? Explain any four applications of vernalization. **[6]**

     b)   Describe Guttation.   **[4]**

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

  a) Denitrification

  b) Significance of seed dormancy

  c) Factors affecting ascent of sap

  d) Scope of plant physiology

  e) Exudation

  f) Application of photoperiodism.

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S.Y. B.Sc.

ZOOLOGY

ZO - 231 : Animal Diversity - III (Theory)

(2019 Pattern) (CBCS) (Paper - I) (Semester - III) (23151)

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

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

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

    a)   Agnatha.

    b)   Heterocercal fin.

    c)   Ichthyophis.

    d)   Scientific name of dog fish.

    e)   Function of Lateral line organ in fishes.

    f)   Polyphyodont dentition.

Q2) a)   Describe female reproductive system of scoliodon.   **[6]**

                  OR

    Explain general characters of cephalochordata.

    b)   Give general characters of cyclostomata.   **[4]**

Q3) a)   Give an account of general characters of pisces.   **[6]**

                  OR

    Explain Habit, Habitat and external characters of scoliodon.

    b)   Describe parental care in Amphibia.   **[4]**

Q4) a) Sketch and label dorsal view of brain of scoliodon. **[6]**

<div align="center">OR</div>

Write down classification of phylum chordata upto class level.

b) Give general characters of cartilagenous fishes. **[4]**

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

a) Urodela.

b) Shagreen.

c) Homodont dentition.

d) Liver of shark.

e) Salient features of class Apoda.

f) Food of scoliodon.

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S.Y. B.Sc. (Theory)
ZOOLOGY
ZO-232: Applied Zoology - I
(2019 Pattern) (CBCS) (Semester - III) (Paper - II) (23152)

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

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

Q1) Solve any <u>FIVE</u> of the following : **[5]**

a) What is deflossing?

b) What is agricultural pest?

c) Write a biological name of mulberry silkmoth.

d) What is IPM?

e) What is reeling?

f) Give any two examples of stored grain pest.

Q2) a) Describe life cycle of <u>Bombyx</u> <u>mori</u>. **[6]**

OR

Describe life cycle of Rice weevil.

b) Describe in brief rearing house of silkworm. **[4]**

Q3) a) Describe the marks of identification, nature of damage and control measures of Red cotton bug. **[6]**

<div align="center">OR</div>

Explain bed clearing methods of silkworm rearing.

b) Explain the cyanogas pump. **[4]**

Q4) a) Describe the post harvest processing of cocoons. **[6]**

<div align="center">OR</div>

Explain Cultural and Biological control measures of pest.

b) Describe any two methods of prunning. **[4]**

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

a) Eri silkworm.

b) Nature of damage caused by rat.

c) Stifling.

d) Nursary Pests.

e) Leaf plucking.

f) Veterinary pests.

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[6054]-112
S.Y.B.Sc.
GEOLOGY
GL - 211 : Structural Geology
(2019 Pattern) (Semester - III) (Regular) (23161) (Credit System)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
  1) *Question1 is compulsory.*
  2) *Solve any three questions from Q.2 to Q.5.*
  3) *Q 2 to Q 5 carry equal marks.*
  4) *Neat diagrams must be drawn wherever necessary.*

Q1) Answer the following. (any 5)   **[5]**

  a)   Define strike.

  b)   Strike and dip symbol of horizontal and vertical strata.

  c)   Draw Anticline Asymmetric fold.

  d)   Define stress.

  e)   Define Boudinage.

  f)   Use of GPS in structural Geology.

Q2) Answer the following.

  a)   What is rock deformation? Explain brittle and ductile deformation.   **[6]**

  b)   Explain parts of folds.   **[4]**

Q3) Answer the following.

  a)   Determination of top of bed by primary sedimentary structure.   **[6]**

  b)   Geometric classification of faults.   **[4]**

Q4) Answer the following.

   a)   Define fracture. Explain genetic types of fractures.   **[6]**

   b)   What is compass? Explain fore bearing and back bearing.   **[4]**

Q5) Write a note on (any five).   **[10]**

   a)   Rotational movement of fault

   b)   Calculation of net slip

   c)   Plunging and non-plunging fold

   d)   Brunton compass

   e)   Rake and plunge

   f)   Genetic classification of joints.

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[6054]-113

S.Y.B.Sc. (Regular)

GEOLOGY

GL - 212 : Palaeontology

(2021 Pattern) (Semester - III) (Paper - II) (23162 B)

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

Instructions to the candidates:

1) *Question no.1 is compulsory.*

2) *Solve any three questions from Question 2 to Question 5.*

3) *Question No. 2 to 5 carry equal marks.*

Q1) Answer the following question in 2-3 line (ANY FIVE) One mark each.   **[5]**

    a)   Define mega fossils.

    b)   What is mutation?

    c)   Enlist periods of Palaeozoic Era.

    d)   Define microfossils.

    e)   Enlist branches of palaeontology

    f)   Define index fossil.

Q2) Answer the following

    a)   Give an account of modes of preservation of fossils.   **[6]**

    b)   What are stromatolites?   **[4]**

Q3) Answer the following

    a)   Give Classification, morphological characters and Geographical distribution of Phylum Mollusca Class Bivalvia.   **[6]**

    b)   Explain uses of micro-palaeontology.   **[4]**

Q4) Answer the following.

  a) Explain field and laboratory techniques for collection of microfosslis.**[6]**

  b) Give morphological characters of Phylum Arthropoda.   **[4]**

Q5) Write short notes on any Four (2.5 marks each).   **[10]**

  a) Uses of fossils

  b) Branches of micropalaeontology

  c) Microevolution

  d) Body parts of trilobite

  e) Ichnofossils

  f) Skeleton of belemnites

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[6054]-114

S.Y. B.Sc.

STATISTICS

ST - 231 : Discrete Probability Distributions and Time Series

(2019 Pattern) (Semester - III) (23171)

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

Instructions to the candidates:

   1)   *All questions are compulsory.*

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

   3)   *Use of calculator and statistical table is allowed.*

   4)   *Symbols and abbreviations have their usual meanings.*

Q1) Attempt each of the following :   **[5]**

  A)   Choose the correct alternative in each of the following :

      a)   If $X \to NB\ (9, 0.6)$ then Var (X) is

         i)   10   ii)   9

         iii)   5.4   iv)   6

      b)   If $(X_1, X_2, X_3) \to MD\ (n, p_1, p_2, p_3)$ then CoV (X_1, X_3) is

         i) $n\ p_1\ p_3$ ii) $-n\ p_1\ p_3$

         iii) $n\ p_1\ q_1$ iv) $n\ p_3\ q_3$

      c)   In time series analysis, method of simple averages is used to estimate.

         i)   Trend   ii)   Seasonal Indices

         iii)   Cyclical variation   iv)   Random variation

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

      a)   Truncated distribution is distribution over a reduced range of corresponding r.v.

      b)   If $(X_1, X_2, ...X_k) \to MD\ (n, p_1, p_2, ... p_k)$ then number of variables in the real sense are K.

