



**K.L.E. Society's
R. L. Science Institute (Autonomous),
Belagavi.**

Question Paper Booklet

B.Sc I Semester Nov. 2019

**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B. Sc Degree Examination NOV- 2019

A01: BASIC ENGLISH

Duration: 3 Hrs

Max Marks: 70



I. Answer the following questions in a word, a phrase or a sentence each. 10X1=10

1. During which season do the neighbors mend the wall in the poem 'Mending Wall'?
2. Name any two characters of the story 'The Open Window.'
3. What does Abraham Lincoln mean by '10 cents earned is of far more value than a dollar found'?
4. 'That was a turning point in our friendship.' What was the turning point in the story 'The Portrait of a Lady'?
5. What is a sonnet? Mention the sonnet you have studied.
6. Who is the speaker of the poem 'The Bangle Sellers'?
7. The passage "Education: Indian and American" is an extracts from.....
8. What is the theme of the poem 'The Village School Master'?
9. Mention the three friends in the story 'The Meeting Pool'.
10. What is the job of a teacher according to Socrates?

II. Explain the following with reference to context.

(One each from prose & poetry to be answered)

2X5=10

- 1) a) "I hope Vera has been amusing you"
b) "And member, it's a secret pool, no one else must know about it"
- 2) a) "Something there is that doesn't love a wall
That sends the frozen-ground-swell under it;"
b) "Summer purple and gold flecked grey
For she who has journeyed through life midway"

III.

1X10=10

- 1) Sketch the character of Rusty?

OR

- 2) Bring out narrator's experiences with his grandmother with reference to the story 'The Portrait of a Lady.'

IV.

1X10=10

- 1) Critically analyze the poem 'The Village School Master'.

OR

- 2) Explain the values that Lincoln expects the teacher to teach his son in the poem "Letter to His Son's Teacher".

V. A. Fill in the blanks with appropriate articles.

5X1=5

1. Akash is _____ tallest boy in the class.
2. Is France _____ European country?
3. School children in _____ UK have to wear a uniform.

4. He is _____ oldest member of the club.
5. Harishchandra was _____ honest king.

B. Fill in the blanks with suitable prepositions.

5X1=5

1. I don't like to get up _____ the morning.
2. Harish gets up _____ 6 o' clock every day.
3. This is a picture _____ my family.
4. That old temple is hidden _____ trees.
5. Virat is my best friend. I have known him _____ 1999.

VI. Give one word substitute for the following

10X1=10

1. One who does not believe in the existence of god?
2. One who feeds on human flesh?
3. A group of judges.
4. A book written by an unknown author.
5. A person who is above hundred years.
6. One who compiles dictionary.
7. One who has no money?
8. An ugly woman.
9. A place for burial of dead body.
10. A government by a king or queen.

VII. Read the following passage and answer the questions given below: 5X2=10

Lies can be divided into two types: white lies and black lies. A black lie is a statement we make that we know is false. A white lie is a statement we make that is not in itself false but that leaves out a significant part of the truth. The fact that a lie is white does not in itself make it less of a lie or any more excusable. White lies may be every bit as destructive as black ones. A government that withholds essential information from its people by censorship is no more democratic than one that speaks falsely. The woman who conveniently forgets to mention that she has used up all the money in the family bank account is no less guilty than if she had lied directly. Indeed, because it may seem less reprehensible, the withholding of essential information is the most common form of lying, and because it may be the more difficult to detect and confront, it is often even more pernicious than black-lying. White lying is considered socially acceptable in many of our relationships because "we don't want to hurt people's feelings". Yet we may bemoan the fact that our social relationships are generally superficial. Parents often feed their children white lies. This is not only considered acceptable but is thought to be loving and beneficent. Even husbands and wives who have been brave enough to be open with each other find it difficult often to be open with their children.

1. What are the two types of lies? How does the author define a white lie?
2. According to the author, what is common to both types of lies?
3. Why is white lying more pernicious than black lying?
4. When is white lie considered socially acceptable?
5. Why does the author feel that our social relationships are superficial?



KLE Society's
Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.
First Semester B.Sc. Degree Examination Nov - 2019
A02: KANNADA

Duration: 3 Hrs

Max Marks: 70

ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.

ಪ್ರ 1. ಕೃಷ್ಣ ಕರ್ಣರ ನಡುವಿನ ಸಂಭಾಷಣೆಯ ಸ್ವಾರಸ್ಯ ವಿವರಿಸಿ.

ಅಥವಾ

ಸ್ತ್ರೀಯರ ಅಂತರಾಳದ ಭಾವನೆಗಳು 'ನಾವು ಹುಡುಗಿಯರೇ ಹೀಗೆ' ಪದ್ಯದಲ್ಲಿ ವ್ಯಕ್ತವಾದ ಬಗೆಯನ್ನು ವಿವರಿಸಿ.

10 ಅಂಕಗಳು

ಪ್ರ 2. ವಿವೇಕಾನಂದರ ಬಾಲ್ಯಜೀವನವನ್ನು ವಿವರಿಸಿರಿ.

ಅಥವಾ

ವಿವೇಕಾನಂದರ ಯುರೋಪ ಪ್ರವಾಸದ ಅನುಭವಗಳನ್ನು ವಿವರಿಸಿ.

10 ಅಂಕಗಳು

ಪ್ರ 3. ಬೇಕಾದ ನಾಲ್ಕಕ್ಕೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.

4x5=20 ಅಂಕಗಳು

- 1) ಗರತಿಹಾಡು
- 2) ಅಲ್ಲಮ ಪ್ರಭುವಿನ ವಚನಗಳು
- 3) ಜಿ. ಎಸ್. ಶಿವರುದ್ರಪ್ಪ
- 4) ಗುರು ವಿಯೋಗ
- 5) ತಾಯ್ನಾಡಿನ ದರ್ಶನ
- 6) ಪ್ರಭುಶಂಕರ

ಪ್ರ 4. ಬೇಕಾದ ಮೂರಕ್ಕೆ ಸಂದರ್ಭದೊಡನೆ ಸ್ಪಷ್ಟೀಕರಿಸಿರಿ.

