

Sub: - MATHEMATICS

- I. Prove that the Greatest Integer Function $f : R \rightarrow R$, given by f(x) = [x] is neither one-one nor onto. Where [x] denotes the greatest integer less than or equal to x.
- 2. Let $A = \{1, 2, 3\}$, $B = \{4, 5, 6, 7\}$ and let $f = \{(1, 4), (2, 5), (3, 6)\}$ be a function from A to B. Show that f is one-one.
- 3. Let the function $f: R \rightarrow R$ be defined by $f(x) = \cos x \quad \forall x \in R$. Show that *f* is neither one-one nor onto.
- 4. Show that the binary operation *, $N \times N \rightarrow N$, given by a * b = a + b ab is not a valid opertion but the operation a * b = a + b + ab is a valid operation.
- 5. Show that the relation R in the set of real numbers, defined as $R = \{(a, b) : a \le b^2\}$ is neither reflexive nor symmetric nor transitive.
- For the second second
- 7. Let A and B be sets. Show that $f : A \times B \rightarrow B \times A$ such that f (a, b) = (b, a) is bijective function.
- ²⁸. Let *T* be the set of all triangles in a plane with *R* a relation in *T* given by $R = \{(T_1, T_2) : T_1 \cong T_2\}$. Show that *R* is an equivalence relation.
- 9. Show that the relation *S* in the set *R* of real numbers, defined as $S = \{(a, b) : a, b \in R \text{ and } a \le b^3\}$ is neither reflexive, nor symmetric, nor transitive.
- 2 10. Let *N* be the set of all natural numbers and let *R* be a relation on *N* × *N* defined by (a,b) R(c,d)*ad=bc*forall $(a,b), (c,d) \in N \times N$. Show that *R* is an equivalence relation on *N* × *N*.

- 11. A relation defined in a non-empty set *A*, having *n* elements, has
 - (a) *n* relations (b) 2 relations
 - (c) n^2 relations (d) 2^{n^2} relations
- 12. The relation R in the set of real numbers defined as $R = \{(a, b) \in R \times R : 1 + ab > 0\}$ is
 - (a) reflexive and transitive
 - (b) symmetric and transitive
 - (c) reflexive and symmetric
 - (d) equivalence relation
- 13. Let the function 'f' be defined by $f(x) = 5x^2 + 2$, $\forall x \in R$. Then 'f' is
 - (a) onto function
 - (b) one-one, onto function
 - (c) one-one, into function
 - (d) many-one, into function
- 14. Let Z be the set of integers. Define a binary operation * in Z × Z as (a, b) * (c, d) = (a + c, b + d), then binary operation * is
 - (a) not commutative
 - (b) not associative

- (c) commutative and associative
- (d) does not have identity element
- 15. Let set $X = \{1, 2, 3\}$ and a relation R is defined in X as : $R = \{(1, 3), (2, 2), (3, 2)\}$, then minimum ordered pairs which should be added in relation R to make it reflexive and symmetric are

- (a) $\{(1, 1), (2, 3), (1, 2)\}$ (b) $\{(3, 3), (3, 1), (1, 2)\}$ (c) $\{(1, 1), (3, 3), (3, 1), (2, 3)\}$ (d) $\{(1, 1), (3, 3), (3, 1), (1, 2)\}$ 16. Let R be a relation defined as $R = \{(x, x), (y, y), \}$ (z, z), (x, z) in set A = {x, y, z} then relation R is reflexive symmetric (a) (b) (c) transitive (d) equivalence If $R = \{(x, y) : x + 2y = 8\}$ is a relation on N, then range of R is (a) {3} (b) {1, 2, 3} {1, 2, 3, 8} (d) (c) {1, 2} 8. Let $A = \{a, b, c\}$, then the total number of distinct relations in set A are
 - (a) 64 (b) 32 (c) 256 (d) 512
- 19. Consider the set A containing n elements, then the total number of injective functions from set A onto itself is/are
- (a) n (b) nⁿ (c) (d) n! 20. If f(x) = (1, 1), $x(\neq 1) \in \mathbb{R}$ then range of 'f' is (i) $\{-1, 1\}$
 - (iii) R
 - (iv) 1
- 21. Let R be a relation in the set of natural numbers N defined by $R = \{(a, b) \in N \times N : a < b\}$. Is relation R reflexive? Give a reason.
- 22. Let $f : R \rightarrow R$ is defined by f(x) = |x|. Is function f onto? Give a reason.

