Total No. of Questions : 4]

SEAT No. :

PA-2032

[Total No. of Pages : 2

[5901]-1

F.Y.B.Sc.

MATHEMATICS

MT - 111 : Algebra

(2019 Pattern) (Semester - I) (Paper - I) (11111)

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

Instructions to the candidates:

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

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

a) If set A = {*a*, *b*, *c*} then write down all partitions of A.

b) Define divisibility in integers.

c) It for integers *a*, *b* *a*/*b* then prove that *a*/*bc* for any integer c.

d) Write 819 in canonical form.

e) State De-Moivre's theorem.

f) Find real and imaginary parts of $(1 + 2i)(-2 + i)$.

g) Find $\left(\overline{2}\right)^3$ in Z_3.

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

i) Let σ be an equivalence relation on a non-empty set X. Then show that $y \in \overline{x}$ if and only if $\overline{x} = \overline{y}$.

ii) If *a* and *b* are any integers with $b > 0$ then show that there exists unique integers *q* and *r* such that $a = bq + r$, $0 \leq r < b$.

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

i) Let $g : R \to R$ be a function defined by $g(x) = 5x - 2$. Show that the function *g* is bijective. Also find a formula for g^{-1}.

ii) If n is odd integer then prove that $n^2 - 1$ is divisible by 8.

P.T.O.

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

i) Show that for arbitrary integers a and b, $a \equiv b \pmod{n}$ if and only if a and b leave the same remainder when divided by n, where $n > 1$.

ii) For any complex numbers z_1, z_2 show that $\big||z_1| - |z_2|\big| \le |z_1 - z_2|$.

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

i) Find all pairs $\bar{i}$ and $\bar{j}$ in z_8 such that $\bar{i} \cdot \bar{j} = \bar{1}$.

ii) Show that $\sin^7\theta = \frac{1}{64}\left[35\sin\theta - 21\sin 3\theta + 7\sin 5\theta - \sin 7\theta\right]$

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

i) Let a, b, c, x, y be integers. If $a|b$ and $a|c$ then show that $a|(bx+cy)$.

ii) Show that for has $\bar{i} \in zn$ an inverse for multiplication modulo n if and only if $(i, n) = 1$.

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

i) Show that the relation ~ defined on R^2 by $(x, y) \sim (a, b)$ if and only if $xy = ab$ is an equivalence relation. Describe the equivalence class of $(1, 1)$ R^2.

ii) Prove that $(-1 + i)^7 = -8(1 + i)$

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Total No. of Questions : 5]

SEAT No. :

PA-2041

[Total No. of Pages : 2

[5901]-10

First Year B.Sc. (Regular)

ZOOLOGY

ZO - 112 : Animal Ecology

(2019 CBCS Pattern) (Semester - I) (Paper - II) (11152)

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) Define ecology.

b) Explain the term "Biome".

c) What is an organism?

d) Define population.

e) What is environment?

f) Explain autotrophy.

Q2) a) Describe the composition and structure of ecosystem. **[6]**

OR

Explain the factors affecting the population. **[6]**

b) Explain characteristics of community. **[4]**

Q3) a) Explain Gause's principle with suitable example. **[6]**

OR

Describe the structure of forest ecosystem. **[6]**

b) Explain the food chain and its importance. **[4]**

Q4) a) Describe the pyramid of number with example. **[6]**

OR

Give biotic and abiotic components of pond ecosystem. **[6]**

b) Explain ecotone and edge effect of community. **[4]**

P.T.O.

Q5) Write short notes (any four). **[10]**

a) Describe productivity of ecosystem.

b) Explain natality.

c) Describe ecological succession.

d) Explain synecology.

e) Describe commensalism with suitable example.

f) Explain parasitic interaction with examples.

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Total No. of Questions : 5]

SEAT No. :

PA-2042

[Total No. of Pages : 2

[5901]-11

F.Y.B.Sc.

GEOLOGY

GL - 111 : Fundamentals of Geology and Understanding the Planet Earth

(2019 Pattern) (Semester - I) (Paper - I) (11161)

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

Instructions to the candidates:

1) ***Question No. 1 is compulsory.***
2) ***Solve any 3 questions from Q2 to Q5.***
3) ***Question No. 2 to 5 carry equal marks.***

Q1) Answer the following in 2-3 lines (ANY FIVE). **[5]**

a) Define Atmosphere.

b) Define Fold.

c) What are seismic waves?

d) Define Fossil.

e) What is the age of Earth?

f) Define Mineralogy.

Q2) Answer the following.

a) Explain the direct & indirect methods of dating. **[6]**

b) Define Geology. Give its importance. **[4]**

Q3) Answer the following.

a) Explain the classification of Atmosphere. **[6]**

b) Explain the uses of fossils. **[4]**

Q4) Answer the following.

a) Explain seafloor spreading. **[6]**

b) Define earthquake. Give its causes. **[4]**

P.T.O.

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

a) Composition of Lithosphere.

b) Central type of eruption.

c) Types of Crust.

d) Historical geology.

e) Geologial Time scale.

f) Mould and cast fossils.

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Total No. of Questions : 5]

SEAT No. :

PA-2043

[Total No. of Pages : 2

[5901]-12

F.Y. B.Sc.

GEOLOGY

GL-112 : Mineralogy and Crystallography

(2019 Pattern) (Semester - I) (11162)

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 carries equal marks.***

Q1) Answer the following in 2-3 Sentences (any 5) **[5]**

a) Define Pseudomorphism.

b) Define cleavage in minerals.

c) Define plane of symmetry in crystals.

d) Define covalent bonding.

e) Give the elements of symmetry of Tetragonal system.

f) Define Anisotropism in minerals.

Q2) Answer the following:

a) Define Hardness of minerals. Give Mohs scale of hardness. **[6]**

b) Describe Isomorphism & Polymorphism. **[4]**

Q3) Answer the following:

a) Describe Refractory minerals give examples. **[6]**

b) Describe forms of Hexagonal system Beryl type. **[4]**

Q4) Answer the following:

a) Explain Covalent bonding in minerals. **[6]**

b) Explain Index system of Miller. **[4]**

P.T.O.

Q5) Answer the following (Any 5): **[10]**

a) Ionic bonding in minerals.

b) Geochemical affinity of elements.

c) Crystallised form in minerals.

d) Parameter system of Weiss.

e) Interference colours.

f) Minerals used in fertilizers.

Total No. of Questions : 4]

SEAT No. :

PA-2044

[Total No. of Pages : 2

[5901]-13

F.Y. B.Sc.

STATISTICS

ST-111 : Descriptive Statistics-I

(2019 Pattern) (Semester - I) (Paper-I) (11171)

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:

a) NSSO stands for **[1]**

i) National sample survey office

ii) National service scheme office

iii) National scheme service office

iv) National sample service organization

b) In case of Symmetric distribution. **[1]**

i) Mean > Median > Mode

ii) Mean < Median < Mode

iii) Mean = Median = Mode

iv) Mode > Mean > Median

c) With two attributes the total number of ultimate class frequency is. **[1]**

i) Two

ii) Four

iii) Six

iv) Eight

B) State whether following statements are true of false:

a) The empirical relation between mean, median and mode is: mean-mode = 3 (mean-median) **[1]**

b) Karl pearson's coefficient of skewness lies between –1 and +1. **[1]**

P.T.O.

