Total No. of Questions : 4]

SEAT No. :

PA-2072

[Total No. of Pages : 2

[5901]-51
F.Y. B.Sc. (Mathematics)
MT-121 ANALYTICAL GEOMETRY
(2019 Pattern) (Semester - II) (Paper - I)

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

Instructions to the candidates :

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

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

a) Show that the equation $4x^2 - 4xy + y^2 - 8x - 6y + 5 = o$ represents a parabola.

b) Find the direction cosines of line AB where A (2,3,-1) and B (0-1,2).

c) State the equation of plane in the intercept form.

d) Find the distance between parallel planes $x + 2y - 3z = 4$ and $2x + 4y - 6z = 11$.

e) Find the centre of the central conic $2x^2 - 2xy + 3y^2 + 6x - 4y - 1 = 0$

f) Find the equation of the sphere with center at (1,2,3) and radius 4.

g) State the direction cosines of X-axis.

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

a) i) Prove that the section of a sphere by the plane is a circle.

ii) Find the angle θ through which the axes are rotated so that the transformed form of the expression $ax^2 + 2hxy + by^2$ is free from the product term.

P.T.O.

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

i) What does the equation $3x^2 + 2xy + 3y^2 - 18x - 22y + 50 = 0$ become under rotation of the axes through 45º?

ii) Find an equation of the sphere on AB as a diameter where A (2,-3,1) and B (-1,-2,4).

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

a) i) Derive equation of the plane in normal form.

ii) Derive the relation between old and new co-ordinates when origin is shitted to the point (h,k).

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

i) Find the angle between two lines planes $2x - y + 2z + 1 = 0$ and $3x + 2y + 6z - 5 = 0$.

ii) Find the angle between two lines whose direction cosines are connected by the relations $\ell + 2m - 2n = 0, 3\ell m - mn = 0$

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

a) i) Derive equation of the plane passing through three points $A(x_1, y_1, z_1), B(x_2, y_2, z_2)$ and $C(x_3, y_3, z_3)$

ii) Obtain the condition for given two lines. $\frac{x-\alpha}{\ell} = \frac{y-\beta}{m} = \frac{z-\gamma}{n}$ and $\frac{x-\alpha'}{\ell'} = \frac{y-\beta'}{m'} = \frac{z-\gamma'}{n'}$ tarbe coplanar.

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

i) Find the equation of tangent plane to the sphere $x^2 + y^2 + z^2 + 4x - 5y - 3z - 3 = 0$ at point (1 2,-1)

ii) Find the direction cosines of a line which is perpendicular to two lines having direction ratios 2,-1,2 and 3,6,2.

Total No. of Questions : 4]

SEAT No. :

PA-2073

[Total No. of Pages : 3

[5901]-52
F.Y. B.Sc.
MATHEMATICS
MT-122: Calculus - II
(2019 Pattern) (Semester - II) (Paper - II) (12112)

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 × 1 = 5]**

a) Does the absolute value function $f(x)=|x|, x\in\mathbb{R}$ differentiable at $x=0$? Justify.

b) State Rolle's Theorem.

c) Evaluate $\lim_{x\to 0}\frac{\tan tx}{x}$.

d) Solve $\frac{dy}{dx}=x(1+y^2)$.

e) State Taylor's theorem with Lagrange's form of remainder.

f) Check whether the following differential equation is exact or not.

$$6x^2y^2dx+4x^3ydy=0$$

g) Find an integrating factor for the differential equation,

$(x^2+y^2+2x)dx+2ydy=0$

P.T.O.

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

i) State and prove Lagrange's Mean Value Theorem.

ii) If $y = e^{ax}\sin(bx+c)$ then show that n[th] derivative of y is,

$y_n = r^n e^{ax}\sin(bx+c+n\theta)$, where $r = \sqrt{a^2+b^2}$ and $\theta \tan^{-1}\left(\frac{b}{a}\right)$

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

i) Find Maclaurin's series of $\sin x$ and hence show that

$x\sin x = x^2 - \frac{x^4}{3!} + \frac{x^6}{5!}$ --

ii) For the function $f:\mathbb{R}\to\mathbb{R}, f(x) = x^2 - 3x + 5,$ Find points of relative extrema and determine the intervals on which the function is increasing and decreasing.

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

i) State and prove the Leibnitz theorem for n[th] derivative of the product of two differentiable functions.

ii) If $p(x)$ is continuous on (a,b) then show that the general solution of the homogeneous equation, $\frac{dy}{dx} + P(x)y = 0$ on (a,b) is $y = ce^{-\phi(x)}$, where $\phi(x) = \int p(x)dx$.

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

i) Evaluate $\lim_{x\to\pi/2}(\sec x - \tan x)$

ii) Solve the following differential equation,
$(y\sin y)dx + x(\sin y - y\cos y)dy = 0$.

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

i) Explain the method of solving Bernoulli's equation, $\frac{dy}{dx} + p(x)y = f(x)y^n$ where n can be any real number other than 0 and 1.

ii) Let 'C' be an interior point of the interval I at which $f : I \to \mathbb{R}$ has a relative extremum. If the derivative of *f* at 'C' exists, then show that $f'(C) = 0$.

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

i) Find the general solution of the following equation by method of variation of parameters, $\frac{dy}{dx} + \left(\frac{1}{x} - 1\right)y = \frac{2}{x}$.

ii) Verify Cauchy's Mean Value Theorem for the functions $f(x) = x^3, g(x) = \tan^{-1}{}_x$ on [0,1], if so find the value of 'C' in the open interval (0,1).

Total No. of Questions : 5]

SEAT No. : ____

PA-2074

[Total No. of Pages : 2

[5901]-53
F.Y. B.Sc. (Physics)
PHY-121 HEAT AND THERMODYNAMICS
(2019 Pattern) (Semester - II) (Paper - I) (12121)

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

Instructions to the candidates :

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

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

a) State first law of thermodynamics.

b) What is PV diagram.

c) What is Heat engine.

d) The working temperature of carnot's engine are 600K and 300K respectively. What is it's efficiency.

e) State the principle of gas thermometer

f) Find the temperature on fahrenheit scale corresponding to 30°c.

Q2) **Answer the following questions:**

a) i) Define the terms - Isothermal change, adiabatic change and isobaric change **[3]**

ii) Determine what temperature on the centigrade scale is represented by the same number on the fahrenheit scale. **[3]**

b) Prove that : $Tds = CvdT + T\left(\frac{\partial P}{\partial T}\right)_V dv$. **[4]**

P.T.O.

Q3) **Answer the following questions** :

a) i) Show that entropy remains constant in reversible process. **[3]**

ii) What is the principle of heat engine? Give it's types. **[3]**

b) Calculate the work done during an isothermal expansion of 4 moles of an ideal gas from a volume of 4 litres to 16 litres at 0°c (Given $R = 8.3 J.mole^{-1}K^{-1}$) . **[4]**

Q4) **Answer the following questions** :

a) Derive the first latent heat equation in the form $\frac{dP}{dT} = \frac{LJ}{T(V_2 - V_1)}$, where symbols have their usual meaning. **[6]**

b) Find the efficiency of the carnot's engine working between the steam point and the ice point. **[4]**

Q5) **Write a short notes on any Four of the following** : **[4 × 2½ = 10]**

a) The slope of an adiabatic is γ times

The slope of the isothermal, explain.

b) Give applications of Refrigeration.

c) Advantages and disadvantages of mercury thermometers.

d) Thermocouple.

e) Write equation of state. Give it's limitations.

f) If the compression ratio for otto engine is g and ratio of principal specific heats for the working substance is 1.4, find the efficiency of the engine.

Total No. Of Questions : 5]

SEAT No. :

PA-2075

[Total No. Of Pages : 2

[5901]-54
F.Y.B.Sc. (Semester-II)
PHYSICS
PHY - 122: Electricity & Magnetism
(2019 Pattern) (Paper - II) (12122)

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

Instructions to the candidates :

1) ***Question 1 is compulsory.***
2) ***Solve any three question from Q.2 to Q.5.***
3) ***Question 2 to 5 carry equal marks.***
4) ***Figure to the right indicates full marks.***
5) ***Use of calculator and log table is allowed.***

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

a) State coulomb's law in electrostatics.

b) Write down the relationship between three magnetic vectors $\overline{B}, \overline{M}$ and $\overline{H}$.

c) State amper's circutal law in magnetostatics.

d) What is diamagnetic substance? Give one example.

e) Calculate an electric dipole moment of an electric dipole consisting of two opposite charges each of magnitude 4 μC is separated by a distance of 4cm.

f) Calculate the magnitude of force between two balls each having a charge of 12 μC and are 8cm apart.