P.T.O.

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

    a)   State c.g.f. of negative binomial distribution and hence find mean and variance.

    b)   Define multinomial distribution of k dimentional random vector $\underline{X} = (X_1, X_2, ... X_k)$. Derive its joint m.g.f.

    c)   Describe the method of ratio to trend for computing seasonal indices.

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

    a)   State and prove additive property of negative binomial distribution.

    b)   Define poisson distribution truncated below at x = 0 and find its mean.

    c)   State the equation of exponential smoothing. Discuss the following cases of smoothing constant :

        i) $\alpha = 0$,

        ii) $\alpha = 1$

        iii) α closer to 0

        iv) α closer to 1

Q4) Attempt any one of the following :

    a)   i)   Estimate trend for 2022 by fitting straight line equation for the following time series. **[7]**

Year	2014	2015	2016	2017	2018	2019	2020	2021
Profit (in '000 Rs.)	90	100	102	93	104	109	102	114

        ii)   What is truncated distribution. State the p.m.f. of truncated binomial distribution at x = 0. Also give one real life situation. **[3]**

    b)   i)   Ten independent observations are made on a r.v. X having p.d.f.

$$f(x) = \frac{1}{3} \; ; \; 1 \leq x \leq 4$$

$$= 0 \; ; \; \text{otherwise}$$

Using the multinomial law, find the probability that 4 observations will be less than mean, 3 will be grater than mean but less than 3 and remaining observations grater than 3. **[7]**

        ii)   Define time series. State its utility. **[3]**

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[6054]-115

S.Y.B.Sc. (Regular)
STATISTICS
ST 232 : Continuous Probability Distributions
(2019 Pattern) (Semester -III) (Credit System) (23172)

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

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

Attempt each of the following

Q1) A) Choose the correct alternative in each of the following :   **[1 each]**

  a) If X and Y are independent random variables (r.v.) then E(X/Y) is

    i)   E(X) / E(Y)   ii)   1/Y E(X)

    iii) X E(1/Y)   iv)   E(X). E(1/Y)

  b) For U(a, b) distribution Q_2 is

    i) $(Q_3+Q_1)/2$ ii) $(Q_3- Q_1)/2$

    iii) $Q_1+Q_{3/2}$ iv) $Q_3+Q_{1/2}$

  c) If x → Exp (Mean = 2) then P(X> x) is

    i)   exp (-2x)   ii)   1- exp (-2x)

    iii) exp (- x/2)   iv)   1- exp (-x/2)

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

  a) For joint r.v.(X, Y) E(X/Y) is the function of X.

  b) The mean of U (a, b) distribution is $\dfrac{a+b}{2}$.

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

a) Find moment generating function (m.g.f.) of $N(\mu, \sigma^2)$ distribution. Hence find the distribution of $Y = 2X + 3$.

b) State and interprete lack of memory property of exponential distribution.

Hence if $X \rightarrow Exp$ (Mean $= 4$) find $P(X>5 / X>2)$.

c) If X is r.v. with probability density function (p.d.f)

$f(x) = 4(x-3)^3 ; \ 3 \le x \le 4$

$\quad = 0 \qquad$; otherwise

find E(X) and median. Also comment on skewness.

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

a) If X and Y are independent standard normal variables.

Find $P(X + Y \le 1, X - Y \le 0)$.

b) A r.v. X has p.d.f.

$f(x) = \dfrac{(x^2 e^{-x})}{2} ; \ x \ge 0$

$\quad = 0 \qquad$; otherwise

Find $E(X^r)$, r>0. Hence find third order central moment.

c) Find Var $(2X+Y)$ where X and Y are independent r.v with joint p.d.f.

$f(x,y) = 1/8 ; 0 \le x \le 2, 0 \le y \le 4$

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

  a)   i)   Obtain the points of inflexion of $N(\mu, \sigma^2)$ distribution.   **[7]**

   ii) $E(Y/X) = 7+8X$ .Find E (Y) if $E(X) = 10$.   **[3]**

  b)   i)   Let r.v. x follow $U(a, b)$ distribution the find p.d.f. of $Y = \dfrac{b - x}{b - a}$.   **[3]**

   ii)   The joint p.d.f of r.v.(x, y) is

     $f(x, y) = 1 ; 0 < x < 1, -x < y < x$

     $= 0$; otherwise.

    Find marginal p.d.f. of x. Also find E(Y/X).   **[7]**

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S.Y.B.Sc (Regular)

GEOGRAPHY - II

Gg -232 : Geography of Maharashtra (Physical - I)

(2019 CBCS Pattern) (Semester - III) (Theory) (Paper - II) (23182)

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

Instructions to the candidates:

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

Q1) Answer the following question in 20 words (Any Five). **[5]**

a) What is Deccan traps?

b) Name any two major rivers in Maharashtra.

c) List the name of highest peaks in the western ghat.

d) What is mean by monsoon?

e) Define term soil.

f) What do you mean by 'agroforestry'.

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

i) Explain the precombarian rocks in Maharashtra.

ii) Describe very high rainfall region in Maharashtra.

iii) Give an account the regur soil in Maharashtra.

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

i) Explain the location and extent of the state of Maharashtra.

ii) Describe the physiography of the Kokan coast.

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

      i) Explain the characteristics of western flowing rivers in Maharashtra.

      ii) Explain the break in monsoon in Maharashtra.

      iii) Explain the administrative divisions of Maharashtra.

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

      i) Write various methods of soil conservation.

      ii) Write a note on 'The Bombay Presidency'.

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

      i) Explain the Maratha empire in Maharashtra.

      ii) Describe the tributaries of Krishna river.

      iii) Explain temperature distribution in Maharashtra.

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

      i) Explain the sub hill ranges of sahyadri.

      ii) Explain causes of deforestation in Maharashtra.

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

  a) Relative location of Maharashtra.

  b) Maharashtra plateau

  c) Rivers of the Konkan

  d) Drought prone region of Maharashtra

  e) Lateritic soil in Maharashtra

  f) Tropical evergreen forest

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S.Y. B.Sc.