- 23. A relation S in the set of real numbers is defined as $xsy \Rightarrow x y + \sqrt{3}$ is an irrational number, then relation S is
 - (a) reflexive

- (b) reflexive and symmetric
- (c) transitive
- (d) symmetric and transitive
- 24. Let A be any non-empty set and P(A) be the power set of A. A relation R defined on P(A) by $X R Y \Leftrightarrow X \cap Y = X, X, Y \in P(A)$. Examine whether R is symmetric.
- 25. Set A has 3 elements and the set B has 4 elements. Then the number of injective functions that can be defined from set A to set B is
 - (a) 144 (b) 12 (c) 24 (d) 64

Sub: - PHYSICS

- 1 A free proton and a free electron are placed in uniform field which of the two experiences greater force and greater acceleration
- 2 Twoelectric field lines can intersect each other why ?
- 3 An electric dipole held 30 degree with respect to uniform electric field of 10 ^4 Newton per coulomb experiences a torque 9×10 -26 Newton meter calculate dipole moment of the dipole
- 2 charges -3 Q&Q are place fixed on the X axis separated by distance r where should a 3rd charge
 2Q be placed such that it will not experience any force
- 5 What is your current density is it a scalar
- 6 Is wheatstone bridge a DC or AC bridge?
- 7 What is the drift velocity of electron in a calculator bhan and electric field strength 200
 Volt per metre is applied it and mobility is 4.5
 ×10^-6 metre square per Volt per second
- 8 When drift velocity is so small how is it that an electric bulb light up as soon as we turn the switch on

- 9 State gauss theorem and find electric field intensity due to hollow aspire at different points also plot graph to show the variation of electric field intensity with different ones
- 10 State principle of wheat stone bridge and verify it

Sub: - CHEMISTRY

- **1.** Explain why,
 - (a) The dipole moment of chlorobenze is lower than that of cyclohexyl chloride.
 - (b) Grignard reagent should be prepared under anhydrous conditions.
- (a) State Raoult's law for a binary solution containing volatile components.
 (b) The vapour pressure of ethyl alcohol at 298 k is

40 mm of Hg. Its mole fraction in a solution with methyl alcohol is 0.80. What is Vapour pressure in solution if the mixture obey Raoult's law?

- **3.** What type of non-idealities are exhibited bycyclohexane-ethanol and acetone-chloroform mixture? Give reasons for your answer.
- **4.** Define the following terms.

(a) Mole fraction (b) Molality (c) Molarity **Sub: - BIOLOGY**

⇒ Complete the given assignment individually

Name of Students	Projects Work
Aastha Singh	Application of biotechnology in the field of agriculture
Akshitanand Kri.	STI
Piyush Kumar	HIV & AIDS
Asad Kamal	Immune System
Nividita sinha	Infectious Diseases
Rajnandini Kumari	Sewage Treatment Plant
Dolly Kumari	Assisted reproductive technology
Sakshi Kumari	Microbes in human welfare
Sonal Kumari	Cancer & its treatment
Anushka Raj	Genetic Engineering
Akansha Raj	PCR. & its application
Siba Fatima	DNA finger printing

<u>Sub: - ENGLISH</u>

Instructions: Answer all the questions.

1. Letter of Invitation

Write a formal letter inviting your school principal to the annual cultural event organized by your class. Mention the date, time, and program details.

2. Job Application Letter

Draft a job application letter for the position of a Content Writer at a reputed publishing house. Include your qualifications, skills, and relevant experience.

3. Summary of the Text

Read the following passage carefully and write a summary in about 50 words, highlighting its main points without any personal opinions.