Q2) **Answer the following questions.**

a) i) State coulomb's law in electrostatics. Express it in vector form. **[3]**

ii) Two spheres of charges +20 and +80 coulomb are placed 18cm apart. Find the position of the point between them where the intensity is zero. **[3]**

b) Distinguish between paramagnetic and dimagnetic substances. **[4]**

P.T.O.

Q3) **Answer the following questions.**

a) i) Derive an expression for electric potential at any point due to an electric dipole along axial line. **[3]**

ii) Derive an expression for torque on a dipole placed in an uniform electric field. **[3]**

b) A coil made of 200 circular loops with radius 0.60m carries an electric current of 2.5A. Find the magnetic field at a point along the axis of coil which is at a distance of 0.80m from the centre. **[4]**

Q4) **Answer the following questions.**

a) State Biot-Savart's law in magnetostatics using Biot-Savart's law, obtain an expression for magnetic field produced in a long straight conductor. **[6]**

b) An electric flux of $6 \times 10^3 \frac{NM^2}{C}$ is found to be linked with a sphere due to some charge inside if. Calculate the magnitude of charge inside the sphere.

$\left(\text{Given} : \varepsilon_0 = 8.85 \times 10^{-12} \frac{C^2}{N.M^2} \right)$ **[4]**

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

a) Applications of ferrites.

b) Polar and non-polar molecule.

c) Antiferromagnetic materials.

d) Magnetization $(\overline{M})$, Magnetic intensity $(\overline{H})$ and magnetic induction $\overline{B}$.

e) Electric field intensity due to a point charge.

f) A charge of 12 nano-coulombs is situated inside a cube. Calculate the electric flux through one of the face of the cube.

$\left(\text{Given} : \varepsilon_0 = 8.85 \times 10^{-12} \frac{C^2}{N.M^2} \right)$

Total No. of Questions : 5]

SEAT No. : ____

PA-2076

[Total No. of Pages : 2

[5901]-55

F.Y. B.Sc.

CHEMISTRY

CH-201: Inorganic Chemistry

(CBCS) (2019 Pattern) (Semester - II) (12131)

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

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

a) Define the term nodal plane.

b) State Einstein's photoelectric effect.

c) Define coordinate bond.

d) What is the condition for formation of ionic bond?

e) What is exchange energy (Ex)?

f) Where is the position of 'P' block elements in long form of periodic table?

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

i) Give difference between classical and quantum mechanics.

ii) What is effective nuclear charge? Calculate effective nuclear charge of Neon element.
(Given: At.No. of Ne = 10, Screening const = 4.15)

iii) What are the assumptions of VSEPR theory?

P.T.O.

b) Calculate the velocity of the electron in the First Bohr orbit of hydrogen atom. **[4]**

(Given: $h = 6.62 \times 10^{-27}$ erg. sec.

$e = 4.80 \times 10^{-10}$ e.s.u.

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

i) Give the significance of any two quantum numbers.

ii) Which elements of the periodic table are called inner transition elements? Write names & symbol of atleast any two elements.

iii) Define hybridisation. Explain the formation of $BeCl_2$ molecule on the basis of hybridisation.

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

i) "Ionisation potential decreases down the group" Why?

ii) Draw the structure of 1) $[Cr(H_2O)_6]^{2+}$ 2) $[Fe\ C(O)_5]$

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

i) What are the limitations of classical mechanics.

ii) Give in short the rules used for filling up electrons in various orbitals.

iii) What is metallic bond? Give characteristic properties of metals.

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

i) "Size of cation is always smaller than its parent atom". Explain

ii) Give characteristics of hybrid orbitals.

Q5) Write a note on any FOUR of the following : **[10]**

a) Threshold frequency.

b) Black body radiation.

c) Fajan's rule.

d) de Broglie's hypothesis.

e) Atomic size & ionic size.

f) Shapes of 's', 'p' & 'd' orbitals.

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Total No. of Questions : 5]

SEAT No. :

PA-2077

[Total No. of Pages : 3

[5901]-56

F.Y. B.Sc.

CHEMISTRY - II

CH-202: Analytical Chemistry

(CBCS) (2019 Pattern) (Semester - II) (12132)

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) ***Questions 2 to 5 carry equal marks.***
4) ***Figures to the right indicate full marks.***
5) ***Draw neat diagrams wherever necessary.***
6) ***Use of logarithm tables and calculator is allowed.***

Q1) Attempt the following (Any Five) : **[5]**

a) What is eluate?

b) What is PH meter?

c) Define Normality.

d) What is grab sample?

e) What are the stationary phase and the mobile phase used in HPLC?

f) Define quantitative analysis.

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

i) What are density and specific gravity? Write the differences between density and specific gravity.

P.T.O.

ii) How to choose the proper solvent for recrystallization.

iii) Write the principal and advantages of gas chromatography.

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

i) Explain the term :

1) mole fraction

2) parts per million (ppm)

ii) What are the applications of HPLC?

Q3) a) Attempt the following (Any TWO) : **[6]**

i) Define qualitative analysis. What are the four different types of organic compound? Give one example each.

ii) Explain TLC technique with reference to

1) Stationary and mobile phase.

2) Development of chromatogram.

3) Detection of spot.

iii) List the advantages of glass electrode.

b) An organic compound having molecular weight of 88 contains 54% carbon, 9% Hydrogen and 36% Oxygen. Calculate the molecular formula of the compound. **[4]**

Q4) a) Attempt the following (Any TWO) : **[6]**

i) Give the functional group test for the following :

1) aldehyde

2) ketone

3) amide

ii) Whether acid-base mixture can be separated by 10% NaH CO_3 or 10% NaOH? Justify your answer.

iii) Explain any one application of ion exchange chromatography.

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

i) A solution of NaOH was prepared by dissolving 2g of NaOH in 1000 cm^3 of water. Calculate the molarity of NaOH.

(Mol. Wt of NaOH = 40).

ii) Calculate the $[H^+]$ in solution that has a PH of 5.

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

a) Sublimation.

b) Separation of solid-liquid mixture.

c) Hydrogen electrode.

d) Ion exchange resins.

e) HPLC.

Total No. of Questions : 5]

SEAT No. : ____

PA-2078

[Total No. of Pages : 2

[5901]-57
F.Y. B.Sc.
BOTANY
BO - 121 : Plant Life and Utilization - II
(2019 Pattern) (Semester - II) (CBCS) (Paper - I) (12141)

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 number 2 to 5 carry equal marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

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

a) What is Pteridophytes?

b) Give any two characters of Gymnosperm.

c) What is Horticulture?

d) What are Angiosperm?

e) Mention any two uses of pteridophyte as food.

f) State any two characters of Dicot.

Q2) a) Mention distinguishing characters of pteridophytes? Give outline classification of pteridophytes as per sporne. **[6]**

b) Comment on diversity of Gymnosperms. **[4]**

Q3) a) Explain Male and Female cone of Cycas. **[6]**

b) Describe ornamental & medicinal value of pteridophytes. **[4]**

P.T.O.

Q4) a) State salient features of Angiosperms. Add a note on fodder plants. **[6]**

b) Write the Economic importance of Gymnosperm. **[4]**

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

a) External morphology of Nephrolep's plant body.

b) Medicinal value of Angiosperms.

c) T. s. of leaflet of Cycas.

d) Economic Aspects of Horticulture.

e) Give the characteristics of Monocot.

f) Systematic position of Nephorolep's with reasons.

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Total No. of Questions : 5]

SEAT No. :

PA-2079

[Total No. of Pages : 2

[5901]-58
F.Y. B.Sc (Botany)
BO - 122 : Principles of Plant Science
(2019 Pattern) (Semester - II) (CBCS) (Paper - II)

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) ***Questions number 2 to 5 carry equal marks.***
4) ***Figures to right indicate full marks.***
5) ***Draw neat labelled diagrams wherever necessary.***

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

a) Enlist any two importance of plant physiology.

b) Define osmosis.

c) What is osmotic pressure?

d) Enlist any four organelles of Eukanyotic cell.

e) What is transcription?

f) What is r.RNA?