Q2) Answer any two of the following:

a) Explain the concept of α% trimmed mean. State its necessity. **[5]**

b) Write short note on systematic random sampling. **[5]**

b) A certain distribution has mean 20, coefficient of variation 20% and coefficient of skewness 0.1. Find its mode. **[5]**

Q3) Attempt any two of the following:

a) What do you mean by central tendency. State different measures of central tendency. **[5]**

b) State merits and demerits of S.D. **[5]**

c) In a particular firm total employees are 700. Out of this 300 are male.100 male like Indian music and rest of them like western music. Only 30 female like western music. Is there any association between gender and type of music. **[5]**

Q4) Attempt any one of the following:

a) i) If attributes A and B are independent then show that: **[6]**

1) A and β are independent

2) α and B are independent

3) α and β are independent

ii) Arithmetic mean of 50 items is 104. While checking it was noticed that observation 98 was misread as 89. Find the correct value of mean. **[4]**

b) i) Define raw and central moments. Express first four central moments in terms of raw moments. **[6]**

ii) Compute mean deviation about mean and median for the data given below: **[4]**

83, 80, 85, 78, 79, 82, 80.

Total No. of Questions : 4]

SEAT No. :

PA-2045

[Total No. of Pages : 2

[5901]-14
First Year B.Sc.
STATISTICS
ST - 112 : Discrete Probability and Probability Distributions - I
(2019 Pattern) (Semester - I) (CBCS) (Paper - II) (11172)

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 statistical tables and calculator is allowed.***
4) ***Symbols have their usual meaning.***

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

a) For two mutually exclusive events A and B, $P(A \cap B)$ will be

i) 0 ii) 0.5
iii) 1 iv) 0.1

b) Let $X \rightarrow B(5, 0.8)$, then mean of X is

i) 0.4 ii) 4.0
iii) 0.2 iv) 2

c) For the following probability distribution of random variable X

X	1	2	3	4
P(x)	0.1	0.2	0.3	0.4

the value of mode of X is equal to

i) 1 ii) 2
iii) 3 iv) 4

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

a) $P(\phi) = 0$ is one of the axiom of probability theory.

b) The first cumulant is equal to first raw moment.

P.T.O.

Q2) Attempt any Two of the following . **(5 each)**

a) Define classical definition of probability and discuss its limitations.

b) If $M_x(t) = e^{t^2/2}$, find the first four central moments of x.

c) Define degenerate distribution. Derive its mean and variance.

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

a) Define discrete uniform distribution and obtain its moment generating function.

b) If A, B, C are any three events defined on a sample space Ω with P (B) > 0 then prove that $P(A \cup C / B) = P(A / B) + P(C / B) - P(A \cap C / B)$.

c) Let X be a discrete random variable with probability mass function

$$P(X = x) = \frac{X}{15};\ X = 1,2,3,4,5$$
$$= 0;\quad otherwise$$

Find E(X) and var (2X–3).

Q4) Attempt any one of the following:

a) i) For any event A of Ω, show that $0 \le p(A) \le 1$. **[4]**

ii) Following is the probability distribution of x. **[4]**

X	0	1	2	3	4
p(x)	k	3k	5k	2k	k

Find value of k and P[X ≥ 2]

iii) Define mutual independence of three events. **[2]**

b) i) Define binomial distribution and derive its mean. **[5]**

ii) A parcel of 12 books contains 4 books with loose binding. What is the probability that a random selection of 6 books (without replacement) will contain three books with loose binding? **[5]**

Total No. of Questions : 5]

SEAT No. :

PA-2046

[Total No. of Pages : 2

[5901]-15

First Year B.Sc.

GEOGRAPHY - I

Gg -111 : Introduction to Physical Geography - I (Geomorphology)

(CBCS 2019 Pattern) (Semester - I) (Paper - I) (11181)

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

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any 3 questions from Q2 to Q5.***
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 Geomorphology.
b) What is mean by epoch?
c) What is mean by syncline?
d) Define the term earthquake.
e) Write the name of any two plateaus.
f) Define the term rocks.

Q2) A) Answer the following questions in 100 words (any two). **[6]**

a) Explain Hydrosphere a components of earth system.
b) Describe the core of the earth's interior.
c) Describe the plate margin.

B) Answer the following questions in 150 words (any one). **[4]**

a) Write the types of seismic waves.
b) Write the characteristics of the sedimentary rocks.

Q3) A) Answer the following questions in 100 words (any two). **[6]**

a) Explain the nature of Geomorphology.
b) Explain the lithosphere of the earth.
c) Explain the types of volcanoes.

B) Answer the following questions in 150 words. (any one) **[4]**

a) Write any five applications of Geomorphology.
b) Write any two evidences in support of continental drift theory.

P.T.O.

Q4) A) Answer the following questions in 100 words.(Any two). **[6]**

a) Discuss Airy's concept of isostosy.

b) Write the causes of volcanic eruption.

c) Write difference between rocks and minerals.

B) Answer the following question in 150 words (any one). **[4]**

a) Write any two criticisms on Wegener's continental drift theory.

b) Write any two types of metamorphism.

Q5) Write short notes on the followings (any four). **[10]**

a) Branches of Geomorphology.

b) Jig-Saw-Fit.

c) Rift valley.

d) Components of volcanoes.

e) Intrusive igneous rocks.

f) Physical weathering.

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Total No. of Questions : 5]

SEAT No. :

PA-2047

[Total No. of Pages : 2

[5901]-16

F.Y. B.Sc.

GEOGRAPHY

Gg-112 : Introduction to Physical Geography-II

(Geography of Atmosphere and Hydrosphere)

(2019 Pattern) (Semester - I) (Paper-II) (CBCS) (11182)

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 stencils is allowed.***

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

a) Define weather.

b) What do you mean by convection?

c) What is meant by periodic winds?

d) What is meant by roaring forties?

e) What do you mean by wavelength?

f) Define Tides.

Q2) a) Answer the following questions in100 words (Any Two): **[6]**

i) Describe inversion of temperature.

ii) Describe 'Anti-trade winds'.

iii) Describe 'Trenches' of ocean floor.

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

i) Describe 'albedo of the earth'.

ii) Explain the North-East monsoon winds.

Q3) a) Answer the following questions in100 words (Any Two): **[6]**

i) Explain the dust particles as a component of earth atmosphere.

ii) Explain the sea breezes with suitable diagrams.

iii) Describe the effects of ocean currents.

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

i) Describe the differance between weather and climate.

ii) Explain any two causes of pressure belts formation.

P.T.O.

Q4) a) Answer the following questions in100 words (Any Two): **[6]**

i) Explain the importance of ozonosphere.

ii) Explain heat budget of the earth.

iii) Discuss the hydrological cycle with suitable diagram.

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

i) Explain any two factors affecting horizontal distribution of temperature.

ii) Describe the characteristics of sea waves.

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

a) Troposphere.

b) Vertical distribution of temperature.

c) Polar high pressure belts.

d) Valley breezes.

e) Continental slope.

f) Types of tides.

Total No. of Questions : 5]

SEAT No. :

PA-2048

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[5901]-17

First Year B.Sc.

MICROBIOLOGY

MB-111 : Introduction to Microbial World

(CBCS 2019 Pattern) (Semester - I) (Paper-I) (11191)

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 diagram wherever necessary.*

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

a) What are animalcules.

b) Define fermentation.

c) TMV was first discovered by _____ scientist.

d) Give any two examples of eukaryotes.

e) What are vaccines.

f) Give any two examples of microbial causative agents of plant diseases.

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

i) Discovery of streptomycin.

ii) Contribution of Edward Jenner in development of vaccines.

iii) Robert Koch's Postulates.

iv) Viroids.

b) What are probiotics? Describe any two fermented foods. **[4]**

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

i) Immunology.

ii) Uses of antibiotics.

iii) Any two microbial diseases in humans and their causative agents.

iv) Nanobiotechnology & it's any two applications.

b) Diagrammatically explain Francesco Redi experiment. **[4]**

P.T.O.

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

i) Robert Hook's contribution.

ii) Contribution of Louis Pasteur in development of vaccine against rabies.

iii) Carl Woes classification.

iv) Give any two examples of food borne diseases with their causative agents.

b) Write morphological and diffentiating characters of protozoa. **[4]**

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

a) Algae.

b) First line of defense mechanism.

c) Actinomycetes.

d) Phagocytosis.

e) Pasteurization.

f) Abiogenesis.

