

Reg. No. :

Name :

Second Semester B.A./B.Sc. Degree Examination, September 2022

First Degree Programme Under CBCSS

Language Course – Additional Language – Hindi

HN 1211.1 — HINDI NIBANDH AUR ANYA GADYA VIDHAYEM

(2020 Admission Ownwards)

Time : 3 Hours

Max. Marks : 80

1. एक शब्द या वाक्य में उत्तर लिखिए।
1. 'आधुनिक हिन्दी का जन्मदाता' कौन है?
2. 'कुटज' का रचनाकार कौन है?
3. 'कलम का सिपाही' किस विधा की रचना है?
4. परसाईजी के अनुसार निन्दा का उद्गम कहाँ से होता है?
5. 'सफेद मेमने' किसकी रचना है?
6. 'सूखे सरोवर का भूगोल' किस विधा की रचना है?
7. 'तिरछी रेखाएँ' का रचयिता कौन है?
8. 'माटी के मूर्तें' किसकी रचना है?
9. सूरदास ने निन्दा को किस नाम से संबोधित किया?
10. 'मेरा हमदम मेरा दोस्त' किस विधा की रचना है?

(10 × 1 = 10 Marks)

P.T.O.

II. किन्हीं आठ प्रश्नों के उत्तर करीब 50 शब्दों में लिखिए।

11. कमलेश्वर के व्यक्तित्व के बारे में राजेन्द्र यादव का विचार व्यक्त कीजिए।
12. राजेन्द्र यादव का, कमलेश्वर से व्यक्तिगत परिचय कब हुआ था?
13. बडौदा राज्य में नौकरी करना अंबेडकर के लिए क्यों आवश्यक हो गया था?
14. पारसी सराय में अंबेडकर का रहन-सहन किस प्रकार का था?
15. हजारी प्रसाद द्विवेदीजी के अनुसार कालिदास ने हिमालय और देवदारु की चर्चा किस प्रकार की है?
16. देवदारु वनस्पति की मर्यादा से वंचित क्यों रहा?
17. मुंशी प्रेमचंद ने कन्यादान क्यों नहीं किया?
18. प्रेमचन्द के समय में लडकी को पढ़ाना अपने आप में एक क्रान्ति क्यों थी?
19. तांडव किस प्रकार का नाच है?
20. धर्मान्तरण संबन्धी डॉ. अंबेडकर की मान्यताओं पर विचार कीजिए।
21. हजारी प्रसाद द्विवेदीजी की रचनाओं का परिचय दीजिए।
22. एक साहित्यकार के रूप में अमृतराय का महत्व समझाइए।
23. मणिमधुकर का परिचय दीजिए।
24. धिराणी माँ किस प्रकार की नारी थी?
25. भारत के अछूतों की स्थिति को डॉ. अंबेडकर ने किस प्रकार चित्रित किया है?
26. गेहूँ और संगीत का आपसी संबन्ध किस प्रकार बना?

(8 × 2 = 16 Marks)

III. किन्हीं छः प्रश्नों के उत्तर करीब 120 शब्दों में लिखिए।

27. 'पता नहीं, किसने इस पेड़ का नाम देवदारु रख दिया था, नाम निश्चय ही पुराना है, कालिदास से भी पुराना, महाभारत से भी पुराना'। कथन की विवेचना कीजिए।
28. 'मगर देवदारु नाम केवल नाम ही नहीं है। मैं ने अपने गाँव के एक महान भूत-भगवान ओझा को देवदारु की लकड़ी से भूत भगाते देखा है'। भाव समझाइए।
29. 'घर में उस समय और कोई न था। इसलिए मुंशीजी खुद ही गये और पास के एक हलवाई के यहाँ से मिठाई ले आये' प्रसंग लिखिए।
30. 'शादी-ब्याह एक दिन का रिस्ता नहीं हमारा उनका यह तीन पुश्तों का रिस्ता होगा। इसलिए आप उनको दिवालिया न कीजिएगा'। कथन की विवेचना कीजिए।
31. व्यंग्य के स्वरूप को समझाइए।
32. 'गेहूँ हम खाते हैं, गुलाब सूँघते हैं। एक से शरीर की पुष्टि होती है, दूसरे से मानस तृप्त होता है'। - आशय समझाइए।
33. 'अभिमन्यु की आत्महत्या' नामक कहानी की पहली चिनगारी राजेन्द्र यादवजी को कैसे मिली?
34. 'हर झूठा और पढ़ा-लिखा आदमी कहानीकार नहीं हो सकता वरना आज सारे के सारे प्रयागवासी कवि आलोचक, कहानीकार हो गए होते।' - आशय समझाइए।
35. 'गेहूँ बनाम गुलाब' शीर्षक की प्रतीकात्मकता पर विचार कीजिए।
36. ललित निबन्ध के स्वरूप का परिचय दीजिए।
37. गद्य के विविध रूपों का परिचय दीजिए।
38. 'क' से क्या मैं गले मिला? क्या मुझे उसने समेटकर कलेजे से लगा लिया? हरगिज़ नहीं'। आशय समझाइए।