Q2) a) Define mitosis & describe any two stages. **[6]**

b) Difference between DNA & RNA. **[4]**

Q3) a) Describe Watson & crick model of DNA. **[6]**

b) Give any four practical applications of gibberellins. **[4]**

P.T.O.

Q4) a) Discuss structure of m.RNA. **[6]**

b) Write role of DNA polymerase. **[4]**

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

a) Ultra structure of Mitochondria.

b) Function of Chloroplast.

c) Bilayer model of plasma membrane.

d) G1 phase.

e) Zygotene.

f) C-Value paradox.

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Total No. of Questions : 5]

SEAT No. :

PA-2080

[Total No. of Pages : 2

[5901]-59
F.Y. B.Sc.
ZOOLOGY
ZO - 121 : Animal Diversity - II
(12151) (2019 Pattern) (Semester - II) (CBCS) (Paper - I)

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) ***Neat diagrams must be drawn whenever necessary.***

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

a) Give two examples of phylum Annelida.

b) Explain the term polychaeta.

c) Define Arthropoda.

d) Give importance of honey bees.

e) Give two examples of class Arachnida.

f) What is Aschelminthes.

Q2) a) Describe the characters of class Nematoda. **[6]**

OR

Describe water vascular system in seastar. **[6]**

b) Explain force type of pedicellariae. **[4]**

Q3) a) Describe economic importance of Phylum Arthropoda. **[6]**

OR

Discuss the general characters of Phylum Echinodermata. **[6]**

b) Explain role of earthworm in vermicomposting. **[4]**

P.T.O.

Q4) a) Describe the structures present on aboral surface of sea star. **[6]**

OR

State general characters of phylum mollusca. **[6]**

b) Write short note on structure & types of pedicellariae in sea urchin. **[4]**

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

a) Economic Importance of phylum Aschelminthes.

b) Explain class cephalopoda with example.

c) Mandibulate type of Mouth parts.

d) Explain economic importance of Phylum Mollusca.

e) Explain pyloric caeca in seastar.

f) General characters of class Asteroidea.

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Total No. of Questions : 5]

SEAT No. :

PA-2081

[Total No. of Pages : 2

[5901]-60

F.Y. B.Sc.

ZOOLOGY

ZO-122: Cell Biology

(12152) (2019 Pattern) (Semester - II) (Paper - II) (CBCS)

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 FIVE of the following : **[5]**

a) What is nuclear envelope?

b) What are lysosomes?

c) What is microvilli?

d) What are spindle fibres?

e) What is ATP?

f) Define the eukaryotic cell.

Q2) a) Describe the structure of prokaryotic cell. **[6]**

OR

Describe the structure and functions of Golgi complex.

b) Explain the structure of nucleolus. **[4]**

P.T.O.

Q3) a) Give the functions of mitochondria. **[6]**

OR

Explain the functions of plasma membrane.

b) Explain the cell cycle. **[4]**

Q4) a) What is stain? Explain any two types of stains with suitable examples. **[6]**

OR

Explain the fluid mosaic model of plasma membrane.

b) Describe prophase of mitosis. **[4]**

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

a) Eukaryotic cell.

b) Vacuoles.

c) Compound microscope.

d) Interphase.

e) Cell signalling.

f) Nuclear pore complex.

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Total No. of Questions : 5]

SEAT No. :

PA-2082

[Total No. of Pages : 2

[5901]-61

F.Y. B.Sc.

GEOLOGY

GL 121: Principles of Stratigraphy and Sedimentation

(2019 Pattern) (Semester - II) (12161)

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) ***Questions No. 2 to 5 carry equal marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

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

a) Define Biostratigraphy.

b) What is conglomerate?

c) Define sedimentary environment.

d) Enlist chronostratigraphic units.

e) What is graded bedding?

f) Lamination.

Q2) a) Define weathering. Explain mechanical and chemical weathering. **[6]**

b) Define stratigraphy. Name stratigraphic procedures on outcrop for stratigraphic data collection. **[4]**

Q3) a) Enlist penecontemporaneous sedimentary structures and explain any two of them. **[6]**

b) Define Sedimentary texture. Explain clastic and non-clastic texture. **[4]**

P.T.O.

Q4) a) What is argillaceous sedimentary rock? Explain mudstone and shale. **[6]**

b) Explain derivation of sediments referring to source of sediments. **[4]**

Q5) Write note on (any four) : **[10]**

a) Importance of stratigraphy.

b) Define competence and capacity of sediment transportation.

c) Sandstone.

d) Enlist continental sedimentary environment. Explain any one.

e) Ripple Marks.

f) Tracks and Trails.

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Total No. of Questions : 5]

SEAT No. :

PA-2083

[Total No. of Pages : 2

[5901]-62

F.Y. B.Sc.

GEOLOGY

GL-122T: Petrology and Geochemistry

(2019 Pattern) (Semester - II) (Paper - II) (12162)

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 Nos. 2 to 5 carry equal marks.***

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

a) Define Petrography.

b) Define magma.

c) What are pyrogenetic minerals?

d) State agents of metamorphism

e) State major constituents of Igneous rocks.

f) Define metamorphism.

Q2) Answer the following :

a) Enlist structures of Igneous rocks, explain formation of any three structures. **[6]**

b) Describe Rock Cycle. **[4]**

P.T.O.

Q3) Answer the following :

a) What is Bowen's reaction series? Explain branches of reaction series. **[6]**

b) Explain formation of crystals and glass with example. **[4]**

Q4) Answer the following :

a) Explain classification of igneous rocks based on depth of formation. **[6]**

b) Explain thermal metamorphism. **[4]**

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

a) Blueschist facies.

b) Colour index.

c) Dynamic metamorphism.

d) Equigranular texture.

e) Batch melting.

f) Stellar evolution.

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Total No. of Questions : 4]

SEAT No. : ____

PA-2084

[Total No. of Pages : 3

[5901]-63
F.Y. B.Sc.
STATISTICS
ST 121 : Descriptive Statistics - II
(2019 Pattern) (Semester - II) (Paper - I) (12171)

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.***

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

i) Karl Pearson's coefficient of correlation between X and Y is

a) independent of change of origin

b) independent of change of scale.

c) dependent on change of origin and scale.

d) independent of change of origin and scale.

ii) If $b_{yx} = b_{xy}$ then the value of coefficient of correlation is

a) 0 b) 1

c) –1 d) ∞

iii) Paasche's index number suffers from

a) No bias

b) either upward or downward bias

c) downward bias

d) upward bias

P.T.O.

B) State whether following statements are true or false. [1 each]

i) To find normal equations of curve $y = ab^x$, one has to convert the equations into linear form.

ii) Marks of a student and his intelligence are negatively correlated.

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

a) Explain the term rank and tie. State the procedure of giving ranks when ties occurs.

b) If $b_{yx} = -1.8$; $b_{xy} = -0.2$ and variance of X is 4 then find the standard deviation of Y and covariance between X and Y.

c) Write any five limitations of index number.

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

a) Describe scatter diagram. State merits and demerits (limitations) of scatter diagram as measure of correlation.

b) Explain the concept of 'explained variation' and 'unexplained variation'.

c) If $\bar{X} = 120.5$ cm; $\bar{Y} = 10.37$ years; standard deviation of X is 12.7 cm; standard deviation of Y is 2.39 years; correlation coefficient between X and Y is 0.93 then fit the regression line of X on Y. Also estimate value of X when Y = 12 years.

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

a) i) Explain the procedure of fitting the curve. $y = a + bx + cx^2$. **[6]**

ii) Find Spearman's rank. Correlation coefficient between ranks obtained by students is Statistics (X) and Mathematics (Y) for the following data : **[4]**

Student number	1	2	3	4	5	6	7	8	9	10
X	9	1	10	4	5	3	8	7	2	6
Y	7	10	2	8	4	6	9	1	3	5

b) i) Explain the procedure to construct cost living index numbers. **[6]**

ii) For the following data fit the curve $y = ab^x$ **[4]**

X	2	3	4	5	6
Y	144	172.8	207.4	248.8	298.5

❄ ❄ ❄

Total No. of Questions : 4]

SEAT No. : ____

PA-2085

[Total No. of Pages : 3

[5901] - 64

F.Y. B.Sc.