Total No. of Questions : 5]

SEAT No. :

PA-2049

[Total No. of Pages : 2

[5901]-18

F.Y. B.Sc. (Microbiology)

MB-112 : BASIC TECHNIQUES IN MICROBIOLOGY

(CBCS 2019 Pattern) (Semester - I) (Paper-II) (11192)

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

Instructions to the candidates:

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

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

a) Mili litre = _____ litre

b) Define : Oligodynamic action.

c) Define : Mordants.

d) Membrane filter with _____ pore size is used for sterilization.

e) Define : Stain.

f) State True or False : Dry heat has higher penetration power than moist heat.

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

i) Pasteurization as physical method of sterilization.

ii) Applications of detergents.

iii) Functions of eye piece lens.

iv) Acidic stains.

b) Explain role of decolorizers by giving two examples. **[4]**

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

i) chromatic aberration.

ii) Principle of capsule staining.

iii) Applications of quaternary ammonium compounds.

iv) Advantages of filtration.

b) Explain working of TEM in detail. **[4]**

P.T.O.

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

i) Accentuators during staining.

ii) Vaccine bath as a physical method of sterilization.

iii) Principle of fluorescence microscopy.

iv) Efficiency of sterilization by using chemical indicators.

b) Describe procedure of spore staining in detail. **[4]**

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

a) Total magnification of compound microscope.

b) Types of condenser.

c) Image formation in phase contrast microscope.

d) Disinfection by using phenol and phenolic compounds.

e) Sterilization by using non ionising radiations.

f) Asbestos filters.

Total No. of Questions : 5]

SEAT No. :

PA-2050

[Total No. of Pages : 2

[5901]-19

F.Y.B.Sc. (Nano Science and Nano Technology)

NS -111 : Fundamentals of Nanoscience

(2019 Pattern) (Semester - I) (Paper - I) (11261)

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) ***Draw neat and labelled wherever necessary.***
5) ***Figure to the right indicate full marks.***

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

a) What are 'Natural nano material's?

b) Give two invention name in 20th century.

c) Give principle chemical reaction in bioluminescence.

d) Give the classification of nanomaterials.

e) What is 'MEMS'?

f) Define 'Tribology'?

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

i) Explain in detail Nano and nature.

ii) Explain 'Standards for Nanotechnolgoy'.

b) Describe background to nanotechnology. **[4]**

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

i) Explain in detail properties of Bucky ball.

ii) Write 'Bottom-up approach for synthesis of Nanomaterials.

b) Write in detail 3-D Nanomaterial. **[4]**

P.T.O.

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

i) Describe Nanotechnology Time-line.

ii) Explain single walled and multiwalled carbon Nanotubes.

b) Explain 'Leaf Lotus effect'. **[4]**

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

a) Single walled carbon Nanotubes.

b) Nanometrology.

c) Biolumescence.

d) Nano biotechnology.

e) Graphene.

f) Tribology.

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Total No. of Questions : 4]

SEAT No. :

PA-2033

[Total No. of Pages : 2

[5901]-2

F.Y.B.Sc.

MATHEMATICS

MT - 112 : Calculus - I

(2019 Pattern) (Semester - I) (Paper - II) (11112)

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) Determine the set A = $\{x \in R / 12x + 3 | < 7\}$.

b) Find the supremum and infimum of the set A, if exist, where A = {–1, 3, 2, 0, 9, 12}

c) Write statement of the Bolzano-Weierstrass theorem.

d) Find the domain and range of the function $y = \sqrt{25 - x^2}$.

e) Evaluate $\lim_{x \to 0^+} \frac{|x|}{x}$.

f) Define continuity of function $f(x)$ at $x = c$.

g) Sketch the graph of the function $f(x) = x^2, x \in [-1, 1]$.

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

i) For all a, b in R, prove that $|a + b| \leq |a| + |b|$

ii) Prove that every convergent sequence is bounded.

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

i) Find a rational number between the numbers $\sqrt{2}$ and $\sqrt{3}$.

ii) Show that the sequence (x_n), where $x_n = \frac{n^2 + 1}{2n^2 + 5}, \forall n \in N$ converges to ½.

P.T.O.

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

i) State and prove squeeze theorem for limit of function.

ii) Prove that the limit of a function $f(x)$ as $x \to c$ is unique, if it exist.

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

i) Discuss the convergence of (a_n), where $a_n = 5 + \dfrac{n(-1)^n}{n+1}$.

ii) Prove that $\lim\limits_{x \to 0}\left(x \sin \dfrac{1}{x} \right) = 0$.

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

i) Let I = $[a, b]$ be a closed and bounded interval and let $f : I \to R$ be continuous on I. Then prove that f is bounded on I.

ii) Let $A \subseteq R$, $K \in R$ and let $f, g : A \to R$. Suppose that f and g are continuous at $C \in A$. Then prove that $f.g$ is continuous at $x = c$.

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

i) Find α and β if the function $f(x)$ is continuous on $(-3, 5)$, where

$f(x) = x + \alpha, \quad -3 < x < 1$

$= 3x + 2, \quad 1 \leq x < 3$

$= \beta + x, \quad 3 \leq x < 5$

ii) Show that the function $f(x) = |x|$ is continuous at every point $C \in R$. **[5]**

Total No. of Questions : 5]

SEAT No. :

PA-2051

[Total No. of Pages : 2

[5901]-20

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

NS-112 : MATERIALS SCIENCE

(2019 Pattern) (Semester - I) (Paper-II) (11262)

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 carries equal marks.***
4) ***Draw neat labeled diagram wherever necessary.***
5) ***Figures to the right indicate full marks.***

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

a) What is mean by interplaner distance?

b) Define solvus line.

c) What is mesoporosity of the material?

d) What is mean by system & surrounding?

e) State Gibb's phase rule.

f) Calculate Miller indices of crystal plane which cut through the crystal axes at (1a, 2b, 2c).

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

i) Define phase diagram. With neat diagram explain type - III phase diagram.

ii) State & explain Lever rule in detail.

b) Calculate the number of atoms in simple cubic, BCC & FCC structures. **[4]**

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

i) Define Bravais lattices. Explain two dimensional Bravais lattices.

ii) What is composite material? Explain early composites & modern composites.

b) Explain insulator material in detail. **[4]**

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

i) Explain bonding & antibonding states.

ii) What is atomic radius? Derive an expression for interplaner distance for cubic system.

b) Explain three dimension crystal structure. **[4]**

P.T.O.

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

a) Oxide materials.

b) Aerogels.

c) Non-primitive translation vectors.

d) Metallic solids.

e) Core-shell Nanoparticles.

f) Packing fraction.

Total No. of Questions : 5]

SEAT No. :

PA-2052

[Total No. of Pages : 2

[5901]-21

F.Y. B.Sc.

ELECTRONICS SCIENCE

EL 111 : Basics of Applied Electronics

(CBCS 2019 Pattern) (Semester-I) (Paper-I) (11221)

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) State working principle of capacitor.

b) If two capacitors c_1 & c_2 cannected in parallel having values 1μf & 10 μf respectively. What will be the equivalant capacitance?

c) State different types of Inductors.

d) State kirchoff's current law.

e) Give any two examples of electronic systems.

f) What is thermostat?