(6 × 4 = 24 Marks)

IV. किन्हीं दो प्रश्नों के उत्तर ढाई सौ शब्दों में लिखिए।

39. 'देवदारु' की विशेषताओं को समझाइए।
40. 'बेटी का विवाह' जीवनी पर विचार कीजिए।

41. 'बडौदा का अनुभव' पर प्रकाश डालिए।
42. 'निन्दारस' में अभिव्यक्त व्यंग्य का परिचय दीजिए।
43. 'सूखे सरोवर का भूगोल' रिपोर्टाज का परिचय दीजिए।
44. 'गेहूँ बनाम गुलाब' का सारांश लिखिए।

(2 × 15 = 30 Marks)

(Pages : 7)

P – 1242

Reg. No. :

Name :

Second Semester B.Sc. Degree Examination, September 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Mathematics

ST 1231.1 : PROBABILITY AND RANDOM VARIABLES

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer all questions. Each question carries 1 mark.

1. Define mutually exclusive events.
2. Describe probability space.
3. Define conditional probability.
4. Give an example of a continuous sample space.
5. When will you say that two events are independent?
6. Describe discrete random variables.
7. Examine whether the following is a probability mass function or not

$$f(x) = \frac{1}{2^x}, x = 1, 2, \dots$$

P.T.O.

8. A random variable X take values 0 and 1 with probabilities $\frac{1}{2}$. Find $E(X)$.
9. Give any two properties of expectation.
10. Define moment generating function.

(10 × 1 = 10 Marks)

PART – B

Answer any eight questions. Each question carries 2 marks.

11. Discuss classical approach to probability. Give any one of its draw backs.
12. Describe multiplication theorem on probability.
13. Distinguish between equally likely and exhaustive events.
14. A bag contains 5 red and 4 black balls. Two balls are drawn at random. What is the probability that both of them are red?
15. Discuss any two properties of moment generating function.
16. If A and B are any two events such that $P(A) = \frac{1}{2}$; $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$. Find (a) $P(A \cup B)$; (b) $P(\bar{A} \cup \bar{B})$.
17. A random variable X has the following probability function. Find the value of K .

$X:$	0	1	2	3	4	5	6	7
$P(X = x):$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$
18. In six tosses of an unbiased coin, let X denote the number of heads occurred. Find $E(X)$.
19. Find the characteristics function of X with probability function

$$P(X = x) = \binom{n}{x} p^x (1-p)^{n-x}, x = 0, 1, \dots, n.$$

20. Discuss conditional expectation.
21. The joint probability density function of (X, Y) is $f(x, y) = 8xy$, $0 < x < y < 1$. Find the marginal distribution of X .
22. With usual notations show that
- $$E(E(X|Y)) = E(X)$$
23. Define independence of random variables.
24. For a random experiment throwing a die let $A = \{1, 2, 3\}$ and $B = \{3, 4, 5, 6\}$. Find
- (a) $P(\bar{A})$
- (b) $P(A \cup \bar{B})$
- (c) $P(\bar{A} \cup B)$
25. Given $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A|B) = \frac{1}{6}$ find (a) $P(B|A)$ (b) $P(A \cap B)$.
26. Find the characteristics function of a random variable X with probability function $f(x, \theta) = \theta e^{-\theta x}$, $x > 0$.

(8 × 2 = 16 Marks)

PART – C

Answer **any six** questions. Each question carries **4** marks.

27. Distinguish between pairwise independence and mutual independence.
28. Show that conditional probability satisfies the axioms of probability.

29. Three urns contains

1 White 2 black and 3 red

2 White 1 black and 1 red

4 White 2 black and 3 red

balls. One urn is chosen at random and two balls are selected. They happens to be white. What is the probability that they came from urn II?

30. Two dice are thrown at random. What is the probability that the sum on the phases is

(a) greater than 8

(b) neither 6 or 7.

31. Describe distribution function. State and establish two of its properties.

32. X and Y are distributed according to

$$f(x, y) = e^{-(x+y)}, \quad x > 0, y > 0.$$

Examine whether X and Y are independent or not.

33. Establish any two properties of characteristics function.

34. Describe raw and central moments. Establish the relation between them.

35. Find the moment generating function of the random variable X with probability function.

$$f(x) = \frac{e^{-\lambda} \lambda^x}{x!}, \quad x = 0, 1, 2, \dots$$

Hence find the first two raw moments of X.

36. Give the empirical definition of probability. Also explain its draw-backs.

37. With usual notations show that for any three events A , B and C .

$$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$$

38. State and prove Baye's theorem.

(6 × 4 = 24 Marks)

PART – D

Answer **any two** questions. Each question carries **15** marks.

