D–7120

Sub. Code
11A/13711

DISTANCE EDUCATION

Common for B.A./B.Sc./B.B.A./B.B.A. (Banking), B.C.A./M.B.A. (5 Year integrated) DEGREE EXAMINATION, DECEMBER 2022.

First Semester

Part I – TAMIL PAPER – I

(CBCS 2018 – 2019 Academic Year Onwards/2021 Calendar Year onwards)

Time : Three hours Maximum : 75 marks

பகுதி அ — ($10 \times 2 = 20$ மதிப்பெண்கள்)

அனைத்து வினாக்களுக்கும் விடையளிக்க.

1. ஸ்ரீ கிருஷ்ண கானம் யாரால் பாடப்பட்டது?

2. பாரதியாரின் இயற்பெயர் என்ன?

3. தீராத விளையாட்டுப் பிள்ளை யார்?

4. பெ.தூரன் 'தளிர்க் கீற்று' என்று எதனைக் குறிப்பிடுகிறார்?

5. வல்லிக் கண்ணன் பிறந்த ஊர் எது?

6. மீரா. வின் படைப்புகள் இரண்டினைக் கூறுக.

7. கவிஞர் ஞானக்கூத்தனுக்கு மோசிகீரனார் மேல் அன்பு தோன்றக் காரணமென்ன?

8. சிலப்பதிகாரக் காண்டங்கள் எத்தனை? அவை யாவை?

9. "தேரா மன்னா செப்புவ துடையேன்" - யார் கூற்று? யாரைக் கூறியது?

10. சீறாப்புராணத்தை இயற்றியவர் யார்?

பகுதி ஆ — ($5 \times 5 = 25$ மதிப்பெண்கள்)

அனைத்து வினாக்களுக்கும் விடையளிக்க.

11. (அ) "குருவாயூருக்கு வாருங்கள்" பாடலின் கருத்துக்களை விளக்குக.

(அல்லது)

(ஆ) செய்யும் தொழிலின் மேன்மையைப் பட்டுக்கோட்டையார் வழி நின்று விளக்குக.

12. (அ) பாரத மாதாவின் பழம் பெருமைகளை விளக்குக.

(அல்லது)

(ஆ) 'உலகப்பன் பாட்டு' வழிப் பாரதிதாசனின் பொதுவுடைமைக் கருத்துக்களை விவரி.

13. (அ) 'நிலாப்பிஞ்சு' கவிதையில் பெ.தூரனின் இயற்கை வருணனையை விளக்குக.

(அல்லது)

(ஆ) வெறும் புகழால் என்ன பயன் என்பதை வல்லிக்கண்ணன் கவிதை வழி விளக்குக.

14. (அ) 'கண்ணும் எழுதேம்' கவிதையில் அப்துல் ரகுமானின் கவிச்சிறப்பை ஆராய்க.

(அல்லது)

(ஆ) கண்ணகியின் வரவை வாயிலோன் உரைத்த திறம் குறித்து எழுதுக.

15. (அ) தயரதன் வினாவும் மன்னர்கள் மறுமொழியும் குறித்து விளக்குக.

(அல்லது)

(ஆ) வீரமாமுனிவரின் தமிழிலக்கியத் தாக்கத்தைத் தேம்பாவணி வழி விளக்குக.

பகுதி இ — ($3 \times 10 = 30$ மதிப்பெண்கள்)

எவையேனும் மூன்றனுக்கு விடையளிக்க.

16. கண்ணனைக் குழந்தையாகப் பாவித்த கண்ணதாசனின் பாடற்கருத்துக்களைத் தொகுத்து எழுதுக.

17. நாமக்கல் கவிஞரின் நோயற்ற வாழ்வு குறித்துக் கட்டுரை வரைக.

18. பாரதிதாசனின் உலகப்பன் பாட்டு - விளக்கும் சமத்துவ சமுதாயத்தைக் கட்டுரைக்க.

19. வழக்குரை காதை கூறும் செய்திகளைத் தொகுத்து எழுதுக.

20. ஈத்தங்குலை வரவழைத்த படலக் கருத்துக்களை விளக்கி எழுதுக.

———————

D–7121	Sub. Code
	11B

DISTANCE EDUCATION

COMMON FOR B.A./B.Sc./B.B.A./B.B.A. (Banking).
B.C.A./M.B.A.(5 Years Integrated) DEGREE
EXAMINATION, DECEMBER 2022.

First Semester

English

Part I – COMMUNICATION SKILLS – I

(CBCS 2018-19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions

1. What are the components of communication?

2. Define rhetorical communication.

3. How does intonation affect the meaning?

4. How does stress and intonation improve spoken communication?

5. What is the accentual function of intonation?

6. What is topic sentence of a paragraph?

7. What are the steps to be followed while drafting the matter?

8. Why is eye contact important in non-verbal communication?

9. What is dynamic posture and static posture?

10. Mention some important techniques for presentation skills.

PART B — (5 × 5 = 25 marks)

Answer ALL questions. Choosing either (a) or (b).

11. (a) Write a short note on Intra-personal communication and Inter-personal communication.

Or

(b) How is communication a dynamic process? Explain.

12. (a) What are the advantages and disadvantages of oral communication?

Or

(b) Are tone and intonation important for communication? Discuss.

13. (a) Who is considered as 'effective speaker'? What are the points to be kept in mind while evaluating the ability of the speaker?

Or

(b) Write a paragraph on "Impact of Covid-19 on world economy".

14. (a) Write about some facial expressions.

Or

(b) Write an application for the post of Peon in a private bank.

15. (a) Write a report on 'Pongal Celebration' at your college.

Or

(b) Which is the very important aspect of body language?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions

16. What are the types of communication? Explain.

17. Give detailed distinction between informal oral communication and formal oral communication.

18. What are the four types of essays? Explain.

19. What are the types of reports? Explain.

20. How do you write the purpose and objective of a meeting?

———————

D–7122	Sub. Code
	12/13712

DISTANCE EDUCATION

COMMON FOR B.A./B.Sc./B.B.A./B.B.A. (Banking)/
B.C.A./M.B.A. (5 Year Integrated) DEGREE
EXAMINATION, DECEMBER 2022.

First Semester

Part II – ENGLISH PAPER – I

(CBCS 2018-19 Academic Year Onwards/
2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions

1. Write about the power and beauty of the element, "Water".
2. How does the end of Mr. Packletide's big-game shooting?
3. List out Carl Sagan's notions of the emergence of human ancestors.
4. How is the picture of Gandhi potrayed in *A Hero on Probation*?
5. Write a short note on the deficiency diseases.
6. Define Gerunds. Give examples.
7. What are called prepositions?
8. Fill in the blanks with suitable auxiliary verbs:
   (a) _____ I speak to Principal, please?
   (b) _____ I use your pen, please?
9. Fill in the blanks with appropriate articles:
   (a) John eats_____fruits in your garden.
   (b) There were many flowers in the park. One flower was ——————Rose.
10. Write a short note on formal letter.

PART B — (5 × 5 = 25 marks)

Answer ALL questions. Choosing either (a) or (b).

11. (a) Write briefly about the conservation and utilization of water which is fundamental for human welfare.

Or

(b) Bring out the reasons why Gardiner considers letter writing as a art which is lost.

12. (a) Write a short note on body building.

Or

(b) Consider '*A Dead of Bravery*' as a tale of courage of an ordinary villager demonstrated in rescuing his friend from the jaws of death.

13. (a) Comment on the title *A Hero on Probation*.

Or

(b) Give an account of *Our Civilization*

14. (a) Fill in the blanks with suitable preposition:

I do not want ———————— feed a typewriter ———————— streets ———————— paper ———————— lose the use ———————— my legs ———————— travelling always ————————car, or ———————— be summoned, ———————— or ———————— warning.

Or

(b) Fill in the blanks with suitable articles:

_____ unusual occurrence in _____ Chambal Valley of ———————— Madhya Pradesh has baffled ———————— government officials. ———————— Elephant from ———————— reserve forest that had strayed out walked into ———————— old and abandoned railway station building ———————— week ago. Ever since then it has refused to move out. All efforts by _____ forest officials to persuade ———————— tusker to go back into ———————— forest.

15. (a) Write a letter to your friend about your recent tour to Ooty.

Or

(b) Change the voice

(i) The company requires staff to watch a safety video every year.

(ii) The teacher always answers the students' questions.

(iii) A forest fire destroyed the whole suburb.

(iv) The children have broken the window glass.

(v) Rita will be invited by Seetha.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions

16. Write a brief note on the character of the cat by Katharine M. Wilson?

17. How does A.G. Gardiner argue for the preservation of the art of letter writing? Elaborate.

18. Write an essay on the dangers of drug abuse.

19. Turn the following sentences into indirect speech.

(a) The poor man exclaimed, 'Will none of you help me?'

(b) Azar said to the magician, 'What have I done to deserve so severe a punishment?'

(c) 'Have you anything to say on behalf of the accused?' said the judge finally.

(d) 'The king was impressed with the magician and asked, 'What can I do for you?'

(e) She asked, 'What is it that makes you stronger and braver than other men?'

