TRIBHUVAN UNIVERSITY
INSTITUTE OF SCIENCE AND TECHNOLOGY

SCHOOL OF MATHEMATICAL SCIENCES

BALKHU, KATHMANDU, NEPAL

Bachelor in Data Science (BDS) Entrance Examination Syllabus

Selection Criteria

- Written Test - 80 Marks
- Academic Qualifications - 10 Marks
- Interview - 10 Marks

Written Test Syllabus

1) Mathematics (30 Marks)

- Set, relation, function and graph
- Real and Complex number
- Sequence and series
- Matrices and determinants
- System of linear equations
- Polynomial equations
- Permutation and combination
- Vectors
- Ratio and proportion
- compound interest and depreciation
- Coordinate Geometry (Circle, straight line and pair of lines)
- Statistics (Central tendency and dispersion)
- Probability
- System of Linear Inequalities and Linear Programming
- Limit and continuity
- Differentiation

2) English (30 Marks)

- Sequence of Tense
- Use of articles
- Subject-verb Agreement
- Affirmative and negative agreements
- Embedded/Indirect questions
- Question tags
- Active and passive voice
- Direct and Indirect Speech
- Kinds of Sentences and Transformation of Sentences
- Parallel Structure
- Causative verbs
- Conjunctions
- Placement of pronouns and adjectives
- Relative pronouns
- Conditional Sentences
- Use of Prepositions

- Word formation: prefix and suffix
- Infinitives, Gerund and Participles
- Synonyms, Antonyms and one-word substitution
- Syllables, stress, and intonation
- Idiomatic Expressions
- Sounds and Phonetics
- Analogies
- Reading Comprehension: Comprehensions of reading passages on a variety of topics with special references to General English and Technical English.

3) General Knowledge and IQ (20 Marks)

- First-person in Nepal and the World
- Geography of Nepal and the World
- Nickname of important places
- Business/ Economics
- Top crop producers in the world
- International Organisation
- Politics and Science
- General knowledge of the Sports
- Prime Ministers of Nepal(Present and Past)
- Prize, Film, and Literature
- Capital cities (Famous Country)
- Some scientific inventions
- Verbal Logical Reasoning
- Missing Number

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Bachelor in Data Science

Model Question for Written Examination 2081

Symbol No…….. Full Marks**: 80**

Time**:** 1.45 Hrs

General Instructions

Please read the following instructions carefully before you start answering the questions.

1. Write your **symbol No.** on your answer sheet.
2. Do not write anything else on your question sheet.
3. Use the blank paper given with the answer sheet for rough work.
4. Mark your correct answers by **darkening option** on your answer sheet.
5. All pages **(Questions, answer sheets and rough papers)** must be submitted after the examination.

How to Answer the Questions?

1. In a certain school 20 students are taking math and 10 are taking computer and 7 are taking both. How many students are there?

a) 30 b) 23 c) 37 d) 27

Indicate your correct answer on the Answer Sheet

Solution

You should indicate your answer by darkening the correct answer choice (b) as shown below:

Section-I: Mathematics [1×30=30]

1. The number of subsets of $A = \{0,1,2\}$ is

a) 3 b) 6 c) 7 d) 8

2. Let R be a relation from A = {2, 3, 4, 5} to B = {3, 6, 7, 8} which is defined by "x divides y". Then the inverse relation of R is