STATISTICS

ST - 122 : Discrete Probability and Probability Distributions - II

(2019 Pattern) (Semester - II) (Paper - II) (12172)

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.***

Q1) a) Choose the correct alternative from each of the following : **[1 Mark Each]**

i) If $X \rightarrow$ Poisson (m) with variance 4, then the 3rd cumulant of X is _____.

1) 3 2) 4

3) 2 4) 12

ii) For two dimensional random variable (X, Y), $E[X/Y=y]$ is a function of _____.

1) x 2) y

3) x and y 4) xy

iii) If Corr(X, Y) = 0.84 then Corr (–3x, –2y) = _____.

1) – 0.84 2) 0

3) 1 4) 0.84

P.T.O.

b) State Whether the following statements are true or false :

[1 Mark Each]

i) Poisson distribution is always Unimodal.

ii) If X and Y are two independent random variables then conditional mean of Y given (X = xi) is the same as mean of Y.

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

a) Obtain moment generating function (m.g.f.) of Poisson distribution, hence obtain its mean.

b) State and Prove lack of memory property of a geometric distribution. Also state its interpretation.

c) The joint probability mass function (p. m. f.) of bivariate discrete random variable (r.v.) (X, Y) is

$$P(x,y)=\frac{1}{4} \; ; \text{for}\,(x,y)=(0,0),(0,1),(1,0),(1,1)$$
$$=0 \; ; \text{otherwise}$$

Obtain Cov (X, Y), Var (X + Y)

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

a) Show that all cumulants of Poisson distribution are equal to parameter m.

b) Define Covariance between two random variables. What does it measures.

Prove CoV (X, X) = Var (X)

c) The joint p. m. f. of (X, Y) is given by

$$P(x,y)=k\,(x^2+y^2)\; ; k>0,\; x=-1,1.\; y=-2,2$$
$$=0 \quad ; \text{otherwise}$$

Obtain i) Constant k occurs in pmf of (x, y).

ii) Are x & y independent r.v.s.? Justify.

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

a) i) If X and Y are two independent Poisson r.v.s. with means 3 and 2 respectively, then find P (X = 4/ X + Y = 5), E (X/ X + Y = 5). **[6]**

ii) If a fair coin is tossed thrice. Let a r.v. X denotes the number of heads and r.v. Y denotes the number of tails. Obtain the joint probability distribution of (X, Y). **[4]**

b) i) Obtain variance of linear combination of two random variables X and Y, Var (ax + by) a and b are any constants. **[6]**

ii) The joint p.m.f. of (X, Y) is **[4]**

$$P(x,y)=\frac{2x+3y}{72} \quad ; x=0,1,2. \quad y=1,2,3.$$

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

Obtain E [Y/X = 0]

Total No. Of Questions : 5]

SEAT No. :

PA-2086

[Total No. Of Pages : 2

[5901]-65
F.Y.B.Sc. (Semester-II)
GEOGRAPHY - I
Gg - 121: Introduction To Human Geography
(2019 Pattern) (Paper - IV) (CBCS) (12181)

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

Instructions to the candidates :

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

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

a) Define 'Human Geography'

b) Write branches of Economic Geography.

c) What is mean by human race.

d) Write location of Eskimo.

e) Which are economic activities of pygmy?

f) Write examples of Tertiary activities.

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

i) Describe Political Geography as a branch of Human Geography.
ii) Discuss the skin colour as a bare of human race.
iii) Describe the Food and Clothing of Eskimo.

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

i) Explain the nature of Human Geography.

ii) Describe griffith Taylor's theory of human race.

P.T.O.

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

i) Discuss the mixed race
ii) Explain economic activities of Eskimo.
iii) Discuss the farming as a primary activity.

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

i) Describe importance of Human Geography.

ii) Explain secondary activities.

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

i) Describe the height as a base of Human race.
ii) Explain Geographic environment of Eskimo.
iii) Write transport as a tertiary activity.

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

i) Explain scope of Human Geography.

ii) Discuss the stages of Human racer

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

a) Meaning of Human Geography
b) Hair as a base of Human race.
c) Physical traits of Eskimo
d) Food and clothing of pygmy.
e) Fishing as a primary activity.
f) Manufacturing as a secondary activity.

Total No. of Questions : 5]

SEAT No. : ____

PA-2087

[Total No. of Pages : 2

[5901] - 66

F.Y. B.Sc.

GEOGRAPHY - II

Gg - 122 : Population & Settlement Geography

(2019 Pattern) (CBCS) (Semester - II) (Paper - V) (12182)

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

Instructions to the candidates :

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

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

a) Write population of India, according to 2011 census.

b) Define population Geography.

c) Name the state has highest population density of India.

d) What is mean by population growth rate?

e) What do you mean by Concentrated Settlements?

f) State any two Million Cities in India.

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

i) Explain scope of population Geography.

ii) Describe cultural factors affecting on population distribution.

iii) Give detail information of any two types of rural settlement.

P.T.O.

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

i) Name the population data sources and give detail information National Sample Survey (NSS).

ii) Explain types of urban settlement.

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

i) Describe vital statistics population data source.

ii) Explain stages of Demographic Transition theory.

iii) Name the patterns of rural settlement and explain linear pattern.

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

i) Explain the nature of Settlement Geography.

ii) Describe functions of Urban Settlement.

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

i) Explain significance of Indian Census.

ii) Explain Scattered Settlement with neat diagram.

iii) Describe economic problems of urbanization.

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

i) Write criticism of Demographic Transition Theory.

ii) Explain Morphology of Urban Settlement.

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

a) Nature of population Geography.

b) Population density.

c) Literacy of India.

d) Circular pattern of rural settlement.

e) Administrative town.

f) Level of urbanization in Maharashtra.

Total No. of Questions : 5]

SEAT No. : ____

PA-2088

[Total No. of Pages : 2

[5901] - 67

F.Y. B.Sc.

MICROBIOLOGY

MB - 121 : Bacterial Cell & Biochemistry

(2019 Pattern) (CBCS) (Semester - II) (Paper - I) (12191)

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

Instructions to the candidates :

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

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

a) Enlist different shapes of bacteria.

b) _____ and _____ are two amino sugars present in peptidoglycan.

c) Define atom.

d) Draw the structure of Ribose Sugar.

e) Glycocalyx in bacteria is type of capsule.

State True/False

f) Name any two basic amino acids.

Q2) a) Describe the following **Any Three** : **[6]**

i) Arrangement of flagella.

ii) Functions of plasmid.

iii) Structure of starch.

iv) Covalent bond with example.

b) Explain the process of sporulation in bacteria. **[4]**

P.T.O.

Q3) a) Explain the following **Any Three** : **[6]**

i) Gram positive cell wall.

ii) Functions of Carboxysome

iii) Coordinate bond with example.

iv) Disaccharide with any one example.

b) Give the ICTV classification of viruses. **[4]**

Q4) a) Discuss the following **Any Three** : **[6]**

i) Functions of Magnetosome.

ii) Spheroplast & Protoplast.

iii) Functions of pili.

iv) Structural levels of protein.

b) Describe the structure and functions of haemoglobin. **[4]**

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

a) Morphological arrangement of bacteria.

b) Bacterial capsule.

c) Glycogen.

d) Compound lipids.

e) Bacterial cell membrane.

f) Chitin.

Total No. of Questions : 5]

SEAT No. : ____

PA-2089

[Total No. of Pages : 2

[5901] - 68

F.Y. B.Sc.

MICROBIOLOGY

MB - 122 : Microbial Cultivation & Growth

(2019 Pattern) (CBCS) (Semester - II) (Paper - II) (12192)

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

Instructions to the candidates :

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

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

a) Give one example of Enriched media.

b) Write example of Non-synthetic media.

c) What are extremophiles?

d) What is TVC?

e) What is Oligodynamic action?

f) Bacteria reproduces by binary fission (True/False).