20. Read the following and write a summary of it. Suggest a title.

There are two problems that cause great worry to our educationists, the problem of religious and moral instruction in a land of many faiths, and the problem arising out of a large variety of languages. Taking up the education of children, we see that they should be trained

to love one another, to be kind and helpful to all, to be tender to the lower animals, and observe and think aright. The task of teaching them how to read and write and to count and calculate is important, but it should not make us lose sight of the primary aim of moulding personality in the right way. For this it is necessary to call into aid culture, tradition and religion. But in our country we have, in the same school, to look after boys and girls born in different faiths and belonging to families that live diverse ways of life and follow forms of worship associated with different denominations of religion. It will not do to tread the easy path of evading the difficulty by attending solely to physical culture and intellectual education. We have to evolve a suitable technique and method for servicing the spiritual needs as school children practise different faiths. We would thereby promote an atmosphere of mutual respect, a fuller understanding and helpful co-operation among the different communities in our society. Again, we must remain as one people, and we have therefore to give basic training in our schools to speak and understand more languages than one and to appreciate and respect the different religions prevailing in India. It is not right for us in India to be dissuaded from this by considerations as to overtaxing the young mind. What is necessary must be done. And it is not in fact too great a burden.

———————

D–7205

Sub. Code
11313

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

First Semester

Mathematics

CLASSICAL ALGEBRA

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define root of a polynomial equation.

2. If α, β, γ are the roots of the equation $x^3 + ax - b = 0$, find $\sum \frac{1}{\beta + \gamma}$.

3. Remove the fractional co-efficient from the equation $x^3 - \frac{1}{4}x^2 + \frac{1}{3}x - 1 = 0$.

4. Define standard reciprocal equation.

5. State Strum's function.

6. Prove that $A.M > G.M$ for the date 5, 4.

7. Find the determinant value of the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 5 & 5 & 5 \end{bmatrix}$.

8. Define Singular matrix.

9. Define Eigen values of a matrix.

10. State the Cayley-Hamilton theorem.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Form the equation with rational coefficients one of whose roots is $\sqrt{2} + \sqrt{3}$.

Or

(b) Show that the sum of 6^{th} powers of the roots of $x^7 - x^4 + 1 = 0$ is 3.

12. (a) Transform the equation $x^4 - 4x^3 - 18x^2 - 3x + 2 = 0$ into one which does not contain the third term

Or

(b) If a, b, c are any three distinct positive real numbers, then prove that $a^2 + b^2 + c^2 > ab + bc + ca$ and hence deduce that $a^3 + b^3 + c^3 > 3abc$.

13. (a) If a, b, c are positive real numbers such that $a^2 + b^2 + c^2 = 27$ then show that $a^3 + b^3 + c^3 \geq 81$.

Or

(b) Find the inverse of the matrix

$$A = \begin{bmatrix} 2 & -1 & 1 \\ -15 & 6 & -5 \\ 5 & -2 & 2 \end{bmatrix}.$$

14. (a) Find the rank of the matrix

$$A = \begin{bmatrix} 3 & -1 & 2 \\ 0 & 1 & -3 \\ 6 & -1 & 1 \end{bmatrix}.$$

Or

(b) Show that the equations

$$x + y + z = 6$$
$$x + 2y + 3z = 14$$
$$x + 4y + 7z = 30$$

are consistent and solve them.

15. (a) Show that the non-singular matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$ satisfies the equation $A^2 - 2A - 5I = 0$.

Or

(b) By using Cayley-Hamilton theorem, find the inverse of the matrix $A = \begin{bmatrix} 3 & 3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Show that the roots of the equation $px^3 + qx^2 + rx + s = 0$ are in G.P. if and only if $r^3 p = q^3 s$.

17. Increase the roots of the equation

$4x^5 - 2x^3 + 7x - 3 = 0$ by 2.

18. If x is any positive real number and p, q are positive rationals then prove that

$$\frac{x^p - 1}{p} \geq \frac{x^2 - 1}{q} \text{ if } p < q.$$

19. Find the inverse of the matrix

$$A = \begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$$

20. Find the eigen values and eigen vectors of the matrix

$$A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$

———————

D–7206

Sub. Code
11314

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

First Semester

Mathematics

CALCULUS

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. If $y = \cos h(ax + b)$ then find $\frac{dy}{dx}$

2. If $y = \cos x$, then show that $y + y'' = 0$.

3. Define radius of curvature.

4. Define evolute.

5. Define circle of curvature.

6. Evaluate $\int_0^1 x^2 \cos x \, dx$

7. Evaluate $\int_0^a \int_0^b \int_0^c dx \, dy \, dz$.

8. Evaluate $\int_0^1 x^4(1-x)^3 dx$ by Beta Gamma function.

9. Find $L[t\cos 2t]$.

10. Form the partial differential equation by eliminating a and b from $z = (x+a)(y+b)$.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) If $y = e^{-x}\cos x$, prove that $y_4 + 4y = 0$.

Or

(b) Find y_n if $y = \sin 3x \cos x$.

12. (a) Find the radius of curvature of $y = c\cos h\left(x/c\right)$.

Or

(b) Find the evolute of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.

13. (a) Find the envelope of the family of circles

$x^2 + y^2 - 2ax\cos\theta - 2ay\sin\theta = c^2$ where θ is a parameter.

Or

(b) If $u = 2xy, v = x^2 - y^2, x = \gamma\cos\theta, y = \gamma\sin\theta$, find $\frac{\partial(u,v)}{\partial(\gamma,\theta)}$.

14. (a) Prove that

$$\int_0^{\pi/2} \sin^n x \; dx = \frac{\sqrt{\pi}}{2}\left[\frac{\sqrt{\frac{n+1}{2}}}{\sqrt{\frac{n+2}{2}}}\right] = \int_0^{\pi/2} \cos^n x \; dx$$

Or

(b) Change the order of integration and hence evaluate $\int_0^a \int_y^a \frac{x+y}{x^2+y^2}\, dx \; dy$.

15. (a) Find $L^{-1}\left[\log \frac{s-1}{s+2}\right]$.

Or

(b) Find the complete integral of $p^3 + q^3 = 8z$.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Find the envelope of the family of straight lines $\frac{x}{a} + \frac{y}{b} = 1$ where $a^2 + b^2 = k^2$.

17. Change the order of integration and hence evaluate $\int_0^a \int_y^a xy \; dx \; dy$.

18. Prove that $\beta(m, n) = \frac{\lceil m \lceil n}{\lceil m+n}$.

19. Solve $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} - 3y = \sin t$ given that $y = \frac{dy}{dt} = 0$ when $t = 0$.

20. Solve

$$(x^2 + y^2 + yz)p(x^2 + y^2 - xz)q = z(x + y).$$

———————

D–7123

Sub. Code
21A

DISTANCE EDUCATION

Common for B.A./B.Sc./B.B.A./B.B.A. (Banking)/B.C.A./M.B.A.
(5 Year integrated) DEGREE EXAMINATION,
DECEMBER 2022.

Second Semester

Part I – TAMIL PAPER – II

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

பகுதி அ — ($10 \times 2 = 20$ மதிப்பெண்கள்)

அனைத்து வினாக்களுக்கும் விடையளிக்க.

1. தேம்பாவணி - ஆசிரியர் குறிப்புத் தருக.

2. நீலபத்மநாபன் எழுதிய 'தாய்' என்னும் கதையின் மையப் பாத்திரம் யார்?

3. உழிஞைத்திணை - குறிப்பு வரைக.

4. சார்பெழுத்துகளின் வகைகளைச் சுட்டுக.

5. அன்மொழித்தொகை - விளக்கம் தருக.

6. 'ஆறில் ஒரு பங்கு' என்னும் சிறுகதையை எழுதியவர்?

7. ஓரங்க நாடகம் - குறிப்பு வரைக.

8. இந்தியாவின் முதல் வானொலி நிலையம் எங்கு அமைக்கப்பட்டது?

9. பெரியபுராணத்தின் காப்பிய நாயகன் யார்?

10. பெண்களின் பாதுகாப்பிற்காகத் தமிழகக் காவல்துறை உருவாக்கியுள்ள 'செயலி' யாது?

பகுதி ஆ — ($5 \times 5 = 25$ மதிப்பெண்கள்)

பின்வரும் வினாக்களுக்கு ஒரு பக்க அளவில் விடை தருக.

11. (அ) சாந்தி உள்ளம் உருகிப் போற்றி நின்றதை வீரமாமுனிவர் எங்ஙனம் விவரிக்கின்றார்?

(அல்லது)

(ஆ) இறைவன் பொறை, மிடி, தாழ்வு கொண்டதன் காரணங்களைத் தேம்பாவணி வழி விளக்குக.

12. (அ) நீலபத்மநாபனின் 'சாளரத்தின் ஊடே' சிறுகதைச் சுருக்கத்தை எழுதுக.

(அல்லது)

(ஆ) தடாகை வதையால் இராமன் பெற்ற பயன்கள் யாவை?

13. (அ) ஆகுபெயர் வகைகளை எடுத்துக்காட்டுகளுடன் விவரிக்க.

(அல்லது)

(ஆ) மொழிமுதல் எழுத்துக்களைச் சான்றுகளுடன் விளக்கி எழுதுக.

14. (அ) மகாகவி பாரதியாரின் தேசப்பற்றைப் பாராட்டியுரைக்க.

(அல்லது)

(ஆ) தமிழ்ச் சிறுகதை வரலாற்றை நும் பாடப்பகுதியால் சுருக்கி வரைக.

15. (அ) குணங்குடி மஸ்தான் படைப்புகளின் சிறப்புகளைத் தருக.

(அல்லது)

(ஆ) சமூக வளர்ச்சியில் வானொலியின் பங்கு குறித்து விளக்கிடுக.

பகுதி இ — ($3 \times 10 = 30$ மதிப்பெண்கள்)

பின்வரும் வினாக்களில் மூன்றனுக்குக் கட்டுரை வடிவில் விடை தருக.