a) {(2, 6), (2, 8), (3, 3), (3, 6), (4, 8)} b) {(2, 6), (3, 3), (3, 6), (4, 8)}

c) {(6, 2), (8, 2), (3, 3), (6, 3), (8, 4)} d) { (8, 2), (3, 3), (6, 3), (8, 4)}

3. The domain of the function $f(x) = \dfrac{4}{\sqrt{x-2}}$ is

a) $(2,\infty)$ b) $[2,\infty)$ c) $(0,\infty)$ d) $[-2,\infty)$

4. For any integer n, the odd integer can be represented as

a) n b) $n+1$ c) $2n+1$ d) $2n$

5. The value of $\dfrac{(1-i)^3}{1-i^3}$ is

a) 1 b) -2 c) -i d) 2i

6. If the first term of an AP be 10,last term is 50 and the sum of all the terms is 300, then the number of terms are

a) 3 b) 6 c) 10 d) 5

7. The third term of GP is 4. Then the product of the first 5 terms is

a) 4^3 b) 4^4 c) 4^5 d) 4^6

8. The value of k for which $A = \begin{bmatrix} k & 8 \\ 4 & 2k \end{bmatrix}$ is a singular matrix is

a) 4 b) -4 c) ± 4 d) 0

9. If A is a square matrix of order 3 and $|A| = 5$, then the value of $|2A^T|$ is

a) -10 b) 10 c) -40 d) 40

10. The system of linear equations $kx + 2y = 5, 3x + y = 1$ has a unique solution if

a) $k = 0$ b) $k = 6$ c) $k \neq 6$ d) $k = -6$

11. A quadratic polynomial whose zeroes are -3 and 4 , is

a) $x^2 - x + 12$ b) $x^2 + x + 12$ c) $x^2 - x - 12$ d) $x^2 - 3x + 4$

12. The number of ways in which n distinct objects can be put in two different boxes so that neither of the boxes is empty is

a) 2^n b) $2^n - 1$ c) $2^n + 1$ d) $2^n - 2$

13. There are 5 questions in each group A and B. A student can answer 3 questions from group A and 2 from group B, then the number of arrangement is

a) 120 ways b) 150 ways c) 100 ways d) 80 ways

14. The vectors 2i + 3j -k and -4i - 6j + 2k are

a) equal b) have the same magnitude

c) parallel d) mutually perpendicular

15. If $a\vec{i}+\vec{j}+\vec{k}, \vec{i}+b\vec{j}+\vec{k}$ and $\vec{i}+\vec{j}+c\vec{k}$ are collinear, then

a) $a+b+c=0$ b) $abc=1$ c) $a+b+c=abc+2$ d) $a+b+c\neq 0$

16. The ratio of wages to Amir, Bishal, and Sambhav is 3:5:7. If Sambhav gets Rs.868 more to Amir, then the Bishal's wage is

a) 1085 b) 1086 c) 1083 d) 1084

17. The difference between simple and compound interest on Rs.1020 for 4 years at 10% per annum is

a) 70 b) 85 c) 75.38 d) 65.38

18. Depreciation on machinery is written off at 5% every year. If its value at the end of 12 years is Rs. 12,500, then was the original cost of the machinery was

a) Rs.23132.72. b) Rs. 1800 c) Rs. 12700 d) Rs. 10800

19. If one end of a diameter of circle $x^2 + y^2 - 2x + 6y - 15 = 0$ is (4, 1), then the coordinates of the other end is

a) (1, –3) b) (2, 7) c) (2, –7) d) (–2, –7)

20. The equation of the line which is perpendicular to the line $7x - 5y + 9 = 0$ and passes through the point (2, –1) is

a) $x - 3y = 7$ b) $5x + 7y + 3 = 0$ c) $7x + 5y - 3 = 0$ d) $5x + 7y - 3 = 0$

21. The angle between the line pair represented by $2x^2 + 7xy + 3y^2 = 0$ is

a) 60^0 b) 120^0 c) 75^0 d) 45^0

22. If mean = 30 and mode is 24, then the median of a distribution is

a) 24 b) 30 c) 27 d) 28

23. The mean and standard deviation of 75 observations are 45 and 10, respectively. If 2 is added to each observation , the new mean and standard deviation will be

a) 47,12 b) 45,12 c) 47,10 d) 45,10

24. The probability of getting the sum as a prime number if two dice are thrown is

a) 5/24 b) 5/12 c) 5/30 d) 1/4

25. If $2x+5>2+3x$ and $2x-3<4x-5$, then x takes the value

a)-2 b)2 c)4 d)-4

26. The maximum value of $z=3x+4y$ subject to the constraints $x+y\leq 4, x\geq 0, y\geq 0$ is

a)12 b)14 c)16 d)18

27. If $f(x) = \dfrac{cx+\mathrm{d}}{x-1}$, $\lim\limits_{x\to 0} f(x) = 2$, $\lim\limits_{x\to\infty} f(x) = 5$, then the value of $f(4)$ is