MICROBIOLOGY

MB - 231: Medical Microbiology and Immunology

(2019 Pattern) (CBCS) (Semester - III) (23191)

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

Instructions to the candidates :

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

Q1) Answer ANY FIVE of the following : **[5]**

a) Define Virulence.

b) State true or false.
   'A disease is constantly present but limited to a particular region is called sporadic disease'.

c) State true or false.
   'Humoral immunity involves production of antibodies that act against foreign organisms and substances'.

d) Define Innate immunity.

e) Antibodies are also known as _____.
   i) Immunoglobulins   ii) Immunogens
   iii) Albumin   iv) Antigens

f) The lowest concentration of an antimicrobial agent that will inhibit growth of a microorganism is known as
   i) MIC   ii) MBC
   iii) LD50   iv) Antibiotic sensitivity

P.T.O.

Q2) a) Describe ANY TWO of the following : **[6]**

      i) Toxins of <u>Staphylococcus</u> <u>qureus</u>.

      ii) Formation of lymphoid linage cells.

      iii) Laboratory diagnosis of dermatophytoses.

   b) Describe in detail 'ABO' blood group system. **[4]**

Q3) a) Explain ANY TWO of the following : **[6]**

      i) Inheritance of 'ABH' antigen.

      ii) Extracellular enzymes of <u>Staphylococcus</u> <u>qureus</u>.

      iii) Bombay blood group.

   b) Describe morphological and cultural characteristics of <u>E. coli</u>. **[4]**

Q4) a) Discuss ANY TWO of the following : **[6]**

      i) Active Immunization.

      ii) Antagonism in drug administration.

      iii) Concept of drug resistance.

   b) Describe Pathogenesis and Laboratory diagnosis of candidiasis. **[4]**

Q5) Write Short notes on ANY FOUR of the following : **[10]**

   a) Antigenic structure of <u>E. coli</u>.

   b) Bioavailability.

   c) Granulocytes.

   d) Medicolegal applications of blood group.

   e) Antibiotic sensitivity.

   f) Passive immunization.

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[6054]-121

S.Y.B.Sc. (Regular)
NANOSCIENCE AND NANOTECHNOLOGY
NS - 232 : Properties of Nanomaterials
(Physical, Chemical, Optical & Magnetic)
(2019 Pattern) (Credit System) (Semester - III) (Paper - II) (23262)

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

Instructions to the candidates:
1) *Question1 is compulsory.*
2) *Solve any three questions from Q. 2 to Q. 5.*
3) *Question 2 to 5 carry equal marks.*
4) *Draw neat & labeled diagrams wherever necessary.*
5) *Figures to the right indicates full marks.*

Q1) Attempt any <u>FIVE</u> of the following.　　　　　　　　　　　**[5]**

   a)　What is Bohr radius?

   b)　What is mean by transmission?

   c)　Write down different types of hardness test.

   d)　Define ferrimagnetism.

   e)　What is mean by blocking temperature?

   f)　What is hydrophobicity?

Q2) a)　Attempt any <u>ONE</u> of the following:　　　　　　　　**[6]**

     i)　With labeled diagram explain the Atomic Absorption Spectroscopy.

     ii)　Explain scanning Electron micro scopy with proper diagram.

   b)　What are excitons? Explain types of excitons.　　　　　**[4]**

Q3) a)　Attempt any <u>ONE</u> of the following:　　　　　　　　**[6]**

     i)　Explain giant magneto resistance (GMR) in detail.

     ii)　Explain diamagnetism in brief.

   b)　Explain oral respiratory tract.　　　　　　　　　　　**[4]**

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

      i)   What is luminescence. Explain cathodoluminescence in brief.

      ii)   Explain electroluminescence in detail.

   b)   Explain tribology in brief.   **[4]**

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

   a)   Spintronic GMR Bridge sensors.

   b)   Antiferromagnetic substances.

   c)   Strength of nanomaterials.

   d)   Surface Plasmon Resonance.

   e)   Strength of Nanomaterials.

   f)   Histopathalogy

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S.Y.B.Sc. (Regular)
ELECTRONIC SCIENCE
EL - 231 : Communication Electronics
(CBCS 2019 Pattern) (Semester - III) (2 Credits) (Paper - I) (23221)

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

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

Q1) Attempt any <u>Five</u> of the following.   **[5]**

    a)   Define electronic communication.

    b)   What is signal multiplexing?

    c)   State sampling theorem.

    d)   Calculate bandwidth of EM spectrum ranges from 300 Hz to 3000 Hz.

    e)   Define demodulation in communication system.

    f)   List different analog pulse modulation techniques.

Q2) a)   Attempt the following:

        i)   What is modulation? State types of modulation.   **[2]**

        ii)   Explain the pulse amplitude modulation (PAM).   **[4]**

    b)   Explain with neat circuit diagram the amplitude modulation using transistor.

                                                            [4]

Q3) a)   Attempt the following:

        i)   Define :-   **[2]**

              1)   Serial communication,

              2)   Parallel communication.

        ii)   Explain the need of modulation.   **[4]**

b) Calculate the carrier frequency, modulating frequency (f_m), modulation index (m_f) and frequency deviation (f_d) for FM wave e = 10 sin (8×10⁸t + 4 sin 1500t) **[4]**

Q4) a) Attempt the following:

   i) What is carrier swing in FM? Write it's mathematical expression.**[2]**

   ii) Draw the block diagram of modem and explain it. **[4]**

b) Calculate the r.m.s. noise voltage appearing across 10 kΩ resistor at room temperature for an effective noise bandwidth 10 kHz.

   Given : KT = 4×10⁻²¹ W/Hz at room temperature. **[4]**

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

   a) Time Division Multiplexing

   b) Vestigial side Band Transmission

   c) Amplitude - shift keying

   d) Modulation index in AM

   e) Bandwidth

   f) Advantages of Digital Communication System

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S.Y.B.Sc. (Regular)
ELECTRONIC SCIENCE
EL - 232 : Digital System Design
(2019 Pattern) (Semester - III) (Paper - II) (23222) (Credit System)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
1) *Question No.1 is compulsory.*
2) *Solve any three questions from Q. 2 to Q. 5.*
3) *Q. 2 to Q. 5 carry equal marks.*

Q1) Attempt any <u>five</u> of the following.   **[5]**
   a) Define resolution of DAC.
   b) Which gate is used for event detector?
   c) Write down excitation table of J-K Flipflop.
   d) Draw the structure of 3 inputs K-Map.
   e) How many voltage comparactors are required to design 4 bit ADC.
   f) How many flip-flops required to design MOD - 5 counter.

