Set – I

SHIVAJI UNIVERSITY, KOLHAPUR
B Sc. I Semester II Examination (NEP)
March/April 2023 (held in June 2023)
English for Communication
Ability Enhancement Compulsory Course (AECC-2) B

Subject code: 90219

Day and Date: Thursday, 1st June 2023 **Marks**: 40
Time: 10.30 to 12.30 pm

Instructions: 1) All questions are Compulsory.

2) Figures to the right indicate full marks.

Q. 1 A) Complete the following sentence by choosing the correct alternatives: [4]

1)The king Midas had a little daughter called ……..

A) MarygoldB) Sunbeam C) Rose D) Mary

2)Robert Frost is an…….poet.

A)African B)Australian C)American D)Indian

3) Name of the owner who bought slave is……..

A) John B) Korra C) Nick D) Jensen

4) An Epitaph is an inscription on a……

A) tomb B) stone C) base D) None

Q. 1 B) Answer the following questions in one word/phrase/ sentence each. [4]

1) What is the poet searching for in the poem *Offering in the Temple*?

2) How many sons did the slave has?

3) What kind of music did the king Midas love?

4) Where was Satish K Tripathi delivered speech?

Q. 2 A) Answer the following questions in three to four sentences each (Any Three) [6]

1) What is the impact of data science in the health science?

2) Why did people blame 'one good man'?

3) How did the dealer describe the slave?

4) Describe the beauty of winter evening of woods.

5) What was the wish of king Midas?

Q. 2 B) Write short notes on the following in about 8 to 10 sentences (Any Two) **[6]**

1) What is speaker's opinion about Data in 21st century?

2) Character of King Midas

3) The theme of the poem *Offering in the Temple*

4) Korra's attitude towards the slave

Q. 3 A) You wish to buy Refrigeratorfor you. Write a telephonic conversation between you and the dealer. (Imagine details about the company, price, facilities, etc.) [**6**]

Or

Write a telephonic conversation between you and Railway Station Master about booking a ticket for Karad to Bombay.

Q. 3B) Write an advertisement copy for a **Laptop**and describe its features. [**6**]

Or

Draft an advertisement on the product of **Mobile** and give a suitable caption of your own.

Q. 4A) Write instructions to be followed while conducting different experiments in different subject laboratories. [**4**]

Or

Write a set of instructions given to you in Physics laboratory.

Q. 4B) Write detailed reports of a few experiments conducted in the laboratory. [**4**]

Or

Write some conclusion drawn at the end of experiment in Chemistry laboratory.

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SHIVAJI UNIVERSITY KOLHAPUR
B. Sc. I, Semester II, Examination (NEP)
October / November 2022 (held in February 2023)
Botany Paper IV: DSC-14B: Archegoniate (Bryophytes, Pteridophytes and Gymnosperms
Subject code: 90226

Day and date: Tuesday, 6 /6/ 2023
Time: 10:30 to 12:30 am **Marks: 40**
Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

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Q. 1. Complete the following sentences with correct alternative. [08]

1. The scientific study of bryophytes is called as ----------

A) phycology B) bryology

C) pteridolgy D) embryology.

2. The sporophytes of Anthoceros is ----------.

A) independent B) dependent

C) semi-independent D) none of these.

3. The class Bryopsida is also known as ----------

A) Moss B) Hornworts

C) Liverworts D)Mould

4. G.M.Smith (1955) classified pteridophytes into-----division.

A) 2 B) 4
C) 3 D) 7

5. Selaginella is ----------.

A) Homosprous B) Heterosporous
C) Asporous D) None of these

6. Generally the megasporangium content ----------megaspores.

A) 2 B) 3

C) 9 D)4

7.Sporne (1965) divided gymnosperm in to ----------.

A) 4 B) 9

C) 3 D)2

8. In Gnetum ovule ---------- layer of integuments is stony .

A) outer B) middle

C) inner D) all of the above

Q. 2. Answer the following questions (Any two) **(16)**

1. Describe General characters of Bryophytes..
2.Describe the male and female strobuli of *Gnetum.*
3.Explain in brief Economic importance of Pteridophytes.

Q. 3. Write short notes (Any four) **[16]**

1. General characters of Gymnosperm.
2. Structure of Anthredium of *Anthoceros.*
3.Economic importance of Bryophytes.
4. T.S .Of Selaginella stem
5.Microsposrophyll of *Selaginella*
6. General characters of Pteridophytes.