39. (a) Given $P(A) = P_1$, $P(B) = P_2$ and $P(A \cap B) = P_3$. Express the following in terms of P_1 , P_2 and P_3

(i) $P(\bar{A} \cup \bar{B})$

(ii) $P(\bar{A} \cap B)$;

(iii) $P(\bar{A} \cup B)$

(iv) $P(A \cup B)$;

(v) $P(\bar{A} \cap \bar{B})$.

(b) Let A and B be two events such that $P(A) = \frac{3}{4}$ and $P(B) = \frac{5}{8}$. Show that

(i) $P(A \cup B) \geq \frac{3}{4}$

(ii) $\frac{3}{8} \leq P(A \cap B) \leq \frac{5}{8}$

40. (a) A and B alternatively throw a pair of dice. A wins if he throws 6 before B throws 7 and B wins if he throws 7 before A throws 6. Find the probability of A winning the game.

(b) Two dice are thrown and three events are defined as

A : Odd face with first dice

B : Odd face with second dice

C : Sum on the two faces is odd

Examine whether A, B and C are mutually independent or not.

41. (a) In a bolt factory machine A, B and C manufactured respectively 25%, 35% and 40% of the total. Of their total output 5, 4, 2 percents respectively are defective bolts. A bolt is drawn at random and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C.

(b) With usual notations show that $P(A \cap B \cap C) = P(A) \cdot P(B|A) \cdot P(C|A \cap B)$

42. (a) A random variable X has the probability function $f(x) = kx(2-x)$, $0 < x \leq 2$. Find the value of k. Also find

(i) $P\left(X \leq \frac{1}{2}\right)$

(ii) $P\left\{\frac{1}{2} \leq X \leq \frac{3}{2}\right\}$

(iii) $P(X \geq 1)$

(b) Explain the method of transformation of one dimensional random variable. A random variable X has the probability function $f(x) = e^{-x}$, $x > 0$. Find the probability density function of

(i) $y = x^2$

(ii) $y = 3x + 5$

43. (a) X and Y are two random variables with probability function $f(x, y) = \frac{1}{27}(x + 2y)$, $x = 0, 1, 2$; $y = 0, 1, 2$. Find the marginal distributions of X and Y .

(b) The joint probability density function of X and Y is given by.

$$f(x, y) = 2, 0 < x < 1, 0 < y < x$$

(i) Find the marginal distribution of X and Y .

(ii) Find the conditional distribution of X given $Y = y$. Also examine the independence of x and Y .

44. (a) State and prove Cauchy-Schwartz inequality.

(b) Given $f(x, y) = 21x^2y^3, 0 < x < y < 1$
= otherwise

Find the conditional mean and conditional variance of X given $Y = y$.

(2 × 15 = 30 Marks)

(Pages : 4)

P – 1243

Reg. No. :

Name :

Second Semester B.Sc. Degree Examination, September 2022

First Degree Programme under CBCSS

Physics

Complementary Course for Mathematics

PY 1231.1 — THERMAL PHYSICS AND STATISTICAL MECHANICS

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer **all** questions in **one** word or maximum **two** sentences. Each question carries **1** mark.

1. State Wiedmann-Franz law.
2. Mention a practical application of conduction of heat.
3. What does statistical mechanics deal with?
4. Define a macrostate.
5. What is an adiabatic process?
6. Write down the equation of state of an isothermal process.
7. Define entropy.
8. Give an expression for the efficiency of heat engine.

P.T.O.

9. State Plank's statement of second law of thermodynamics.
10. Draw a T-S diagram for a Carnot cycle.

(10 × 1 = 10 Marks)

PART – B

Answer any **eight** questions in about **one** paragraph. Each question carries **2** marks.

11. Define solar constant. Name the instrument used to measure the solar constant.
12. What are postulates of statistical mechanics?
13. Derive an expression for entropy.
14. Discuss the change in entropy during a reversible process.
15. Prove that entropy is a state function.
16. What are the characteristics of a black body?
17. Explain the concept of phase space.
18. State principle of increase of entropy.
19. State and explain Rayleigh-Jeans law.
20. Define probability. When will be the probability be zero?
21. A heat engine cannot attain 100% efficiency. Explain why?
22. Explain the work done by an ideal gas in an isothermal process.
23. Define temperature gradient and thermal conductivity.
24. Define an ensemble.
25. What is meant by reversible and irreversible process?
26. Write a note on microcanonical ensemble.

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. Each carry **4** marks.