Q2) a) Answer the following.

i) Explain Application of Electronics in consumer systems. **[2]**

ii) Explain construction & working of Electro magnetic relag **[4]**

b) State & prove maximum power transfer theorem **[4]**

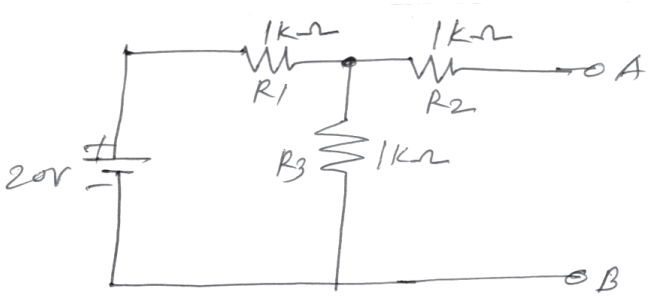
Q3) a) Answer the following.

i) State any two types of batteries & draw it symbols. **[2]**

ii) State the use of switches in Electronic appliances. State its types & draw its symbols. **[4]**

P.T.O.

b) Find the therenin's equivalent circuit for the following network. **[4]**



Q4) a) Answer the following.

i) State superposition theorem **[2]**

ii) Explain CCTV system with block diagram **[4]**

b) What is public adress system? Give specifications of standard public adress system. **[4]**

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

a) Passive Electronic components.

b) Electronic fuse

c) Nortan's theorem

d) GPS feature of smart phone

e) Sensars in smart phone

f) Electronic system.

Total No. of Questions : 5]

SEAT No. :

PA-2053

[Total No. of Pages : 2

[5901]-22

F.Y. B.Sc.

ELECTRONIC SCIENCE

EL-112 : Electronic Devices and Circuits

(CBCS 2019 Pattern) (2 Credits) (Semester - I) (Paper-II) (11222)

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

a) What is PN junction? Draw symbol of PN junction diode.

b) Why FET is called field effect transistor?

c) Give any two applications of LED.

d) Write the full form of i) LDR ii) LED.

e) Define depletion region.

f) For a bipolar junction transistor if base current is 40 μA and collector current is 10mA, find current flowing through emitter.

Q2) a) Attempt the following.

i) Explain forward biasing of PN junction diode with neat diagram. **[2]**

ii) Give transistor configurations in detail. **[4]**

b) Explain Operating principle of photo diode. **[4]**

Q3) a) Attempt the following:

i) Define rectifiers? Explain halfwave rectifier with neat diagram. **[2]**

ii) What is zener diode? Give symbol and write any two applications. **[4]**

b) Explain opto-isolator with block diagram. **[4]**

P.T.O.

Q4) a) Attempt the following:

i) Give construction of LED. **[2]**

ii) Draw block diagram of power supply and explain each block in short. **[4]**

b) Explain the action of transistor as a switch. **[4]**

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

a) Barrier potential.

b) FET as a VVR.

c) IR Trans mitter.

d) Output characteristics of BST.

e) Street light controller.

f) Mobile charger.

Total No. of Questions : 5]

SEAT No. :

PA-2054

[Total No. of Pages : 1

[5901]-23

F.Y. B.Sc.

PSYCHOLOGY

PSY-111 : Foundations of Psychology

(2019 Pattern) (Semester - I) (11201)

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) Solve Any five of the following: **[5]**

a) Define memory.
b) Write the formula of I.Q.
c) Define Psychology.
d) Define Perception.
e) Define attention.
f) Define motivation.

Q2) a) Explain the types of memory. (80 words). **[6]**
b) State the motivational cycle . (50 words) **[4]**

Q3) a) Explain the biological motives. (80 words) **[6]**
b) Explain any two fields of psychology. (50 words) **[4]**

Q4) a) Explain the structure of personality. (80 words) **[6]**
b) Explain any two concepts in classical conditioning. (50 words) **[4]**

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

a) Goals of psychology.
b) Types of attention.
c) Needs of achievement motivation.
d) Long term memory.
e) Reinforcement.
f) Sensation.

Total No. of Questions : 5]

SEAT No. :

PA-2055

[Total No. of Pages : 1

[5901]-24

First Year B.Sc. (Regular)

PSYCHOLOGY

PSY-112 : Experimental Psychology

(2019 Pattern) (Semester - I) (11202)

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]**

a) What is alternative hypothesis.

b) Who is the pioneer of study of individual differences.

c) What is the research design?

d) Define Sensitivity.

e) What is the Active Variables?

f) Define psychophysics.

Q2) a) Describe nature of Experimental psychology. (80 words) **[6]**

b) Explain types of variables. (50 words) **[4]**

Q3) a) Explain the types of factorial design. (80 words) **[6]**

b) Describe basic concepts of psychophysics. (50 words) **[4]**

Q4) a) Describe scope of experimental psychology. (80 words) **[6]**

b) Explain types of Quasi experimental design. (50 words) **[4]**

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

a) Applications in clinical setting of experimental psychology.

b) Characteristics of the good hypothesis.

c) Interrupted Time-Series designs.

d) Method of constant stimuli

e) How do control variable.

f) Point of subjective equlity.

Total No. of Questions : 5]

SEAT No. :

PA-2056

[Total No. of Pages : 1

[5901]-25

First Year B.Sc.

ENVIRONMENTAL SCIENCE

EVS-111 : Fundamentals of Environmental Biology

(2019 Pattern) (Semester - I) (Paper-II) (11241)

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

Instructions to the candidates:

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

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

a) What is the scope of biology?
b) Define Epochs.
c) Write any 2 examples of Gymnosperm.
d) What do you understand by bio resources?
e) What is the biggest cause of habitat loss?
f) How did extinction start?

Q2) a) What are the main causes of continental drift? **[6]**
b) What was the main purpose of the voyage of the HMS Beagle? **[4]**

Q3) a) How many bio geographical realms are there in the world? **[6]**
b) Which factors have affected biogeography? **[4]**

Q4) a) Explain in detail major livestock varieties in India. **[6]**
b) How do scientists use taxonomy? **[4]**

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

a) Food plants resource in world
b) Halophytes
c) Vestigiality
d) Gangetic plain
e) Invasive species
f) Extraction of Bio resources by traditional method.

Total No. of Questions : 5]

SEAT No. :

PA-2057

[Total No. of Pages : 1

[5901]-26

First Year B.Sc.

ENVIRONMENTAL SCIENCE

EVS-112 : Fundamental of Environmental Chemistry& Physics

(2019 Pattern) (Semester - I) (Paper-II) (11242)

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

a) What are the four biogen-chemical cycles?

b) What types of reaction is O_3 to O_2.

c) What is meant by Green Chemistry.

d) What is primary air pollutants in atmosphere.

e) Define anionic detergents.

f) Write any 3 types of food additives.

Q2) a) What is heat exchange. Explain the latent heat with examples. **[6]**

b) Briefly explain the principle of conductivity meter. **[4]**

Q3) a) Briefly explain the Gibbs energy equation. **[6]**

b) Explain the basic principle of conductivity meter. **[4]**

Q4) a) Briefly write earth radiation balance. Add a note on atmospheric window. **[6]**

b) What is food adultration. Explain its consequences. **[4]**

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

a) Global warming

b) Flavoring agent in food

c) Detergents

d) Oxygen cycle

e) Ozone layer and its importance

Total No. of Questions : 4]

SEAT No. :

PA-2058

[Total No. of Pages : 1

[5901]-27

First Year. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS-101 : India's National Security : Key Concept

(2019 Pattern) (Semester - I) (Paper-I) (11281)

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) Define National Security.

b) Define Collective Security.

c) State the Meaning of Terrorism.

d) What is the meaning of Human Trafficking?

e) State the role of media in security issue.

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

a) India's National Security.

b) Water Security.

c) Cyber Crime.

d) Comprehensive Security.

Q3) Attempt the following questions. **[10]**

a) Explain the Meaning and Elements of State.

b) Explain the Conceptual framework of India's National security.

c) State the role of civil society in Tackling security challenges.

d) Sate the role of political institution in Tackling security challenges.

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

a) Explain in detail India and South Asian Problems and Prospects.

b) Discuss in brief the concept of National power and National Security.

Total No. of Questions : 4]

SEAT No. :

PA-2059

[Total No. of Pages : 1

[5901]-28

F.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS-102 : Evolution of Defence Organization in India

(2019 Pattern) (Semester - I) (Paper-I) (11232)

Time : 2 ½Hours] *[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) Define Security Policies.

b) Define Intelligence.

c) Explain the Organization of Ministry of Defence.

d) State the role of Sashastra Seema Bal (SSB).

e) State the role of Assam Rifle (AR).