Q2) a) Answer the following:
   i)   What is ECL logic family? State its advantages.   **[2]**
   ii) Design full adder using K-Maps and draw logic diagram of the outputs.   **[4]**
   b) Draw the circuit of CMOS NAND gate, explain its action.   **[4]**

Q3) a) Answer the following:
   i)   What are the limitations of binary weighted resistor DAC?   **[2]**
   ii) Explain with logic diagram MOD-10 counter using J-K flipflop. **[4]**
   b) 4 bit DAC using R - 2R ladder is designed. Calculate the output voltage for the following cases if $V_{ref} = 20V$.   **[4]**
   i)   0010
   ii) 1101

Q4) a) Answer the following:

  i) Give two advantages of K-Map Over Boolean algebra. **[2]**

  ii) Explain 4 bit parallel adder with diagram. Give advantages of look ahead carry bit. **[4]**

 b) Design two bit binary up counter using KMap. **[4]**

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

 a) BCD to seven segment decoder.

 b) Up-Down counter.

 c) Counter - type ADC.

 d) Ex-OR gate for parity generation and checker.

 e) State table and state diagram.

 f) Specifications of ADC.

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S.Y. B.Sc.

PSYCHOLOGY

Psychology of Adjustment (Credit System)

(2019 Pattern) (Paper - I) (Semester - III) (23201)

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

Instructions to the candidates:

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

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

     a)   Define adjustment.

     b)   What is conflict?

     c)   Name the types of parenting style.

     d)   State the component of communication process.

     e)   Define coping.

     f)   Define loneliness.

Q2) a)   Describe the family life cycle.   **[6]**

                         OR

        Discuss the various types of Interpersonal conflict.

     b)   Explain the various roots of happiness.   **[4]**

Q3) a)   Elaborate the approaches to behaviour.   **[6]**

                         OR

        Explain the supers career development model.

     b)   What are the roots of loneliness.   **[4]**

Q4) a) Discuss the academic performance improving techniques.   **[6]**

OR

Explain the relation between technology and interpersonal communication.

b) Analyze the various dimensions of child rearing.   **[4]**

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

a) Nature of Adjustment.

b) Conflict Management style.

c) Marital Adjustment.

d) Job Stress - causes.

e) Authoritarian parenting style.

f) Symptoms of loneliness.

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S.Y. B.Sc.

PSYCHOLOGY

Research Methods in Behavioural Sciences (Credit System)

(2019 Pattern) (Semester - III) (23202) (Paper - II)

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

Instructions to the candidates:

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

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

a) What is non experimental research?

b) Define probability sampling.

c) What is the meaning of element in sampling?

d) Define Interview.

e) State the stages in research report.

f) What is research report?

Q2) a) What are the factors influencing decision of sampling.   **[6]**

OR

Explain the advantages and disadvantages of psychological tests as a tool of data collection.

b) Elaborate the process of data collection in research.   **[4]**

Q3) a) Discuss the process and implications of experimental research.   **[6]**

OR

Discribe the applications of information technology in research.

b) Analyze the advantages and disadvantages of non experimental research.

[4]

P.T.O.

Q4) a) Compare the interview and case study method of data collection. **[6]**

OR

Sketch the structure of research report.

b) Compare the advantages and disadvantages of probability sampling. **[4]**

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

a) Importance of Research.

b) Steps in research.

c) Need of Sampling.

d) Participative observation.

e) Need of interpretation.

f) Concepts in sampling.

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[6054]-126

S.Y.B.Sc. (Regular)

ENVIRONMENTAL SCIENCE

EVS - 231 : Ecology & Ecosystem

(2019 Pattern) (Semester - III) (Paper - I) (Credit System) (23241)

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

Instructions to the candidates:

  1)   Question1 is compulsory.
  2)   Solve any three questions from Question No. 2 to Question No. 5.
  3)   Question No. 2 to Question No. 5 carry equal marks.

Q1) Attempt any FIVE of the following.

   a)   Who proposed first ecology?   **[1]**

   b)   Write a full form of GPP.   **[1]**

   c)   Define mortality.   **[1]**

   d)   How is ecology related to ecosystem?   **[1]**

   e)   How do abiotic & biotic factors affect ecosystem?   **[1]**

   f)   What is both aquatic & terrestrial animals called?   **[1]**

Q2) Answer the following

   a)   What are the different types of both terrestrial & aquatic ecosystem?**[6]**

   b)   What are the three main biotic factors?   **[4]**

Q3) a)   Explain in detail Gaseous cycles with diagram.   **[6]**

   b)   Draw a Lithosere model of succession.   **[4]**

Q4) Answer the following.

   a)   Explain in detail population Growth curve.   **[6]**

   b)   What are the human impact on Bigeochemical cycles.   **[4]**

P.T.O.

Q5) Write a short note on Any Four of the following.   **[10]**

   a)   Dispersion   **[2½]**

   b)   Trophic structure   **[2½]**

   c)   Ecological Niche   **[2½]**

   d)   Causes of Succession   **[2½]**

   e)   Micro - Nutrients   **[2½]**

   f)   Taxonomic affinity   **[2½]**

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[6054]-127

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

EVS-232 : ENVIRONMENTAL SCIENCES

Natural Resources Conservation and Management (Paper - II)

(2019 Pattern) (23242) (Credit System)

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

Instructions to the candidates:

1) Question 1 is compulsory.

2) Solve any Three questions from Question No 2 to Question No 5.

3) Question No 2 to Question No 5 carry equal marks.

Q1) Answer <u>any five</u> of the following : **[5 × 1 = 5]**

a) Give examples of any 2 non renewable sources of energy.

b) Enlist any 2 functions of forest.

c) Full form of HYV.

d) Define the term watershed management.

e) Give examples of any 2 sanctuaries in India.

f) What are the effects of soil erosion.

Q2) a) Explain the concept of Rainwater harvesting technique. **[6]**

b) Write a short note on Joint Forest Management in India. **[4]**

Q3) a) Explain various Traditional water conservation techniques found in India.
[6]

b) Write a short note on various soil conservation methods. **[4]**

Q4) a) Write a short note on forest management in India. **[6]**

b) Explain the various problems associated with Natural Resources. **[4]**

P.T.O.

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

    a)   Flood and Flood plain management

    b)   Sustainable agriculture

    c)   Conflicts over water in India

    d)   World Food Problems

    e)   Classification of Natural Resources

    f)   Genetically modified crops regulation in India.