27. Find the change in entropy when a perfect gas expands isothermally and adiabatically.
28. Give the concept of ensemble. Calculate the number of states per unit volume of phase space.
29. Show that the adiabatic curve has a steeper negative slope than does an isothermal curve at the same point.
30. A Carnot's engine has an efficiency of 30% when the temperature of the sink is 27°C . What must be the change in temperature of the source to make its efficiency 50%.
31. Obtain the expression for change in entropy when ice changes to steam.
32. A Carnot engine takes 200 calories of heat from a source at temperature 400K and rejects 150 calories of heat to the sink. What is the temperature of the sink? Also calculate the efficiency of the engine.
33. The efficiency of an ideal engine is 0.2. If the temperature of the sink is lowered by 20°C , the efficiency becomes 0.25. Find the temperature of the source and sink.
34. If a black body at a temperature 6174 K emits 4700 \AA with maximum energy; calculate the temperature at which it will emit a wavelength of $1.4 \times 10^{-5} \text{ m}$ with maximum energy.
35. Four molecules are to be distributed in 2 cells. Find the number of macrostates and microstates.
36. Derive maxwell's law of distribution of velocities of the molecules of an ideal gas.
37. Ten particles are distributed in two equal sized cells. Find the number of macrostates and microstates.

38. A thermal conductor in the form of a long bar is heated at one end at constant temperature. Discuss the distribution of temperature along the bar before and after the steady state is reached.

(6 × 4 = 24 Marks)

PART – D

Answer any **two** questions. Each carry **15** marks.

39. Derive Maxwell-Boltzmann distribution Law.
40. Describe the distribution of energy of a black body at different temperatures by drawing the graphs. Discuss briefly the different laws which explain the above energy spectrum.
41. Describe with necessary theory, the construction and working of petrol engine.
42. Describe Carnot's cycle and obtain an expression for the efficiency of an ideal heat engine.
43. Explain the Lee's disc experiment to measure thermal conductivity.
44. What are Kelvin-plank and Clausius statement of second law of thermodynamics? Prove that they are correct in terms of principle of increase of entropy.

(2 × 15 = 30 Marks)

(Pages : 7)

P – 1031

Reg. No. :

Name :

Second Semester B.A./B.Sc./B.Com. Degree Examination, September 2022

First Degree Programme under CBCSS

Language Course-English

**EN 1212.1/EN 1211.2/EN 1211.3 : ENGLISH GRAMMAR USAGE AND
WRITING**

(Common for B.A./B.Sc./B.Com. & Career Related 2(a) Courses)

(2020 Admission onwards)

Time : 3 Hours

Max. Marks : 80

- I. Answer all questions, each in a word or a sentence.
 1. The earth revolves round the sun. (Identify the predicate)
 2. I am not so great as him. (change into Affirmative)
 3. As soon as the bell rang the children ran out of the classroom. (Begin with "no sooner")
 4. He had a _____ escape. (use suitable form of the word 'miracle')
 5. Who would not like to win a prize? (change into assertive)
 6. How he managed to escape is not clear. (Begin with "It")
 7. The _____ portion of the book is rather difficult. (later/latter)
 8. The man approached the door stealthily. (Identify the adverb)

P.T.O.

9. Novel you gave me yesterday is masterpiece of author. (Insert articles wherever necessary)
10. A hundred centimetres _____ equal to a metre. (are/is).

(10 × 1 = 10 Marks)

II. Answer **any eight**, each in a short paragraph not exceeding **50** words.

11. Convert the following into a complex sentence :

(a) We did not stir out of the house because it was raining heavily.

(b) The fire had devastated the building, yet the people managed to escape.

12. Convert the following into a simple sentence :

(a) You must take exercise or you will not keep healthy.

(b) If one is kind alone, it will not help one in his career.

13. Change the voice:

(a) He is being deceived by his own friends.

(b) The boys are conducting a debate in the college auditorium.

14. Fill in with conjunctions:

(a) He lost his balance _____ fell off his bicycle.

(b) Rocky is slow _____ sure.

15. Add appropriate question tag:

(a) You like it, _____

(b) She is not hardworking, _____

16. Change into comparative degree :
- (a) The tiger is the most ferocious animal.
 - (b) Mumbai is the seaport nearest to Europe.
17. Give the basic pattern of the following sentences :
- (a) I showed the conductor our tickets.
 - (b) Mary plays the violin beautifully.
18. Rearrange the jumbled words to form meaningful sentences :
- (a) favour / this / to / you / for / am / obliged / I
 - (b) accused / he / been / of / has / theft.
19. Rewrite the sentences using the adverbs provided :
- (a) She pronounced the word correctly. (quite)
 - (b) Diya spoke in front of the audience. (boldly)
20. Punctuate
- (a) ma am could you help me he asked
 - (b) the ganga the yamuna and the narmada are three of the longest Indian rivers
21. Complete using a clause :
- (a) All believed _____ (noun clause)
 - (b) I saw a man _____ (adjectival clause)
22. Add an appropriate interrogative pronoun :
- (a) _____ would you like to go for a picnic?
 - (b) To _____ shall I send this letter?

23. Frame questions to get the underlined words as answers :
- (a) The book is dedicated to his father.
 - (b) The government has launched a new road safety campaign.
24. Convert the sentences into plural form :
- (a) The ox has a cloven hoof
 - (b) A thief stole the box of a traveller.
25. Identify the principal and subordinate clauses in the sentences:
- (a) She left the office when her work was over.
 - (b) It is clear that it is going to rain today.
26. Fill in using since or for:
- (a) Life has changed completely _____ I left college.
 - (b) He has been ill _____ a month now.