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SHIVAJI UNIVERSITY KOLHAPUR

Faculty: Science & Technology- Course: B. Sc. Examination (NEP)

B. Sc. I Semester II Examination

March / April 2023 (held in June 2023)

Botany Paper III DSC-13 B: Mycology, Phytopathology and Mushroom Cultivation

Subject code: 90226

Centre: B. V.'s Matoshri Bayabai Shripatrao Kadam Kanya Mahavidyalaya, Kadegaon

Day and date: Monday, 05/06/2023

Time: 10.30 to 12.30 am **Marks: 40**

Instructions: 1) All questions are compulsory.

2) Figures to right indicate full marks.

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Q. 1. Complete the following sentences with correct alternative. [08]

1. The word 'fungus' is derived from Latin which means .....

A) mushroom B) dead

C) saprophyte D) organic

2. ……. is known as the '**Father of Indian Mycology**'.

A) Shiv Ram Kashyap B) W. M. Stanley

C) D. J. Iwanowsky D) Adolf Mayer

3. *Mucor* exhibits .....

A) isogamy B) oogamy

C) anisogamy D) mesogamy

4. Lichen body is made up of .....

A) algae and gymnosperm B) fungus and bryophytes

C) fungus and algae D) pteridophyte and angiosperm

5. Pomegranate blight is ..... disease.

A) fungal B) bacterial

C) mycoplasmal D) viral

6. Grassy shoot disease of sugarcane is ……

A) fungal B) bacterial

C) mycoplasmal D) viral

7. Oyster mushroom is common name of …….

A) *Pleurotus* B) *Volvariella*

C) *Agaricus* D) *Morchella*

8. Mushrooms are ……. plants.

A) heterotrophic B) autotrophic

C) synthetic D) photosynthetic

Q. 2. Answer the following questions (Any two) **[16]**

1. Give an economic importance of fungi.
2. Describe general characters of lichen.
3. Describe symptoms and control measures of grassy shoot disease of sugarcane.

Q. 3. Write short notes (Any four) **[16]**

1. Economic importance of lichen
2. Pomegranate blight
3. Vegetative thallus structure of *Mucor*
4. Commercial importance of mushroom
5. Asexual reproduction in *Penicillium*
6. General symptoms of phytopathology

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Shivaji University, Kolhapur
B.Sc.-I Semester-II Examination (NEP)
March / April 2023(Held in June 2023)

Subject Code- 90225 **Paper No.-III DSC B-3**
Subject- Physical Chemistry
Day & Date- Friday, 02/06/2023
Time.-.10.30 to 12.30 pm **Total Marks: 40**

Instruction: 1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat labeled diagrams wherever necessary.
4. Use of a Scientific calculator is allowed.

……

Q.1. Select the alternative from the following. (08)

1) Chemical equilibria are …….in nature.
a) dynamic b) gaseous c) liquid c) solid

2) In endothermic reaction the enthalpy of products is ……..enthalpy of reactants.
a) less than b) greater than c) equal to d) much less than

3) The velocity of the reaction when the concentrations of all the reactants are unity is known as…….
(a) velocity constant (b) velocity coefficient
(c) specific reaction rate (d) all of these

4) The process that does not occur of its own accord is called……. .. process.
(a) non-spontaneous (b) spontaneous
(c) isothermal (d) adiabatic

5) Gases which do not obey the gas laws at all temperature and pressure are called……
(a) Ideal gases (b) non-ideal gases
(c) perfect gas (d) gases

6) No machine has ……..... efficiency.
(a) 50% (b) 100% (c) 10% (d) 20%

7) Inversion of cane sugar is an example of ……reaction.
(a) first order (b) second order
(c) third order (d) pseudounimolecular

8) *Pc, Vc, and Tc* are known as ……..
(a) Gas constant (b) van der Wall's constant
(c) velocity constant (d) critical constant

Q.2. Attempt any TWO of the following. (16)

(a) Give characteristics of a first-order reaction.

(b) Derive kinetic gas equation.

(c) Discuss in detail activated complex theory.

Q.3. Attempt any FOUR of the following. (16)

(a) State the first law of thermodynamics and give its mathematical equation.

(b) Give the postulates of the kinetic theory of gases.

(c) Derive kirchhoff's equation.