3x5=15 ಅಂಕಗಳು

- 1) "ಬಾಲಕರಿಲ್ಲದ ಬಾಲಿದ್ಯಾತರ ಜನ್ಮ"
- 2) "ನಿಮ್ಮ ಕಾಲದ ಕಟ್ಟಳೆಯ ಕಲಿತನಕ್ಕೆ ನಾನು ಬೆರಗಾದೆನು"
- 3) "ನೆಲಕ್ಕೆ ಹಸಿರು ಮೂಡಿಸು ಹೇಗೆ?"
- 4) "ಚಕ್ರವರ್ತಿಯ ಮುಂದೆ ನಿಂತು ಬದನೆಂಕಾಯಿ ಬೇಡುವುದೇ?"
- 5) "ನರೇಂದ್ರ ನನ್ನ ಸರ್ವಸ್ವವನ್ನು ನಿನಗೆ ಕೊಟ್ಟುಬಿಟ್ಟಿದ್ದೇನೆ"

ಪ್ರ. 5. ಒಂದೇ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿ.

15x1=15 ಅಂಕಗಳು.

- 1) ಪಲಸಂಗಿ ಗೆಲೆಯರ ಗುಂಪಿನ ಸದಸ್ಯರು ಯಾರು?
- 2) ಅಲ್ಲಮಪ್ರಭುವಿನ ತಂದೆತಾಯಿಗಳ ಹೆಸರು ಏನು?
- 3) ಕುಮಾರವ್ಯಾಸನ ಕೃತಿ ಯಾವುದು?
- 4) ಜಿ. ಎಸ್. ಶಿವರುದ್ರಪ್ಪನವರ ಕವನ ಸಂಕಲನವನ್ನು ಹೆಸರಿಸಿ.
- 5) ಮುದೇನೂರು ಸಂಗಣ್ಣನವರ ಹುಟ್ಟೂರು ಯಾವುದು?
- 6) ವಿವೇಕಾನಂದರ ತಂದೆತಾಯಿ ಯಾರು?
- 7) ರಾಮಕೃಷ್ಣರ ಮೊದಲ ಹೆಸರು ಯಾವುದು?
- 8) ರಾಮಕೃಷ್ಣರ ಹೂಟ್ಟೂರು ಯಾವುದು?
- 9) ಭವತಾರೀಶಿ ದೇವಾಲಯವನ್ನು ಯಾರು ಕಟ್ಟಿಸಿದರು?
- 10) "ಸರ್ವಧರ್ಮ ಸಮ್ಮೇಳನದ" ಅಧ್ಯಕ್ಷರು ಯಾರಾಗಿದ್ದರು?
- 11) "ಸರ್ವಧರ್ಮ ಸಮ್ಮೇಳನ" ಯಾವ ವರ್ಷ ನಡೆಯಿತು?
- 12) "ವೇದಾಂತ ಸೋಸೈಟಿ"ಯನ್ನು ಯಾರು ಸ್ಥಾಪಿಸಿದರು?
- 13) ರಾಮಕೃಷ್ಣರು ಮಹಾಸಮಾಧಿ ಹೊಂದಿದ್ದು ಎಲ್ಲಿ?
- 14) ವಿವೇಕಾನಂದರು ಭೇಟಿಯಾದ ಆಲ್ಬರ್ಟ್ ಸಂಸ್ಥಾನದ ದೊರೆ ಯಾರು?
- 15) ವಿವೇಕಾನಂದರು ರಚಿಸಿದ ಗ್ರಂಥಗಳಾವವು?



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Raja Lakhamagouda Science Institute (Autonomous)

Belagavi.

First Semester B.Sc. Degree Examination November- 2019

A03: HINDI

Duration : 3 Hrs

Max Marks : 70

पाठ्य-क्रम

“सदा गद्य-गरिमा

अनुवाद

सूचना:- सभी प्रश्नों के उत्तर देवनागरी लिपि में लिखिए:

प्र.1. सही उत्तर लिखिए (कोई दस)

10 X1=10

- हल्कू ने कम्बल खरीदने के लिये कितने रूपये इकट्ठा किये थे?
अ) चार ब) तीन क) दो
- एक दिन के लिये राजा को क्या बनना पडता है।
अ) व्यापारी ब) राजदूत क) कृषक
- 'सोना' किस जानवर का नाम है।
अ) हिरन ब) कुत्ता क) खरगोश
- राजनर्तकी का नाम क्या है?
अ) रमा ब) अलका क) शीमा
- 'ए पापा बाहरगाए है', यह वाक्य किस पाठसे लिया गया है?
अ) कफन ब) त्यागवीर लिंगराज क) समयपर मिलनेवाले.
- दारा का वध किसने किया ?
अ) जल्लाद ब) सैनीक क) मंत्री
- 'विज्ञानाचार्य जगदीश चंद्र बसु' पाठ का लेखक कौन हैं?
अ) प्रेमचन्द ब) ब्रह्मावतीनारंग क) महादेवी वर्मा
- लिंगराज की प्रियपत्नी का नाम क्या है।
अ) उमाबाई ब) अंबाबाई क) भागीरती बाई
- मॉरीशस की बोलचाल की भाषा कौनसी है ?
अ) क्रियोल ब) फारसी क) उर्दु
- लिंगराज अपना हस्ताक्षर किस लिपि में करते थे?
अ) रोमन लिपि ब) मोडिलिपि क) देवगरी लिपि
- हल्कू के खेतको किसने सर्वनाश किया ?
अ) भालू ब) सुअर क) नीलगाय
- 'सदा गद्य गरिमा' के संपादक कौन हैं?
अ) डॉ. राजीव.एस.हिरेमठ ब) प्रा.आर.एन. हिरेमठ क) सदा हिरेमठ

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
2. Any revealing of identification, appeal to valuator and / or equations written will be treated as malpractice.