(8 × 2 = 16 Marks)

III. Answer **any six** of the following as directed :

27. Fill in the blanks with suitable prepositions.
- (a) He fought _____ courage.
 - (b) He is indebted _____ his friend.
 - (c) The mountains were covered _____ snow.
 - (d) The father has faith _____ his son.
 - (e) Do not speak ill of a person _____ his back.

- (f) I left school _____ the age of sixteen.
- (g) Jake was standing _____ the counter.
- (h) Please pay me _____ cash.

28. Complete the sentences using the correct form of the tenses:

The water level _____ (rise) fast. It _____ (continue) to rise and _____ (reach) the danger mark already. The authorities _____ (look) into the matter.

29. Complete using suitable modals.

- (a) I _____ speak Bengali fluently.
- (b) Her father _____ permit her to join the course.
- (c) What _____ you like for dinner?
- (d) She _____ have worked harder for her examinations.

30. Join the sentences using a connective:

- (a) We got into a bus. It was crowded.
- (b) The dog bit the burglar. The burglar had broken into the house.
- (c) He cannot afford a motor-car. He is too poor.
- (d) The storm ceased. The sun came out.

31. Change the italicized word as directed:

- (a) Satyajit Ray is a film director of *repute*. (into adjective)
- (b) The soldiers fought the battle *courageously*. (into noun)
- (c) He treated us with *kindness*. (into adverb)
- (d) Smoking is *injurious* to health. (into verb)

32. Correct the sentences:

- (a) They can't hardly speak English.
- (b) The pineapple is less sweet than the mango.
- (c) Whatever happen I will face it.
- (d) When I was in Kerala, he came to see me each day.

33. Complete using articles:

_____ effective way of opening _____ essay is with _____ question. _____ reader's attention is at once gripped by _____ striking questions. Therefore, _____ good essay should never miss _____ question in _____ beginning.

34. Rewrite as instructed:

- (a) It is your duty to look after your parents. (rewrite using the modal "ought to")
- (b) I saw a _____ of ships in the harbor. (use a collective noun)
- (c) The waiter served us food. (change the gender of the underlined word)
- (d) Give me some food which I can eat. (replace the adjectival clause with "to")

35. Identify the difference in meaning of the sentences :

- (a) He said he had worked in Chennai.
He said he would be working in Chennai.
- (b) Someone phoned you.
Someone has been phoning you.

36. Change the narration (into direct or indirect):
- (a) "Sit down boys," said the teacher.
 - (b) My father asked me if I had to leave the following week.
 - (c) He said to me, "Can I use your computer?"
 - (d) The sailor said, "My captain is a cruel fellow".
37. Construct a dialogue between Ravi and the clerk at a post office regarding the sending of a document by speed post.
38. Draft a questionnaire to be circulated among the students of a college to assess the impact of online shopping.

(6 × 4 = 24 Marks)

IV. Answer **any two** of the following.

39. Write a short essay on Social Media-A Necessary Evil.
40. You are the Sports Secretary of ABX College. Write a report on the inauguration of the new indoor gymnasium in the college.
41. Construct a story from the given outline :
- An old lady loses her eye sight-calls a doctor-promises high fees if cured- doctor calls daily-covets pieces of her furniture daily-finally cures her-asks for fees-she refuses-doctor files a case-she says her sight not properly restored-cannot see her furniture-judge gives verdict in her favour.
42. Expand the proverb: A stitch in time saves nine.
43. Prepare a newspaper report on the damage caused by the indiscriminate use of plastic in your city.
44. Write a dialogue between two friends about a movie released in OTT platform.

(2 × 15 = 30 Marks)

(Pages : 4)

P – 1028

Reg. No. :

Name :

Second Semester B.A./ B.Sc. Degree Examination, September 2022

First Degree Programme under CBCSS

Language Course – III - English

EN 1211.1 : Ability Enhancement Compulsory Course:

ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT


(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

I. Answer **all** questions, each in a sentence or **two**.

1. What do you understand by energy conservation?
2. Who is Chief Seattle?
3. What is meant by Flagship species?
4. Where is 'A Fable for Tomorrow' set?
5. What does the narrator's wife do to the centipede?
6. What is cumulative impact?
7. What is WWF?
8. Who is the speaker of Satchidanandan's poem?
9. What is Basel Convention?
10. Who is in charge of a relief camp?

 (10 × 1 = 10 Marks)

P.T.O.