Q2) a) Describe the following **Any Three** : **[6]**

i) Disadvantages of pour plate technique.

ii) Importance of Mac Conkey's agar medium.

iii) Exponential growth phase of bacteria.

iv) Diauxic growth of bacteria.

b) Define Anaerobes. Explain cultivation of anaerobic bacteria. **[4]**

P.T.O.

Q3) a) Explain the following **Any Three** : **[6]**

i) Lyophilization.

ii) Spread plate technique.

iii) Petroff-Hausser's chamber.

iv) Effect of temperature on bacterial growth.

b) Name any three common ingredients of culture media & give their role. **[4]**

Q4) a) Discuss the following **Any Three** : **[6]**

i) Methods of cultivation of fungi.

ii) What are synthetic media?

iii) Stationary growth phase in bacteria.

iv) Estimation of Cell Nitrogen.

b) Describe the methods of cultivation of photosynthetic and chemolithotrophic bacteria. **[4]**

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

a) Cultivation of viruses.

b) Acidophiles.

c) Methods of cell carbon estimation.

d) Cultivation of Actinomycetes.

e) Classification of microorganisms based on oxygen requirement.

f) Methods of biomass measurement.

Total No. of Questions : 5]

SEAT No. : ____

PA-2090

[Total No. of Pages : 2

[5901]-69
F.Y. B.Sc.
NANOSCIENCE AND NANOTECHNOLOGY
N.S.-121 : Chemical and Biological Techniques for Synthesis of Nanomaterials
(2019 Pattern) (Semester - II) (Paper - I) (12261)

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

Instructions to the candidates:

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

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

a) Define collide.

b) What is Electrodeposition.

c) What is chemical vapour deposition.

d) Give the name of plants from which silver nanoparticles.

e) Why Biological synthesis method are called as 'Green Synthesis'?

f) Draw the 'Lamer diagram'.

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

i) Explain in detail 'Electrodeposition'.

ii) Explain in detail 'Hydrothermal Synthesis'.

b) Explain Plasma Enhanced Chemical vapour deposition. **[4]**

P.T.O.

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

i) Explain Kirkindall effect & its methods.

ii) Explain in detail 'Langmuir Blodgett method'.

b) Explain metal-oxide framework. **[4]**

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

i) Explain 'SILAR' method in detail.

ii) Explain synthesis of nanomaterials using micro-organism.

b) Explain in detail 'metallorganic chemical vapour deposition'. **[4]**

Q5) Write Short Note on any FOUR of the following : **[10]**

a) Langmuir-Blogette method.

b) Electrodeposition.

c) Sonothermal synthesis.

d) Kirkindall effect.

e) Green Synthesis.

f) Sol-gel.

□□□

Total No. of Questions : 5]

SEAT No. : ____

PA-2091

[Total No. of Pages : 2

[5901]-70

F.Y. B.Sc. (Nanoscience and Nanotechnology)

NS-122 : INTRODUCTION TO CHARACTERIZATION TECHNIQUES

(2019 Pattern) (Semester - II) (Paper - II) (12262)

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) ***Questions 2 to 5 carry equal marks.***
4) ***Draw neat & labelled diagram wherever necessary.***
5) ***Figures to the right indicate full marks.***

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

a) Draw the block diagram of PL spectrometer.

b) Define molarity of solution.

c) What is elastic stattering?

d) Write down the properties of secondary standard.

e) What is mean by luminescence?

f) What is mean by spectroscopy?

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

i) Explain particle size determination.

ii) With neat labeled diagram explain Scanning Electron Microscope.

b) Explain electron-matter interaction. **[4]**

P.T.O.

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

i) With block diagram explain UV-Vis absorption spectroscopy.

ii) Explain any four types of characterization methods.

b) Explain any four methods of concentration expressions. **[4]**

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

i) Explain Thermogravimetric analysis of nanomaterials.

ii) Explain Fourier Transform Infra Red Spectrometer with neat diagram.

b) Explain nano perspectives in details. **[4]**

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

a) Porosity

b) Nano-optics

c) Fluorescence analysis method

d) Electroluminescence

e) Principle of Volumetric analysis

f) Types of indicators

Total No. of Questions : 5]

SEAT No. :

PA-2092

[Total No. of Pages : 2

[5901]-71
F.Y. B.Sc.
ELECTRONIC SCIENCE
EL-121 : Fundamentals of Digital Electronics
(2019 Pattern) (Semester - II) (Paper - I) (12221)

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 Five of the following : **[5]**

a) Write the base (i.e. radix) of binary, octal, decimal and hexadecimal number systems.

b) Write the full form of 'SOP' and 'POS'.

c) Write the two types of seven segment displays.

d) What is the natural count of a counter having 'n' Flip-Flops?

e) Write the inputs which is forbidden in S-R Flip-Flop.

f) How many clock pulses are needed to shift a byte serially into a Shift Register?

Q2) Attempt the following :

a) i) Write the applications of a Multiplexer. **[2]**

ii) State and verify De-Morgan's First and Second Theorem. **[4]**

b) Simplify the following logical expression using k-map. **[4]**

$$Y = \overline{A}BC + \overline{A}B\overline{C} + ABC + AB\overline{C}$$

P.T.O.

Q3) Attempt the following :

a) i) List the types of parity bit and write the need of a parity bit. **[2]**

ii) Design the NOT, OR, AND and NAND gates/functions using only NOR gates. **[4]**

b) Convert the following logic expression from its non-standard (i.e. non-canonical) POS form into standard (i.e. canonical) POS form. **[4]**

$$Y = \left(A + \overline{B}\right).\left(B + \overline{C}\right)$$

Q4) Attempt the following :

a) i) Compare Asynchronous and Synchronous counters. **[2]**

ii) Explain the working of a 1 : 2 Demultiplexer with the help of logic diagram and truth table. **[4]**

b) Draw the circuit diagram of a 3-bit Asynchronous Down Counter and explain its working. **[4]**

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

a) Binary and BCD code.

b) Rules of binary addition or subtraction with an example.

c) Parity Generator or Parity Checker.

d) Parallel Binary Adder.

e) Modulus (Mod)-8 Counter.

f) Event Counter.

Total No. of Questions : 5]

SEAT No. : ____

PA-2093

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[5901]-72
F.Y. B.Sc.
ELECTRONIC SCIENCE
EL - 122 : Analog & Digital Device Applications
(2019 Pattern) (Semester - II) (2 Credits) (Paper - II) (12222)

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

Instructions to the candidates :

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

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

a) Why op-amp is called operational amplifier?

b) Define duty cycle.

c) What are limitations of binary weighted resistor?

d) What is a comparator?

e) Define resolution in DAC.

f) Calculate gain of an inverting amplifier. If the value of input resistor is 10kΩ feedback resistor is 100kΩ.

Q2) a) Attempt the following:

i) Draw systematic symbol of op-amp. **[2]**

ii) Explain Astable multivibrator circuit using IC 555. **[4]**

b) What is virtual ground? Explain in detail. **[4]**

P.T.O.

Q3) a) Attempt the following:

i) What is CMRR? Mention it's ideal value. **[2]**

ii) Draw and explain integrator circuit using op-amp, when input signal squarewave is applied. **[4]**

b) A 4-bit DAC using binary ladder is designed, calculate output for each binary bit input,

i) 0100

ii) 0101

iii) 0110

iv) 1000 **[4]**

Q4) a) i) Draw neat diagram of Schmitt trigger circuit using op-amp. **[2]**

ii) Explain working of R-2R ladder. Derive formula for equivalent analog voltage for 4-bit ladder. **[4]**

b) Explain working of PWM with IC 555. **[4]**

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

a) IC 741.

b) V to I converter.

c) Counter type ADC.

d) Bistable multivibrator.

e) Negative feedback.

f) Virtual ground concept.

Total No. of Questions : 5]

SEAT No. :

PA-2094

[Total No. of Pages : 2

[5901]-73

F.Y. B.Sc.

PSYCHOLOGY

PSY- 121 : INTRODUCTION TO SOCIAL PSYCHOLOGY

(2019 Pattern) (Semester - II) (12201)

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

Instructions to the candidates:

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

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

a) Define social psychology.

b) What is group?

c) Define attitude.

d) What is interpersonal attraction?

e) Define social cognition

f) Define self-concept.