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

a) Ministry of Defence.

b) India's Nuclear Doctrine.

c) Coast Guard.

d) National Security Guard.

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

a) Discuss the functions of Higher Defence Organization.

b) Explain the role of Indian Air Force.

c) Explain the role of National Security Council.

d) Discuss the functions of Central Reserve Police Force (CRPF).

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

a) Explain in detail Genesis of Indian Navy.

b) Explain in role of Research and Analysis Wing (RAW).

Total No. of Questions : 4]

SEAT No. :

PA-2060

[Total No. of Pages : 1

[5901]-29

F.Y. B.Sc.

DEFENCE AND STRATEGIC STUDIES

DS-103 : India and Its Neighbours

(2019 Pattern) (Semester - I) (Paper-I) (11233)

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) Define Dispute.

b) What do you mean by ethnic crisis?

c) Define political Geography.

d) Define regional leadership.

e) What do you mean by trade relation?

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

a) India-Myanmar relations.

b) India-Maldives relations.

c) India-China relations.

d) India-Japan relations.

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

a) Explain the India-Sri Lanka reclation.

b) Explain the Maritime Security.

c) State the Indian role of Bhutan Development.

d) State the Indian role of Nepal Development.

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

a) Explain India and United States relation with special reference to trade relation.

b) Explain India and Russia relation with special reference to Military co-operation.

Total No. of Questions : 5]

SEAT No. :

PA-2034

[Total No. of Pages : 2

[5901]-3

F.Y.B.Sc. (Regular)

PHYSICS

PHY - 111 : Mechanics and Properties of Matter

(2019 CBCS Pattern) (Semester - I) (Paper - I) (2 Credits) (11121)

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

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

a) State Newton's second law of motion.

b) Define conservative force. Give its example.

c) Define coefficient of viscosity. Give its S.I. unit.

d) What is surface tension? Give S.I. its unit.

e) The position of a particle along x-axis is given by $x=3-4t+8t^2$ find the acceleration of particle at t=2.0 second.

f) Find the work done in moving a particle along a vector $\vec{r}=\left(3\vec{i}-\vec{j}+6\vec{k}\right)m$, if the applied force is $\vec{f}=\left(\vec{i}+3\vec{j}+2\vec{k}\right)$ Newton.

Q2) a) i) Explain various types of forces in nature. **[3]**

ii) explain the term work done, calculate work done by constant force. **[3]**

b) A position of a car on a straight road with time is given by following function of time, $x(t) = 10 + 25t + 5t^2$ in meters when t is in second, find the instantaneous velocity at **[4]**

i) t = 1sec

ii) t = 5sec and

iii) t = 10 sec

P.T.O.

Q3) a) i) What is pseudo force? Illustrate with examples. **[3]**

ii) State and prove work energy theorem. **[3]**

b) When the load suspended from the end of a wire is increased from 1kg to 6kg. The extension produced in the wire increases from 0.5mm to 3mm. Find the work done during extension of the wire. **[4]**

Q4) a) State the working principle of venturimeter and discuss in detail the working of venturimeter. **[6]**

b) A bullet of mass 25 gram was moving with a speed of 400 m/s. After passing through solid substance. It is continued to move at the rate of 100 m/s how much work the bullet and to do in passing through a solid substance. **[4]**

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

a) State and explain principle of conservation of energy.

b) Distinguish between steady and turbulent flow.

c) Explain few applications of viscous force.

d) Show that workdone during volume strain = ½ × volume stress × change in volume.

e) Explain inertial and non-inertial frame of references.

f) Show that the value of poission's ratio lies between – 1 to 0.5.

Total No. of Questions : 5]

SEAT No. :

PA-2061

[Total No. of Pages : 2

[5901]-30

F.Y. B.Sc. (Restructuring)

RE-A-FC-101(A) COMPONENT : FOUNDATION - I

(CBCS 2019 Pattern) (Semester - I) (2 Credits) (11601)

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 5 carry equal marks.***

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

a) What is globalization?
b) What is socialism?
c) Who founded Satyashodhak Samaj?
d) What is liberalization?
e) What is Nationalisms.
f) What is humanism?

Q2) a) Explain the demerits of nationalism. **[6]**
b) State the effects of imperialism. **[4]**

Q3) a) Explain the nature of democracy. **[6]**
b) Mention the disadvantages of privatization. **[4]**

Q4) a) State the educational movement in Maharashtra. **[6]**
b) Explain natural freedom. **[4]**

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

a) Satyashodhak Samaj.
b) Economic imperialism.
c) Democracy.
d) Farmer movement.
e) Liberalization.
f) Humanism.

P.T.O.

Total No. of Questions : 5]

PA-2061

[5901]-30

F.Y. B.Sc. (Restructuring)

RE-A-FC-101(A) COMPONENT : FOUNDATION - I

(CBCS 2019 Pattern) (Semester - I) (2 Credits) (11601)

(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.

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

अ) जागतिकीकरण म्हणजे काय?

ब) समाजवाद म्हणजे काय?

क) सत्यशोधक समाजाची स्थापना कोणी केली?

ड) उदारीकरण म्हणजे काय?

इ) राष्ट्रवाद म्हणजे काय?

फ) मानवतावाद म्हणजे काय?

प्र.*2)* अ) राष्ट्रवादाचे दोष स्पष्ट करा. **[6]**

ब) साम्राज्यवादाचे परिणाम सांगा. **[4]**

प्र.*3)* अ) लोकशाहीचे स्वरूप स्पष्ट करा. **[6]**

ब) खाजगीकरणाचे दोष सांगा. **[4]**

प्र.*4)* अ) महाराष्ट्रातील शैक्षणिक चळवळ सांगा. **[6]**

ब) नैसर्गिक स्वातंत्र्य स्पष्ट करा. **[4]**

प्र.*5)* खालीलपैकी कोणतेही चारवर टीप लिहा. **[10]**

अ) सत्यशोधक समाज

ब) आर्थिक साम्राज्यवाद

क) लोकशाही

ड) शेतकरी चळवळ

इ) उदारीकरण

फ) मानवतावाद

Total No. of Questions : 5]

SEAT No. :

PA-2062

[Total No. of Pages : 2

[5901]-31

F.Y. B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

CHNA-111 : Essentials of Computer - I

(CBCS 2019 Pattern) (Semester - I) (Paper-I) (11871)

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) List different types of sound devices of computer system.

b) Write the full form of CRT, SMPS.

c) What is microprocessor?

d) Define UPS.

e) What is RAM?

f) What is expansion slot?

Q2) a) i) Explain input output operation of microprocessor. **[2]**

ii) Explain hardware interrupts of computer system. **[4]**

b) Explain the working of LASER printer. **[4]**

Q3) a) i) Explain bus structure of computer. **[2]**

ii) Explain computer system architecture with functional block diagram. **[4]**

b) Draw Block diagram of power supply and explain each block in detail. **[4]**

Q4) a) i) Write a notes on LCD panel. **[2]**

ii) Explain the concept of DMA. **[4]**

b) Give detailes of the components connected to motherboard. **[4]**

P.T.O.

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

a) Explain the working of keyboard in short.

b) Write short note on plotter.

c) What is HDMI?

d) What are different voltages provided by SMPS for computer.

e) What is packing of microprocessor?

f) Write in short 'History of computers'.

Total No. of Questions : 5]

SEAT No. :

PA-2063

[Total No. of Pages : 2

[5901]-32

First Year B.Sc. (Vocational)

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

CHNA-112 : Computer Organization-I

(2019 CBCS Pattern) (Semester - I) (Paper-II) (118752)

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

a) Define Hardware.

b) Define Software.

c) What is Editor?

d) What is RTO?

e) What is open source software?

f) What is function of processor?