16. சாந்தி உள்ளம் மகிழ்ந்து குழந்தை ஏசுவைப் போற்றுமாற்றை விவரிக்க.

17. நீலபத்மநாபனின், 'விமோசன்' கதை உணர்த்தும் பெண்கள் நிலையைக் கட்டுரைக்க.

18. ஒற்றெழுத்து மிகுதல் மிகாமைக்கான வரையறைகளை விளக்கி வரைக.

19. கம்பராமாயணத்தில் காணப்படும் போர் குறித்த செய்திகளைத் தொகுத்துரைக்க.

20. மக்கள் வாழ்வியல் பயன்பாட்டில் இணையத்தின் பங்கு குறித்து விவரித்து எழுதுக.

———————

D–7124	Sub. Code
	21B

DISTANCE EDUCATION

Common for B.A. / B.Sc. / B.B.A. / B.B.A. (Banking) / B.C.A. / M.B.A. (5 Years Integrated)
DEGREE EXAMINATION, DECEMBER 2022.

Second Semester

Part I – COMMUNICATION SKILLS - II

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What are the basic elements of communication?

2. Explain the process of encoding.

3. What are the ways to improve one's pronunciation?

4. Explain front vowels.

5. Define plosive sounds with examples.

6. What are the sub-skills of listening?

7. What is meant by informational mode of conversation?

8. What is an opening statement in a resume?

9. Explain problem letters with illustrations.

10. What is the importance of interview skills?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Write a note on the significance of communication skills.

Or

(b) Discuss the different types of codes of communication skills.

12. (a) What are the ways to improve fluency of speaking English.

Or

(b) Write a note on diphthongs.

13. (a) Elaborate the barriers of listening skills.

Or

(b) Enumerate the significance of soft skills.

14. (a) Write a paragraph on the topic "COVID 19".

Or

(b) Explain the structure of an interview.

15. (a) Discuss the guidelines that are to be followed in writing business letters.

Or

(b) Comment on the role played by the Chief-Editor of a leading newspaper.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write an essay on the stimulus and response adopted while communicating.

17. Elaborate on the pronunciation etiquetes in communication.

18. Discuss the different modes of conversations.

19. You are building a house. Place an order for supplying electric fittings with a firm in Hyderabad.

20. Write a resume for the post of a sub-editor in a sports magazine.

———————

D–7125	Sub. Code
	22/13722

DISTANCE EDUCATION

COMMON FOR B.A./B.Sc./ B.B.A./B.B.A. (Banking)/
B.C.A./M.B.A./ (5 Year Integrated) DEGREE EXAMINATION,
DECEMBER 2022.

Second Semester

Part II – ENGLISH PAPER – II

(CBCS 2018-19 Academic Year Onwards/
2021 Calendar Year onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions

1. Discuss the structure of "Lines composed upon Westminister Bridge" by William Wordsworth.

2. What is an ode?

3. Describe the setting of the poem "The Road Not Taken".

4. What is the symbolic element of Stephen Spender's "The Express".

5. How is Shylock punished for seeking to take Antonio's life?

6. What does Bassanio offer the young law clerk who saves Antonio? Why?

7. Mention two tips to write an essay effectively.

8. What is a report?

9. Who is Andrea? What is the meaning of the title "Andrea Del Sarto".

10. What is the basic idea of the poem 'Gitanjali".

PART B — (5 × 5 = 25 marks)

Answer ALL questions. Choosing either (a) or (b).

11. (a) Comment on the Characteristics of a sonnet.

Or

(b) Discuss the themes of "Lines composed upon Westminister Bridge".

12. (a) Write a note on the symbolic elements of "The Road Not Taken".

Or

(b) Bring out the message of "Strange meeting".

13. (a) Discuss the character of Portia in "The Merchant of Venice".

Or

(b) Analyse the trial or court scene of "The Merchant of Venice".

14. (a) Write a report on the road accident that you have witnessed.

Or

(b) Discuss the structure of note-making.

15. (a) Write an essay on the topic "COVID 19".

Or

(b) Discuss the different forms of writing reports.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE of the following

16. Consider "Andrea Del Sarto" as a dramatic monologue.

17. In what way is "Gitanjali" considered a song offering.

18. Critically analyse Sorojini Naidu's "The coromandel Fishers".

19. Discuss the background and themes of "The Merchant of Venice".

20. Opera refers to a dramatic art form, originating in Europe, in which the emotional content is conveyed to the audience as much through music, both vocal and instrumental, as it is through the lyrics. By contrast, in music theatre an actor's dramatic performance is primary, and the music plays a lesser role. The drama in opera is presented using the primary elements of theatre such as scenery, costumes, and acting. However, the words of the opera, or liberetto, are sung rather than spoken. The singers are accompanied by a musical ensemble ranging from a small instrument ensemble to a full symphonic orchestra.

(a) What is the importance of an opera?

(b) We can understand from the reading that

(i) People are captivated more by opera than musical theatre.

(ii) Drama in opera is more important than the music

(iii) Orchestra is operas can vary considerably in size

(iv) Musical theatre relies above all on music.

(v) There is argument over whether the music is important to the words in opera.

(c) How is the acting in opera displayed?

(d) Discuss the performance in an opera.

(e) Give a suitable title and justify it.

———————

D–7207

Sub. Code
11323

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Second Semester

Mathematics

ANALYTICAL GEOMETRY AND VECTOR CALCULUS

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Find the direction ratios and direction cosines of the line joining the points (1, 2, –1) and (2, 1, 3).

2. If $\cos\alpha$, $\cos\beta$, $\cos\gamma$ are the direction cosines of a straight line show that $\sin^2\alpha + \sin^2\beta + \sin^2\gamma = 2$.

3. Find the angle between the planes $2x - y + z = 6$ and $x + y + 2z = 7$.

4. Show that the lines $\frac{x-2}{1} = \frac{y-4}{2} = \frac{z-5}{2}$ and $\frac{x-5}{2} = \frac{y-8}{3} = \frac{z-7}{2}$ are coplanar.

5. Define : Skew lines.

6. Define : Right circular cylinder.

7. Write the formula for finding the shortest distance between two skew lines.

8. If $\vec{f} = (ax + 3y + 4z)\vec{i} + (x - 3y + 3z)\vec{j} + (3x + 2y - z)\vec{k}$ is solenoidal find the constant 'a'.

9. Define : Irrotational vector.

10. State : Stake's theorem.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Find the ratio in which the xy plane divides the line joining the points $A(7, 4, -2)$ and $B(8, -5, 3)$. Also find the point of division.

Or

(b) Find the direction cosines of the lines AB and CD where $A = (1, 2, -4)$, $B = (2, 1, -3)$, $C = (4, 6, -1)$ and $D = (5, 7, 0)$. Hence find the acute angle between them.

12. (a) Find the equation of the plane through $(2, 3, -4)$ and $(1, -1, 3)$ and parallel to the x – axis.

Or

(b) Find the foot of the perpendicular from the origin on the line $3x - y - z - 4 = 0 = 4x - 3y - 2z + 2$.

13. (a) Find the centre and radius of the circle given by the equations

$$x^2 + y^2 + z^2 - 2y - 4z = 11; x + 2y + 2z = 15.$$

Or

(b) Show that the equation of a right circular cone whose vertex is O, axis OZ and semi-vertical angle α is $x^2 + y^2 = z^2 \tan^2 \alpha$.

14. (a) Obtain the directional derivative of $\phi = xy^2 + yz^3$ at the point (2, –1, 1) in the direction of $\vec{i} + 2\vec{j} + 2\vec{k}$.

Or

(b) If $\nabla\phi = (y + \sin z)\vec{i} + x\vec{j} + x \cos z\vec{k}$ then find ϕ.

15. (a) Verify Green's theorem for the function $\vec{f} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ and C is the rectangle in the xy-plane bounded by $y = 0, y = b, x = 0$ and $x = a$.

Or

(b) Verify Stoke's theorem for $\vec{f} = (x^2 - y^2)\vec{i} + 2xy\vec{j}$ in the rectangular region $x = 0, y = 0, x = a, y = b$.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. A line makes angles $\alpha, \beta, \gamma, \delta$ with the four diagonals of a cube. Prove that $\sin^2 \alpha + \sin^2 \beta + \sin^2 \gamma + \sin^2 \delta = \frac{8}{3}$.

17. Find in symmetrical form the equations of the line given by $x + 5y - z = 7; 2x - 5y + 3z + 1 = 0$.

18. Find the equation of the sphere which passes through the circle, $x^2 + y^2 + z^2 - 2x - 4y = 0$, $x + 2y + 3z = 8$ and touches the plane $4x + 3y = 25$

19. Find the divergence and curl of the vector $\vec{f} - xyz^2\vec{i} + yzx^2\vec{j} + zxy^2\vec{k}$.

20. Verify Gauss divergence theorem for $\vec{f} = (2x - z)\vec{i} + x^2y\vec{j} - xz^2\vec{k}$ taken over the region bounded by $z = 0,\ z = 1,\ x = 0,\ x = 1,\ y = 0,\ y = 1$.

———————

D–7208

Sub. Code
11324

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Second Semester

SEQUENCES AND SERIES

(CBCS 2018 – 2019 A.Y. Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. When do you say that a set is bounded below? Give an example.