प्र. II. किन्हीं दो की सप्रसंग व्याख्या कीजिए:

2X5=10

1. "हल्कू ने प्रसन्न-मुख से कहा, रात की ठंडी में यहाँ सोना तो न पड़ेगा।
2. "यह समय तो नगरी की शोभा देखने का होगा, नर्तकी की शोभा देखने का नहीं।"
3. कंबख्तो, तैमूर का वंशज दारा कुते की तरह घुट कर नहीं, एक बहादूर की तरह लडते-लडते मरेगा।

प्र. III. किन्हीं दो प्रश्नों के सही उत्तर लिखिए:

2X10=20

1. पूस की रात कहानी का सारांश लिखिए।
2. मधुलिका के राष्ट्र प्रेम पर चर्चा कीजिए।
3. महादेवी वर्माजी ने हिरन के प्रति प्रेम कैसा व्यक्तकीया है?
4. चन्द्रगुप्त का चरित्र चित्रण कीजिए।

प्र. IV. किन्हीं तीन पर टिप्पणी लिखिए:

3X5=15

1. समय-पर मिलनेवाले
2. त्यागवीर लिंगराज
3. मौरिशस
4. डाकियाँ की कर्तव्य

प्र. V. हिन्दी में अनुवाद कीजिए:

15 Marks

The Tajmahal is a very famous building. It is one of the wonders of the world. It is situated at Agra, on the right bank of Yamuna. It was built by Shahjahan. He built it in the memory of his wife Mumtaz.

ताजमहल एक बहुत प्रसिद्ध कಟ್ಟडवागिद. इदु जगत्तिन अदुतगळुदुगिद. इदु अग्राद यमुनये बलदडदल्लिद. शहाजानसु इदनु कಟ್ಟसिदुदुन. अवसु तनु पत्ति ममुताजल ननसिनल्लि इदनु कಟ್ಟसिदुदुन.



I. Answer the following questions in a word, a phrase or a sentence each:

10x1=10

1. How long is the initial bet in the story 'The Bet'?
2. What was the present that Della choose for Jim?
3. What was the actual cost of necklace in 'The Diamond Necklace'?
4. Who in the story is a student of Confucius?
5. How was Henry Apjohn(HE) described in story 'How he lied to her Husband'?
6. Who has written short story 'The Homecoming'?
7. Where did the travelers and foreigners from all parts of world converse?
8. How long did it take Mathilde and Loisel to repay the cost of necklace?
9. How old was Jim in story 'The Gift of Magi'?
10. Who extends the length of bet in 'The Bet'?

II. Explain any two reference to context of the following.

2x5=10

1. 'But mine was imitation. It was worth at the very most five hundred francs.'
2. 'Introducing a fine woman to you is casting pearls before swine.'
3. 'They are too nice to use just right now.'
4. 'This morning I was eighteen. Now I am -confound it!'

III.

10x1=10

1. What was the bet between the young lawyer and the old banker? Who won it?

OR

2. Is the title of the story 'The Gift of Magi' appropriate? Justify.

IV.

10x1=10

1. What are the views of god as presented by the people at the coffee house?

OR

2. 'The Diamond Necklace' reveals that vanity is evil. If you were placed in a situation similar to that of Mathilde/Madame Loisel, What would you have done? Write your view.

V. Use the appropriate linkers in the bracket and frame a meaningful sentence.

(So, although, too, because, however, and, but)

5x1=5

1. It was raining. We still went to the picnic.
2. The restaurant has a good reputation. The food was terrific.
3. Dry your clothes. The sun is still strong.
4. The boy is intelligent. The boy is lazy.
5. I learnt French language. I learnt German language.

VI. Use the following Phrases and Idioms in your own words.

5x1=5

1. To break the news
2. To go ahead
3. Need of the hour
4. To take care of
5. Call a spade a spade

VII. Write a welcome speech on the eve of 150 th celebration of Gandhi Jayanti.

10 Marks

VIII. Prepare an agenda for annual prize distribution ceremony.

10 Marks



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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc./BCA Degree Examination Nov - 2019

A10: INDIAN CONSTITUTION

Duration: 1 ½ Hrs

Max Marks: 70

Instructions to candidates:

1. Instruction: Answer any 70 of the following questions in the OMR sheet provided.

- 1) India has been described under Article-1 of the Constitution as
 - a) Union of States
 - b) Federation
 - c) Unitary State
 - d) None of these
- 2) The Indian Constitution was enforced on
 - a) 15th Aug, 1947
 - b) 26th Nov, 1949
 - c) 26th Jan, 1950
 - d) 30th Jan, 1950
- 3) The Constituent Assembly was set according to the proposals of
 - a) The Cripps Mission
 - b) The Cabinet Mission
 - c) Mountbatten Plan
 - d) Rajagopalachari Plan
- 4) Setting a Supreme Court at Calcutta is a part of
 - a) Regulating Act of 1773
 - b) Pitts India Act of 1784
 - c) Charter Act of 1793
 - d) Charter Act of 1893
- 5) The Constitution of India was adopted by the
 - a) Parliament of India
 - b) Constituent Assembly
 - c) Governor General
 - d) British Parliament
- 6) The Constitution of India is
 - a) Flexible
 - b) Rigid
 - c) Partly flexible and partly rigid
 - d) None of these
- 7) Who was the first elected chairman of the Constituent Assembly?
 - a) B.R.Ambedkar
 - b) B.N.Rao
 - c) Dr. Rajendra Prasad
 - d) Jawaharlal Nehru
- 8) Who was the chairman of the Drafting Committee for making the Constitution of India?
 - a) Rajendra Prasad
 - b) Baldev Singh
 - c) H. C. Mukherjee
 - d) Dr. B. R. Ambedkar
- 9) The objective resolution was moved in the Constituent Assembly on
 - a) December 13, 1946
 - b) January 26, 1950
 - c) November 26, 1946
 - d) November 26, 1950
- 10) Which among the following is not a feature of the Indian Constitution?
 - a) Parliamentary form of Government
 - b) Federal form of Government
 - c) Double citizenship
 - d) A written constitution
- 11) What was the total number of members in the Drafting Committee of Constitution?
 - a) Five
 - b) Six
 - c) Seven
 - d) Eight
- 12) How long did the Constituent Assembly take to finally pass the Constitution?
 - a) 5years 11 months 19 Days
 - b) 2years 11 months 18 Days
 - c) 7years 11 months 19 Days
 - d) 3years 11 months 19 Days
- 13) The Preamble states that the Constitution derives its authority from
 - a) Indian Culture
 - b) Government of India
 - c) The People of India
 - d) The Supreme Court
- 14) Who boycotted the Indian Constituent Assembly?
 - a) Unionist Muslim
 - b) Muslim League
 - c) Unionist Scheduled Caste
 - d) Krishak Poja
- 15) Fraternity means
 - a) Spirit of Brotherhood
 - b) Unity and Integrity of India
 - c) Social Justice
 - d) None of these
- 16) India is a
 - a) Hindu state
 - b) Secular state
 - c) Bilingual state
 - d) None of these
- 17) The Government has declared which day as Constitution Day/National Law Day
 - a) 26th January
 - b) 26th November
 - c) 26th December
 - d) 15th August
- 18) India is 'Republic' because
 - a) Its head of the State is elected by its people.
 - b) There is a parliamentary rule
 - c) It is completely free
 - d) It prescribes democratic government
- 19) The words socialist and secular were added to the Preamble by
 - a) 44th Amendment
 - b) 42nd Amendment
 - c) 52nd Amendment
 - d) 46th Amendment