(d) Derive the relationship between K_p and K_c for a reaction involving ideal gases

(e) State LeChatelier's Principal. Explain in the brief effect of change of concentration and temperature on the state of equilibrium.

(f) Write a note on Ideal gases and Non-ideal Gases.

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Shivaji University, Kolhapur
B.Sc.-I Semester-II Examination (NEP)
March / April 2023 (Held in June 2023)

Subject Code- 90225 **Paper No.-III DSC B-3**
Subject- Physical Chemistry
Day & Date- Friday, 02/06/2023
Time.-.10.30 to 12.30 pm **Total Marks: 40**

Instruction: 1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat labeled diagrams wherever necessary.
4. Use of a Scientific calculator is allowed.

……

Q.1. Select the alternative from the following. (08)

1) The relation between free energy and equilibrium constant, K of a reaction is ……
(a) $\Delta G = RT\ ln k$ (b) $\Delta G^0 = - RT\ ln k$
(c) $\Delta G^0 = RT\ ln k$ (d) $\Delta G = - RT\ ln k$

2) According to Max Planck, the entropy of all perfectly crystalline substance are……..at 0 K.
(a) Greater than zero (b) less than zero
(c) zero (d) none of these

3) According to law of mass action, the rate of a chemical reaction is directly proportional to ……
(a) volume of container (b) nature of products
(c) equilibrium constant (d) molar concentration of reactants

4) Chemical equilibria are …….in nature.
a) dynamic b) gaseous
c) liquid c) solid

5) The expression, PV = $\frac{1}{3} mNu^2$ is known as ……
a) reduced equation b) Kinetic gas equation
c) both a and b d) none of these

6) According to ……. law, V α 1/P at constant T.
a) Charle's b) Boyle's c) real d) none of these

7) Inversion of cane sugar is an example of ……reaction.
b) (a) first order (b) second order
c) (c) third order (d) pseudounimolecular

8) The rate of reaction depends on ……
a) temperature b) pressure
c) concentration d) all of these

Q.2. Attempt any TWO of the following. (16)

(a) Explain the relationship between critical constants and van der Waal's constants.

(b) Write a note on the second law of thermodynamics.

(c) Discuss in detail activated complex theory

Q.3. Attempt any FOUR of the following. (16)

(a) Distinguish between the order of reaction and molecularity of the reaction.

(b) What is thermochemistry? Explain endothermic and exothermic reactions.

(c) State LeChatelier's Principal. Explain in the brief effect of change of concentration and temperature on the state of equilibrium.

d) Explain the effect of catalyst and inert gas on a state of equilibrium.

e) What do you mean by K_p,K_c,and K_x?

f) Give the postulates of kinetic theory of gases.

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SHIVAJI UNIVERSITY KOLHAPUR
Faculty: Science and Technology- Course: B. Sc. I Semester II Examination (NEP)
March/April 2023(Held in June 2023)
Mathematics Paper III DSC-B5
Multivariable Calculus
Subject code - 90222

Day & Date: Friday, 9/06/2023

Time: 10.30 to 12.30 pm **Marks**: 40

Center: MatoshriBayabaiShripatraoKadamKanyaMahavidyalaya, Kadegaon

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Q.1 Choose the correct alternative (08)

1)If $u = \frac{1}{\sqrt{x^2+y^2+z^2}}, x^2 + y^2 + z^2 \neq 0$ then $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} =$

a) 0 b) 1 c) -1 d) None of these

2) If $u = log(x^3 + y^3 + z^3 - 3xyz)$then $(\partial/\partial x + \partial/\partial x + \partial/\partial x)^2 u =$

a) 9 b) -9 c) 3 d) -3

3) $\lim_{h\to 0} \frac{f(x+h,y)-f(x,y)}{h}$if exists is called the partial derivative of f with respect to ---

a) $xat\ (a,b)$ b) $xat\ (x,y)$ c)$yat\ (a,b)$ d) $yat\ (x,y)$

4)If each of $u, v, w$is function of the variable x,y,z then the Jacobian$\frac{\partial(u,v,w)}{\partial(x,y,z)}$ is determinant of order –

a) 9 b) 3 c) 1 d) n

5)$\frac{\partial(u,v)}{\partial(x,y)} \times \frac{\partial(x,y)}{\partial(u,v)} =$