2. Define : Monotonic decreasing sequence.

3. State Cauchy's general principle of convergence.

4. Prove that $\lim_{n\to\infty} \frac{x^n}{n!} = 0$.

5. Prove that any Cauchy sequence is a bounded sequence.

6. Define a limit point of a sequence and give an example.

7. Define limit inferior and limit superior.

8. Define absolutely convergent sequence.

9. State Dirichlet's test.

10. Find the Cauchy product of 1 + 1 + 1 + 1..... with itself.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Prove that a sequence cannot converge to two different limits.

Or

(b) If $(a_n) \to a$ and $(b_n) \to b$ then prove that $(a_n + b_n) \to a + b$.

12. (a) State and prove Cesaro's theorem.

Or

(b) Discuss the convergence of the geometric series $1 + r + r^2 + \ldots + r^n + \ldots$.

13. (a) State and prove Cauchy's root test.

Or

(b) Discuss the convergence of the series $\sum \frac{\sqrt{n+1} - \sqrt{n}}{n^p}$.

14. (a) State and prove Leibnitz's test.

Or

(b) State and prove Abel's test on the product of series.

15. (a) Prove that the series $\left(1 - \frac{1}{2}\right) + \left(1 - \frac{3}{4}\right) + \left(1 - \frac{7}{8}\right) + \ldots$ converges but, when the brackets are removed, it oscillates.

Or

(b) Prove that the sum of an absolutely convergent series is unaltered by any rearrangement of its terms.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. If $a_n = 1 + \frac{1}{1!} + \frac{1}{2!} + \ldots + \frac{1}{n!}$, show that $\lim_{n \to \infty} a_n$ exists and lies between 2 and 3 $n \to \infty$.

17. State and prove Cauchy's general principle of convergence.

18. State and prove Kummer's test.

19. Prove the harmonic series $\sum \frac{1}{n^p}$ convergence if $p > 1$ and diverges if $p \leq 1$.

20. State and prove Merten's theorem.

———————

D–7126

Sub. Code
31A/13731

DISTANCE EDUCATION

Common for B.A./B.Sc./B.C.A. DEGREE EXAMINATION, DECEMBER 2022.

Third Semester

Part I – TAMIL PAPER III

(CBCS 2018 – 2019 Academic Year Onwards/2021 Calendar Year onwards)

Time : Three hours Maximum : 75 marks

பகுதி அ — ($10 \times 2 = 20$ மதிப்பெண்கள்)
அனைத்து வினாக்களுக்கும் விடையளிக்க.

1. ஐங்குறுநூற்றின் குறிஞ்சித்திணைப் பாடல்களைப் பாடியவர் யார்?

2. 'நெடுந்தொகை' என்னும் சிறப்புப் பெயர் கொண்ட சங்க இலக்கியம் யாது?

3. நற்றிணை - பெயர்க்காரணம் கூறுக.

4. பாசறையின் வகைகளைக் குறிப்பிடுக.

5. சங்க இலக்கியத்தில் அதிகப் பாடல்களைப் பாடியவர்?

6. 'இற்செறிப்பு' என்றால் என்ன?

7. புறநானூறு - நூற் குறிப்பு வரைக.

8. திருக்குறளின் சிறப்புக்களைப் போற்றி எழுந்த நூல்?

9. இராசராசசோழன் நாடகத்தை இயற்றியவர் யார்?

10. சுவடுகள் நாவலில் காந்தியக் கொள்கையைப் பேசும் பாத்திரம்?

பகுதி ஆ — ($5 \times 5 = 25$ மதிப்பெண்கள்)

பின்வரும் வினாக்களுக்கு ஒரு பக்க அளவில் விடை தருக.

11. (அ) ஊடல் பொருளுக்கான திணை யாது? ஐங்குறுநூற்றின் வழி விளக்குக.

(அல்லது)

(ஆ) கபிலர் பாடல்களின் தனிச் சிறப்புகளைத் தொகுத்துரைக்க.

12. (அ) ஐங்குறுநூற்று நூல் தொகுப்பு வரலாற்றை எடுத்துரைக்க.

(அல்லது)

(ஆ) அகநானூற்றின் நூல் அமைப்பும் பகுப்பும் குறித்து விளக்கி வரைக.

13. (அ) நற்றிணையில் காணப்படும் மணிமணியான கருத்துக்களைத் தொகுத்துரைக்க.

(அல்லது)

(ஆ) தலைமகன் பாசறையிலிருந்து சொல்லிய செய்தியைச் சேந்தம்பூந்தனார் வழி விளக்குக.

14. (அ) அறிவுடையார் குறித்து வள்ளுவர் உரைக்குமாற்றை எழுதுக.

(அல்லது)

(ஆ) நான்மணிக்கடிகையிலுள்ள எளிமையான கருத்துக்களை எடுத்துரைக்க.

15. (அ) இராசராசசோழன் நாடகக் கதைக்களத்தைச் சுருக்கி வரைக.

(அல்லது)

(ஆ) சுவடுகள் நாவல் கதைக்கருவை விளக்கி எழுதுக.

பகுதி இ — ($3 \times 10 = 30$ மதிப்பெண்கள்)

பின்வரும் வினாக்களில் மூன்றனுக்குக் கட்டுரை வடிவில் விடை தருக.

16. கபிலரின் கவித்திறத்தை நும் பாடப் பகுதியால் நிறுவுக.

17. மஞ்ஞைப்பத்துப் பாடல்களின் கருத்துக்களைத் தொகுத்துரைக்க.

18. அகநானூற்றுப் பாடல்களால் அறியவரும் வரலாற்றுச் செய்திகளை விவரிக்க.

19. திருக்குறளின் அமைப்பும் சிறப்பும் குறித்துக் கட்டுரை வரைக.

20. சுவடுகள் நாவலின் ராசாத்தி பாத்திரப் படைப்பைச் சான்றுகளுடன் பாராட்டியுரைக்க.

———————

D–7127	Sub. Code
	31B

DISTANCE EDUCATION

COMMON FOR B.A./B.Sc./B.C.A. DEGREE EXAMINATION, DECEMBER 2022.

Third Semester

Part I – HUMAN SKILLS DEVELOPMENT – I

(CBCS 2018-19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions

1. What are the different types of human skills?

2. What is meant by interpersonal relationship?

3. Mention any two factors for building positive personality.

4. Define self-esteem.

5. Why the goal setting skill is important?

6. What are the steps to be followed in decision in decision making skills?

7. What is the structure of negotiating skills?

8. How can you create positive attitudes in human relations?

9. What are the different types of stress?

10. Write any two qualities of a good leader.

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Differentiate interpersonal relationship and interpersonal behaviour.

Or

(b) Write a short note on significance of thinking ahead.

12. (a) Write short note on self efficacy.

Or

(b) Illustrate the importance of goal setting skills.

13. (a) What are the basic elements of negotiating skills?

Or

(b) Write a note on the types of attitudes.

14. (a) Why coping with change is necessary for the development of human relations?

Or

(b) What are the different styles of selecting a leader?

15. (a) What are the duties of a counsellor?

Or

(b) Write a note on anger management.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE of the following

16. Write an essay on different levels of mind functions.

17. Explain the need of developing personality and the ways of developing personality.

18. Explain briefly about different types of skills in developing personality.

19. Write briefly on the qualities of a good leader.

20. What is meant by conflicts? Explain its types and causes.

———————

D–7128

Sub. Code
32/13732

DISTANCE EDUCATION

COMMON FOR B.A. / B.Sc. / B.C.A. DEGREE
EXAMINATION, DECEMBER 2022.

Third Semester

Part – II ENGLISH PAPER - III

(CBCS 2018 – 2019 Academic Year Onwards /
2021 Calender years Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Why did Swami feel relieved at the end?

2. What did Matilda suffer from?

3. What kind of person is Lomov in “The Proposal”?

4. White a few lines about the character of Mrs. Meldon.

5. Who opens the door when Jean goes to get the tart?

6. What is the main idea of “The Refugee"?

7. Who are all the friends in the play “Reunion”?

8. Who is the author of the play “A Kind of Justice”?

9. Define verb with examples.

10. What is Agenda?

PART B — ($5 \times 5 = 25$ marks)

Answer the following questions, choosing either (a) or (b).

11. (a) Narrate how a coward boy Swami became a hero overnight?

Or

(b) Describe the circumstances under which the verger had to lose his job.

12. (a) What is the importance of dream in the play "The Boy Comes Home"?

Or

(b) Write a brief character sketch of Lomov from "The proposal"?

13. (a) Sketch the character Betty in "The Silver Idol"?

Or

(b) What happened at Comilla University?

14. (a) Describe how Jean and Pierre managed to get the Pie.

Or

(b) Write a short note on the treatment of Partition in "The Refugee".

15. (a) How do you prepare minutes of a meeting?

Or

(b) What are the basic formats for writing an essay?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE of the following questions.

16. Discuss the comic elements in the play "The Boy comes Home".

17. Write an essay on the Westerner's view of Eastern countries as illustrated in "The Silver Idol"?

18. Comment on the view of justice according to Margaret Wood in "A King of Justice".

19. To what extent does yassin become a representative of all refugees?

20. Write an essay on advantages and disadvantages of Mobile – Phone.

———————

D–7209

Sub. Code
11333

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Third Semester

DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Solve : $a(x\,dy + 2ydx) = xy\,dy$.

2. Solve : $ydx - xdy - 3x^2y^2e^{x^3}\,dx = 0$.

3. Solve : $y = 2px + y^2p^3$.

4. Solve $y = px + \frac{a}{p}$.

5. Solve $\left(D^2 - 13D + 12\right)y = 0$.

6. Solve : $\frac{dx}{y+z} = \frac{dy}{z+x} = \frac{dz}{x+y}$.

7. Solve : $pq = k$.

8. Find the complete integral of $z = px + qy + \frac{p}{q} - p$

9. Solve $q = xp$.

10. Solve $p^2 + q^2 = z^2(x^2 + y^2)$.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Solve $x^2p^2 + 3xyp + 2y^2 = 0$

Or

(b) Solve $x^2 = (1 + p^2)$.