Q2) a) i) Explain the features of 8086 processor. **[2]**

ii) Explain any four DOS commands. **[4]**

b) Compare System software and Application software. **[4]**

Q3) a) i) Explain advance e-series processors. **[2]**

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

b) Define flow chart with one example. **[4]**

Q4) a) i) Define operating system. **[2]**

ii) Explain Different types of programming languages. **[4]**

b) Write a note on ANDRIOD operating system. **[4]**

P.T.O.

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

a) What is BIU?

b) What is EU?

c) Explain any two instructions of 5086.

d) Write a note on window's 05.

e) What is LINUX? Explain the advantages of LINUX.

f) Explain compiler and Assembler.

Total No. of Questions : 5]

SEAT No. :

PA-2064

[Total No. of Pages : 2

[5901]-33

F.Y.B.Sc. (Vocational)

VBT - 111 : BIOLOGICAL CHEMISTRY

(2019 CBCS Pattern) (Semester - I) (11571)

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

Instructions to the candidates:

1) ***Questions No.1 is Compulsory.***
2) ***Solve any three questions from Question 2 to Question 5.***
3) ***Questions 2 to 5 carry equal marks.***
4) ***Draw neat labelled diagrams wherever necessary.***

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

a) Give any two examples of non-reducing sugars.

b) Name any two positively charged amino-acids.

c) Define lipids.

d) What do you understand by phosphodiester bond?

e) Give any one function of Riboflavin.

f) Define molality.

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

a) Explain any one type of non-covalent interaction with the help of example.

b) Define asmosis. What happens when a cell is placed in hypertonic solution?

c) With the help of examples, explain the interaction of water with biomolecules.

P.T.O.

B) Answer any one of the following. **[4]**

a) The molecular weight of NaOH is 40. How will you prepare 100ml, 3M solution of NaOH.

b) You have a stock solution of 100×buffer. How will you prepare 100ml, 1×working solution of the buffer?

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

a) Classify lipids with the help of examples.

b) Enlist any four fat soluble vitamins. Give their functions.

c) Classify carbohydrates with the help of examples.

B) Answer any one of the following. **[4]**

a) Give any four functions of proteins.

b) Give any four functions of carbohydrates.

Q4) A) Answer any 2 of the following. **[6]**

a) Classify amino-acids on the basis of presence or absence in protein.

b) Classify polysaccharides an the basis of their functions. Give examples of each type.

c) Explain any three physical properties of lipids.

B) Give any 2 functions of folic acid and vitamin B_{12}. **[4]**

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

a) Peptide bond formation.

b) Any three properties of water.

c) Molarity and Normality.

d) Inversion of sugars.

e) Structural lipids.

f) Any three properties of amino - acids.

✪ ✪ ✪

Total No. of Questions : 5]

SEAT No. :

PA-2065

[Total No. of Pages : 2

[5901]-34

First Year B.Sc. (Vocational)
BIOTECHNOLOGY
VBt - 112 : Biotechnology Concepts and Applications
(2019 CBCS Pattern) (Semester - I) (11572) (Regular) (Paper - II)

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

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

a) Define prebiotics.

b) Name any two branches of biotechnology.

c) Give are example biopesticide.

d) Define biotechnology.

e) What is disease prognosis.

f) Give any one example of functional food.

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

a) What is medical biotechnology. Comment its role in medicine.

b) Draw schematic diagram for various branches in biotechnology.

c) What is disease diagrasis? Expalin its role in detail.

B) Answer the following (any one). **[4]**

a) Comment on Industry as one of the opportunities in biotechnology.

b) Explain in detail with one example production of vaccine.

P.T.O.

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

a) Explain biofuels in detail with any one example.

b) Comment on various opportunities of biotechnology in research.

c) What are biofertilizers. Explain with are example.

B) Answer the following (any one). **[4]**

a) Explain in detail activated sludge method inwaste water treatment.

b) Comment on different milestones in Biotechnology.

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

a) What are stem cells. Give applications of stem cells in field of biotechnology.

b) Comment on probiotics as human frindly organisms.

c) Explain in detail application of biotechnology in regenerative medicine.

B) Answer the following (any one). **[4]**

a) Discuss indetail history of biotechnology.

b) Enlist and explain any two applications of agricultural biotechnology.

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

a) Food safety

b) Nutraceuticals

c) Biopesticides

d) Biosersors

e) GMO's

Total No. of Questions : 5]

SEAT No. : ____

PA-2066

[Total No. of Pages : 2

[5901]-35

First Year B.Sc. (Vocational)
SEED TECHNOLOGY
ST-1.1 : Morphology
(2019 CBCS Pattern) (2 Credits) (Semester - I) (Paper-I) (11891)

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

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

a) Give the botanical name of any one member of family Malvaceae.

b) Define Microsporangium?

c) Define Fertilization?

d) Define Flower?

e) Describe the androecium.

f) What is stigma?

Q2) a) Define Pollination? Describe self pollination and its advantages and disadvantages. **[6]**

b) Define flower? Enlist the parts of typical flower. **[4]**

Q3) a) Describe the process of fertilization in angiosperms with neat labeled diagram. **[6]**

b) Give Scientific classification of family Poaceae. **[4]**

P.T.O.

Q4) a) Define Seed? Give Difference between Seed and Grain. **[6]**

b) Describe the structure of ovule with neat labeled diagram. **[4]**

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

a) Achene.

b) Berry.

c) Types of Embryo.

d) Patch Budding.

e) Anemophily.

f) Scientific classification of family liliaceae.

Total No. of Questions : 5]

SEAT No. :

PA-2067

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[5901]-36

F.Y.B.Sc. (Vocational)

SEED TECHNOLOGY

ST-1.2 : Plont Breeding and Testing for Cultivar Genuineness

(2019 CBCS Pattern) (Semester - I) (2 Credits) (Paper-II) (11892)

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

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

a) Define clonal selection.

b) Define Hybridization.

c) Give the name of any two physical mutagens.

d) Give any two advantages of pureline selection.

e) Give two applications of Plant tissue culture.

f) Give the achievements of mass selection.

Q2) a) Define plant breeding. Add a note on its scope and importance. **[6]**

b) Describe cross pollination and its advantages and disadvantages. **[4]**

Q3) a) Describe in detail the procedure of pureline selection. **[6]**

b) Application and Limitation of Mutation breeding. **[4]**

P.T.O.

Q4) a) What is mass selection? Describe the procedure for mass selection and add a note on its advantages. **[6]**

b) Write brief account of Phenol Colour and Peroxidase test. **[4]**

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

a) Evaluation

b) Types of plant introduction

c) Peroxidase test

d) Bagging

e) Somaclonal variation

f) GOT

Total No. of Questions : 5]

SEAT No. :

PA-2068

[Total No. of Pages : 2

[5901]-37

F.Y.B.Sc. (Vocational)

INDUSTRIAL MICROBIOLOGY

IMB 111 : Introduction to Indusrial microbiology and microorganisms

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

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

Instructions to the candidates:

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

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

a) What are pre - clinical trials?

b) What is fermentation?

c) What is GMP?

d) What is validation?

e) Why is 16Sr RNA used for classification of microorganism?

f) What is the capacity of production scale fermenter?

Q2) A) Attempt any three of the following. **[6]**

a) What is 'GRAS'? State examples of GRAS organisms?

b) What is trademark?

c) Write different parts of patent.

d) What are different modes of fermentation?

B) What are aseptic and non-aseptic modes of fermentation? **[4]**

P.T.O.

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

a) What is the importance of fermentation?

b) State minimum three characteristics of microorganisms used in fermentation.

c) What is meant by submerged mode of fermentation?

d) State importance of proteobacteria in fermentation industry.

B) Explain the development of pharmaceutical product. **[4]**

Q4) A) Attempt any three of the following. **[6]**

a) Explain the concept of culture collection center.

b) What are clinical trials? Why are they carried out?

c) What is orphan disease and orphan drug?

d) Enlist the important actinomy cetes used in fermentation technology.