a) 1 b) -1 c) 0 d) ∞

6)A function $f(x)$ has maximum value at $x = c$ if

a) $f'(c) = 0\ and f"(c) > 0$ b) $f'(c) = 0\ and f"(c) < 0$

c) $f'(c) = 0\ and f"(c) \neq 0$d) $f'(c) \neq 0\ and f"(c) < 0$

7) The maximum value of $sinx + cosx$ is

a) 2 b) $\sqrt{2}$ c) 1 d) 1+$\sqrt{2}$

8) The maximum value of cos(cos(sinx)) is

a) cos1 b) cos(cos1) c) 1 d) 0

Q.2 Attempt any two of the following **(16)**

1) Discuss the maximum or minimum value of u given by $u = x^3y^2(1 - x - y)$

2) If $u = log(x^3 + y^3 + z^3 - 3xyz)$then show that

a) $(\partial/\partial x + \partial/\partial x + \partial/\partial x)^2 u = \frac{-9}{(x+y+z)^2}$

b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = \frac{-3}{(x+y+z)^2}$

3) Prove that $\frac{\partial(y_1,y_2,y_3)}{\partial(x_1,x_2,x_3)} \times \frac{\partial(x_1,x_2,x_3)}{\partial(y_1,y_2,y_3)} = 1$

Q.3Attempt any four of the following **(16)**

1) If $x = rcos\theta\ , y = rsin\theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$ and $\frac{\partial(r,\theta)}{\partial(x,y)}$

2) Prove that if $y^3 - 3ax^2 + x^3 = 0$ then $\frac{\partial^2 y}{\partial x^2} + \frac{2a^2x^2}{y^5} = 0$

3) If $u = cot^{-1}(\frac{x+y}{\sqrt{x}+\sqrt{y}})$ show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + \frac{1}{4}sin2u = 0$

4) Find the maximum and minimum value of function $f(x) = 3x^4 - 2x^3 - 6x^26x + 1$ in the interval [0, 2]

5) Show that the maximum value of $(\frac{1}{x})^x$ is $(e)^{\frac{1}{e}}$

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Faculty: Science and Technology- Course: B. Sc. I Semester II Examination (NEP)
March/April 2023(Held in June 2023)
Mathematics Paper III DSC-B5
Multivariable Calculus
Subject code - 90222

Day & Date: Friday, 09/06/2023

Time: 10.30 to 12.30 pm **Marks**: 40

Center: MatoshriBayabaiShripatraoKadamKanyaMahavidyalaya, Kadegaon

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Q.1 Choose the correct alternative (08)

1)If $u = f(y-z, z-x, x-y)$ then value of $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$ is

a) 0 b) 3 c) $\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} + \frac{\partial f}{\partial z}$ d) None of these

2) A function $f(x)$ has maximum value at $x = c$ if

a) $f'(c) = 0\ and f"(c) > 0$ b) $f'(c) = 0\ and f"(c) < 0$

c) $f'(c) = 0\ and f"(c) \neq 0$ d) $f'(c) \neq 0\ and f"(c) < 0$

3) $\lim_{h\to 0} \frac{f(x+h,y)-f(x,y)}{h}$ if exists is called the partial derivative of f with respect to ---

a) $xat\ (a,b)$ b) $xat\ (x,y)$ c)$yat\ (a,b)$ d) $yat\ (x,y)$

4) The maximum value of cos(cos(sinx)) is

a) cos1 b) cos(cos1) c) 1 d) 0

5) The maximum value of $sinx + cosx$ is

a) 2 b) $\sqrt{2}$ c) 1 d) 1+$\sqrt{2}$

6) If $u = log(x^3 + y^3 + z^3 - 3xyz)$then $(\partial/\partial x + \partial/\partial x + \partial/\partial x)^2 u =$

a) 9 b) -9 c) 3 d) -3

7) $\frac{\partial(u,v)}{\partial(x,y)} \times \frac{\partial(x,y)}{\partial(u,v)} =$

a) 1 b) -1 c) 0 d) ∞

8) If each of $u, v, w$is function of the variable x, y, z then the Jacobian $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ is determinant of order –

a) 9 b) 3 c) 1 d) n

Q.2 Attempt any two of the following **(16)**

1) Obtain Taylors formula for $f(x, y) = \cos(x + y)\,, n = 3\ at\ (0,0)$

2) If $u = log(x^3 + y^3 + z^3 - 3xyz)$then show that

a) $(\partial/\partial x + \partial/\partial x + \partial/\partial x)^2 u = \frac{-9}{(x+y+z)^2}$

b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = \frac{-3}{(x+y+z)^2}$

3) Discuss the maximum or minimum value of u given by $u = x^3y^2(1 - x - y)$

Q.3Attempt any four of the following **(16)**

1) If Find the maximum and minimum value of function $f(x) = 3x^4 - 2x^3 - 6x^2 6x + 1$ in the interval [0, 2]