12. (a) Solve $(D^2 + 5D + 6)y = e^x$.

Or

(b) Solve $(D^2 + 9)y = \cos^3 x$.

13. (a) Solve $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} - 3y = x^2$.

Or

(b) Solve the equation $\frac{dx}{y - xz} = \frac{dy}{yz + x} = \frac{dz}{x^2 + y^2}$.

14. (a) Solve $\begin{matrix}(D + 5)x + y = e^t \\ (D + 3)y - x = e^{2t}\end{matrix}$.

Or

(b) Solve $p(1 + q^2) = q(z - 1)$.

15. (a) Solve $y^2p - xyq = x(z - 2y)$.

Or

(b) Solve $pxy + pq + qy = yz$.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Solve $\left(D^3 - 7D^2 + 16D - 12\right) y = 2e^{3x} - 12x^2 + 20x - 10$.

17. Solve the equation :

$$\left(1 + x^2\right)^3 \frac{d^2y}{dx^2} + 2x\left(1 + x^2\right)^2 \frac{dy}{dx} + \left(1 + x^2\right) y = 3x .$$

18. Verify the condition of integrability of

$$\left(x^2y - y^3 - y^2z\right)dx + \left(xy^2 - x^2z - x^3\right)dy + \left(xy^2 + x^2y\right)dz = 0$$

and hence solve it.

19. Solve $z = px + qy + \sqrt{1 + p^2 + q^2}$.

20. Solve $\left(D^2 - 2DD^1\right) z = e^{2x} + x^3y$.

———————

D–7210

Sub. Code
11334

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Third Semester

Mathematics

MECHANICS

(CBCS 2018 – 19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. State the triangle law of forces.
2. State the polygon of forces.
3. Define : couple.
4. Define : statical and dynamical friction.
5. Define : catenary.
6. Define : trajectory and time of flight.
7. What is an impulse?
8. When do you say that two bodies impinge directly?
9. What is a SHM?
10. Write the differential equation of central orbit in polar coordinates.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Derive an analytical expression for the resultant of two forces acting at a point.

Or

(b) State and prove the theorem on resolved parts.

12. (a) Find the resultant of two unlike and unequal parallel forces acting on a rigid body.

Or

(b) Derive the resultant of two unlike parallel forces acting on a rigid body.

13. (a) Write the geometrical properties of the common catenary.

Or

(b) Derive the characteristics of the motion of a projectile.

14. (a) Find the impact of a smooth sphere on a fixed smooth plane.

Or

(b) Find the loss of kinetic energy due to direct impact of two smooth spheres.

15. (a) Describe the simple harmonic motion in a straight line.

Or

(b) Derive the differential equation of central orbit.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. State and prove Lami's theorem.

17. State and prove Varigon's theorem.

18. Find the loss of kinetic energy due to oblique impact of two smooth spheres.

19. Derive the radial and transverse components of velocity and acceleration in polar coordinates.

20. Show that the path of a projectile is a parabola.

———————

D–7129

Sub. Code
41A/13741

DISTANCE EDUCATION

Common for B.A./B.Sc./B.C.A. DEGREE EXAMINATION, DECEMBER 2022.

Fourth Semester

Part I: TAMIL PAPER – IV

(CBCS 2018 – 2019 Academic Year Onwards/2021 Calendar Year onwards)

Time : Three hours Maximum : 75 marks

பகுதி அ — ($10 \times 2 = 20$ மதிப்பெண்கள்)
அனைத்து வினாக்களுக்கும் விடையளிக்க.

1. யாப்பியல் கூறும் அசை வகைகளை எழுதுக.

2. அகவல் பா என அழைக்கப்படும் 'பா' எது?

3. சிந்து எத்தனை இசை உறுப்புகளால் ஆனது?

4. ஊடல் சார்ந்த நிகழ்ச்சிகளைப் பேசும் அகத்திணை யாது?

5. கையறுநிலை - குறிப்பு வரைக.

6. மதி போன்ற முகம் - இத்தொடரில் உவமை எது?

7. ஐங்குறுநூற்றில் மருதப் பாடல்களைப் பாடியவர் யார்?

8. புலவராற்றுப்படை என அழைக்கப்படும் நூல் யாது?

9. 'இராமாவதாரம்' என்னும் காப்பியத்தை இயற்றியவர் யார்?

10. 'பாண்டியன் பரிசு' காப்பியத்தின் கதைத் தலைவன்?

பகுதி ஆ — ($5 \times 5 = 25$ மதிப்பெண்கள்)

பின்வரும் வினாக்களுக்கு ஒரு பக்க அளவில் விடை தருக.

11. (அ) சீர் எத்தனை வகைப்படும்? அவற்றைச் சான்றுகளுடன் விளக்குக.

(அல்லது)

(ஆ) படிமம் என்றால் என்ன? புதுக்கவிதையில் பெறுமிடத்தைச் சுட்டி வரைக.

12. (அ) முல்லைத்திணையின் கருப்பொருட்களைப் பட்டியலிடுக.

(அல்லது)

(ஆ) ஆநிரை கவர்தல் என்றால் என்ன? அத்திணையை விரிந்துரைக்க.

13. (அ) எல்லா விளக்கும் விளக்கல்ல சான்றோர்க்குப் பொய்யா விளக்கே விளக்கு - இக்குறளில் பயின்று வரும் அணியை விளக்குக.

(அல்லது)

(ஆ) சிலேடை அணியைச் சான்று காட்டி விளக்கி வரைக.

14. (அ) தொல்காப்பியம் தமிழரின் அடையாளமாக விளங்குவதை நிறுவுக.

(அல்லது)

(ஆ) நாலடியார் நூல் வரலாற்றையும் சிறப்பியல்புகளையும் எழுதுக.

15. (அ) ஐம்பெருங்காப்பியங்கள் யாவை? அவற்றின் சிறப்புகளை எழுதுக.

(அல்லது)

(ஆ) இயேசு காவியம் கூறும் செய்திகளை எடுத்துரைக்க.

பகுதி இ — ($3 \times 10 = 30$ மதிப்பெண்கள்)

பின்வரும் வினாக்களில் மூன்றனுக்குக் கட்டுரை வடிவில் விடை தருக.

16. வெண்பாவின் இலக்கணத்தை வகைகளுடன் விளக்குக.

17. அன்பின் ஐந்திணைகள் குறித்த செய்திகளைத் தொகுத்துரைக்க.

18. தற்குறிப்பேற்ற அணியின் இலக்கணத்தைச் சான்றுகள் காட்டி விவரிக்க.

19. சிலப்பதிகாரம் ஏன் தமிழ்க்காப்பியம் என்று அழைக்கப்படுகின்றது? விவரிக்க.

20. பாஞ்சாலி சபதத்தின் கதைக் களத்தை விரிந்துரைக்க.

———————

D–7130	Sub. Code 41B

DISTANCE EDUCATION

COMMON FOR B.A./B.Sc./B.C.A. DEGREE EXAMINATION, DECEMBER 2022.

Fourth Semester

Part I – HUMAN SKILLS DEVELOPMENT – II

(CBCS–2018-19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions

1. What are the different types of counselling techniques?

2. Why managerial skill is important for human skills development?

3. What are the ways to develop our communication skills?

4. Define conceptual skills.

5. Mention any two practices in developing technical skills.

6. What is the role of preparation in presentation skills?

7. What are the various types of organizational skills?

8. How can you select a leader?

9. What are the major qualities for formal interactions?

10. What is the role of eye contact in problem solving skills?

PART B — (5 × 5 = 25 marks)

Answer the following questions choosing either (a) or (b).

11. (a) Write a short note on the salient aspects of counselling.

Or

(b) Differentiate interpersonal and intrapersonal communication.

12. (a) Illustrate the tools and procedure in technical skills.

Or

(b) Write the function of delivery in presentation skills.

13. (a) What are the important qualities of a multi-tasking skills?

Or

(b) Write some ways to select a leader for a HR organization.

14. (a) Write a note on the etiquettes of interactions in a group discussion.

Or

(b) What are the salient aspects of understanding skills in developing human relationships?

15. (a) What is the role of cooperative learning skills in human skills development?

Or

(b) Write a note on causes of making social responsibilities.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE of the following questions.

16. Explain briefly on importance and techniques of counselling.

17. Write an essay on different types of technical skills.

18. List out the types of communication skills. Explain briefly.

19. Write briefly on understanding skills in group communication.

20. Explain the role of handling and facing situations in problem solving skills.

———————

D–7131

Sub. Code
42/13742

DISTANCE EDUCATION

Common for B.A./B.Sc./B.C.A. DEGREE EXAMINATION, DECEMBER 2022.

Fourth Semester

English

Part II – ENGLISH Paper – IV

(CBCS 2018 – 2019 Academic Year Onwards/ 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What surprise was in store for lalajee before he left Mokameh Ghat?

2. What is the pontoon bridge? Why has it been made?

3. How does Eliza dress herself up when she visits Higgins to ask to take speech lessons?

4. Shortly describe about Swami's four friends.

5. Why did Bassanio approach Antonio?

6. What similies does Romeo use to convey Juliet's beauty?

7. What were Martin Luther King's dreams?

8. When was the first meeting occured between Nehru and Toynbee?

9. Write the correct question tag?

(a) The weather in really bad today

(b) They are not in Mumbai at the moment.