- 20) The Indian Constitution is a
 a) brief constitution
 b) medium size constitution
 c) bulkiest constitution
 d) very brief constitution
- 21) The Preamble to the Constitution of India declares India to be
 a) Sovereign, Secular, Democratic, Republic
 b) Sovereign, Democratic, Republic
 c) Sovereign, Socialist, Secular, Democratic, Republic
 d) Democratic, Republic
- 22) There is popular sovereignty in India because the Preamble to the Constitution begins with the words
 a) Democratic India
 b) People's Democracy
 c) Sovereignty of People
 d) We the people of India
- 23) The Constitution of India provides
 a) Double Citizenship
 b) Single Citizenship
 c) Both (a) and (b)
 d) None of these
- 24) At the time of enactment of the Constitution which one of the following ideals was not included in the Preamble?
 a) Equality
 b) Justice
 c) Socialist
 d) Liberty
- 25) Under which Article the procedure for Amendment of Constitution is given
 a) Article-352
 b) Article-368
 c) Article-392
 d) Article-360
- 26) The Preamble to our Constitution includes all except
 a) Adult franchise
 b) Equality of status
 c) Fraternity
 d) Justice
- 27) The idea of the Constitution of India was first of all given by
 a) Dr. B.R. Ambedkar
 b) Jawaharlal Nehru
 c) Shri M.N. Roy
 d) Mahatma Gandhi
- 28) Which of the following articles deal with Fundamental Rights?
 a) Article 5-11
 b) Article 12-35
 c) Article 14-18
 d) Article 12-40
- 29) Which of the following is given the power to implement the Fundamental Right by the Constitution?
 a) All courts in India
 b) The Parliament
 c) The President
 d) The Supreme Court and High Courts
- 30) Which of the following is not a condition for becoming a citizen of India?
 a) Birth
 b) Acquiring property
 c) Descent
 d) Naturalization
- 31) Which right was deleted from the list of Fundamental Rights?
 a) Right to Equality
 b) Right to Freedom of Religion
 c) Right to Constitutional Remedies
 d) Right to Property
- 32) Under the Indian Constitution, what does 'Adult Suffrage' signify?
 a) Children
 b) Persons
 c) Any Indian citizen who is of the age of 18 years and above
 d) None of these
- 33) Which fundamental right is concerned with abolition of social discrimination?
 a) Right to equality
 b) Right against exploitation
 c) Right to life and liberty
 d) Cultural and education rights
- 34) Which of the following countries enjoys a federal form of government?
 a) China
 b) USA
 c) Cuba
 d) Belgium
- 35) Article 15 provides special provisions for
 a) Women and Children
 b) SC & STs
 c) Both (a) & (b)
 d) Only (a)
- 36) Which Article of the Constitution defines "State"
 a) Articles 12
 b) Article 15
 c) Article 11
 d) Article 20
- 37) Article 17 of Constitution of India
 a) Protects individual freedom
 b) Grants right to equality
 c) Abolishes Untouchability
 d) None of the these
- 38) Fundamental Rights are enforceable only against the
 a) Citizens
 b) Aliens
 c) State
 d) None
- 39) Article 19 of the Constitution of India contains
 a) 9 Fundamental Freedoms
 b) 8 Fundamental Freedoms
 c) 7 Fundamental Freedoms
 d) 6 Fundamental Freedoms
- 40) For enforcement of Fundamental Rights the Court can issue
 a) A Decree
 b) A Writ
 c) An Ordinance.
 d) A Notification
- 41) Right to privacy is contained in
 a) Article 22
 b) Article 19
 c) Article 21
 d) Article 22
- 42) Right to life also includes right to
 a) Get education
 b) Contest Election
 c) Die
 d) None of these

- 43) Clause (1)(b) of Article 19 of the Indian Constitution guarantees the freedom of citizens to meet with each other in any number provided the assembly is
- a) Peaceable b) Unarmed c) Large d) Both (a) and (b)
- 44) Article 20(3) of the Indian Constitution is about "accused's immunity from being compelled to be a witness against himself". This clause gives protection:
- a) To a person accused of an offence b) Against compulsion to be a witness
c) Against himself d) All of them
- 45) Certain Fundamental Rights are not applicable to _____ under Article-33
- a) Prime Minister b) President c) Armed Forces d) Chief Minister
- 46) Right to Constitutional Remedies is granted under
- a) Article- 32 b) Article- 35 c) Article-41 d) Article-51
- 47) Which part of the Indian Constitution deals with Directive Principles of State Policy?
- a) Part I b) Part II c) Part III d) Part IV
- 48) The Directive Principles of State Policy seek to establish
- a) Political democracy b) cultural democracy
c) Social and economic democracy d) political and cultural democracy
- 49) Under Article 21A of Constitution of India is about
- a) Secondary education b) Primary education c) Higher education d) None of these
- 50) Right to life does not include right to
- a) Get education b) Contest Election c) Die d) None of these
- 51) Which article provides protection against arrest and detention
- a) Art. 22 b) Art. 32 c) Art. 19 d) Art. 21A
- 52) Under which article the Fundamental Duties are included in Indian Constitution?
- a) Article 50 b) Article 52 c) Article 51A d) Article 54
- 53) Directive Principles of the State Policy are
- a) Justiciable b) Non Justiciable c) Mandatory d) Discretionary
- 54) Respecting the National Flag and National Anthem is a
- a) Fundamental Right b) Fundamental Duty c) Directive Principle d) All
- 55) Which of the following writ is issued by the Court in case of unlawful detention of a person?
- a) Quo Warranto b) Habeas Corpus c) Mandamus d) Certiorari
- 56) Article 32 stands suspended during an emergency under Article
- a) 352 b) 356 c) 360 d) 362
- 57) Minimum age required to contest for Presidentship is
- a) 23 years b) 21 years c) 35 years d) 30 years
- 58) Who elects the president of India?
- a) Electoral College b) Chief Minister c) Prime Minister d) Vice President
- 59) The President gives his resignation to the
- a) Chief Justice of India b) Parliament c) Vice President d) Prime Minister
- 60) Which article of the Constitution empowers the President to promulgate ordinances?
- a) Article-122 b) Article-129 c) Article-123 d) Article-125
- 61) Article _____ empowers the President to give assent to the Bills
- a) Article 100 b) Article 111 c) Article 201 d) Article 356
- 62) The impeachment of the president takes place on the ground of
- a) Violation of the Constitution b) Unable to perform his duty due to old age
c) Misbehavior with the foreign dignitaries d) None of the above
- 63) During National Emergency which of the following Article cannot be suspended
- a) Article 18 b) Article 17 c) Article 20 d) Article 19
- 64) Who administers the oath of office to the President of India before he enters upon the office?
- a) Chief Justice of India b) Speaker c) Vice President d) Prime Minister
- 65) The Vice President is ex-officio chairman to the
- a) Rajya sabha b) Lok sabha c) Both (a) and (b) d) None of these
- 66) Judge of the Supreme Court can be removed from offices by
- a) Executive order b) Impeachment c) Judicial order d) Bureaucracy