2) Prove that if $y^3 - 3ax^2 + x^3 = 0$ then $\frac{\partial^2 y}{\partial x^2} + \frac{2a^2x^2}{y^5} = 0$

3) If $u = cot^{-1}(\frac{x+y}{\sqrt{x}+\sqrt{y}})$ show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + \frac{1}{4}sin2u = 0$

4) If $u = f(y - z, z - x, x - y)$ then prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$ =0

5) If $x = rcos\theta\,, y = rsin\theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$ and$\frac{\partial(r,\theta)}{\partial(x,y)}$

SHIVAJI UNIVERSITY KOLHAPUR
Faculty: Science and Technology- Course: B. Sc. I Semester II Examination (NEP)
March/April 2023(Held in June 2023)
Mathematics Paper IV DSC-B6
Basic Algebra
Subject code - 90222

Day & Date: Saturday, 10/06/2023

Time: 10.30 to 12.30 pm **Marks**: 40

Center: MatoshriBayabaiShripatraoKadamKanyaMahavidyalaya, Kadegaon

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Q.1 Choose the correct alternative (08)

1) $cosh^2x + sinh^2x =$

a) $-\cosh(2x)$ b) $\sinh(2x)$ c)$\tanh(2x)$ d) $\cosh(2x)$

2 The value of i^{100} is

$a)\ 1$ $b)\ -1$ $c)\ id)\ -i$

3 What is the GCD of 4598 and 3211?

a) 11 b) 40 c) 19 d) 13

4) If φ is Euler phi function then $\varphi(31)$ is

a) 30 b) 31 c) 20 d) 0

5) If a/b and b/c with gcd(a,b) = 1 then -----

a) ab/c b) c/ab c) c/a d) c/b

6) Let R= {(3,3),(6,6),(9,9),(12,12),(6,12),(3,9),(3,12),(3,6)} be a relation on the set A = {3,6,9,12}. The relation is

a) reflexive and transitive d) reflexive only

c) an equivalence relation d) reflexive and symmetric

7) The range of function $f(x) = \frac{2+x}{2-x}$, x ≠ 2 is

a) R b) R-{1} c) R-{-1} d) R-{2}

8) What is the cardinality of the set of odd positive integer less than 10?

a) 10 b) 5 c) 3 d) 20

Q.2 Attempt any two of the following (16)

1) For any positive integer n, show that $1^2 + 2^2 + 3^2 \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$

2) If A={1,2,3,4}, B={3,4,5,6}, X = {1,2,3,4,5,6,7,8,9,10} then verify the following

a) $(A \cup B)' = A' \cap B'$b) $(A \cap B)' = A' \cup B'$

3) Given integer a & b with b>0, there exist unique integers q and r satisfying

$$a = qb + r \qquad 0 \leq r < b$$

Q.3Attempt any four of the following (16)

1) If a/b and b/c with $gcd(a, b) = 1$ then prove that ab/c

2) Find the modulus and the argument of the complex number $z = 2 - 3i$

3) Let $f, g ; R \to R$ be defined as $f(x) = x^2$ and $g(x) = 3x + 2$find$fog\ and\ gof$. Are they same?

4) Find the range and domain of the following function

i) $f(x) = 7x^2 + 4x - 1$ii) $f(x) = \sqrt{(16 - x^2)}$

5) Find the solution of equation$z^3 = 1$.