10. Expand the Proverb, "A stitch in time saves nine".

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the qualities of Lalajee as described by Jim Corbelt.

Or

(b) Why was schatz sad? Explain.

12. (a) What is the significance of the title "Pygmalion"?

Or

(b) Swami and Friends a realistic drama. Elaborate.

13. (a) Why does Antonio agree to shylock's terms for the loan?

Or

(b) Sketch the character of Romeo.

14. (a) What sort of discrimination did Martin Luther King Jr. fight against?

Or

(b) Describe the first meeting of Toynbee and Nehru.

15. (a) Identify the sentence for clause or phrase.

(i) He works hard everyday

(ii) Before the next light

(iii) In a dark and dangerous hallway

(iv) If I need to call you

(v) After a good day

(vi) Because it's the right thing to do

(vii) As quickly as possible

(viii) This car's not working

(ix) Working for himself

(x) Whenever it gets cold

Or

(b) Explain Group Discussion.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Give the summary of 'Lalajee'.

17. Discuss the relationship between Higgins and his mother.

18. Character sketch of Antonio in Merchant of venice.

19. Write about the racial discrimination prevailed during the tone of Martin Luther king.Jr.

20. Illustrate the final meeting of Toynbee with Nehru.

———————

D–7211

Sub. Code
11343

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Fourth Semester

ANALYSIS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define discrete metric.

2. Define uncountable set.

3. Define complete metric space.

4. Prove that any non empty open interval (a, b) in R is of second category.

5. State Rolle's theorem.

6. P.T. (0,1) with usual metric is not compact.

7. State mean value theorem.

8. A and B closed subset of R. Prove that $A \times B$ is a closed subset in $R \times R$.

9. Define contraction mapping.

10. Given example to show that a subspace of a connected metric space need not be connected.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Let (M, d) be a metric space. Define $d_1(x, y) = \min\{1, d(x, y)\}$ prove that d_1 is a metric on M.

Or

(b) Prove that R is countable.

12. (a) Prove that any discrete metric space is countable

Or

(b) Prove that any non empty open subset of R can be expressed as countable union of mutually disjoint open intervals.

13. (a) State and prove mean value theorem on derivatives.

Or

(b) Let $f : (M_1, d_1) \to (M_2, d_2)$ be a function. Show that f is continuous on M_1. Iff $f(\overline{A}) \subseteq \overline{f(A)}$ for any set A in M.

14. (a) Prove that every continuous function is Riemann integrable.

Or

(b) Prove that any compact subset A of a metric space (M, d) is closed.

15. (a) Prove that any compact subset of a metric space is closed.

Or

(b) State and prove contraction mapping theorem.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. (a) Prove that in any metric space intersection of finite number of open set is open.

(b) State and prove Minkowski inequality.

17. Let (M, d) be a metric space and P be another metric is M. If $k > 1$ is such that $\frac{1}{k}\rho(x, y) \leq d(x, y) \leq k\rho(x, y) \forall x, y \in M$. Prove that d and ρ are equivalent metrics.

18. State and prove Baire's category theorem.

19. In a metric space M, prove that the following are equivalent.

(a) M is compact

(b) Any finite subset of M has a limit point

(c) M is sequentially compact.

(d) M is totally bounded and complete.

20. State and prove Heine Borel theorem.

———————

D–7212

Sub. Code
11344

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Fourth Semester

STATISTICS

(CBCS 2018 – 2019 A.Y. onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. What do you mean by measure of central tendency?

2. Define median.

3. What is scatter diagram?

4. Write the Karl Pearson's coefficient of correlation.

5. Form the difference table for the following data.

x:	0	1	2	3	4
Ux:	8	11	9	15	6

6. Write Newton's formula for forward interpolation.

7. Draw the frequency class table for two attributes.

8. Given $(A) = 30$, $(B) = 25$, $(\alpha) = 30$, $(\alpha\beta) = 20$ find N and (AB).

9. What is fixed base method for index numbers?

10. What are the components of time series?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Calculate arithmetic mean for the following frequency table.

Weight in kgs:	50	48	46	44	42	40
No. of persons:	12	14	16	13	11	09

Or

(b) Calculate mean deviation from mean of marks obtained by 9 students given by 7, 4, 10, 9, 15, 12, 7, 9, 7.

12. (a) Prove that the correlation coefficient is independent of the change of origin and scale.

Or

(b) Out of the two lines of regression given by $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$. Which one is the regression line of x on y?

13. (a) Prove that $E = 1 + \Delta$.

Or

(b) Given that $(A) = (\alpha) = (B) = (\beta) = \frac{N}{2}$ show that $(AB) = (\alpha\beta)$.

14. (a) From the following data construct the simple aggregative index number for 1992.

Commodities	Price in 1991 (Rs.)	Price in 1992 (Rs.)
Rice	7	8
Wheat	3.5	3.75
Oil	40	45
Gas	78	85
Flour	4.5	5.25

Or

(b) Explain about the simple average method for measurement of seasonal variation.

15. (a) Find the cost of living index number for 1992 on the base of 1991 for the following data using family budget method.

Commodity	Price in Rs.		Quantity in quintals in 1991
	1991	1992	
Rice	7	7.5	6
Wheat	6	6.75	3.5
Flour	5	5	0.5
Oil	30	3.2	3
Sugar	8	8.5	1

Or

(b) Explain the four methods of measurement of trend in time series.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Show that the variance of first n natural numbers is $\frac{1}{12}\left(n^2 - 1\right)$.

17. Calculate rank correlation coefficient for the following data.

x:	5	2	8	1	4	6	3	7
y:	4	5	7	3	2	8	1	6

18. The following data relate to the marks of 10 students in the internal test and the university examination for the maximum of 50 in each.

Interval marks:	25	28	30	32	35	36	38	39	42	45
University marks:	20	26	29	30	25	18	26	35	35	46

Obtain two regression equations.

19. Find the greatest and least values of (ABC) if $(A) = 50$; $(B) = 60$; $(C) = 80$; $(AB) = 35$, $(AC) = 45$ and $(BC) = 42$.

20. Calculate (a) Laspeyre's (b) Paa Sches (c) Fisher's index numbers for the following data.

Commodities	Base year 1990		Current year 1992	
	Price	Quantity	Price	Quantity
A	2	10	3	12
B	5	16	6.5	11
C	3.5	18	4	16
D	7	21	9	25
E	3	11	3.5	20

———————

D–7213	Sub. Code
	11351

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Fifth Semester

Mathematics

MODERN ALGEBRA

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define symmetric difference of two sets.

2. Define equivalence relation.

3. Define cyclic group.

4. Prove that in a finite group every element is of finite order.

5. State the Fermat's theorem.

6. Define Boolean ring.

7. Define Field.

8. Define quotient ring.

9. Show that $\mathbb{C}$ is vector space over the field $\mathbb{R}$.

10. Define inner product space.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL the questions, choosing either (a) or (b).

11. (a) For any three set A, B, C prove that $A - (B \cup C) = (A - B) \cap (A - C)$.

Or

(b) Let H and k be subgroups of a group G. Prove that $H \cap K$ is also a subgroup of G.

12. (a) Let G be a group and a be an element of order n in G. Then prove that $a^m = e$ if and only if n divides m.

Or

(b) Prove that every subgroup of an abelian group is a normal subgroup.

13. (a) Let R be a ring with identity prove that the set of all units in R is a group under multiplication.

Or

(b) Prove that any field F is an integral domain.

14. (a) Prove that the only idempotent elements of an integral domain are 0 and 1.

Or

(b) Let a be a non-zero element of an Euclidean domain R, prove that a is a unit in R if and only if $d(a) = d(1)$.

15. (a) Prove that the union of two subspace of a vector space is a subspace if and only if one is contained in the others.

Or

(b) Prove that every finite dimensional inner product space has an orthonormal basis.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Prove that any permentation can be expressed as a product of disjoint cycles.

17. State and prove Euler's theorem.

18. State and prove the fundamental theorem of homomorphism.

19. Let W and W be vector spaces over a field F and $T : V \to W$ be an epimorphism. Prove that

(a) $\ker T = V_1$ is a subspace of V and

(b) $\frac{V}{V_1} \cong W$

20. Let V be a finite dimensional vector space over a field F. Let A and B be subspaces of V. Prove that $\dim(A + B) = \dim A + \dim B - \dim(A \cap B)$

———————

D–7214	Sub. Code
	11352

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Fifth Semester

OPERATIONS RESEARCH

(CBCS 2018 – 2019 Academic year onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define group replacement policy.

2. Write down any two applications of OR.

3. What is meant by Big-M-method?

4. State weak duality theorem.

5. Define two-person zero-sum games.

6. Define pay-off matrix.

7. Write short notes on network.

8. Let $A=\begin{bmatrix} 4 & 7 \\ 6 & 5 \end{bmatrix}$, does have the saddle point?

9. What are the time estimates in PERT technique?

10. Find the value of the game

$$\begin{array}{c} \\ A \\ \\ \end{array} \begin{array}{c} B \\ \begin{pmatrix} 5 & 1 \\ 3 & 4 \end{pmatrix} \end{array}$$

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

11. (a) Enumerate the different applications of operations research.