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[6054]-128

S.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS - 201 : Science, Technology & National Security

(2019 Pattern) (Semester - III) (23231)

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

Instructions to the candidates:

1)   *All questions are compulsory.*

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

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

a)   Defme 'Technology'.

b)   What is Warfare?

c)   State the information Technology.

d)   What is the Cold War?

e)   Define 'National Security'.

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

a)   Impact of Technology on warfare.

b)   New challenges of National Security.

c)   Artificial Technology.

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

a)   State the relevance of Science &Technology in National Security.

b)   Explain in detail the post Cold War era.

c)   What are the Advantages of Foreign Collaboration?

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

a)   State in detail 'Military Technology'.

b)   Explain in detail Comprehensive approach to putting science and technology.

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[6054]-129

S.Y.B.Sc. (Regular)
DEFENCE AND STRATEGIC STUDIES
DS -202 : Military Geography & Geopolitics
(Credit System) (2019 Pattern) (Semester - III) (23232)

Time : 2 Hours] *[Max. Marks : 35*
Instructions to the candidates:
    1)   *All questions are compulsory.*
    2)   *Figures to the right indicate full marks.*

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

    a)   Define strategic features.

    b)   Define Land-Locked States.

    c)   Define Nation.

    d)   Define water topography.

    e)   Define Nation-State.

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

    a)   Hydrography

    b)   Land Power Theory

    c)   Tactical level

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

    a)   Explain the Meaning & Concepts A.T. Mahan's survey strategy.

    b)   State the Problems of Land-Locked and Buffer States.

    c)   Explain the Tactics - Definition, Meaning & Concepts.

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

    a)   Discuss in detail the Grand Strategy - Meaning, Definition and Formation of Grand Strategy.

    b)   Explain the political objectives of RimLand Theory.

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[6054]-131

S.Y. B.Sc.

AECC - II A LANGUAGE - ENGLISH

(2019 Pattern) (Semester - III) (23321)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates :

1) *All questions are compulsory.*

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

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

a) How does the author deal with the idea of death and memory in the story 'A Shadow''?

b) Comment on the title of the poem 'La Belle Dame Sans Merci' and how it relates to what the poem is about.

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

a) Introduce your friend to your family members who has come to celebrate your birthday.

b) Write a note on your daily routine.

c) Write a dialogue between you and principal to get permission to celebrate 'Women's Day' in college.

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

a) Discuss the various techniques for effective participation in 'Group Discussion'.

b) Write a note on the significance of visual aids in the presentation.

c) Discuss the essential etiquettes of interview.

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[6054]-132

S.Y. B.Sc. (Regular)

MARATHI (मराठी)

AECC-IIB : उपयोजित मराठी

(2019 Pattern) (CBCS) (Semester - III) (23331)

वेळ : 2 तास]

[एकूण गुण : 35

सूचना :

1) सर्व प्रश्न सोडविणे आवश्यक आहेत.

2) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्रश्न 1) अ) खालीलपैकी कोणत्याही पाच प्रश्नांची उत्तरे 20 शब्दांत लिहा. **[5]**

   i) श्राव्य माध्यमाच्या भाषेची दोन वैशिष्ट्ये लिहा.

   ii) प्रसार माध्यमांचे दोन उद्देश लिहा?

   iii) दृक–श्राव्य माध्यम म्हणजे काय?

   iv) व्यवहार भाषा म्हणजे काय?

   v) दैनंदिन जीवन व्यवहारातील भाषेची दोन कार्य सांगा.

   vi) साहित्याची भाषा म्हणजे काय?

   vii) फेसबुकचा शोध कोणी लावला?

ब) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे लिहा. **[10]**

   i) आपल्या महाविद्यालयातील प्राचार्यांच्या नावे बोनाफाईड प्रमाणपत्र मिळणेबाबत विनंती अर्ज करा.

   ii) आपल्या गावातील सरपंचाकडे रस्ता दुरूस्तीसाठी अर्ज लिहा.

   iii) संगणकीय अर्जलेखनात युनिकोडचे महत्त्व स्पष्ट करा.

P.T.O.

प्रश्न 2) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे लिहा. **[15]**

अ) 'विज्ञान प्रदर्शन' या विषयावर वर्तमान पत्रासाठी लेख लिहा.

ब) 'पशुसंवर्धन' या विषयावर आकाशवाणीसाठी भाषण लिहा.

क) 'कोरोना प्रतिबंधक काळजी' या विषयावर दूरदर्शनसाठी माहितीपट तयार करा.

प्रश्न 3) खालीलपैकी कोणत्याही एका प्रश्नाचे उत्तरे लिहा. **[5]**

अ) 'बदलती जीवनशैली आणि आजार' या विषयावर ब्लॉगलेखन करा.

ब) 'आधुनिक तंत्रज्ञान' या विषयावर फेसबुकसाठी लेखन करा.

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[6054]-133

S.Y. B.Sc.

HINDI (हिंदी)

AECC - II C : हिंदी काव्य तथा कहानी साहित्य

(2019 Pattern) (Semester - III) (23341)

समय : 2 घण्टे]   *[पूर्णांक : 35*

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

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

अ)   कवि नागार्जुन ने अकाल की स्थिति का वर्णन किस प्रकार किया है।

ब)   'ये लोग कितने मुनासिब हैं इस सफर के लिए' इस पंक्ति के आशय को स्पष्ट कीजिए।

क)   'इसको भी अपनाता चल' कविता में प्रेम और भाईचारे का संदेश किस प्रकार दिया है।

ड)   'पालतु कुत्ता' कविता में नारी के सामाजिक स्थिति पर किस प्रकार प्रकाश डाला है।

इ)   'घर' कविता का भावार्थ लिखिए।

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

अ)   लहनासिंह की चारित्रिक विशेषताओं को स्पष्ट कीजिए।

ब)   मोहन कौन था? वह भिखारिन के पास कैसे आया?