- 67) All speeches made in the House of People are addressed to
 a) The Prime Minister
 b) The Speaker
 c) Minister for Parliamentary Affairs
 d) Respective Ministers
- 68) Where is the Supreme Court of India situated?
 a) Mumbai
 b) Kolkata
 c) New Delhi
 d) Chennai
- 69) The minimum age required for becoming the Prime Minister of India is
 a) 30 years
 b) 35 years
 c) 40 years
 d) 25 years
- 70) Our parliament consists of
 a) Lok Sabha
 b) Rajya Sabha
 c) Both (a) &(b)
 d) only Rajya Sabha
- 71) In Parliament of India Lower House is known as
 a) House of People
 b) Rajya Sabha
 c) Council of States
 d) None
- 72) The budget is presented in the House of people by
 a) the Prime Minister
 b) the President
 c) the Finance Minister
 d) the Defense Minister
- 73) A Judge of the Supreme Court of India is to hold office until he attains the age of
 a) 58 years
 b) 62 years
 c) 60 years
 d) 65 years
- 74) The Article 370 of the Constitution deals with
 a) Special status for Jammu and Kashmir
 b) Special provisions for minorities
 c) Amendment method
 d) None of the above
- 75) The only-Union Territory which has a High Court of its own
 a) Daman and Diu
 b) Delhi
 c) Lakshadweep
 d) Chandigarh
- 76) Three-tier system was first advocated by the Committee headed by
 a) Balwant Rai Mehta
 b) Rajesh Mehta
 c) Jawaharlal Nehru
 d) Mahatma Gandhi
- 77) Panchayat Raj was introduced in the Country in
 a) 1957
 b) 1952
 c) 1951
 d) 1959
- 78) Who was the first Prime Minister of India?
 a) Jawaharlal Nehru
 b) Mrs. Indira Gandhi
 c) Dr. Rajendra Prasad
 d) Mahatma Gandhi
- 79) Who is the President of India
 a) Shri. Ram Nath Kovind
 b) Shri. Pranab Mukherjee
 c) Smt.Pratibha Singh Patil
 d) Shri.Narendra Modi
- 80) Which is the list that contains subjects in which both the Centre and the States can legislate?
 a) Union list
 b) State list
 c) Residuary list
 d) Concurrent list



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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi

First Semester B.Sc. Degree Examination Nov - 2019**A11: STATISTICS**

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Mathematical and Statistical tables will be supplied on request.
- 2) Use of calculators is permitted.

I. Answer any FIVE of the following**5X2=10**

1. Define statistics.
2. Mention any two uses of diagrams.
3. Define Harmonic mean.
4. Write two demerits of mean deviation.
5. State mathematical definition of probability.
6. Write Marshal-Edgeworth and Dorbish – Bowely's Price I. No. Formula.
7. Write two uses of consumer price index number.

II. Answer any SIX of the following**6X5=30**

8. Explain different parts of a statistical table.
9. Define Geometric mean and discuss its merits and demerits.
10. What are partition values? Write the formula for calculation of Q_1 , D_6 and P_{80} for continuous case.
11. Define standard deviation and write its properties.
12. Briefly explain types of Skewness.
13. State and prove multiplication theorem of probability.
14. The probabilities of a husband and wife surviving for 10 more years are 0.8 and 0.9 respectively. Find the probability that after 10 years.
 - a) Both of them are alive
 - b) At least one of them is alive
15. Discuss the various steps involved in the construction of Index number.

III. Answer any THREE of the following

3X10=30

16. a) What is classification? Discuss different types of classification.
b) Distinguish between diagrams and graphs.
17. If a and b are any two positive integers.
Find the A·M, G·M, H·M also show that
i) $G^2=AH$
ii) $A \geq G \geq H$
18. a) What are measures of dispersion? Write the characters of an ideal measures of dispersion.
b) What is C·V? If C·V=25 mean=10 find S·D.
19. a) For any two events A and B.
Prove that i) $P(\bar{A} \cap B) = P(B) - P(A \cap B)$
ii) $P(A \cap \bar{B}) = P(A) - P(A \cap B)$
b) In a bolt factory machines A,B and C manufacture respectively 25%, 35% and 40% of the total of their output 5,4,2 percent respectively are defective bolts. A bolt is drawn at random and is found to be defective. What is the probability that it was manufactured by machine A?
20. Explain Time Reversal Test and Factor Reversal Test. Show that Fisher's I. No satisfy both these tests.



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KLE Society's

**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B.Sc. Degree Examination Nov - 2019

A13: PHYSICS

Duration : 3 Hrs

Max Marks : 70

Instructions to candidates:

- 1) Attempt all Questions.
- 2) Simple calculators are allowed for calculations.