SHIVAJI UNIVERSITY KOLHAPUR
Faculty: Science and Technology- Course: B. Sc. I Semester II Examination (NEP)
March/April 2023(Held in June 2023)
Mathematics Paper IV DSC-B6
Basic Algebra
Subject code - 90222

Day & Date: Saturday, 10/06/2023

Time: 10.30 to 12.30 pm **Marks**: 40

Center: MatoshriBayabaiShripatraoKadamKanyaMahavidyalaya, Kadegaon

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Q.1 Choose the correct alternative (08)

1) What is the GCD of 306 and 657?

a) 6 b) 9 c) 19 d) 13

2 The value of i^{64} is

$a)$ 1 $b)$ -1 $c)$ $id)$ $-i$

3$cosh^2x + sinh^2x =$

a) – $\cosh(2x)$ b) $\sinh(2x)$ c)$\tanh(2x)$ d) $\cosh(2x)$

4) If φ is Euler phi function then $\varphi(101)$ is

a) 30 b) 31 c) 100 d) 0

5) If a/b and b/c with gcd(a,b) = 1 then -----

a) ab/c b) c/ab c) c/a d) c/b

6) What is the cardinality of the set of even positive integer less than 10?

a) 10 b) 5 c) 3 d) 20

7) The range of function $f(x) = \frac{2+x}{2-x}$, x ≠ 2 is

a) R b) R-{1} c) R-{-1} d) R-{2}

8) Let R= {(3,3),(6,6),(9,9),(12,12),(6,12),(3,9),(3,12),(3,6)} be a relation on the set A = {3,6,9,12}. The relation is

a) reflexive and transitive

d) reflexive only

c) an equivalence relation

d) reflexive and symmetric

Q.2 Attempt any two of the following **(16)**

1) Forgiven integer a & b with b>0, there exist unique integers q and r satisfying

$$a = qb + r \qquad 0 \leq r < b$$

2) If A={1,2,3,4}, B={3,4,5,6}, X = {1,2,3,4,5,6,7,8,9,10} then verify the following

a) $(A \cup B)' = A' \cap B'$b) $(A \cap B)' = A' \cup B'$

3) For any positive integer n, show that $1^2 + 2^2 + 3^2 \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$

Q.3Attempt any four of the following **(16)**

1) Find the solution of equation$z^3 = 1$.

2) Find the range and domain of the following function

i) $f(x) = 7x^2 + 4x - 1$ii) $f(x) = \sqrt{(16 - x^2)}$

3) Let $f, g\,; R \to R$ be defined as $f(x) = x^2$ and $g(x) = 3x + 2$find$fog\ and\ gof$. Are they same?

4) The modulus and the argument of the complex number $z = 2 - 3i$

5) Ifa/bc with $gcd(a, b) = 1$ then prove that a/c

SHIVAJI UNIVERSITY KPLHAPUR
B.Sc. I, Semester II Examination (NEP)
March/April 2023 (Held in June 2023)
MICROBIOLOGY
Paper-III (DSC 25 B): Bacteriology
Subject Code: 90230

Day and Date: Wednesday 7/06/2023 **Marks:40**

Time: 10:30 to 12:30

Instructions: 1) All Question are Compulsory.

2) Figures to the right indicate full marks.

Q 1. Select the correct alternatives from the following **08**

1) Name those bacteria which obtain energy from chemical compound is called as ……
   b) chemotrophs b) phototrophs c) organotrophs d) heterotrophs
2) …… of these is NOT a selective media.
   b) Blood agar b) Eosin methylene blue agar c) MacConkey agar d) Mannitol salt agar
3) …… type of culture media is best for growing bacteria.
   b) Solid (agar Based) b) Liquid c) Semisolid d) Both a & C
4) Platinum catalyst is present in …….
   a) Brewer's anaerobic jar b) Anaerobic gas pack system c) Candle jar d) Anaerobic chamber
5) …….. is not a carbon source.
   a) Blackstrap molasses b) Corn molasses c) Beet molasses d) Yeast extract
6)……. Method is used for qualitative determination of bacterial number
   a) streak plate b) pour plate c) spread plate d) both a & b
7) the risk of genetic changes as well as contamination is usually associated with the…...method of culture preservation.
   a) Sub culturing b) paraffin c) refrigeration d) freeze drying
8)…….is alternative name of freeze drying.
   a) Cold pasteurization b) irradiation c) liposuction d) lyophilization

Q 2. Attempt any TWO of the following **16**

1) Explain in details types of culture media
2) Explain various methods of preservation of microorganisms.
3) Explain in detail growth factor.