a) 5 b) 10 c) 6 d) does not exist

28. The values of x for which the function $f(x)=\dfrac{x^2-3x-4}{x^2+3x-4}$ is not continuous are

a) 4 and -1 b) 4 and 1 c) -4 and 1 d) -4 and -1

29. If $f(x)=2x^2+\dfrac{1}{x}$, then $f'(1)$ is

a) 1 b)2 c) 3 d)4

30. If $y\sqrt{1-x^2}+x\sqrt{1-y^2}=1$, then $\dfrac{dy}{dx}$ is

a) $-\sqrt{\dfrac{1-y^2}{1-x^2}}$ b) $\sqrt{\dfrac{1-y^2}{1-x^2}}$ c) $\sqrt{1-x^2}$ d) $\sqrt{1-y^2}$

Section-II: English [1×30=30]

31. Choose the correct phonetic transcription of the word "cat":

a) /kat/ b) /kæt/ c) /ket/ d) /cit/

32. The teacher is having the students ……an essay.

a) Wrote b) To write c) Writing d) Write

33. He watched television yesterday and……

a) So do I b) I watched too c) So did I d) I do so

34. him……..

a) How old is he? b) How old was he? c) How old he is. d) How old he will be.

35. The food I want to order is not …….the menu.

a) In b) On c) At d) With

36. I was <u>taken by storm</u> when I come to know he passed the exam. The underlined expression here means……..

a) Felt gloomy b) Felt depressed c) Felt surprised d) Felt foolish

37. He goes to……Little Angel's School.

a) A b) An c) The d) None

38. The word "watermelon" has…….syllables.

a) Two b) Three c) Four d) Five

39. If leaf is to sap in the same way as bone is to……..

a) blood b) fluid c) marrow d) calcium

40. I don't think you can do it, …….?

a) Can you b) Can't you c) Don't you d) Do you

41. The moon is as beautiful as…….

d) Her b) She c)Hers d) me

42. “You are John, aren’t you?” Is reported as:

a) She asked him whether he was John. b) She told him that he was John.

c) She told him that he was John. d) She told him that he wasn’t John.

43. ……..are invited to the party tomorrow.

a) He, you and I b) I, he and you c) You, he and I d) He, I and you

44. She is young, enthusiastic and …….

a) Has talent b) Will be talented c) Has talency d) Talented

45. We…….it if you explained it more slowly.

a) Understood b) Had understood c) Would understand d) Would have understood

46. He is anxious ……his test results.

a) Knowing b) Known c) To know d) To knowing

47. Before he joined our office in Kathmandu, he……for an NGO in Pokhara.

a) Worked b)Was working c) Had worked d) Had been working

48. What does “To turn the candle at both ends meet” mean?

a) To waste energy b) To act foolishly c) To work hard d) To waste money

49. “Where……?” In Kathmandu.

a) Were you born b) Are you born c) Have you been born d) Did you born

50. The principal, accompanied by the teachers, …… working honestly.

a) Are b) is c) Have been d) were

51. Something existing only in name is called……..

a) Pseudonym b) Anonymous c) Pen name d) Titular

52. What is the typical intonation pattern for a yes-no question in English?

a) Falling intonation b) Rising intonation

c) Level intonation d) Falling-rising intonation

53. In the sentence "His remarks were seen as audacious by the audience," which word could be used as a synonym for "audacious"?

a) Daring b) Cautious c) Modest d) Reserve

54. Which word is the most appropriate antonym for "eccentric" in the context of describing someone's behavior?

a) Conventional b) Unusual c) Quirky d) Peculiar

55. Passive voice of “Help the poor” is……

a) Let the poor be helped. b) The poor should be helped.

c) You should help the poor. d) The poor is to be helped.

Read the passage below and answer Q.no.56 to 60.

If there were no mountains or oceans and if the winds circled the earth with perfect regularity then the amount of heat and the length of farmer's growing season would progress uniformly from north to south. Instead, there are all kinds of unexpected differences in climate, as temperature maps of the United States show. For instance, all along the western coast, the temperature changes little between winter and summer. In some places, the average difference between July and January is as little as 10 degree Celsius. The climate along the northern part of this coast is similar to that of England.