Q2) a) Explain the nature of aggression. (80 Words) **[6]**

b) Explain the psychodynamic approach. (50 Words) **[4]**

Q3) a) Explain the nature of social psychology. (80 Words) **[6]**

b) State the nature of self-presentation. (50 Words) **[4]**

P.T.O.

Q4) a) Explain the Pro-social behaviour. (80 Words) **[6]**

b) Explain the nature of social influence. (50 Words) **[4]**

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

a) Conflicts.

b) Social psychology and industry.

c) Individual behavior.

d) Child abuse.

e) Conformity.

f) Obedience.

Total No. of Questions : 5]

SEAT No. : ____

PA-2095

[Total No. of Pages : 2

[5901]-74

F.Y. B.Sc.

PSYCHOLOGY

PSY- 122 : PSYCHOLOGICAL TESTING

(2019 Pattern) (Semester - II) (12202)

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

Instructions to the candidates:

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

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

a) What is correlation techniques?

b) What is reliability?

c) Define psychological test.

d) Define validity.

e) Name any two standardized psychological test.

f) What is mean by norms?

Q2) a) Explain the purpose of item analysis. (80 Words) **[6]**

b) Explain the Test - Retest Reliability. (50 Words) **[4]**

Q3) a) Explain the steps in psychological test construction. (80 Words) **[6]**

b) Discuss criterion related validity. (50 Words) **[4]**

P.T.O.

Q4) a) Explain the uses of psychological tests. (80 Words) **[6]**

b) Explain the predictive validity. (50 Words) **[4]**

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

a) Scorer reliability

b) Power tests.

c) Construct validity.

d) Objectivity of psychological test.

e) Item difficulty.

f) Speed tests.

Total No. of Questions :5]

SEAT No. :

PA-2096

[Total No. of Pages : 2

[5901]-75

F.Y. B.Sc. (Environmental Science)

EVS - 121- FUNDAMENTALS OF ENVIRONMENTAL GEOSCIENCES

(2019 Pattern) (Semester - II) (Paper - I) (12241)

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 carries equal marks.***

Q1) **Answer the following (any five)** : **[5]**

a) Define the term: Metamorphism.

b) What is Temperature inversion?

c) Write few forms of precipitation.

d) What are Isobars?

e) Mention the types of landslides.

f) Wtite the names of agencies that manage Natural disasters.

Q2) a) Explain plate tectonic theory. **[6]**

b) Describe any four characteristics of igneous rocks. **[4]**

Q3) a) Discuss the classification of soil on the basis of texture. **[6]**

b) Write the functions of micro - nutrients required for plant growth. **[4]**

P.T.O.

Q4) a) Explain the verticle structure of atmosphere. **[6]**

b) Describe any four factors affecting rate of evaporation. **[4]**

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

a) Causes of forest fire.

b) Effects of flood.

c) Classification of volcanoes on the basis of ejected material.

d) General properties of atmosphere.

e) Types of Soil profile.

f) Soils of India.

Total No. of Questions :5]

SEAT No. :

PA-2097

[Total No. of Pages : 2

[5901]-76

F.Y. B.Sc. (Environmental Science)

EVS - 122- FUNDAMENTALS OF ENVIRONMENTAL POLLUTION

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

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

Instructions to the candidates :

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

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

a) Define air pollution?

b) What is meant by anthropogenic pollution of environment?

c) What are the sources of solid waste?

d) Which elements initiates the process of Eutrophication?

e) Write any two effects of soil pollution on soil microorganisms?

f) What causes ozone depletion?

Q2) a) Describe causes and effects of global warming on environment? **[6]**

b) What are the effects of heavy metal pollution? **[4]**

Q3) a) Explain sources and effects of radioactive pollution? **[6]**

b) What is Biofertilizers and their importance? **[4]**

P.T.O.

Q4) a) Discuss major air pollutants and their effects of biological systems? **[6]**

b) What is desertification and its causes? **[4]**

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

a) Bioaccumulation.

b) Soil acidification.

c) Itai-Itai disease.

d) Gypsum application to soil

e) Ground water pollution.

f) Effects of noise pollution.

Total No. of Questions : 4]

SEAT No. :

PA-2098

[Total No. of Pages : 2

[5901]-77

F.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS-201: Information Warfare

(2019 Pattern) (Semester - II) (Paper - I) (12231)

Time : 2½ 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 (any five) : **[5]**

a) Define Command and Control Warfare.

b) Define Information Warfare.

c) State the meaning of RMA.

d) What is China's Doctrine of Information Warfare?

e) What is Cyber space?

f) State the meaning of C4.

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

a) Cyber Crime.

b) Cyber Terrorism.

c) Information Operation.

P.T.O.

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

a) What is the Security of Information Systems?

b) Explain in detail Electronic Warfare.

c) State in detail the Intelligence Based Warfare.

d) Explain the India's Doctrine of Information Warfare.

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

a) Explain in detail the America's Doctrine of Information Warfare.

b) State in detail the Social Media and Cyber Security.

Total No. of Questions : 4]

SEAT No. :

PA-2099

[Total No. of Pages : 2

[5901]-78

F.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS 202: Homeland Security of India

(2019 Pattern) (Semester - II) (Paper - I)

Time : 2½ 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]**

a) Understand the conditions that give rise to terrorism.

b) What is Strategic Planning?

c) What is Homeland Security?

d) Homeland security and emergency management.

e) Define counter terrorism.

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

a) Identify and evaluate basic counter terrorism operations.

b) Homeland Security and Defense in Practice.

c) Terrorism.

P.T.O.

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

a) Explain the United States and its Homeland Security.

b) State the Concept of Homeland Security.

c) What are the Approaches of Homeland Security.

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

a) Explain to Indian Homeland Security.

b) State the International cooperation in Homeland Security.

Total No. of Questions : 4]

SEAT No. : ____

PA-2100

[Total No. of Pages : 1

[5901]-79
F.Y. B.Sc.
DEFENCE AND STRATEGIC STUDIES
DS 203 : Disaster Management and National Security
(2019 Pattern) (Semester - II) (CBCS) (12233)

Time : 2½ 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]**

a) What is Natural Disaster?
b) Define the concept of Hazards.
c) Explain the Concept of Risk?
d) State the full form of EOC.
e) What is NDMA?

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

a) Flood
b) Disasters Management
c) Social awareness of Disaster

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

a) Explain in brief the types of Natural Disasters.
b) Explain the CBRN Disasters.
c) Write the Importance of Disaster Management policy.

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

a) Explain in detail the Manmade Disasters.
b) Explain in detail Risk analysis.

❄ ❄ ❄

Total No. of Questions : 5]

SEAT No. : ____

PA-2101

[Total No. of Pages : 4

[5901]-80

F.Y. B.Sc. (Restructuring)

RE - A - FC - 102 (A) : FOUNDATION COURSE

(2019 Pattern) (CBCS) (Semester - II) (12601)

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

Instructions to the candidates :

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

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

a) Who is called the architect of Indian constitution?

b) Define democracy.

c) State any two human rights.

d) State any two responsibilities of Indian citizen.

e) State any two national values.

f) What is secularism?

Q2) a) Explain the features of Indian constitution. **[6]**

b) State the right to information Act - 2005. **[4]**

Q3) a) Discuss the fundamental human rights. **[6]**

b) Explain the concept of freedom. **[4]**

Q4) a) Explain the features of Local Governments. **[6]**

b) Explain the structure of Gram Panchayat. **[4]**

P.T.O.

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

a) Universal brotherhood.

b) Types of freedom.

c) Formulation of Indian constitution.

d) Fraternity.

e) Aesthetic values.

f) Religious values.

❄ ❄ ❄

Total No. of Questions : 5]

PA-2101

[5901]-80

F.Y. B.Sc. (Restructuring)

RE - A - FC - 102 (A) : FOUNDATION COURSE

(2019 Pattern) (CBCS) (Semester - II) (12601)

(मराठी रूपांतर)

वेळ : 2 तास] *[एकूण गुण : 35*

सूचना : 1) प्रश्न 1 सोडविणे अनिवार्य आहे.

2) प्रश्न 2 ते प्रश्न 5 पर्यंत कोणतेही तीन प्रश्न सोडवा.