- II. Answer **any eight**, each in a paragraph not exceeding **50** words.
11. Which are the four subsystems / spheres of the earth?
 12. What is the opinion of Chief Seattle about the white man's cities?
 13. Explain the central theme explored in Tagore's essay.
 14. What are terrestrial and aquatic ecosystems?
 15. What do you understand by the term 'Trophic Cascade'?
 16. Which are the factors for biodiversity depletion according to Edward Wilson?
 17. Comment on the narrator's encounter with the cobra.
 18. Mention a few sustainable forestry practices.
 19. What is deforestation?
 20. How does Gieve Patel explain the growth of a tree?
 21. What are the single-use plastic products?
 22. How does plastic affect the marine life?
 23. What is Chernobyl disaster?
 24. "Rise up, brave peasants, reaping/future's gold in paddy fields". Comment.
 25. Who is Tasha?
 26. How does WHO define a natural disaster?

(8 × 2 = 16 Marks)

III. Answer any **six** in a paragraph not exceeding **100** words.

27. "The earth does not belong to man-man belongs to earth". Comment.
28. How does Kalidasa bring out the relationship between man and nature in his works?
29. "Then a strange blight crept over the area and everything began to change". Discuss.
30. What are the narrator's contemplations on killing rats?
31. Which are the major kinds of pollution? Explain.
32. Why is it important for the poet to remember Hiroshima?
33. What is e-Waste? What are the challenges and threats posed by e-waste?
34. What is SCMG? What are its functions?
35. Explain the various methods adopted to mitigate the adverse effects of floods.
36. Comment on the irony in the lines "till I told them I wasn't a government official".
37. "It felt like somebody had filled our bodies up with red chillies". Comment.
38. What were the two emergency situations faced by Arif?

(6 × 4 = 24 Marks)

IV. Answer any **two** of the following in not less than **300** words.

39. Elucidate the contrasting attitudes of the Red man and the white man towards Nature as explained in Chief Seattle's speech.
40. Camille T. Dungy's poem discusses a major ecological concern. Substantiate.
41. Attempt a critical appreciation of Basheer's story.

42. Nissim Ezekiel's poem presents the apathy and indifference of the bureaucracy towards the victims of natural disasters. Examine.
43. "People simply started dying in the most hideous ways". Comment on the immeasurable devastation caused by the Bhopal gas tragedy.
44. "Briefly explain the measures taken in the setting up of a relief camp and the rehabilitation of the victims of disasters.

(2 × 15 = 30 Marks)

(Pages : 6)

P – 1241

Reg. No. :

Name :

Second Semester B.Sc. Degree Examination, September 2022

First Degree Programme under CBCSS

Mathematics

Foundation Course – II

MM 1221 : FOUNDATIONS OF MATHEMATICS

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer all questions. Each question carries 1 mark.

Answer in one word to a maximum of two sentences.

1. Find the range of the function $f(x) = 11 + 5\cos x$.
2. Prove that $p \wedge \sim p$ is a contradiction.
3. Give an example of a relation which is reflexive, symmetric but not transitive.
4. Let $f(x) = \sqrt{x+1} + 4$. The natural domain of f is _____.
5. Write the negation of the statement : If she works she will earn money.
6. Find the rectangular coordinates of the point P whose polar coordinates are given by $(r, \theta) = \left(6, \frac{2\pi}{3}\right)$.

P.T.O.

7. Identify the curve $r = 4 \sin \theta$ by transforming to rectangular coordinates.
8. State the reflection property of ellipse.
9. Identify the quadratic surface $z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$.
10. Find a normal vector for the plane $4x - 2y + 7z - 11 = 0$.

(10 × 1 = 10 Marks)

SECTION – II

Answer **any eight** questions. Each question carries **2** marks.

11. Determine whether the following sentence is a statement. In 2003 George W. Bush was the president of the United States.
12. Define the terms : Converse and contrapositive.
13. Write the negation of the statement : If x is odd, then $x^2 - 1$ is even.
14. Find the truth value of the implication, if $3 + 3 = 6$ then $3 + 4 = 9$.
15. Using truth table, show that the statement $q \vee (p \vee \neg q)$ is a tautology.
16. Show that the function $f : R \rightarrow R$ defined by $f(x) = 3x + 7$ is one – to – one.
17. Graph the parametric curve $x = 2t - 3$, $y = 6t - 7$ by eliminating the parameter.
18. Find the circumference of a circle of radius a from the parametric equations $x = a \cos t$, $y = a \sin t$ ($0 \leq t \leq 2\pi$).
19. Find the arc length of the spiral $r = e^\theta$ distance travelled between $\theta = 0$ and $\theta = \pi$.
20. Find the slope of the tangent line to the unit circle $x = \cos t$, $y = \sin t$ ($0 \leq t \leq 2\pi$) at the point where $t = \frac{\pi}{6}$.

21. Find the equation of the hyperbola with vertices $(0, \pm 8)$ and asymptotes $y = \pm 4x/3$.
22. Find the asymptotes of the hyperbola $\frac{x^2}{4} - \frac{y^2}{9} = 1$.
23. Find the unit vector that has the same direction as $v = i + 2j - 2k$.
24. Find the new coordinates of the point $(2, 4)$ if the coordinate axes rotated through an angle of 30° .
25. Sketch the graph of $x^2 + y^2 = 1$ in 3-space.
26. Find the direction cosine of the vector $v = 2i - 4j - k$.