I. Answer any FIVE of the following:

5X2=10

1. Define inertial frame of reference.
2. What are the forces that come into play in a rotatory frame?
3. Mention any two uses of Lissajous figures.
4. Write any two uses of artificial satellite.
5. The young's modulus and modulus of rigidity of material are $18 \times 10^{10} \text{ Nm}^{-2}$ and $9 \times 10^{10} \text{ Nm}^{-2}$ respectively. Calculate the bulk modulus of the material.
6. Define streamline flow of a liquid.
7. Find the excess pressure inside a spherical drop of water of diameter $4 \times 10^{-3} \text{ m}$.
[Given: S.T of water is $72 \times 10^{-3} \text{ Nm}^{-1}$].

II. Answer any SIX of the following :

6X5=30

8. Describe centre of mass as frame of reference.
9. Derive an equation for the composition of two rectangular SHM's of equal period.
10. Obtain the condition for a satellite to be placed in orbit.
11. Obtain an expression for moment of inertia of an rectangular lamina about an axis passing through its centre and parallel to its sides.
12. Give the molecular theory of surface tension.
13. A body executing SHM, such that its velocity at mean position is 4 ms^{-1} and acceleration at one of its extreme position is 6.28 ms^{-2} . Calculate Time period and frequency.
14. A metal rod of length 1m and breadth 0.03m and thickness 2.5mm is clamped at one end and loaded at the free end with 2.5kg. Calculate the depression produced.
[Given: $Y = 4 \times 10^{11} \text{ Nm}^{-2}$]
15. Calculate the depth of water at which air bubble of diameter $8 \times 10^{-4} \text{ m}$ remains in equilibrium. [ST of water is $70 \times 10^{-3} \text{ Nm}^{-1}$]

III. Answer any THREE of the following:

3X10=30

16. What are Galilean transformation? Show that acceleration and force are invariant under Galilean transformation.
17. Give the theory of Helmholtz resonator.
18. Discuss about construction, launching and returning of satellite.
19. Derive an expression for bending moment of beam.
20. Derive an expression for Poiseuille's formula for the flow of viscous fluid through narrow tube.



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KLE Society's

**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B.Sc. Degree Examination Nov - 2019

A14: CHEMISTRY

Duration: 3 Hrs

Max Marks: 70

Instruction to Candidates:

1. Attempt all questions.
2. Draw neat labelled diagrams and give equations wherever necessary

I. Answer any FIVE of the Following.

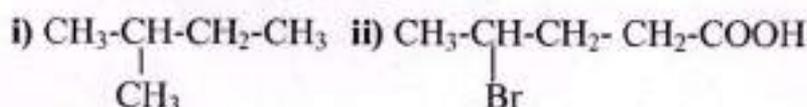
5X2=10

1. Classify the following elements into respective blocks in the periodic table.
Ti, Mg, N and K.
2. What is redox indicator?
3. What is electromeric effects?
4. Name the two geometrical structures of carbanion.
5. An aqueous solution of ammonium sulphate is acidic. Give reason.
6. What are real gas isotherms?
7. Define collision number.

II. Answer any SIX of the Following.

6X5=30

8. Explain emission spectrum of hydrogen.
9. Discuss classification of elements into 's' and 'p' block elements.
10. State Hund's rule of maximum multiplicity and verify the rule by taking 'O' and 'N' as examples.
11. Explain the classification of organic compounds with example.
12. What are the conformations? Explain the basic concepts of conformational analysis taking ethane as an example.
13. Name the compounds and give their prefix, root word, primary suffix and secondary suffix of the following compounds.



14. Describe a method to determine the critical temperature and critical pressure.
15. State and verify Henry's law. Give its limitations.

III. Answer any THREE of the Following.

3X10=30

16. a) What are quantum numbers? Discuss the significance of principal and magnetic quantum numbers.
- b) What is primary standard? Mention the requirements of primary standard.
17. a) Explain SP^2 hybridization taking ethylene as an example.
- b) How can figuration of butenedioic acid is determined by anhydride formation.
18. a) Derive reduced equation of state from vander Waals equation.
- b) State Nernst distribution law and mention any two limitations.
19. a) Define critical solution temperature and give its application to
- i) Triethylamine –water system and ii) Nicotine-water system.
- b) Calculate the pH of 0.2M NH_4Cl K_b for $NH_4OH=1.8 \times 10^{-5}$ and $K_w=10^{-14}$.
20. a) Discuss the variation of Ionisation potential, electro positive character and oxidation states of alkali metals.
- b) What are reactive intermediates? Explain the formation and structure of carbocation.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.



First Semester B.Sc. Degree Examination Nov- 2019

A152: BOTANY

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Attempt all questions.
- 2) Draw labelled diagrams wherever necessary.

I. Answer any FIVE of the following:

5X2=10

1. Microtomy.
2. *Vicia*.
3. Cork cambium.
4. Annular ring.
5. Apomixes.
6. Hydathode.
7. Endothelium.

II. Answer any SIX of the following :

6X5=30

8. What is Phase contrast microscope? Explain its applications.
9. What are Meristem? Explain Tunica-Corpus theory.
10. With a neat labelled diagram explain Anatropous ovule.
11. Describe different types of vascular bundles.
12. Explain the structural features and functions of collenchymas tissue.
13. Write a note on Lacticiferous ducts.

15. Describe the pollenwall features.

III. Answer any THREE of the following:

3X10=30

16. Describe the Embryogeny in Dicot.
17. With a neat labelled diagram, describe the anomalous secondary growth in Bignonia stem.
18. Describe the Mechanical tissue system.
19. Describe the structure of Anther wall and add note on types of tapetum and their function.
20. Give an account of Double fertilization.



**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B. Sc Degree Examination Nov - 2019

A16: ZOOLOGY

Duration: 3 Hrs

Max Marks: 70

Instruction to Candidates

- 1) Attempt all questions.
- 2) Draw neat labelled diagrams wherever necessary

I. Answer any Five of the following.

5x2=10

1. Define Entamology.
2. What are flame cells?
3. What are spicules?
4. Assign the following to their respective phyla
a) Pinacocytes b) Nematocysts c) Nephridia d) Tube feet
5. Name any two larval stages of echinoderms.
6. What is metamerism?
7. Mention any two economic importance of Lac.