क)   'ककडी की कीमत' कहानी के माध्यम से रईस लोगों के दिखावेपन को स्पष्ट कीजिए।

ड)   'कप्तान' कहानी के सुभद्रा का चरित्र–चित्रण कीजिए।

इ)   'बदबू' कहानी की संतोष ने रूढी परंपराओं का विरोध किस प्रकार किया है।

प्रश्न 3)   निम्नलिखित में से किन्हीं एक प्रश्न का उत्तर लिखिए।   **[5]**

अ)   'बदबू' कहानी की संतोष का चरित्र–चित्रण कीजिए।

ब)   'इसको भी अपनाता चल' कविता में सांप्रदायिक एकता को किस प्रकार स्पष्ट किया है।

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[6054]-134

S.Y. B.Sc. (Regular)
SANSKRIT (संस्कृत)

AECC - IVE : Gīrvanabhāratī
गीर्वाणभारती (निवडक वेचे)

(2019 Pattern) (Credit System) (Semester - III) (23351)

वेळ : 2 तास]

[एकूण गुण : 40

सूचना :
1) All questions are compulsory.
   सर्व प्रश्न सोडविणे अनिवार्य आहेत.
2) Figures to the right indicate full marks.
   उजवीकडील अंक प्रश्राचे पूर्ण गुण दर्शवितात.

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

पुढील प्रश्रांची दोन ते चार ओळीत उत्तरे लिहा.

ī

i) From whichtext, lesson 'च्यवनभार्गवकथा' has taken?

'च्यवनभार्गवकथा' हा पाठ कोणत्या ग्रंथातून घेतली आहे?

ii) Which ब्राह्मणग्रंथ is associated to यजुर्वेद?

यजुर्वेदाशी संबंधित ब्राह्मणग्रंथ कोणता?

iii) Who is the wife of ?

च्यवनाची पत्नी कोण?

iv) Which library has been classified the उपिनषद्?

उपनिषदांची वर्गवारी कोणत्या ग्रंथालयाने केली आहे?

v) Who was the Mother of ?

सत्यकामाची आई कोण होती?

vi) Who is the Adviser of अनन्तवान्पाद?

अनन्तवान्पादाचा उपदेशकर्ता कोण?

vii) Who is the author of 'शिवमानसपूजा'?

'शिवमानसपूजा' स्तोत्राचे रचयिता कोण?

viii) From which text, lesson 'छायाग्राहिसत्त्वम्' has taken?

'छायाग्राहिसत्त्वम्' हा पाठ कोणत्या ग्रंथातून घेतला आहे?

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

टीपा लिहा. (कोणत्याही दोन)

   i)   च्यवनः

   ii)   उपनिषद्

   iii) अश्विनौ

Q4) Write short notes (any two)   **[8]**

टिपा लिहा. (कोणत्याही दोन)

   i)   भक्तिः

   ii)   सिंहिका

   iii) गुमानिः

Q5) Explain thesummary of the lesson 'सेयंयातिशकुन्तलापतिगृहम्'.   **[8]**

'सेयंयातिशकुन्तलापतिगृहम्' या पाठाचा सारांश लिहा.

<div align="center">OR/किंवा</div>

'Explain any two **उपदेश** fromthelesson 'उपदेशप्रबन्धः'.

'उपदेशप्रबन्धः' यापाठातील कोणतेही दोन उपदे शस्पष्ट करा.

<div align="center">🝙 🝙 🝙</div>

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[6054]- 135

S.Y.B.S.c (Semester-III)
AECC-II D LANGUAGE ARBIC FUNCTIONAL
(23371) (2019 Pattern) (Credit System)

Total Marks :35]

[Time : 2 Hours

Instruction to candidates :

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

Q.1 Define and illustrate any Two of the Following. Grammar: **[10]**

a) حُرُوفُ الهِجاءِ ۔

b) مبُتَدَا والَخَبرِ ۔

c) اَسئمَاءُ ۔

Q.2 Translate into English Only. **[10]**

a) اَلكُرسِيُّ مُرِيسِحٌ ۔

b) اَلوَلَدُ ذكِىٌّ ۔

c) هٰذِه المدرسةُ حَبّيدَةٌ ۔

d) تِلكَ السّيّارَةُ جَمِيلَةٌ ۔

e) اَلمُدَرِّسُ مَشغُولٌ ۔

P.T.O.

Q.3 Translate into Arabic Only.   **[10]**

a) The Student is going to the School.

b) The Girl is Sitting On the Chair.

c) This Bus is Coming From the College.

d) That Bus is Going to the University.

e) Ali is Returning With Fatima From the Market.

Q.4 Write the Term in Arabic Only.   **[05]**

a) Atom

b) Heat

c) Matter

d) Hard

e) Soft

f) Orbit

g) Motion

h) Coolness

i) Solid

j) Voltage

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[6054]-136

S.Y.B.Sc. (Vocational)

(Computer Hardware & Network Administration)

CHNA-231 : OPERATING SYSTEM & DIAGNOSTICS TOOLS

(2019 Pattern) (CBCS) (Semester - III) (Paper-III) (23871)

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

Instructions to the candidates :

1)   Question 1 is compulsory.

2)   Solve any three questions from Q.2 to Q.5.

3)   Q.2 to Q.5 carry equal marks.

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

a)   Define virus.

b)   What is flash card?

c)   Write the full form of NTFS.

d)   What are the different types of operating system?

e)   What are the advantage of MS Word?

f)   Write the uses of Auto-CAD.

Q2) a)   i)   What are the basics of corel DRAW?   **[2]**

ii)   Explain the installation process of WLAN card to PC.   **[4]**

b)   How to solve the electric power issues in PC.   **[4]**

Q3) a)   i)   What is DOS & write it's features.   **[2]**

ii)   Explain multi-boot operating system.   **[4]**

b)   How to install Mozilla Firefox and explain how is it Safe?   **[4]**

Q4) a) i) Explain File Allocation Table in short. **[2]**

ii) Write short note on flash memory card. **[4]**

b) Explain the concept of modem in brief. **[4]**

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

a) MS Power point.

b) Effect of computer virus on computer system.

c) Access point.

d) Internet.

e) Small computer system interface (SCSI).

f) Windows-8.

[6054]-137

S.Y.B.Sc. (Vocational) (Regular)
COMPUTER HARDWARE AND NETWORK ADMINISTRATION
CHNA - 232 : Microprocessor & Interfacing - I
(CBCS 2019 Pattern) (Semester - III) (Paper - IV) (23872)

Time : 2 Hours]   *[Max. Marks : 35*
Instructions to the candidates:
1) *Question 1 is compulsory.*
2) *Solve any three questions from Q.2 to Q.5.*
3) *Question 2 to Q.5 carry equal marks.*

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

     a)   Define accuracy of DAC.

     b)   List any two Non-intel processors.

     c)   Define term transducer.

     d)   What is full-form of USB?

     e)   What is cache memory?

     f)   What is function of address bus?