B) Explain approach for isolation of microorganisms from environmental sample. **[4]**

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

a) Firmicutes in fermentation.

b) Upstream process in fermentation.

c) Process flow diagram.

d) GILSP

e) Quality assurance.

f) Role of microbiologist in fermentation process.

Total No. of Questions : 5]

SEAT No. :

PA-2069

[Total No. of Pages : 2

[5901]-38

F.Y.B.Sc. (Vocational)

INDUSTRIAL MICROBIOLOGY

IMB-112 : Introduction to Industrial Process and Economics

(2019 CBCS Pattern) (Semester - I) (11822) (Paper - II)

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

Instructions to the candidates:

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

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

a) Explain the role of shareholders.

b) Write examples of any two microorganisms used for production of recombinant proteins.

c) Define 'strain'.

d) Write any two types of grants given to a biotechnology company.

e) Explain any two factors affecting the choice of expression system.

f) What is 'due diligence'?

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

i) Explain the concept of business plan.

ii) What is the basic infrastructure of the biotechnology company?

iii) Explain the concept of design excercise.

iv) Describe the process of strain improvement.

b) Write applications of a biotechnology in medicinal industry. **[4]**

P.T.O.

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

i) Explain the significance of seed investment in biotechnology company.

ii) Describe the concept of success with respect to biotechnology company.

iii) Explain the process of strain design with help of flow-chart.

iv) Explain criteria for optimization of a fermentation process.

b) Explain tests used for determining the caricatured of CEO in details. **[4]**

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

i) Explain the concept of market need "with respect to a biotechnology comapny".

ii) Describe various strategies applied while running a sucessful biotechnology company.

iii) Explain the process of design optimization.

iv) Describe basic applications of a biotechnology comapny.

b) Explain various factors governing capital cost estimates. **[4]**

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

a) Need of biotechnology company.

b) The costs case - to build or not to buid.

c) Competitive advantage.

d) Process design optimization.

e) Cost estimates.

f) Strain selection.

Total No. of Questions : 5]

SEAT No. :

PA-2070

[Total No. of Pages : 2

[5901]-39

F.Y.B.Sc. (Vocational)
ELECTRONIC EQUIPMENT MAINTENANCE
VOC-EEM-111 : Maintenance of Domestic Equipments - A (Heating Appliances)
(2019 CBCS Pattern) (Semester - I) (Paper-I) (11811)

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

Instructions to the candidates:

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

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

a) What are common problems in instant geyser?

b) Why cold water inlet is kept at bottom?

c) What is coating material used in geyser?

d) How many diodes are used in bridge rectifier?

e) How to control temperature of induction coil?

f) What is principle of working of induction cooker?

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

i) What are market limitations of induction cooker?

ii) What is MOSFET? What are its different types?

b) Draw circuit diagram of bridge rectifier & explain it's working. **[4]**

P.T.O.

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

i) What is IGBT? Draw its symbol and explain its working.

ii) What are forward biased characteristics of diode?

b) What are common faults in geysor? **[4]**

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

i) Explain the working of induction cooker.

ii) What will be fault in microwave oven if it sparking inside?

b) "Cooktop shuts off while cooking". Comment on this & what is solution of problem? **[4]**

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

a) Parts of induction cooker.

b) Parts of microwave oven.

c) Overheating and uneven heating of induction cooker.

d) Internal parts of geyser.

e) Types of geysers.

f) Different coating materials.

Total No. of Questions : 5]

SEAT No. :

PA-2035

[Total No. of Pages : 2

[5901]-4

F.Y.B.Sc.

PHYSICS

PHY-112 : Physics Principles and Applications

(CBCS 2019 Pattern) (Semester - I) (Paper - II) (11122)

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) ***Use of calculator is allowed.***

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

a) What is population inversion?

b) Define the convalent bond.

c) The radius of first Bohr orbit is $0.52A^c$ calculate radius of third Bohr orbit.

d) What is photon?

e) What is photoelectric effect?

f) Define ionic bond.

Q2) a) i) What is metallic bond? Writ the properties of metallic bond. **[3]**

ii) What are the sources of radio and micro waves. **[3]**

b) Explain the Frank-Hertz experiment. **[4]**

Q3) a) i) Give the characteristics of laser. **[3]**

ii) Explain the plank's hypothesis. **[3]**

b) The efficiency of solar cell is 11% and it has ISC = 525mA, Voc= 0.5V and F.F = 0.6 calculate input power.

(Given : $h = 6.626\times10^{-34}$Js, 1 ev = 1.6×10^{-19}J) **[4]**

P.T.O.

Q4) a) Explain the various types of solar cells. **[6]**

b) A lithium atom and hydrogen atom have masses 1.17×10^{-26} kg and $1.6>\times10^{-27}$kg respectively. If the equilibrium seperation between two nuclei in litl molecule is 1.59Aº, Find the rotational energy levels in l=1 and l=3 states. **[4]**

(Given : h = 6.625×10^{-34}Js, l ev =1.6×10^{-19}J).

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

a) Give the properties of electro magnetic waves

b) Calculate the shortest wave length in Lyman series (Given : R = $1.097\times10^{7}m^{-1}$).

c) Applications of radio waves.

d) Rutherford atomic model.

e) Characteristics of ionic bond.

f) Applications of LASER.

Total No. of Questions : 5]

SEAT No. :

PA-2071

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[5901]-40

F.Y.B.Sc. (Vocational)
ELECTRONIC EQUIPMENT DESIGN - A
EEM-112 : Elements of Electronic Equipment Design - A (PCB Techniques)
(2019 CBCS Pattern) (Semester - I) (Paper - II) (11812)

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

a) What is artwork in PCB design?

b) What is double sided PCB?

c) What is silk screen?

d) What is tinning.

e) What is purpose of using flux?

f) What is SMT?

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

i) Write a note on track sizes on PCB.

ii) What is cross talk? How to avoid it?

b) Explain in details the PCB manufacturing process. **[4]**

P.T.O.

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

i) Describe the factor affecting the cost of PCB.

ii) Write a note on different software's available for PCB manufacturing.

b) Explain in details the screen printing technology used in PCB manufacturing. **[4]**

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

i) What is reflow soldering? Where is it used?

ii) Compare SMD with single sided PCB.

b) What is hot air gun? Describe its use in soldering. **[4]**

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

a) Write in brief about soldering surface mount resistor.

b) What is foot, print? Describe it for SMD device.

c) Write a short note on SMD work station.

d) Explain the terms – pads, datum, netlist.

e) Write short note on solder material.

f) Write a short note on use of masks in PCB designing.

Total No. of Questions : 5]

SEAT No. :

PA-2036

[Total No. of Pages : 2

[5901]-5

First Year B.Sc. (Chemistry - I)

CH -101 : PHYSICAL CHEMISTRY

(CBCS 2019 Pattern) (Semester - I) (Paper - I) (11131)

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

Q1) Attempt the following (ANY FIVE). **[5]**

a) Define the endothermic reaction.

b) Explain the extensive property.

c) What is strong electrolyte?

d) Define the term catalyst.

e) What is the pH of solution when concentration of HC1 is 0.01M?

f) Calculate the value of Cv when Cp = 32.16JK^{-1} mol^{-1} and R = 8.314 JK^{-1} mol^{-1}.

Q2) A) Attempt the following (ANY TWO). **[6]**

a) State and explain: Thermodynamic equilibrium.

b) Derive the equation for perfect gas equilibria.

c) Define the buffer solution. Explain types of buffer.

B) Define the solubility product. Give the applications of solubility product. **[4]**

Q3) A) Attempt the following (ANY TWO). **[6]**

a) Derive $K_a = \frac{\alpha^2 c}{1-\alpha}$.

b) Explain the different kinds of enthalpy of reactions.

c) Explain the factors affecting on the equilibrium constant.