II. Answer any Six of the following.

6x5=30

8. Write a note on locomotion in protozoa.
9. Sketch and label Digestive system of leech.
10. Write the general characters of ctenophora.
11. Explain host-parasitic relationship of *Ascaris lumbricoides*.
12. Draw a neat labeled diagram of Male reproductive system of prawn.
13. Write a note on shell in Molluscs.
14. Explain Ascon type of canal system.
15. Sketch and label Reproductive system in *Taenia solium*.

III. Answer any Three of the following.

3x10=30

16. Explain digestive system of starfish with the help of a neat labeled diagram.
17. Write the general characters of phylum Annelida and classify upto classes with suitable example.
18. Describe the nervous system of pila with help of a neat labeled diagram.
19. Write the general characters of phylum Coelenterata and classify upto classes with suitable example.
20. Give an account on beneficial insects.



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**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B.Sc. Degree Examination Nov – 2019

A17: ELECTRONICS

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Attempt all Questions.
- 2) Draw diagrams, wherever necessary.

I. Answer any FIVE of the following

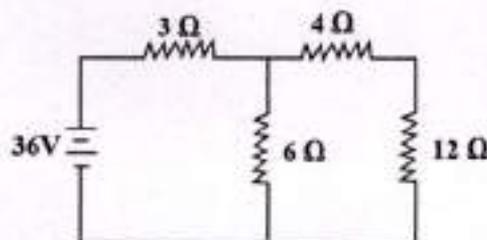
5x2=10

1. State current divider theorem.
2. What are ripple? What is the ripple factor of half wave rectifier?
3. Define transformer utilization factor (TUF).
4. Define stability factor(S), write expression.
5. Draw circuit diagram of transistor series voltage regulator.
6. What are optoelectronic devices? Give examples.
7. A transistor has $\alpha=0.98$, find the value of β .

II. Answer any SIX of the following.

6x5=30

8. State and prove maximum power transfer theorem.
9. With neat circuit diagram explain inductor filter.
10. Explain fixed bias method in detail.
11. Describe adjustable voltage regulator LM317.
12. Explain the construction and working photoconductive cell (LDR).
13. Calculate the current through resistance 12Ω in the below circuit diagram



14. For a transistor circuit $\alpha=0.99$, $I_{CO}=5\mu A$, $I_E=5mA$. Calculate I_C , I_B , β and I_{CEO} .
15. In the voltage divider bias circuit, if $R_1=10K\Omega$, $V_{CC}=15V$, $R_2=5K\Omega$, $R_C=1K\Omega$ and $R_E=2K\Omega$. Find the operating point for silicon transistor?

III. Answer any THREE of the following.

3x10=30

16. State and prove Reciprocity theorem.

17. In fullwave rectifier circuit show that

a) Efficiency (η) is 81.2% and **b)** ripple factor $\gamma = 0.48$.

18. Describe collector feedback bias method and hence derive an expression for stability factor.

19. Write short note on the following

a) IC78XX **b)** Transistor short voltage Regulator.

20. Explain construction, working and IV characteristics of Light Emitting Diode(LED).

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**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.**

First Semester B.Sc. Degree Examination Nov – 2019

A18: BIOTECHNOLOGY

Duration: 3 Hrs

Max Marks: 70

Instruction to candidates

- 1) Attempt all questions.
- 2) Draw neat labeled diagrams wherever necessary

I Answer any FIVE of the following.

5X2=10

1. Define Biotechnology.
2. Write a definition for chromatography.
3. What is chromosomal abnormality?
4. Define programmed cell death.
5. What is tumor?
6. State Beer Lambert's Law.
7. Define centrifugation.

II Answer any SIX of the following.

6X5=30

8. Give a note on chromosomal structural abnormalities.
9. Write functions of microtubule.
10. Explain cAMP dependent pathway.
11. Explain the process of active transport mechanism.
12. Write a note on density gradient centrifugation.
13. Explain paper electrophoresis.
14. With neat diagram explain the structure of chromosome.
15. Write the scope of Biotechnology.

III Answer any THREE of the following.

3X10=30

16. With neat diagram explain the process of mitosis.
17. Write principle and applications of NMR.
18. Give detailed account on compound microscope.
19. Explain thin layer chromatography and HPLC.
20. a) Define radioisotopes.
b) Explain the following.
 - i) Malditof.
 - ii) Isoelectric focusing

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KLE Society's
Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.

First Semester B.Sc. Degree Examination Nov- 2019
A19: COMPUTER SCIENCE

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Attempt all Questions.
- 2) Draw diagrams, wherever necessary.

I. Answer any FIVE of the following:**5x2=10**

1. Write any two applications of OOPs.
2. Define Class and Object.
3. What is copy constructor?
4. What is function prototype?
5. Mention any two advantages of inheritance.
6. Define polymorphism.
7. What is meant by pure virtual function?

II. Answer any SIX of the following:**6x5=30**

8. Write a note on data abstraction and data encapsulation.
9. Write a C++ program to check whether a given year is a leap year or not.
10. Explain base class and derived class with an example.
11. What is a friend function? What are the merits and demerits of using friend functions?
12. How do we invoke a constructor function? Explain with example.
13. What is function overloading? Explain with example.
14. Differentiate single and multiple inheritances with example.
15. Write a C++ program to find the length of string without using library function.

III. Answer any THREE of the following:**3x10=30**

16. How do you classify C++ control statements? Explain with syntax and example.
17. Explain access specifiers in C++ with example.
18. What are virtual functions? Explain with example.
19. What is exception handling? Explain three components of exception handling with syntax and example.
20. a) Write a note on static binding and dynamic binding.
b) Write a note on template with example.

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53KLE Society's

**Raja Lakhamagouda Science Institute (Autonomous),
Belagavi.****First Semester B.Sc. Degree Examination Nov- 2019****A20: MATHEMATICS: PAPER - I**

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Question paper has 3 sections. Answer all questions.
- 2) Simple Calculators are allowed.
- 3) Write all the intermediate steps and draw diagrams whenever necessary.