Tensions along the India-Pakistan border have escalated into open conflict over the past fortnight. Following a disputed airspace violation, both nations mobilized additional troops and deployed advanced missile systems within the contested Kashmir region. Civilians in nearby towns face frequent power outages and intermittent communication blackouts, while aid organisations struggle to deliver food and medical supplies amid heavy shelling. Despite repeated appeals from the United Nations and neighbouring countries for an immediate ceasefire, diplomatic talks have stalled over disagreements on prisoner exchanges and demarcation of control lines. Schools and markets in border districts remain closed, and an estimated 150,000 residents have evacuated to makeshift camps set up in safer hinterlands. Journalists report scenes of shattered homes, fields scorched by artillery fire, and the wail of air-raid sirens piercing the night sky. Humanitarian agencies warn that without a swift resolution, the conflict could trigger a regional refugee crisis and further destabilise South Asia. Meanwhile, social media platforms are flooded with eyewitness accounts and unverified footage, fuelling outrage and hardening public opinion on both sides. As winter approaches, the humanitarian toll is expected to rise unless diplomatic channels reopen and a lasting ceasefire is secured.

4. Word Meanings

Choose the correct meaning of the following words from the given options:

1. Impeccable

i) Flawless ii) Uncertain iii) Tedious iv) Decorative

2. Benevolent i) Kind-hearted ii) Aggressive iii) Neutral iv) Deceptive 3. Vivid i) Dull ii) Clear iii) Complex iv) Hidden 4. Eloquent i) Reserved ii) Fluent iii) Clumsy iv) Shy 5. Resilient ii) Adaptable i) Fragile iii) Stubborn iv) Unmoving 6. Exquisite i) Ordinarv ii) Beautiful iii) Cheap iv) Confusing 7. Prodigious i) Small ii) Huge iii) Unnecessary iv) Common 8. Melancholy i) Joyful ii) Gloomy iii) Inquisitive iv) Confident 9. Ephemeral i) Permanent ii) Brief iii) Unchanging iv) Complex 10. Audacious i) Timid ii) Brave iii) Pessimistic iv) Lazy

<u>Sub: - HINDI</u>

- हिंदीभाषामें प्रकाशित किन्हीं पांच समाचारपत्रोंकेनाम लिखिए।
- २. हिंदीभाषाकीचर्चित पांच पत्रिकाओं के नाम लिखिए।
- ३. महादेवीवर्मा रचित प्रसिद्ध पुस्तकों के नाम लिखिए।
- ४. हरिवंशरायबच्चन रचित प्रसिद्ध मधुशाला कीबीसपंक्तियां लिखिए।
- मनोहरश्याम जोशी अथवा जैनेन्द्र कुमार रचित प्रसिद्ध
 पुस्तकों के नाम लिखिए।
- ६. हिंदीभाषा एवं साहित्य से जुड़े विभिन्न पुरस्कारोंके नाम लिखिए।
- जईशिक्षानीति अथवा लोकतंत्र में मीडिया कीभूमिका विषय पर निबंध लिखिए।
- ९. किसीकविता काभावसौंदर्य या भावार्थ अच्छी तरह लिखिए।
- १०. सिल्वरवेडिंग अथवा बाजार दर्शन पाठकाउद्देश्य स्पष्ट कीजिए।

- S<u>ub: I.P</u>
- 1. Write the difference between Series Object and Lists.
- 2. What is the difference between Series Object and 1D Ndarray
- 3. Write a program to create a Series object that stores the initial budget allocated (50000/each) for the four quarters of the year: Qtr1, Qtr2, Qtr3 and Qtr4.
- 4. Total number of medals to be won is 200 Inter-University games held every alternate year. Write code to create a Series object that stores these medals for games to be held in the decade 2020 – 2029.
- 5. Write a program to create a Series object using a dictionary that stores the number of students in each section of class 12 in a school
- 6. Write four attributes of Series objects.
- 7. Define Data Structure.

- 8. Write a program to create a Series object using individual characters 'a', 'e', 'i', 'o', 'u'.
- Write a program to create a Series object using an ndarray that is created by tiling a list[3,5], (twice)
- 10. Write the code to set the index name.

PHY.EDUCATION

- 1. Define the term fixture. Explain briefly various types of tournaments.
- 2. League tournament is a better way to judge the best team of tournament. Comment
- 3. Draw a fixture of 19 teams for a Knockout tournament.
- 4. Draw a fixture of 8 teams for league tournaments
- 5. Write the name of different committee to conduct a tournament & explain any four of them.