3) प्रश्न 2 ते प्रश्न 5 समान गुण आहेत.

प्रश्न 1) खालीलपैकी कोणतेही पाच प्रश्न सोडवा : **[5]**

अ) भारतीय राज्यघटनेचे शिल्पकार कोणास म्हणतात?

ब) लोकशाहीची व्याख्या सांगा.

क) कोणतेही दोन मुलभूत हक्क सांगा.

ड) भारतीय नागरीकांच्या कोणत्याही दोन जबाबदाऱ्या सांगा.

इ) कोणतीही दोन राष्ट्रीय मुल्ये सांगा.

फ) धर्मनिरपेक्षता म्हणजे काय?

प्रश्न 2) अ) भारतीय राज्यघटनेची वैशिष्टये स्पष्ट करा. **[6]**

ब) माहिती अधिकार कायद – 2005 सांगा. **[4]**

प्रश्न 3) अ) मानवी मुलभूत हक्कांवर चर्चा करा. **[6]**

ब) स्वातंत्र्य ही संकल्पना स्पष्ट करा. **[4]**

प्रश्न 4) अ) स्थानिक स्वराज्य संस्थांचे वैशिष्टय स्पष्ट करा. **[6]**

ब) ग्रामपंचायतीची रचना सांगा. **[4]**

प्रश्न 5) खालीलपैकी कोणत्याही चारवर टीप लिहा : **[10]**

अ) विश्वबंधूता.

ब) स्वातंत्र्याचे प्रकार.

क) भारतीय संविधानाची निर्मिती.

ड) बंधुत्व.

इ) सौंदर्य मुल्ये.

फ) धार्मिक मुल्ये.

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Total No. Of Questions : 5]

SEAT No. :

PA-2102

[Total No. Of Pages : 2

[5901]-81
F.Y.B.Sc. (Vocational)
COMPUTER HARDWARE AND NETWORK ADMINISTRATION
CHNA - 121: Essentials of Computer - II
(2019 Pattern)(CBCS) (Semester - II) (Paper - I) (12871)

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

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

a) Define Sector.

b) Write the full form of MB, GB.

c) What is register?

d) Write examples of at least three super computing applications.

e) How many address lines are required to address 4k×8 memory.

f) What is the function of Instruction register?

Q2) a) i) Explain hardwired control unit. **[2]**

ii) Differentiate between PROM and EPROM **[4]**

b) Draw and explain broad classification diagram of popular secondary storage devices used in today's computer systems. **[4]**

P.T.O.

Q3) a) i) What is floppy disk. **[2]**

ii) What is CDROM? Why it is so called? **[4]**

b) What is the meaning of DDR? What is the difference between DDR 2 and DDR 3 RAM? **[4]**

Q4) a) i) Write the basis on which computers are classified today? **[2]**

ii) What is a flash memory? Why it is so called? **[4]**

b) List some commonly used registers and describe the function of each in brief. **[4]**

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

a) Write short notes on cache memory.

b) What is server computer.

c) What is memory capacity?

d) Write short notes on WORM disk.

e) What is mainframe computers?

f) Write short notes on ALU.

Total No. Of Questions : 5]

SEAT No. : ____

PA-2103

[Total No. Of Pages : 2

[5901]-82

F.Y.B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

CHNA- 122: Computer Organization - II

(CBCS) (2019 Pattern) (Paper - II) (Semester - II) (12872)

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

Instructions to the candidates :

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

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

a) What is Internet?

b) What is NOS?

c) Define virtual PC

d) What is the function of clock generator?

e) Which controller is used control-slow speed devices in computer?

f) What is function of CRT controller?

Q2) a) i) What are the advantages of serial interface? **[2]**

ii) Explain the need of Math co-processor. **[4]**

b) Write a note on RS-232 **[4]**

P.T.O.

Q3) a) i) What is NIC? **[2]**

ii) Write a note on USB **[4]**

b) What is tri-state buffer? Explain the need of tri-state buffer. **[4]**

Q4) a) i) What is multimedia? **[2]**

ii) Write a note on HDMI. **[4]**

b) What is the need of networking? Explain any one topology of networking. **[4]**

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

a) What are the types of Networking?
b) Define Thick and Thin PC.
c) What are the connection types of Internet?
d) Write a note on chipset of computer.
e) What is keyboard controller?
f) Write a note on Wi-Fi.

Total No. Of Questions : 5]

SEAT No. :

PA-2104

[Total No. Of Pages : 2

[5901]-83
F.Y.B.Sc. (Vocational)
BIOTECHNOLOGY
VBt - 121: Bioinstrumentation
(CBCS) (Semester-II) (2019 Pattern) (Paper - I) (12571)

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

Instructions to the candidates :

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

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

a) Name any 2 detectors of gas liquid chromatography.

b) Define wavelength.

c) What is centrifugation?

d) Define refractive index.

e) What is electrophoresis?

f) Name any 2 radioisotopes used in cancer treatment.

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

i) Give the principle of paper chromatography.
ii) Explain the principle of pH-meter.
iii) Distinguish between β & γ particles.

b) Describe the principle & working of TEM. **[4]**

P.T.O.

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

i) Describe the components and working of double beam spectrophotometer.

ii) Explain any one method of counting radioactivity.

iii) Describe affinity chromatography in detail.

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

i) Describe the principle and procedure of PAGE.

ii) Explain rate zonal centrifugation in detail.

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

i) Give applications of IR region of electro magnetic spectrum.

ii) Describe high speed centrifuge in detail.

iii) Give the applications of ion-exchange chromatography.

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

i) What are the applications of radioisotopes in biology?

ii) Give the applications of spectroscopy to biomolecules.

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

a) α - particles.
b) Partition co-efficient.
c) Principle of inverted microscope.
d) Electromagnetic spectrum and its regions.
e) Role of ethidium bromide and gel loading buffer in agarose gel electrophoresis.
f) RCF and RPM.

Total No. Of Questions : 5]

SEAT No. :

PA-2105

[Total No. Of Pages : 2

[5901]-84
F.Y.B.Sc
VOCATIONAL BIOTECHNOLOGY
VBT 122: Biostatistics And Computers For Biologists
(CBCS) (2019 Pattern) (12572) (Semester - II) (Paper-II)

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

Instructions to the candidates :

1) ***Question 1 is compulsory.***
2) ***Question 2 to Q5 attempt any three questions.***
3) ***Question 2 to Q5 carry equal marks.***
4) ***Draw diagrams wherever Necessary.***

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

a) Define Biostatistics

b) What is secondary data?

c) Give one function of yahoo as search engine.

d) Give significance of bar diagram in data presentation.

e) Define Probability.

f) Give any two functions of output devices

Q2) **Answer the following (any Two).** **[6]**

a) i) Define Skewness. Explain types of skewness.

ii) Explain with one example regression equation.

iii) Define mean, mode and median.

Answer any One of the following. **[4]**

b) i) Explain in detail normal distribution and its significance.

ii) Explain in detail coefficient of variation and its significance is biostatistics.

P.T.O.

Q3) **Answer the following (any Two).** **[6]**

a) i) comment on how computers can be explored by biologists

ii) What are computer viruses. Menton threats imposed by computer viruses on data

iii) Add a note on minicomputer.

Answer any One of the following. **[4]**

b) i) Discuss overview and functions of computer system.

ii) Explain in detail concepts in text based searching.

Q4) **Answer the following (any Two).** **[6]**

a) i) Explain in detail Z-test with its significance.

ii) Comment on need of biostatistics in biology.

iii) What is hypothesis testing. Give its applications.

Answer any One of the following. **[4]**

b) i) Explain in detail V and II generation computers. Give their importance.

ii) Explain in detail concept and application of probability.

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

a) Types of errors

b) Histogram

c) Sample size

d) Methods of data collection

e) Power point in data presentation

Total No. of Questions : 5]

SEAT No. : ____

PA-2106

[Total No. of Pages : 2

[5901] - 85

F.Y. B.Sc. (Vocational)

SEED TECHNOLOGY

ST - 1.4 : Seed Physiology (Paper - III)

(2019 Pattern) (CBCS) (Semester - II) (12891) (2 Credits)

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 Q.5 carry equal marks.***

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

a) Define Embryo.

b) What is Epigeal germination?

c) Define artificial seed.

d) Enlist any two methods of breaking seed dormancy.

e) What is seed deterioration?

f) What is seed viability?