Or

(b) Solve graphically the following LPP

Maximize $Z = 50x_1 + 60x_2$

Subject to the constraints :

$$2x_1 + 3x_2 \leq 1500$$
$$3x_1 + 2x_2 \leq 1500$$
$$0 \leq x_1 \leq 40$$
$$0 \leq x_2 \leq 400$$

12. (a) Solve the following LPP using Big-M method

Minimize $Z = 4x_1 + 6x_2$

Subject to

$$x_1 + 2x_2 \geq 80$$
$$3x_1 + x_2 \geq 75$$
$$x_1, x_2 \geq 0$$

Or

(b) Form the dual of the following primal LPP

Maximize : $Z = 4x_1 + 10x_2 + 25x_3$

Subject to :

$$2x_1 + 4x_2 + 8x_3 \leq 25$$
$$4x_1 + 9x_2 + 8x_3 \leq 30$$
$$x_1, x_2, x_3 \geq 0$$

13. (a) Using North West corner value find an initial basic feasible solution for the following transportation problem

	W_1	W_2	W_3	a_i
F_1	2	7	4	5
F_2	3	3	1	8
F_3	5	4	7	7
F_4	1	6	2	14
b_j	2	9	18	34
				29

Or

(b) Write down the mathematical formulation of an assignment problem.

14. (a) Construct the network diagram comprising activities $B, C, ..., Q$ and N such that the following constraints are satisfied

$B < E, F; C < G, L; E, G < H; L, H < I; L < M;$

$H < N; H < J; I, J < P; P < Q$.

The notation $X < Y$ means X should be completed before starting Y.

Or

(b) Determine the optimum sequence for the following sequencing problem in which 5 jobs are done in 2 machines M_1 and M_2 in the order M_1 M_2. Processing times are given in hours in the following data:

	M_1	M_2
J_1	10	4
J_2	2	12
J_3	18	14
J_4	6	16
J_5	20	6

15. (a) Solve the following game :

		Players B			
		I	II	III	IV
Players A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

Or

(b) Narrate the following terms :

(i) Maximin minimax principle

(ii) Saddle point and

(iii) Optimum strategy.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Use simplex method to solve the following LPP

Maximize $Z = x_1 + x_2 + 3x_3$

Subject to :

$$3x_1 + 2x_2 + x_3 \leq 3$$
$$2x_1 + x_2 + 2x_3 \leq 2$$
and $x_1, x_2, x_3 \geq 0$

17. Use duality to solve the LPP:

Maximize : $Z = 2x_1 + x_2$

Subject to :

$$x_1 + 2x_2 \leq 10$$
$$x_1 + x_2 \leq 6$$
$$x_1 - x_2 \leq 2$$
$$x_1 - 2x_2 \leq 1$$
$$x_1, x_2 \geq 0$$

18. Find the optimal solution to the following TP :

	D_1	D_2	D_3	D_4	Availability
O_1	23	27	16	18	30
O_2	12	17	20	51	40
O_3	22	28	12	32	53
Required	22	35	25	41	123

The cell entries are unit transport cost.

19. Determine the optimal solution to the following assignment problem :

	I	II	III	IV
A	10	5	13	15
B	3	9	18	3
C	10	7	3	2
D	5	11	9	7

20. Solve the following 2×4 game graphically

	Player B			
Player A	2	1	0	–2
	1	0	3	2

D–7215

Sub. Code
11353

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Fifth Semester

Mathematics

NUMERICAL ANALYSIS

(CBCS 2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Write down the formula for Newton-Raphson method.

2. Evaluate $\Delta(\tan^{-1} x)$.

3. Show that $E\Delta = \nabla E = \Delta$.

4. Find the n^{th} difference of e^x.

5. Find $\Delta f(x)$ if $f(x) = x^2 + x + 1$.

6. Write down the Gauss forward interpolation formula.

7. State the central difference formula for computing the derivatives.

8. State Simpson's rule.

9. What is the order of error in the trapezoidal rule?

10. State Milne's predictor – Corrector formula.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Find the root of $x^3 + x - 1 = 0$ by using Newton-Raphson method.

Or

(b) Using Newton's forward interpolation formula find y at $x = 8$ from the table :

x	0	5	10	15	20	25
y	7	11	14	18	24	32

12. (a) Prove that $\mu = \dfrac{E^{1/2} + E^{-1/2}}{2}$.

Or

(b) Prove that $\dfrac{\Delta^2}{E^2} = E^{-2} - 2E^{-1} + 1$.

13. (a) Find the function whose first difference is $9x^2 + 11x + 5$.

Or

(b) Solve $y_n - 6y_{n-1} + 9y_{n-2} = 0$.

14. (a) Find $\dfrac{dy}{dx}$ from the following table.

x	0	1	2	3	4	5
y	0	1	8	27	64	125

Or

(b) Evaluate $\int_0^1 \dfrac{dx}{1+x^2}$, using Trapezoidal rule with $h = 0.2$.

15. (a) Solve $2y_{n+2} - 5y_{n+1} + 2y_n = 0,\ y_0 = 0,\ y_1 = 1$.

Or

(b) Using Taylor's series method, solve $\frac{dy}{dx} = xy + y^2$, $y(0) = 1$ at $x = 0.1$.

PART C— ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Solve the equation $x^2 - 5x + 2 = 0$ using iterative method.

17. If $f(x)$ is a polynomial of nth degree, then prove that

$$\Delta^r f(x) = \begin{cases} \text{constant}, & r = n \\ 0, & r > n \end{cases}.$$

18. From the following table, obtain $\frac{d^2y}{dx^2}$ at the point $x = 0.96$.

x	0.96	0.98	1.00	1.02	1.04
$f(x)$	0.7825	0.7739	0.7651	0.7563	0.7473

19. Using Runge – kutta method of fourth order solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x = 0.2$.

20. Using Milne's predictor corrector formula, find $y(0.8)$ given that $\frac{dy}{dx} = y - x^2;\quad y(0) = 1,\quad y(0.2) = 1.12186,$ $y(0.4) = 1.46820,\ y(0.6) = 1.7379$.

———————

D–7216

Sub. Code
11354

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Fifth Semester

TRANSFORM TECHNIQUES

(CBCS 2018-19 Academic Year onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Find $L[e^{-at}]$.

2. Find $L[\cos^2 3t]$.

3. Find $L^{-1}\left[\frac{1}{(s+a)^2}\right]$.

4. What is $L[t^2 f(t)]$?

5. State the Euler's formulae.

6. Define odd and even functions.

7. State the Fourier integral theorem.

8. Show that $F[e^{iax} f(x)] = F(s+a)$.

9. Find $z(n^k)$.

10. Define inverse z – transform.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) If $L[f(t)] = F(s)$, then show that $L[tf(t)] = \frac{-d}{ds} F(s)$.

Or

(b) Find $L\left[\frac{1 - e^t}{t}\right]$.

12. (a) Find $L^{-1}\left[\frac{s+2}{(s^2 + 4s + 5)^2}\right]$.

Or

(b) Solve $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 5y = 5$ given that $y = 0$, $\frac{dy}{dt} = 2$ when $t = 0$.

13. (a) Obtain the Fourier sine series for the function $f(x) = x$ in $(0, \pi)$.

Or

(b) Find the Fourier series for the function $f(x) = k$ in $(0, 2\pi)$.

14. (a) Find the Fourier cosine transform of $f(x) = e^{-ax}$.

Or

(b) State and prove Parseval's identify.

15. (a) Using convolution theorem find the sum of first n natural numbers.

Or

(b) Find $z^{-1}\left[\frac{3z^2 - 18z + 26}{(z-2)(z-3)(z-4)}\right]$ by the partial fraction method.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions

16. (a) Solve $L^{-1}\left[\frac{1}{s(s+1)(s+2)}\right]$

(b) Solve $L^{-1}\left[\frac{1}{(s^2+a^2)^2}\right]$.

17. Solve the simultaneous equation

(a) $3\frac{dx}{dt} + \frac{dy}{dt} + 2x = 1$

(b) $\frac{dx}{dt} + 4\frac{dy}{dt} + 3y = 0$.

18. Find the Fourier series for the function

$f(x) = x^2, -\pi < x < \pi$.

19. Find the Fourier transform of

$$f(x) = \begin{cases} 1 - |x|, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$$

Hence deduce that $\int_0^\infty \left(\frac{\sin t}{t} \right)^4 dt = \frac{\pi}{3}$.

20. Solve $y_{n+3} - 3y_{n+1} + 2y_n = 0$ given that $y(0) = 4$, $y(1) = 0$ and $y(2) = 8$.

———————

D–7217

Sub. Code
11361

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Sixth Semester

DISCRETE MATHEMATICS

(CBCS – 2018–2019 Academic Year onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions..

1. Verify whether $(P \vee Q) \to P$ is a tautology.

2. What are all rules of Inference?

3. Define quantifiers. Give an example.

4. Define an equivalence relation.

5. Define "Least upper bound and greatest lower bound" of a poset.

6. What is meant by a group code?

7. Define the following terms. Give an example for each:

   (a) Simple graph;

   (b) Multiple graph

8. Draw all tress with six vertices.

9. Define the chromatic number of a graph. Also find the chromatic number of C_{2n}.

10. Define an Eulerian graph with an example.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Establish $\neg(P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Rightarrow (\neg P \vee Q)$.

Or

(b) Obtain a disjunctive normal for $\neg(P \vee Q) \leftrightarrow (P \wedge Q)$.

12. (a) Show that $\neg Q, P \rightarrow Q \Rightarrow \neg P$.

Or

(b) Write each of the following in symbolic form. (Assume that the universe consists of literally everything).