Q2) a)   Attempt the following:

         i)   What is data bus? What is the size of 8086 microprocessor data bus?   **[2]**

         ii)   Differentiate USB 2.0 and 3.0.   **[4]**

     b)   Explain 2 - bit flash ADC.   **[4]**

Q3) a)   Attempt the following:

         i)   What is interrupt? List anyone software interrupt.   **[2]**

         ii)   Explain PCI bus architecture.   **[4]**

     b)   Explain working of LM-35 as temperature sensor.   **[4]**

Q4) a) Attempt the following:

        i)   State any two features of 8086 processor. **[2]**

        ii)   What are the main features of core i3 processor. **[4]**

   b) Explain with neat diagram keyboard interfacing with microprocessor. **[4]**

Q5) Write short note on any Four of the following. **[4×½=10]**

   a) Bus architecture

   b) DMA controller

   c) Sensors and Transducers

   d) Cache memory

   e) LVDT

   f) Flag register of 8086 microprocessor

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[6054]-139

S.Y.B.Sc. (Vocational) (Regular)
BIOTECHNOLOGY
VBt - 212 : Molecular Biology
(CBCS 2019 Pattern) (Semester - III) (Paper - IV) (23572)

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

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

Q1) Solve <u>any five</u> of the following.   **[5×1=5]**

    a)   What do you understand by denaturation of DNA?

    b)   How many pairs of autosomes do human beings have?

    c)   Define genome.

    d)   What do you understand by molecular biology?

    e)   Define hydrogen bond.

    f)   What is meant by post translational modification?

Q2) a)   Answer <u>any one</u> of the following:-   **[6]**

      i)   Describe the steps involved in elongation of translation in prokaryotes.

      ii)   Diagrammatically explain the steps involved in prokaryotic genome organization.

      iii)   Explain the steps involved in initiation of replication in prokaryotes.

    b)   Answer <u>any one</u> of the following:-   **[4]**

      i)   Enlist the types of RNA. Add a note on "structure of t-RNA".

      ii)   Any four features of translation.

Q3) a)   Answer <u>any two</u> of the following:-   **[6]**

   i)   Write a short note on base analogues.

   ii)   Any three features of genetic code.

   iii)   Write a short note on "Inhibitors of translation in Prokaryotes".

b)   Answer <u>any one</u> of the following:-   **[4]**

   i)   Write a short note on "Semiconservative model of DNA".

   ii)   Describe the steps involved in 5' capping of eukaryetic m-RNA.

Q4) a)   Answer <u>any two</u> of the following:-   **[6]**

   i)   Write a short note on "Structure of DNA Polymerase III" in prokaryotes.

   ii)   Define supercoiling of DNA. What is the difference between positive supercoiling and negative supercoiling of DNA?

   iii)   Write a short note on "glycosylation".

b)   Answer <u>any one</u> of the following:-   **[4]**

   i)   Write a short note on "base excision repair mechanism".

   ii)   Name the proteins involved in mismatch repair mechanism. Also add a note on their role in mismatch repair mechanism.

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

   a)   Group I introns

   b)   Any three features of transcription.

   c)   Central dogma of molecular biology

   d)   Any three features of Watson and Crick model of DNA.

   e)   Functions of any two proteins involved in initiation of translation in prokaryotes.

   f)   Prokaryotic ribosomal subunits and its proteins.

♦   ♦   ♦

[6054]-141

S.Y. B.Sc. (Vocational Paper-IV)
SEED TECHNOLOGY
ST - 2.2 : Seed Testing
(2019 Pattern) (Semester - III) (2 Credits) (23892) (CBCS)

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

Instructions to the candidates :

1)   *Question no. 1 is compulsory.*

2)   *Solve any three questions from Q.2 to Q5.*

3)   *Questions 2 to 5 carry equal marks.*

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

a)   What is Seed Testing?

b)   What is official seed sample?

c)   What is a multigerm seed?

d)   Define seed sampling.

e)   Enlist any two equipments used in moisture testing.

f)   What is the fullform of ISTA?

Q2) a)   Write the importance and history of seed testing.   **[6]**

b)   Comment on ISTA.   **[4]**

Q3) a)   Comment on service and official seed sample.   **[6]**

b)   Write the procedure of physical purity analysis.   **[4]**

Q4) a)   Write the procedure of seed sampling.   **[6]**

b)   Write the procedure of germination testing w.r.t. soil method.   **[4]**

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

   a)   State Seed Testing Laboratory.

   b)   Certification seed sample.

   c)   Digital moisture meter.

   d)   Seed sampling.

   e)   Seed vigour.

   f)   Heterogeneity test.

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Total No. of Questions : 5]

SEAT No. :

[Total No. of Pages : 2

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S.Y. B.Sc. (Vocational Paper - IV)
INDUSTRIAL MICROBIOLOGY
IMB 212 : Screening and Process Optimization
(2019 Pattern) (CBCS) (Semester - III) (23822)

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

Instructions to the candidates :
　　1)　Question No. 1 is compulsory.
　　2)　Solve any three questions from Q.2 to Q.5.
　　3)　Question No. 2 to 5 carry equal marks.

Q1) Solve any five of the following :　　　　　　　　　　　　　　**[5]**
　　a)　What role is played by Chelators in fermentation media?
　　b)　Enlist any two carbon sources used in fermentation industry.
　　c)　What is the significance of 'crowded plate technique'?
　　d)　Enlist any two industrially important microorganisms.
　　e)　Define 'strain improvement'.
　　f)　Define 'revertant mutant'.

Q2) a)　Describe the following any two :　　　　　　　　　　　**[6]**
　　　　i)　Describe the need of strain improvement.
　　　　ii)　Describe the concept of feedback repression.
　　　　iii)　Write the difference between Simpson's and Shannon's diversity index.
　　b)　Explain in detail targeted screening.　　　　　　　　　　**[4]**

Q3) a)　Explain the following any two :　　　　　　　　　　　　**[6]**
　　　　i)　Describe the co-operative feedback control with the help of a diagram.
　　　　ii)　Explain the limitations of metagenomics.
　　　　iii)　Explain the concept of primary screening.
　　b)　Explain in detail the process of media sterilization.　　　　**[4]**

P.T.O.

Q4) a) Discuss the following any two : **[6]**

    i) Discuss fermenter design as one of the parameters to be scaled up.

    ii) Describe 'pH' as important process parameter.

    iii) Describe the concept of secondary screening process.

  b) Describe the concept of unculturable bacteria. **[4]**

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

  a) Modification of cell permeability.

  b) Aeration as important process parameter.

  c) Function based targeted screening.

  d) OFAT.

  e) Scale-up window.

  f) Microbial diversity.