Q2) a) Describe the composition of seed. **[6]**

b) Explain hypogeal type of germination with suitable diagram. **[4]**

Q3) a) Explain factors affecting seed dormancy. **[6]**

b) Comment on the advantages and precaution during seed pelleting. **[4]**

P.T.O.

Q4) a) Describe seed deterioration in detail and its importance in seed storage. **[6]**

b) Comment on quick viability test (Tz). **[4]**

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

a) Seed endosperm.

b) Viviparous germination.

c) Seed pelleting.

d) Chemical method of breaking seed dormancy.

e) Sanitation during seed storage.

f) Seed vigour.

Total No. of Questions : 5]

SEAT No. : ____

PA-2107

[Total No. of Pages : 2

[5901] - 86

F.Y.B.Sc. (Vocational)

SEED TECHNOLOGY

12892 : ST - 1.5 : Seed Production (Paper - IV)

(2019 Pattern) (CBCS) (Semester - II) (2 Credits)

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

Instructions to the candidates :

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

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

a) Define Nucleus Seed.

b) Enlist any two seed production organizations in India.

c) What do you mean by isolation distance?

d) What is sowing?

e) Define irrigation.

f) Enlist any one disease of groundnut.

Q2) a) Describe the classes of seed in detail. **[6]**

b) Comment on National Seed Corporation and its objectives. **[4]**

Q3) a) Explain in brief various steps in seed production. **[6]**

b) Describe steps in land preparation for chilli crop. **[4]**

P.T.O.

Q4) a) Explain the early blight disease of Tomato w.r.t. causal organism, symptoms and control. **[6]**

b) Comment on the precautions during crossing program. **[4]**

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

a) Seed as a basic input.

b) Disease and insect pest.

c) Weed control and roughing.

d) Methods of sowing.

e) Sources of irrigation.

f) Roughing.

Total No. of Questions : 5]

SEAT No. :

PA-2108

[Total No. of Pages : 2

[5901]-87
F.Y. B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
IMB-121 : Quantitative Industrial Microbiology
(2019 Pattern) (CBCS) (Semester - II) (Paper - I) (12821)

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

Instructions to the candidates:

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

Q1) Answer the following questions in one/2 lines any 5 : **[5]**

a) Define Unit

b) What is the need to study quantitative microbiology?

c) State true or false : Atm pr is one of the units of pressure.

d) What do you mean by 'data' in microbiology?

e) Mention different types of data presentation.

f) Define Variable.

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

i) What is control region?

ii) Write short note on Log-log plot.

iii) What is the necessity for modelling a fermentation process?

iv) What is specific gravity? Give it's units & use in fermentation.

b) What are linear and non-linear models? Explain with the help of examples. **[4]**

P.T.O.

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

i) What do you mean by stoichiometry?

ii) Explain the mole-concept.

iii) What are semi-log plot?

iv) What are the ways of data analysis?

b) Explain general procedure for plotting a graph. **[4]**

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

i) What are errors in measurement? Explain with the help of example.

ii) What is mean & standard deviation?

iii) Define Temperature. Give different units of temperature.

iv) Draw a pie-chart and explain its advantage over table as form of presentation.

b) Explain different types of errors in brief. **[4]**

Q5) Write short notes on any 4 of the following : **[10]**

a) Substantial variable

b) PPm & ppb

c) Yield

d) Natural variable

e) Dimension

f) Dimensional homogeneity in equations

□□□

Total No. of Questions : 5]

SEAT No. :

PA-2109

[Total No. of Pages : 2

[5901]-88
F.Y. B.Sc. (Vocational)
INDUSTRIAL MICROBIOLOGY
IMB-122 : Industrial Bioprocesses and Microbial Products
(2019 Pattern) (CBCS) (Semester - II) (Paper - II) (12822)

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

Instructions to the candidates:

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

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

a) Write importance of growth factors in fermentation media.

b) Give examples of any two vitamins produced by fermentation process.

c) Enlist two organisms used for production of hydrogen.

d) What is submerged fermentation? Write its application.

e) Define 'Malting-process'.

f) Give examples of enzymes used as catalysts in organic synthesis.

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

i) Explain in details 'carbon sources' used in fermentation media.

ii) With help of flow-chart explain production of 'fine' enzymes.

iii) Describe use of bacterial vaccines.

iv) Explain the microbial production of polysaccharides with a suitable example.

b) Explain applications of microbial enzymes in plant juice production. **[4]**

P.T.O.

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

i) Write examples of enzymes and their use in cheese production.

ii) Write production of antibiotics with a suitable example.

iii) Explain the process of fermentation for production of beer.

iv) Write applications of enzymes in leather manufacture.

b) Explain the term 'Prebiotics' in details. **[4]**

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

i) Explain the use of recombinant therapeutic peptides and proteins.

ii) Give advantages of using bacteriophages as therapeutics.

iii) Explain the microbial biomass production of Mushroom with substrate and organism.

iv) Explain "Advantage of using microorganisms for production of commercial enzymes".

b) Describe with help of flow chart microbial production of Industiral ethanol using various substrates. **[4]**

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

a) Butanol

b) Factors affecting choice of fermentation media.

c) Natural preservatives.

d) Microbial production of butter.

e) Enzymes used in treatment of wood pulp.

f) Vinegar production.

□□□

Total No. of Questions : 5]

SEAT No. : ____

PA-2110

[Total No. of Pages :2

[5901]-89
F.Y. B.Sc. (Vocational)
ELECTRONIC EQUIPMENT MAINTENANCE
VOC EEM - 121 : Maintenance of Domestic Equipments - B (Cooling Appliances)
(2019 Pattern) (CBCS) (Semester - II) (Paper - I) (12811)

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

Instructions to the candidates :

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

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

a) What is refrigeration?

b) What are the components of cooling system of refrigerator?

c) Who invented fridge?

d) What is use of circuit breaker in AC?

e) What is dehumification?

f) What to do if AC is not working?

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

i) What materials are used for making a refrigerator?

ii) What are raw materials for AC?

b) What are basic components of air conditioner? **[4]**

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

i) What is working principle of refrigerator? Explain.

ii) What are parts of freezer?

b) What are the steps to change AC filter? **[4]**

P.T.O.

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

i) What causes a capacitor to fail in air conditioner?

ii) What are the symptoms of a bad AC capacitor?

b) What are different types of refrigerants? **[4]**

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

a) What is a function of refrigerant?

b) What are parts of air compressor?

c) Which refrigerant is banned?

d) How to prevent evaporator coil leaks?

e) How often should AC evaporator coils be cleaned?

f) What is condenser coil air conditioner?

Total No. of Questions : 5]

SEAT No. :

PA-2111

[Total No. of Pages :2

[5901]-90
F.Y. B.Sc. (Vocational)
ELECTRONIC EQUIPMENT AND MAINTENANCE
EEM122 : Elements of Electronic Equipment
Design - B (Open Source Tools)
(2019 Pattern) (CBCS) (12812) (Semester - II) (Paper - II)

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

Instructions to the candidates :

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

Q1) Answer the following: (any five) **[5]**

a) Which programming language does android studio support?

b) Mention any two applications of LED.

c) Give the meaning of stack view in android.

d) What do you mean by Bluetooth?

e) What is APK file for android studio?

f) Give the definition of device emulator.

Q2) Answer the following:

a) Describe the LCD interfacing with ESP32. Give the connection diagram and program code. **[6]**

b) Explain in short digital read ( ) and digital write ( ) commands. **[4]**

Q3) Answer the following:

a) Explain in detail the bluetooth module with the help of neat labelled diagram. **[6]**

b) Give the difference between emulator and simulator. **[4]**

P.T.O.

Q4) Answer the following:

a) What is android operating system? Give the importance and benefits of android operating system. **[6]**

b) Explain the procedure of installation of ESP32. **[4]**

Q5) Write a short note on: (any four) **[10]**

a) GPIO pins of ESP32.

b) Serial monitor.

c) Android SDK manager.

d) Principle of working of LED.

e) Build - gradle file.

f) API in android.