I Answer any FIVE of the following:**5x2=10**

1. Prove that $|x - y| \geq |x| - |y|$.
2. Discuss the continuity at $x=1$ of the following function

$$f(x) = \begin{cases} 5x - 4 & \text{for } 0 \leq x \leq 1 \\ 4x^2 - 3x & \text{for } 1 < x < 2 \end{cases}$$
3. Define continuity in an closed interval $[a, b]$.
4. Prove that $f(x) = \begin{cases} x \sin \frac{1}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$ is continuous at $x=0$ but not differentiable at $x=0$
5. Evaluate $\lim_{x \rightarrow 1} \left[\frac{2}{x^2 - 1} - \frac{1}{x - 1} \right]$.
6. Define Equivalent matrices with an example.
7. Define rank of matrix.

II Answer any SIX of the following:**6x5=30**

8. State and prove Archimedian property of real numbers.
9. If $\lim_{x \rightarrow a} f(x) = l$ and $\lim_{x \rightarrow a} g(x) = m$ where $m \neq 0$, then show that $\lim_{x \rightarrow a} \left[\frac{f(x)}{g(x)} \right] = \frac{l}{m}$.
10. Prove that continuous function in a closed interval is bounded.
11. Verify the Rolle's Theorem $f(x) = e^x(\sin x - \cos x)$ in $\left[\frac{\pi}{4}, \frac{5\pi}{4} \right]$.
12. State and prove Lagrange's Mean Value theorem.
13. Evaluate $\lim_{x \rightarrow \frac{\pi}{2}} (\tan x)^{\sin 2x}$.
14. Find the inverse of the matrix by the elementary operation $\begin{bmatrix} 1 & 6 & 4 \\ 0 & 2 & 3 \\ 0 & 1 & 2 \end{bmatrix}$.
15. Prove that Rank of a matrix is unaltered by multiplying the elements of row by a non-zero scalar.

III Answer any THREE of the following:

3x10=30

16. a) i) If $x, y, z \in \mathbb{R}$ then show that $x^2 + y^2 + z^2 \geq xy + yz + zx$.

ii) If $a, b, c \in \mathbb{R} \forall$ positive then show that $\frac{a+b+c}{3} > \sqrt[3]{abc}$.

b) Prove that limit of a function exists then it is always unique.

17. a) State and prove Intermediate value theorem.

b) Show that $f(x) = \frac{e^{\frac{1}{x}} - 1}{e^{\frac{1}{x}} + 1}$ for $x \neq 0$

$f(0) = 0$ is discontinuous at $x=0$

18. a) Verify cauchy's mean value theorem $f(x) = \sin x, g(x) = \cos x$ in $[a, b]$

b) Show that $x - \frac{x^2}{2(1+x)} > \log(1+x) > x - \frac{x^2}{2}$.

19. a) Show that $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots + (-1)^{n-1} \frac{x^{2n-1}}{(2n-1)!}$.

b) Evaluate $\lim_{x \rightarrow a} \left(2 - \frac{x}{a}\right)^{\tan \frac{\pi x}{2a}}$

20. a) Prove that interchanging any two rows of a matrix do not alter the rank of matrix.

b) Reduce the matrix $A = \begin{bmatrix} 1 & 0 & 1 & 1 \\ -1 & -2 & 1 & 3 \\ 3 & 2 & 1 & -1 \\ 1 & 4 & 5 & 9 \end{bmatrix}$ to its normal form & find its rank.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Nov-2019**A21: MATHEMATICS: PAPER – II**

Duration: 3 Hrs

Max Marks: 70

Instructions to candidates:

- 1) Question paper has 3 sections. Answer all questions.
- 2) Simple Calculators are allowed.
- 3) Write all the intermediate steps and draw diagrams whenever necessary.

I Answer any FIVE of the following:**5X2=10**

1. Define Countable set and Uncountable set.
2. State Factor theorem.
3. Find quotient and remainder when $3x^3 - 4x^2 + 2x + 1$ is divided by $x - 3$.
4. Find the n^{th} derivative of $\cos(ax+b)$.
5. Find the n^{th} derivative of $y = \sin^2 x$.
6. Find the reduction formula for $\int \cot^n x dx$
7. Write the expression of length of the perpendicular from pole to tangent.

II Answer any SIX of the following:**6X5=30**

8. Prove that an equivalence relation on a non-empty set A partitions into equivalence class.
9. Prove that every polynomial equation of n^{th} degree has exactly 'n' roots.
10. Find all the rational roots of $p(x) = 2x^4 + x^3 - 19x^2 - 9x + 9$.
11. Find the n^{th} derivative of $e^{ax} \sin (bx + c)$.
12. If $y = [\log (x + \sqrt{1 + x^2})]^2$ then show that $(1 + x^2)y_{n+2} + (2n + 1)xy_{n+1} - n^2y_n = 0$.
13. Deduce the Reduction formula for $\int \cos^n x dx$
14. If $I_n = \int_0^{\frac{\pi}{4}} \tan^n x dx$ then show that $I_n + I_{n-2} = \frac{1}{n-1}$.
15. With usual notations prove that $an\phi = r \frac{d\theta}{dr}$.

III Answer any THREE of the following:

3X10 = 30

16.a) If $\{A_\alpha : \alpha \in \Lambda\}$ be indexed family of sets, then prove that

$$(i) \left(\bigcup_{\alpha \in \Lambda} A_\alpha \right)' = \bigcap_{\alpha \in \Lambda} A_\alpha' \quad (ii) \left(\bigcap_{\alpha \in \Lambda} A_\alpha \right)' = \bigcup_{\alpha \in \Lambda} A_\alpha'$$

b) Prove that any countably infinite set can be made equivalent with a proper subset of itself.

17.a) Prove that the unit interval $[0, 1]$ is not countable

b) State and prove Rational Root theorem.

18.a) Solve cubic equation $28x^3 - 9x^2 + 1 = 0$ by Cardan's method.

b) Find n^{th} derivative of $\cos^4 x$.

19.a) Find the reduction formula for $\int_0^{\pi} \frac{\sin^4 \theta}{(1 + \cos \theta)^2} d\theta$.

b) Evaluate $\int \tan^8 x dx$.

20.a) Show that the curves $r = a(1 + \cos \theta)$ and $r = a(1 - \cos \theta)$ cut orthogonally

b) Find the pedal equation of the parabola $y^2 = 4a(x + a)$.