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S.Y. B.Sc. (Vocational Paper - IV)

ELECTRONIC EQUIPMENT MAINTENANCE

Voc-EEM 232 : Smart Phone Based Electronic Equipment Design

(2019 Pattern) (CBCS) (Semester - III)

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

Instructions to the candidates :

1) Question No. 1 is compulsory.

2) Solve any three questions from Q.2 to Q.5.

3) Question No. 2 to 5 carry equal marks.

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

a) Dose Android have GUI?

b) What are basics of Arduino?

c) What is life cycle activity in Android?

d) What is iteration in data structure?

e) Can you use smart phone as thermostat?

f) How many digital I/O pins are available to Arduino Uno?

Q2) a) Answer the following :

i) What is service in Android? **[3]**

ii) What are basic functions of Arduino Uno? **[3]**

b) Differentiate Activities from services. **[4]**

Q3) a) Answer the following :

i) Explain sensors in adroid. **[3]**

ii) What is serial communication? What are it's advantages? **[3]**

b) Write a program to print the "Hellow World" 5 times. **[4]**

P.T.O.

Q4) a) Solve the following :

      i)   How to create Webview inside widget for an Android? **[3]**

      ii)   What is use of Bundle in android? **[3]**

  b) What is home automation using android? **[4]**

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

  a) Give any four examples of android VI.

  b) How to create content provider in android?

  c) Explain: fragments in Android.

  d) What is scope of Android?

  e) What is android architecture?

  f) What are animation techniques in android?

S.Y.B.Com./B.A./B.Sc.(Regular)/B.C.A./B.Sc.(Comp.Sci.)/Biotech./Animation
AECC-I : ENVIRONMENTAL AWARENESS
(2019 Pattern) (Credit System) (Semester - III) (23361)

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

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

Q1) Attempt any FIVE of the following. **[5]**
   a) What is poaching?
   b) What is ecological succession.
   c) What is Habitat loss?
   d) What is flood?
   e) Define land Degradation.
   f) What is Biodiversity hot spot?

Q2) Answer the following.
   a) Write detail note on deforestation. **[6]**
   b) Write note on Renewable energy sources. **[4]**

Q3) Answer the following.
   a) Explain India as a mega biodiversity nation. **[6]**
   b) Write note on In-situ conservation of biodiversity. **[4]**

Q4) Answer the following.
   a) Describe soil erosion. **[6]**
   b) Write note on desertification. **[4]**

Q5) Write a short note on Any Four of the following. **[10]**
   a) Desert ecosystem.
   b) Over exploitation of surface water.
   c) Poaching
   d) Ecosystem.
   e) Biological Invasion.
   f) Genetic Biodiversity.

☯ ☯ ☯ ☯

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S.Y.B.Com./B.A./B.Sc./B.C.A./B.Sc.(Comp.Sci.)/Biotech./Animation(Regular)
AECC-I : ENVIRONMENTAL AWARENESS
(2019 Pattern) (Credit System) (Semester - III) (23361)
(मराठी रूपांतर)

वेळ : *2 तास*]   [एकूण गुण : *35*

सूचना :–   *1)*   प्रश्न क्र. 1 अनिवार्य आहे.
          2)   प्रश्न क्र. 2 ते 5 पैकी कोणतेही तीन प्रश्न सोडवा.
          3)   प्रश्न क्र. 2 ते 5 या प्रश्नांचे अंक समान आहेत.

प्र.1) खालीलपैकी कोणतेही पाच प्रश्न लिहा.   **[5]**

    अ)   शिकार म्हणजे काय?

    ब)   पर्यावरणीय उत्तराधिकार काय आहे?

    क)   अधिवास हानी म्हणजे काय?

    ड)   पूर म्हणजे काय?

    इ)   जमिनीच्या ऱ्हासाची व्याख्या करा.

    फ)   जैवविविधता हॉटस्पॉट म्हणजे काय?

प्र.2) खालील प्रश्नांची उत्तरे लिहा.

    अ)   जंगलतोडीवर तपशीलवार नोंद लिहा.   **[6]**

    ब)   अक्षय ऊर्जा स्त्रोतांवर टीप लिहा.   **[4]**

प्र.3) खालील प्रश्नांची उत्तरे लिहा.

    अ)   भारत एक विशाल विविधता असलेले राष्ट्र आहे हे स्पष्ट करा.   **[6]**

    ब)   जैवविविधते मधील इन सिटू संवर्धनेवर टिप लिहा.   **[4]**

प्र.4) खालील प्रश्नांची उत्तरे लिहा.

    अ)   मातीची धूप वर्णन करा.   **[6]**

    ब)   वाळवंटीकरणावर टिप लिहा.   **[4]**

प्र.5) थोडक्यात टिपा लिहा. (कोणतेही चार)   **[10]**

    अ)   वाळवंट परिसंस्था

    ब)   पृष्ठभागावरील पाण्याचे अतिशोषण

    क)   शिकार करणे

    ड)   परिसंस्था

    इ)   जैविक इन्व्हेन्शन

    फ)   अनुवांशिक जैवविविधता

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S.Y. B.Sc. (Regular)
GEOLOGY
GL - 212 : Principles of Stratigraphy and Sedimentation
(Credit System) (2019 Pattern) (Semester - III) (23162A)

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

Instructions to the candidates:
1) *Question 1 is compulsory.*
2) *Solve any three questions from Q2 to Q5.*
3) *Q2 to Q5 carry equal marks.*
4) *Neat diagrams must be drawn wherever necessary.*

Q1) Answer the following. (any 5)   **[5]**

     a)   Lithostratigraphy

     b)   Sandstone

     c)   Enlist chronostratigraphic units

     d)   Roundness

     e)   Porosity

     f)   Clastic texture

Q2) Answer the following.

     a)   Define stratigraphy. Explain principles of stratigraphy.   **[6]**

     b)   Define sedimentary environment. Mention types.   **[4]**

Q3) Answer the following.

     a)   Enlist primary sedimentary structures. Explain any two of them.   **[6]**

     b)   Define Biochemical deposits. Write note on carbonaceous deposits. **[4]**

Q4) Answer the following.

    a)   Explain progressive changes in sediments during transport with respect to size and shape. **[6]**

    b)   Define residual sedimentary rock. Write a note on Laterite. **[4]**

Q5) Write a short note (any 4) **[10]**

    a)   Cementation & lithification

    b)   Load cast and Flute cast

    c)   Derivation of sediments referring to source of sediments

    d)   Tracks and trails

    e)   Define weathering and its types.

    f)   Biostratigraphy

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