But in the north center pert of the country, summer and winter are worlds apart. There the average difference between July and January is 36 degree Celsius and more violent extremes are common. The coldest days of a typical January may be -4 degree Celsius and the hottest July day may be 45 degree Celsius. This is the sort of climate that is also found in central Asia, far from the moderating influence of the oceans. In the eastern part of the United States, the difference between summer and winter is also very distinct, but not nearly so extreme. Near the south western corner of the country, the climate is mild and spring-like in winter, but in summer the temperature may reach equatorial intensity. In Alaska almost continuous day light in summer makes the short growing season an intense one. The variations in temperature within the United States have had a marked effect on the country's economy and living standards

56. What are the causes of unexpected differences in climate?

a) winds and heat b) mountains and seas c) temperature and farmer d) winter and summer

57. In which part of the United States are summer and winter worlds apart?

a) northern part b) eastern part c) south central part d) north central part

58. What is the temperature of the coldest days of a typical January in the north?

a) 4 degree Celsius b) -4 degree Celsius c) 36 degree Celsius d) 45 degree Celsius

59. What is the effect of continuous daylight in summer of the growing season in Alaska?

a) it makes the difference between summer and winter very distinct
b) it makes the climate mild and spring-like
c) it makes its growing season an intense one
d) it makes the winter violent extreme

60. Which sectors are markedly affected by the variations in temperature in the United States?

a) Alaska b) northern coastal area
c) farming and economy d) economy and living standards

Section-III: GK & IQ [1×20=20]

61. " Siruwa Parba" belongs to which community?

a) Rajbanshi b) Magar c) Newar d) Brahmins

62. "Grammy Award" is related to …

a) Film b) Music c) Literature d) Sports

63. When was Machine Readable Passport (MRP) introduced in Nepal?

a) 2010 January b) 2010 April c) 2010 May d) 2010 March

64. Who won the Miss Nepal title 2023 ?

a) Asmi Shrestha b) Nikita Chandak c) Subin Limbu d) Srichchha Pradhan

65. Who established the World famous website hotmail.com?

a) David Filo b) Yahoo and Tiker c) Sabeer Bhatia d) Jerry Yang

66. Who wrote the book, "The Mousetrap"?

a) Harka Gurung b) Ian Fleming c) Rudyard Kipling d) Agatha Christie

67. Which team won the third position in FIFA World Cup 2018?

a) England b) Croatia c) Denmark d) Belgium

68. Which of the following uses the slogan "Don't Read the Comments"?

a) Youtube b) Facebook c) Ted Talks d) Whatsapp

69. Which animal is imprinted in a 1000 Rupee note?

a) Leopard b) Rhino c) Elephant d) Tiger

70. When did the former Indian President APJ Abdul Kalam die?

a) 2014 b) 2015 c) 2016 d) 2013

71. Who won the Prestigious Nobel Peace Prize in 2016?

a) Bob Dylan b) Juan Manuel Santos c) Yoshinori Ohsumi d) JeanPierre Sauvage

72. What is the total budget of the Government of Nepal for the fiscal year 2080/2081 ?

a) Rs.18.60 trillion b) Rs.11.40 trillion c) Rs.19.60 trillion d) Rs.20.04 trillion

73. Which country does the famous shoe brand Adidas belong to?

a) Britain b) The USA c) Germany d) Italy

74. In a farm there are goats and hens. They have 96 feet and 28 heads. How many goats are there?

a) 21 b) 22 c) 20 d) 12

75. A lizard climbs up a wall by 8 meters in the day and falls down 4 meters by the night. How many days does it take to reach the top of a 23 meters wall?

a) 7 days b) 8 days c) 9 days d) none of the above

76. If the doctor gave you 5 tablets and advised you to take each tablets every half an hour. How much time does it take you to take the tablets?

a) 2 hours b) 2.30 hours c) 3 hours d) 3.30 hours

77. Pointing towards Anisha, Prabin said, "I am the only son of your mother's son." How is Anisha related to Prabin?

a) Aunt b) Niece c) Mother d) Cousin

78. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?

a) His Uncle's b) His Father's c) His Maternal uncle's d) His own

79. Complete the series 4, 7, 12, 19, 28, (?)

a) 30 b) 36 c) 39 d) 49

80. 'JKLM' is related to 'XYZA' in the same way as 'NOPQ' is related to…..

a) RSTU b) YZAB c) DEFG d) BCDE

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