(i) All men are gaints; (ii) No men are gaints; (iii) Some men are giants (iv) Some men are not giants

13. (a) Prove that every chain is a distributive lattice.

Or

(b) Find the principal disjunctive normal form of

$P(x_1, x_2, x_3) = (x_2 + x_1 x_3)(\overline{(x_1 + x_3)x_2})$.

14. (a) Let $e : B^m \to \mathrm{B}^n$ be a group code. Prove that the minimum distance of e is the minimum weight of a non-zero code word.

Or

(b) Show that a closed walk of odd length contains a cycle.

15. (a) Enumerate the following terms with an illustration for each.

(i) Circuit matrix;

(ii) Adjacency matrix

Or

(b) Prove that every tree has a centre consisting of either one point or two adjacent points.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. (a) Obtain the principal conjuctive normal form of the formula $(\neg P \to R) \cap (Q \leftrightarrow P)$.

(b) Narrate an open statement.

17. (a) Let R be a relation on a set A. Prove the following:

(i) If R is reflexive then R^{-1} is also reflexive

(ii) If R is transitive then R^{-1} is also transitive

(iii) If R is an equivalence relation, then R^{-1} is also an equivalence relation.

(b) Show that $(m, m+1)$ parity check code can detech one error.

18. Let L be a complemented distributive lattice. For $a, b \in L$, prove the following are equivalent:

(a) $a \leq b$;

(b) $a \wedge b' = 0$

(c) $a' \wedge b = 1$

(d) $b' \leq a'$.

19. (a) With the usual notations, prove that $\delta \leq \frac{2q}{p} \leq \Delta$

(b) Prove that a simple graph with n vertices and k components can have at most $(n-k)(n-k+1)/2$ edges.

20. (a) Show that the vertex connectivity of any graph G can never exceed the edge connectivity of G.

(b) If G is a tree with n points, $n \geq 2$, then prove that $f(G, \lambda) = \lambda(\lambda - 1)^{n-1}$.

D–7218

Sub. Code
11362

DISTANCE EDUCATION

B.Sc. (Mathematics) DEGREE EXAMINATION,
DECEMBER 2022.

Sixth Semester

FUZZY ALGEBRA

(CBCS – 2018-19 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define a strong α-cut with an example.

2. Define complement of a fuzzy set, give an example.

3. Find the value of :

   (a) $[2, 5] - [1, 3]$

   (b) $[4, 10] / [1, 2]$

4. Define fuzzy number and give an example.

5. Define fuzzy homomorphism.

6. Describe necessity measure.

7. Define the measure of fuzziness.

8. What are the three types of entropy?

9. Express the U-uncertainty.

10. Define syntactic and semantic concept of Information.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Show that a fuzzy set A on R is convex iff $A(\lambda x_1 + (1-\lambda) x_2) \geq \min[A(x_1), A(x_2)]$.

Or

(b) Prove that every fuzzy complement has atmost one equilibrium.

12. (a) Let A, B be two fuzzy numbers whose membership functions are given by

$$A(x) = \begin{cases} (x+2)/2 & for \quad -2 < x \leq 0 \\ (2-x)/2 & for \quad 0 < x < 2 \\ 0 & otherwise. \end{cases}$$

$$B(x) = \begin{cases} (x-2)/2 & for \quad 2 < x \leq 4 \\ (6-x)/2 & for \quad 0 < x \leq 2 \\ 0 & otherwise. \end{cases}$$

Calculate fuzzy numbers $A + B$ and $A \times B$.

Or

(b) Verify the following properties for $A = [a_1, a_2]$, $B = [b_1, b_2]$, $0 = [0, 0], 1 = [1, 1]$.

(i) $A + B = B + A$

(ii) $A \cdot B = B \cdot A$

(iii) $A = 0 + A = A + 0$

(iv) $1 \cdot A = A \cdot 1 = A$.

13. (a) Find the transitive closure of the fuzzy relation

$$R = \begin{bmatrix} .7 & .5 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & .4 & 0 & 0 \\ 0 & 0 & .8 & 0 \end{bmatrix}.$$

Or

(b) Let a given finite body of evidence $(\mathcal{F}, m)$ be nested. Then prove that the associated belief and plausibility measures have the following properties : for all $A, B \in \mathcal{P}(X)$,

(i) $Bel\ (A \cap B) = \min[Bel(A), Bel(B)]$

(ii) $Pl(A \cup B) + \max[Bel(A), Bel(B)]$.

14. (a) Describe the types of uncertainty in detail.

Or

(b) Explain the Measure of Dissonance.

15. (a) Describe the aspects of uncertainty and Information in detail.

Or

(b) Explain the measure of confusion.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. (a) State and prove the second characteristics theorem of fussy complement.

(b) Let $f : X \to Y$ be crisp function, then show that $A \in f(x)$, for all $\alpha \in [0, 1]$, ${}^{\alpha+}[f(A)] = f({}^{\alpha+}A)$.

17. Narrate the following types of fuzzy relations with suitable example for each :

    (a) Reflexive

    (b) Symmetric

    (c) Transitive

    (d) Antireflexive

    (e) Irreflexive.

18. Describe the relationship between belief measures and probability measures.

19. Explain Hartley Information in detail.

20. Explain the measures of nonspecificity.

———————

D–7219

Sub. Code
11363

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Sixth Semester

Mathematics

COMPLEX ANALYSIS

(CBCS–2018 – 2019 Academic Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define magnitude of the complex number

2. Verify C.R. equations for $f(z)=z^3$.

3. What is the use of Milne-Thompson method.

4. Verify whether $u=x^2-y^2$ is harmonic or not.

5. Define fixed points.

6. State Abel's limit theorem.

7. State Morera's theorem.

8. Define Simply connected region.

9. What is meromorphic function.

10. Write Taylor's series.

PART B — ($5 \times 5 = 25$ marks)

Choose either (a) or (b).

11. (a) Prove that an analytic function in a region with constant modulus is constant.

Or

(b) Let $u = x^3 - 3xy^2$ and $v = 3x^2y - y^3$. Verify Cauchy-Riemann equation.

12. (a) Find the bilinear transformation which maps the points $Z_1 = 2_1\ Z_2 = i, Z_3 = -2$ onto $w_1 = 1, w_2 = i, w_2 = -1$ respectively.

Or

(b) Prove that the transformation $w = \bar{z}$ is not a bilinear transformation.

13. (a) Evaluate by Cauchy's integral formula.

$\frac{1}{2\pi i}\int_c \frac{z^2+5}{z-3}\,dz$ where c is $|Z| = 4$.

Or

(b) Prove that $\int_c \frac{e^z}{z^n} dz = \frac{2\pi i}{(n-1)!}$ where c is the issue $|Z| = 1$.

14. (a) Expand $f(z) = \frac{z-1}{z+1}$ as Taylor's series about $z = 0$

Or

(b) Find Laurent's series expansion of $f(z) = z^2 e^{1/2}$ about z = 0.

15. (a) Determine and classify the singularities of $f(z)=\sin(1/2)$.

Or

(b) Calculate the residue of $\frac{z+1}{z^2-2z}$ as it poles

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Derive complex form of C.R equations and prove that $f(z)-\sin x\cosh y+i\cos x\sinh y$ is differentiable at every point.

17. Find the image of the circle $|z-3i|=3$ under map $w=\frac{1}{z}$.

18. Evaluate $\int_c \frac{z+2}{z}dz$ where c is the semi circle $z=2e^{i\theta}$ where $o\leq\theta\leq\pi$.

19. Find Taylor's series to represent $\frac{z^2-1}{(z+2)(z+3)}$ is $|z|<2$.

20. Evaluate $\int_c \tan z dz$ where c is $|z|=2$.

———————

D–7220

Sub. Code
11364

DISTANCE EDUCATION

B.Sc. DEGREE EXAMINATION, DECEMBER 2022.

Sixth Semester

Mathematics

COMBINATORICS

(CBCS – 2018 – 19 Academic year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL the questions.

1. Define binomial number.

2. In how many ways can 5 men and 5 women be seated in a round table if no two women may be seated side by side.

3. Write the symbolic expressions of the ordinary generating function for a sequence.

4. Define recurrence relation with example.

5. Define the lexicographic ordering with largest part first.

6. State the Sieve formula.

7. Define the rook polynomial of the chess board.

8. Define the G – equivalent.

9. What is the Fibonacci sequence of numbers?

10. State Polya's enumeration theorem.

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) What is meant by the stirling numbers of the first kind and explain with suitable example?

Or

(b) Explain patterns of distributions.

12. (a) Prove that $\sum_{\phi \in R^D} W(\phi) = \left(\sum_r W(r) \right)^{|D|}$.

Or

(b) Let n be a positive integer. Show that the ordinary enumerator, for the partition of n is

$$f(t) = \frac{1}{(1-t)(1-t^2)(1-t^3).....}$$

13. (a) Prove that if $\lambda + N, k_\lambda$ is a linear combination of the $S_\mu's$, where the μ, s are partitions of N.

Or

(b) Describe the monomial symmetric function k_λ with suitable illustrations.

14. (a) Explain permutations with Forbidden positions with suitable example.

Or

(b) Prove that $\varepsilon_s(t) = \sum_{j=0}^{N} W(j)\ (t-1)^j$.

15. (a) State and prove the Burnsides lemma.

Or

(b) How many distinct dice are possible?

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Derive Recurrence formula for P_n^m.

17. Discuss the monomial symmetric function k_λ.

18. State and prove the multinomial theorem.

19. State and prove generalised inclusion and exclusion principle.

20. Explain the binary operations on permutation groups.

———————