Q 3. Attempt any FOUR of the following **16**

1) What are Macronutrients & explain in brief with example.
2) Carbon source
3) Pour plate method
4) Colony characteristics of bacteria
5) Auxotroph's
6) Anaerobic culture media

SHIVAJI UNIVERSITY KPLHAPUR
B.Sc. I, Semester II Examination (NEP)
March/April 2023 (Held in June 2023)
MICROBIOLOGY
Paper-IV (DSC 26 B): Microbial Biochemistry & Metabolism
Subject Code: 90230

Day and Date: Thursday 8/06/2023 **Marks:40**

Time: 10:30 to 12:30

Instructions: 1) All Question are Compulsory.

2) Figures to the right indicate full marks.

Q 1. Select the correct alternatives from the following **08**

1) Enzymes are …….
   a) Proteins b) lipids c) carbohydrates d) fats
2) Phosphorylation is a process of ……
   a) Formation of phosphate b) addition of phosphate c) removal of phosphate d) degradation of phosphate
3) The term enzyme was coined by ……
   a) Watson b) Crick c) Buchner d) Pasteur
4) In exergonic reactions, the change in free energy is …….
   a) negative b) positive c) equal d) None
5) Amino acids are building blocks of ……
   a) Carbohydrates b) lipids c) proteins d) nucleic acid
6) Energy is produced in …… reaction
   a) catabolic b) anabolic c) metabolic d) biochemical
7) Tertiary structure of proteins is stabilized by ….
   a) Hydrogen bonds b) electrostatic interactions c) Vander Waals interaction d) All of these
8) TCA cycle is…...type pf pathway
   a) catabolic b) anabolic C) metabolic D) reductive

Q 2. Attempt any TWO of the following **16**

1) What are proteins? Explain various structural levels of protein
2) Explain in details catabolism of glucose with EMP
3) What are enzymes? Describe in detail constitutive & inducible enzymes

Q 3. Attempt any FOUR of the following **16**

1) Induced fit hypothesis
2) Concept of anabolism with example
3) Characters of enzyme
4) Endergonic reactions
5) Peptides
6) Substrate level phosphorylation

SHIVAJI UNIVERSITY KOLHAPUR
B. SC. I, Semester II Examination (NEP)
March/April 2023 (Held in June 2023)
Physics Paper –IV –DSC-2B
Electricity and Magnetism- II
Subject Code: -------

Day and Date: ---------- **Total Marks: 50**

Time: ----------

Instructions: 1) Attempt all questions.

2) Figures to the right indicate full marks.

3) Neat diagrams must be drawn wherever necessary.

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1. Question: Select the most correct alternative 8

I) Resonance frequency of series LCR circuit is --------

a) $f = \frac{1}{2\pi\sqrt{LC}}$ b) $f = \frac{1}{\sqrt{LC}}$ c) $f = 2\pi\sqrt{LC}$ d) $f = \frac{2\pi}{\sqrt{LC}}$

II) The capacitive reactance (X_C) is given by ----------

a) $X_C = \omega C$ b) $X_C = \frac{\omega}{C}$ c) $X_C = \frac{1}{\omega C}$ d) $X_C = \frac{C}{\omega}$

III) Which of the following is an active element?

a) Resistor b) Inductor c) Capacitor d) Transistor

IV) Unit of current sensitivity of B. G. is -----

a) $\mu A/mm$ b) $mm/\mu A$ c) mm/A d) $mm/\mu V$

V) S. I. unit of the permeability is ----------

a) $\mu A/mm$ b) $mm/\mu A$ c) mm/A d) $mm/\mu V$

VI) For diamagnetic material -----

a) $\mu > \mu_0$ b) $\mu < \mu_0$ c) $\mu \gg \mu_0 i$ d) $\mu \ll \mu_0$

VII). Magnetic induction at a point due to current carrying infinite straight conductor is -----

a) $\frac{\mu_0 I}{2\pi R}$ b) $\frac{\mu_0 I}{2 R}$ c) $\frac{\mu_0 I}{4\pi R}$ d) $\frac{\mu_0 I}{4 R}$

VIII). ---------- is a paramagnetic material.

a) Iron b) Aluminium c) Silver d) Lead

2. Attempt any two of the following **16**

I) Obtain an expression for magnetic induction at centre of a current carrying circular coil.

II) Using j- operator obtain an expression for an instantaneous current in series LCR circuit.

III) Define magnetic intensity and magnetic induction. Prove the relation $B = \mu_0 (H + M)$

3. Attempt any four of the following **16**

I) State the properties of ferromagnetic material.

II) State and explain Thevenin's theorem.

III) State and prove Biot-Savart's law.