B) Determine the amount of heat released when. **[4]**

a) 0.75 moles of NaOH is neutralised by 0.50 moles of HC1.

b) 0.50 moles of HC1 is neutralised by 0.50 moles of KOH.

P.T.O.

Q4) A) Attempt the following (ANY TWO). **[6]**

a) Define salt hydrolysis. Give its type.

b) Give the statements of second law of thermodynamics.

c) Derive van't Hoff equation.

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

a) The solubility Product of $BaSO_4$ is 1.5×10^{-9} in water. Calculate the solubility of $BaSO_4$.

b) Calculate the value of K_e at 127ºC for the reaction.

$$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}.$$

Given: $[NH_3] = 3.1\times10^{-2}$ mol lit $^{-1}$.

$[N_2] = 8.5\times10^{-1}$ mol lit $^{-1}$.

$[H_2] = 3.1\times10^{-3}$ mol lit $^{-1}$.

Q5) Attempt the following (ANY FOUR). **[10]**

a) Write short note on "Bond enthalpy".

b) State and explain "Law of mass action".

c) Explain the response of equilibria to concentration.

d) Derive an expression Handerson - Hasselbalch equation of acidic buffer.

e) Explain the hydrolysis of salt of strong acid and weak base.

f) Explain the factors affecting on the degree of ionization.

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Total No. of Questions : 5]

SEAT No. :

PA-2037

[Total No. of Pages : 3

[5901]-6

First Year B.Sc.

CHEMISTRY

CH - 102 : Organic Chemistry

(2019 CBCS Pattern) (Semester - I) (Paper - II) (11132)

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) Answer any five of the following. **[5]**

a) Define nucleophiles.

b) What is position isomerism?

c) State markownikoff's rule.

d) Define enantiomers.

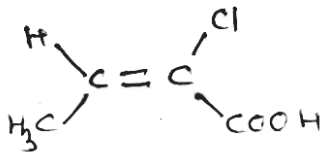
e) What is the action of Na metal on ethyl chloride.

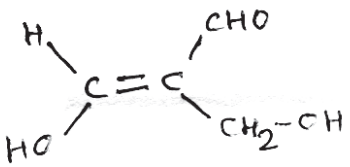
f) Define carbanion.

Q2) A) Attempt the following. **[6]**

a) Dimethylamine is stronger base than methylamine. Explain.

b) Assign E/Z configuration of following compounds.

i) 

ii) 

P.T.O.

B) Answer the following. **[4]**

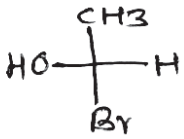
a) Draw resonance structure of anisole.

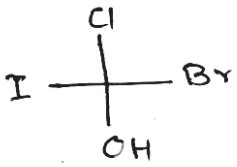
b) How will you prepare propyne from 1,2 - Dibromopropane.

Q3) A) Attempt the following. **[6]**

a) What is isomerism? Draw the isomeric structures of compound having molecular formula C_4H_{10}.

b) Assign R/S configuration of following compounds.

i) 

ii) 

B) Answer the following. **[4]**

a) Trans isomer is more stable than cis isomer. Explain.

b) Staggered conformation is more stable than eclipsed conformation. Explain.

Q4) A) Attempt the following. **[6]**

a) How will you prepare propane from.

i) Propene

ii) Propyl magnesium bromide

b) How will you prepare cis and trans 2-Butene from 2-Butyne.

B) Answer the following. **[4]**

a) Define the terms.

i) Chiral centre

ii) Dihedral angle

b) Give the reaction of 1 - Butene with HBr/H_2O_2.

Q5) Attempt any two of the following. **[10]**

a) What is conformational isomerism? Discuss conformational isomerism in cyclohexane.

b) What is resonance effect? Give necessary conditions for resonance.

c) Identify the products.

i) $CH_3-CH=CH_2 \xrightarrow{H-C1} \underset{\text{Major}}{A} \xrightarrow{alc.KOH} B$

ii) $CH_3-C\equiv C-H \xrightarrow{NaNH_2} A \xrightarrow{CH_3\text{-}Br} B$

iii) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_3 \xrightarrow[Uvlight]{Cl_2} \underset{\text{major}}{A}$

Total No. of Questions : 5]

SEAT No. :

PA-2038

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[5901]-7

First Year. B.Sc.

BOTANY

BO 111 : Plant Life and Utilization - I

(CBCS 2019 Pattern) (Semester - I) (Paper - I) (11141)

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 Q5 carry equal marks.***
4) ***Draw neat labelled diagram wherever necessary.***

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

a) What are cryptogams?

b) Mention any two divisions of Algae according to Bold and Waynne.

c) What is mycobiont?

d) Give any one general charater of fungi.

e) Write any two classes of bryophytes proposed by G.M. Smith.

f) Mention two types of asexual spores in fungi.

Q2) a) Give an account on scalariform conjugation in Spirogyra. **[6]**

b) Write any four general characters of monocotyledons. **[4]**

Q3) a) Define mycelium. Discuss the structure of basidiocarp in Agaricus. **[6]**

b) Describe crustose Lichens. **[4]**

Q4) a) Describe internal structure of the Riccia thallus. **[6]**

b) Give any four economic importance of fungi. **[4]**

P.T.O.

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

a) Thallus structure of Spirogyra.

b) Algae as food.

c) Algae in pharmaceutials.

d) Types of mycelia in fungi.

e) Antheriadium of Riccia.

f) Bryophytes as fuel.

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Total No. of Questions : 5]

SEAT No. :

PA-2039

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[5901]-8

First Year B.Sc.

BOTANY - II

BO - 112 : Plant Morphology & Anatomy

(CBCS 2019 Pattern) (Semester - I) (Paper - II) (11142)

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) ***Figures to the right indicate full marks.***
5) ***Draw neat labelled diagrams wherever necessary.***

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

a) What is interpretative morphology.

b) Give any one importance of anatomy in physiology.

c) Define Multiple fruit.

d) Give any one function of sclereids.

e) What is etario fruit?

f) What is peduncle?

Q2) a) What is epidermal tissue? Describe various functions of epidermal tissue system. **[6]**

b) Describe cyathium inflorescence. **[4]**

Q3) a) What is placentation? Describe any three types of placentation. **[6]**

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

Q4) a) Describe primary internal structure of dicot stem with labelled diagram. **[6]**

b) Describe any two special forms of cerolla. **[4]**

P.T.O.

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

a) Importance of morphology in plant identification.

b) Glandular hair.

c) Syngeny.

d) Vascular bundle in monocot stem.

e) Drupe fruit.

f) Importance of anatomy in ecological interpretation.

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Total No. of Questions : 5]

SEAT No. :

PA-2040

[Total No. of Pages : 2

[5901]-9

First Year B.Sc.

ZOOLOGY

ZO -111 : Animal Diversity - I

(CBCS 2019 Pattern) (Semester - I) (Paper - I) (11151)

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.***

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

a) Define Macrotaxonomy.

b) Define Eumetazoa.

c) Explain Polyp.

d) Give two examples of Cestoda.

e) Explain Spicule.

f) Explain Sporozoa.

Q2) a) Give the general characters of phylum porifera. **[6]**

OR

Define taxonomy. Explain Alpha and beta taxonomy.

b) Explain the role of Tryphanosoma on human health. **[4]**

Q3) a) Draw a neat labelled diagram explaining morphological characters of Paramoecium. **[6]**

OR

With suitable examples explain radial symmetry.

b) Write the significance of polymorphism in Cnidaria. **[4]**

Q4) a) With suitable examples, give characters of Turbellaria. **[6]**

OR

Give an account of kingdom monera with examples.

b) Discuss asconoid type canal in sponges. **[4]**

P.T.O.

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

a) Class-Anthozoa.

b) Economic importance of sponges.

c) Phylum cnidaria.

d) Significance of taxonomy.

e) Flagellar locomotion in Protozoa.

f) Physiological adaptation in platyhelmenthes.

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