(8 × 2 = 16 Marks)

SECTION – III

Answer any six questions. Each question carries 4 marks.

27. Construct the truth table for $[(\neg q) \wedge (p \Rightarrow q) \Rightarrow (\neg p)]$.
28. Prove or give a counter example that "for every integer n , $n^2 + 3n + 8$ is even".
29. Negate and simplify the statement $\forall x[p(x) \rightarrow q(x)]$.
30. Show that the function $f : \mathbb{R} \rightarrow \mathbb{R}$ defined by $f = \{(x, y); y = mx + b\}$ is invertible. Also find its inverse.
31. Let $f : A \rightarrow B$ and $g : B \rightarrow C$ are injective, show that $g \circ f$ is injective.
32. Determine whether the planes
 $2x - 8y - 6z - 6 = 0$ and $-x + 4y + 3z + 4 = 0$ are perpendicular.

33. Find the slope of the tangent line to the circle $r = 4 \cos \theta$ at the point where $\theta = \frac{\pi}{4}$ and hence show that the circle has a horizontal tangent line at the point.
34. Find the entire area within the cardioid $r = 1 - \cos \theta$.
35. Describe the graph of the equation $y^2 - 8x - 6y - 23 = 0$.
36. (a) Find the vector of length 2 that has an angle of $\frac{\pi}{4}$ with the positive x -axis.
 (b) Find the angle that the vector makes with the positive x -axis.
37. Let $A = \{1, 2, 3, 4, 5\}$. Consider the relation R on A defined as $R = \{(2, 2), (4, 4), (5, 5), (2, 5), (5, 2), (3, 3)\}$. Is R an equivalence relation?
38. Find the parametric equation of the line
 (a) passing through $(4, 2)$ and parallel to $v = (-1, 5)$
 (b) passing through $(-1, 2, 4)$ and parallel to $v = 3i - 4j + 2k$.

(6 × 4 = 24 Marks)

SECTION – IV

Answer any **two** questions. Each question carries **15** marks.

39. The relation R on the set of integers Z is defined by xRy if and only if $x - y = 4k$ for some integer k .
- (a) Verify that R is an equivalence relation on Z
- (b) Determine the equivalent classes and a partition of Z induced by R .

40. (a) Determine the truth value of the following statements with suitable justification :
- $\forall x \exists y$ such that $x + y = 3$
 - $\forall x \exists y$ such that $x + y \neq 3$
- (b) Let $f:A \rightarrow B$ and $g:B \rightarrow C$ be bijective functions. Show that the composition $g \circ f:A \rightarrow C$ is also bijective.
41. (a) Find the equation of the curve $2x^2 + xy + 2y^2 - 1 = 0$ in $x'y'$ - coordinate system obtained by rotating the xy -coordinate system through an angle of 45° .
- (b) Sketch the graph of $r = \frac{2}{1 - \cos \theta}$ in polar coordinates.
42. (a) Identify and sketch the curve $xy = 9$.
- (b) Sketch the graph of the following equations in polar coordinates
- $r = 3$
 - $\theta = \frac{\pi}{4}$
 - $r = \sin \theta$ ($\theta \geq 0$).
43. (a) Find the parametric equations of the line L passing through the points $P(2, 4, -1)$ and $Q(5, 0, 7)$. Where does the line intersect the xy - plane?
- (b) Let L_1 and L_2 given by
- $$L_1: x = 1 + 4t, y = 5 - 4t, z = -1 + 5t \text{ and}$$
- $$L_2: x = 2 + 8t, y = 4 - 3t, z = 5 + t \text{ be two lines.}$$
- Are the lines parallel?
 - Do the lines intersect?

44. (a) Find the equation of the plane through the points $P_1(1, 2, -1)$, $P_2(2, 3, 1)$ and $P_3(3, -1, 2)$.
- (b) Determine whether the planes $3x - 4y + 5z = 0$ and $-6x + 8y - 10z - 4 = 0$ are Parallel.
- (c) Determine whether the line $x = 3 + 8t$, $y = 4 + 5t$, $z = -3 - t$ is parallel to the plane $x - 2y + 5z = 12$.