IV) Describe construction and working of ballistic galvanometer.

v) Define figure of merit, current sensitivity, voltage sensitivity and charge sensitivity of the B. G.

VI) Explain Branch, Loop and Mesh.

Seat No.	

Total No. of Pages: 2

SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. (Part – I) Semester – II Examination (CBCS)

March/April 2023 (Held in June 2023)

ZOOLOGY (Paper - III)

Cell Biology and Evolutionary Biology

Sub. Code:72846

Day and Date: **Total Marks: 50**

Time:

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

Q.1 Select the correct answer from the following and rewrite complete sentence. 10M

1. The radioactive carbon 14C decays into…….

   A) Cobalt B) Calcium C) Nitrogen D) Uranium

2. The ……. called "The Power House" of cells.

   A) Lysosomes B) Mitochondria C) Ribosomes D) Nucleus

3. …… plays a role in the formation of acrosome during spermiogenesis

   A) Golgi complex B) Nucleus C) Endoplasmic reticulum D) Mitochondria

4. The number of chromosomes in man is …….

   A) 48 B) 46 C) 47 D) 60

5. The decay rate of a radioactive isotope is expressed in terms of….. life.

   A) Double B) Single C) Half D) One forth

6. The dinosaurs ruled the earth during ….. period.

   A) Jurrasic B) Devonion C) Cambrian D) Permian

7. The theory of natural selection for organic evolution is put forward by ……

   A) De Vries B) Lamarck C) Darwin D) Mendel

8. ……. are called ‘suicide bag’.

   A) Nucleolus B) Lysosomes C) Endoplasmic reticulum D) Mitochondria

9. ……. is the membrane-bound cell organelles, having genetic material and various proteins.

   A) Lysosome B) Nucleolus C) Nucleus D) Ribosomes

10. ……. is the study of fossils.

    A) Anthropology B) Palaeontology C) Entomology D) Ecology

Q.2 Attempt any two of the following. 20M

1. Describe the Theory of natural selection
2. Describe different types of fossils
3. Describe the fluid mosaic model of the plasma membrane.

Q.3 Attempt any four of the following. 20M

1. Functions of Golgi complex
2. Urey and Miller’s experiment
3. Polytene chromosome
4. Mitochondria
5. Carbonization

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Seat No.

SHIVAJI UNIVERSITY, KOLHAPUR
B.Sc. (Part – I) (Semester – II) Examination (NEP)
March/April 2023(Held in June 2023)
ZOOLOGY (Paper - IV)
Genetics
Sub. Code: 90227

Day and Date: **Total Marks: 40**
Time:
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1) Select the correct answer from each of the following and rewrite the sentence. [10]

1) Griffith effect is related with……
   a) DNAtranscription
   b) RNA translation
   c) Bacterial transformation
   d) Bacterial transduction

2) Phenotypic monohybrid ratio is ….....
   a) 2:1
   b) 3:1
   c) 4:1
   d) 1:3

3) ABO blood group system is due to……
   a) Multifactor inheritance
   b) Incomplete dominance
   c) Multiple allelism
   d) Dominance

4) The ratio obtained in complementary interaction of gene is ……..
   a) 9:7
   b) 9:3:3:1
   c) 9:3:4
   d) 3:1

5) Mechanism of crossing over occurring during……
   a) Pachytene of prophase
   c) Second meiotic division
   b) Before synapsis
   d) Diplotene

6) In Drosophila and in humans, the mechanism of sex determination is of……
   a) XX, XY type
   b) XX, XO type
   c) ZZ, ZW type
   d) haploidy, diploidy

7)An organism is 4n. This condition is called……
   a) Multifactor inheritance
   b) Multiple allelism
   c) Incomplete dominance
   d) Dominance

8) A genetic disorder called Down's syndrome is due to…….
   a) Polyploidy
   b) Triosomy
   c) Nullisomy
   d) Monosomy

Q.2) Answer the following questions (any two) **[20]**

a) Give an account of the law of dominance with a suitable example
b) Give an account of multiple alleles. Explain it with ABO blood groups in man.
c) What do you mean by mutation? Describe various types of mutation due to change in chromosomal number.

Q.3) Write short notes (any four) **[20]**

A) Complete Linkage

B) Incomplete Dominance

C) Blood Group

D) Mendel's hybridization Technique

E) Sex determination mechanism in Honey bee.

F) Griffith Effect