(2 × 15 = 30 Marks)

(Pages : 4)

P – 1035

Reg. No. :

Name :

Second Semester B.A./B.Sc. Degree Examination, September 2022

First Degree Programme under CBCSS

Language Course V – Additional Language – Malayalam

ML 1211.1 : ഗദ്യസാഹിത്യം

(2020 Admission)

Time : 3 Hours

Max. Marks : 80

1. ഒരു വാക്കിലോ രണ്ടു വാക്യത്തിലോ ഉത്തരം എഴുതുക.
1. മലയാളത്തിലെ ആദ്യ ചെറുകഥ ഏത്?
2. 'കുന്ദലത' എന്ന നോവൽ എഴുതിയതാര്?
3. 'കടൽത്തീരത്ത്' എന്ന കഥയിലെ വെള്ളായിയപ്പന്റെ ഭാര്യയുടെ പേരെന്ത്?
4. കെ. സരസ്വതിയമ്മയുടെ പ്രസിദ്ധീകൃതമായ ആദ്യകഥ ഏത്?
5. 'ആരാന്റെ കുട്ടി' എന്ന കഥയുടെ മറ്റൊരു പേര് എഴുതുക.
6. "അവന്റെ പല നാളത്തെ ശ്രമഫലം! അക്ഷയമായ സമ്പാദ്യം" എന്ത്? ആരുടെ?
7. മലയാള കാവ്യകല കണ്ട ഏറ്റവും വലിയ കോമിക് ജീനിയസ് ആര്?
8. 'നീലക്കുയിൽ' എന്ന ചിത്രത്തിന്റെ കഥാസംഭാഷണരചയിതാവ് ആര്?

P.T.O.

- 20. 'പുതുമുഖം' എന്ന പേരിൽ എഴുതിയ കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 19. "മുഖമെഴുതിയൊരാൾ" എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 18. 'കണ്ണിൻമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 17. "ഇന്ത്യയിലെ ജനങ്ങൾ" എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 16. "അന്ത്യം" എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 15. 'ആത്മീയത' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 14. "പാത" എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 13. 'പുതുമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 12. 'പുതുമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 11. 'പുതുമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)
- 10. 'പുതുമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)

(10 x 1 = 10 Marks)

- 9. 'പുതുമുഖം' എന്ന കവിതയുടെ രചയിതാവ് ആരാണ്? (10 Marks)

34. ഭാഷ കലണ്ടർ വർഷം കണക്കാക്കുന്നതിൽ എന്ത് മാറ്റം വരുത്തേണ്ടതുണ്ട്?
33. പാലിയോന്യൂട്രിപ്റ്റിക് ടൈം സ്കെയിലിനെക്കുറിച്ച് പരാമർശിക്കുക.
32. തർജ്ജമയിൽ എഴുതേണ്ട കാര്യങ്ങൾ ഏവ? ഉദാഹരണങ്ങൾ നൽകുക.
31. മതം മനുഷ്യനെക്കുറിച്ചുള്ള അറിവ് നൽകുന്നതിൽ എന്ത് പങ്ക് വഹിക്കുന്നു?
30. "വിടയാടകൾ" എന്താണ്? ഏതെല്ലാ വിഷയങ്ങളിലും അവയെക്കുറിച്ച് പരാമർശിക്കുക.
29. പാലിയോന്യൂട്രിപ്റ്റിക് ടൈം സ്കെയിലിനെക്കുറിച്ച് പരാമർശിക്കുക.
28. ഭൂമിയിലെ ജീവജാലങ്ങളുടെ വികാസത്തെക്കുറിച്ച് പരാമർശിക്കുക.
27. "ബോംബിങ്ങ്" എന്നതിന് പരിഭാഷയെന്താണ്? "ബോംബിങ്ങ്" - "ബോംബിങ്ങ്" എന്നതിനെക്കുറിച്ച് പരാമർശിക്കുക.
- III. 120 വാക്കിൽ കവിതയെക്കുറിച്ച് ചർച്ച ചെയ്യുക.
- (8 × 2 = 16 Marks)
26. എഴുതിയതിന്റെ സാഹചര്യങ്ങൾ കണക്കാക്കുക.
25. കാലാനുസൃത എഴുതിയതിന്റെ മലയാളീകരണത്തെക്കുറിച്ച് പരാമർശിക്കുക.
24. മതത്തിന്റെ പ്രാധാന്യം എന്താണ്?
23. ഇന്ത്യയിലെ പ്രധാന മതങ്ങൾക്ക് പരിഭാഷയെന്താണ്?
22. "ഇന്ത്യയിലെ പാലിയോന്യൂട്രിപ്റ്റിക് ടൈം സ്കെയിലിനെക്കുറിച്ച് പരാമർശിക്കുക.
21. ഗവൺമെന്റ് കമ്മീഷന്റെ റിപ്പോർട്ടിനെക്കുറിച്ച് പരാമർശിക്കുക.

(2 x 15 = 30 Marks)

- 44. തുറന്നിട്ടുള്ള സ്പീക്കിംഗ് കാർഡുകളിൽ നിന്നും മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 43. മലയാളത്തിലെ മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 42. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 41. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 40. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 39. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- IV. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)

(6 x 4 = 24 Marks)

- 38. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 37. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 36. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)
- 35. മൂന്നു വാക്യങ്ങൾ എഴുതുക. (2 x 15 = 30 Marks)