K.L.E. Society's

Raja Lakhamagouda Science Institute

(Autonomous)

BELAGAVI.

SUBJECT

B.Sc. I - Semester

Dec-2016

QUESTION PAPER BOOKLET

Reg. No. | | | | | | | | |

KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc. Degree Examination Dec- 2016

A01: BASIC ENGLISH

Duration: 3 Hrs **Max Marks: 70**

CONFIDENTIAL - [illegible]/12/2016 - 9:00 AM

I. Answer the following questions in a word, a phrase or a sentence each: **1x10=10**

1. Which is the song that Ronnie always sings to his sister?
2. Which are the three fancy names of Astrologer given by a vendor?
3. What is the worthy name of 'Victor Prince'?
4. Name the writer of "The Mark of Vishnu".
5. What is the speciality of Vera?
6. What is one talent which is death to hide?
7. Who are the Gopi & Brinda in the poem 'A River'?
8. What was the man seeing when he sits in front of his own door at Sunset?
9. Who turned the face away from the poet?
10. What is the state of God?

II. Explain the Reference to context of the following
(One each from prose and poetry to be answered) **5x2=10**

a) 1) It is quite warm for the time of the year.
2) You and your warriors are a nice set of cowards!

b) 1) God doth not need either man's work, or His own gifts.
2) 'O Love! Shall sorrow or death conspire?

III. **10x1=10**

a) Explain the conversation between Guru Nayak and Astrologer.

OR

b) Discuss how Victor Prince becomes famous by his achievements.

IV. **10x1=10**

a) Critically appreciate the poem 'A River' by A. K. Ramanujan.

OR

b) How the poet expresses her sorrow of love towards her beloved one. Explain.

V. A) Fill in the blanks with appropriate articles **1x5= 5**

1. ____ apple a day keeps the doctors away.
2. It is ____ universal truth.
3. _____ Ganga is a holy river.
4. He waited for half _____ hour.
5. Kamala saw _____ accident.

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
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PTO

B) Fill in the blanks with appropriate prepositions 1x5=5

1. Smoking is injurious _____ health.
2. Savitri is suffering _____ cold.
3. He is fond _____ music.
4. The policeman ran _____ the robber.
5. The snake crawled _____ the hole.

VI.

A) Give the Synonyms of the following words 1x5=5

1. Beauty
2. Delicacy
3. Feeling
4. Ethnic
5. Necessary

B) Give the antonyms of the following words: 1x5=5

1. Bliss
2. Modest
3. Flexible
4. Polite
5. Kind

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VII. Read the passage carefully and answer the questions given below 2x5=10

Most of the land of Japan is mountainous. The highest mountain of Japan is the 'Fujiyama' at the top of which is an active Volcano. Rice is the main crop and is grown extensively in the south. It is planted in June and harvested in September. Then Wheat and Barley are grown in autumn and harvested in May. Tea is also grown on terraced hill-sides in the south of Japan. The formers of Japan are very hard working people. By the use of fertilizer, irrigation and terracing, these formers raise large crops. Being surrounded by the ocean, the Japanese are also good sea-faring people. They use advanced methods of fishing. They have motor-driver boats and the nets they use are huge, often kilo-meters long, and are made to hang like drifting curtains in the sea. The most important food of the people of Japan is rice and fish. The Japanese eat rice from bowls with chop sticks. They hold two sticks in one hand and pick the rice from the bowls.

1. What is the highest mountain of Japan?
2. What is the main crop of Japan & in which month it has planted?
3. What crops are grown in autumn?
4. Who are very hard working people?
5. What is the most important food of the people of Japan?

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Reg. No.

KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec- 2016

A02: KANNADA

Duration: 3 Hrs **Max Marks: 70**

ಭಾಷೆ ಮತ್ತು ಬರಹದ ಶುದ್ಧಿಗೆ ಗಮನ ಕೊಡಲಾಗುವುದು.

ಪ್ರ. 1. ಅಲ್ಲಮ ಪ್ರಭುದೇವರ ವಚನಗಳು 'ಮಾನವನ ಆತ್ಮ ಕಲ್ಯಾಣಕ್ಕಾಗಿಯೇ' ನಿರ್ಮಿತವಾಗಿವೆ ? ವಿವರಿಸಿರಿ

ಅಥವಾ

'ಗರತಿಯ ಹಾಡು'ಗಳಲ್ಲಿ ಬರುವ ವೈಶಿಷ್ಟತೆಗಳೇನು ವಿಶ್ಲೇಷಿಸಿರಿ. **10 ಅಂಕಗಳು**

ಪ್ರ. 2. ನರೇಂದ್ರನಾಥನು ಸ್ವಾಮಿ ವಿವೇಕಾನಂದರಾದದ್ದು ಹೇಗೆ ? ಬಣ್ಣಿಸಿರಿ.

ಅಥವಾ

ಸ್ವಾಮಿ ವಿವೇಕಾನಂದರ ಯುರೋಪ ಪ್ರವಾಸದಲ್ಲಿ ಆದ ಅನುಭವಗಳನ್ನು ಸಂಗ್ರಹಿಸಿ ಬರೆಯಿರಿ.

10 ಅಂಕಗಳು

ಪ್ರ. 3. **ಬೇಕಾದ ನಾಲ್ಕಕ್ಕೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.**

1) ಕರ್ಣನಿಗೆ ಕೃಷ್ಣನು ನೀಡಿದ ಉಪದೇಶಗಳು
2) ಪ್ರೀತಿ ಇಲ್ಲದ ಮೇಲೆ
3) ಅದ್ದೂರಿ ಶವ ಸಂಸ್ಕಾರ ಕವಿತೆಯ ಆಶಯ
4) ಶಾರದಾದೇವಿ
5) ಗುರು-ಶಿಷ್ಯರ ಸಂಬಂಧ
6) ಕೊಲಂಬೋದಿಂದ ಆಲ್ಮೋರಾಕ್ಕೆ **5x4=20 ಅಂಕಗಳು**

ಪ್ರ. 4. **ಬೇಕಾದ ಮೂರಕ್ಕೆ ಸಂದರ್ಭದೊಡನೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.**

1) ಲೋಕದಾಗಿರುವತನಕ ಬೇಕಾಗಿ ಇರಬೇಕ
2) ಎನಗೆ ನಿಮ್ಮಡಿಗಳಲಿ ಸಮಸೇವನೆಯ
3) ಒತ್ತಿಟ್ಟ ಭಾವನೆಗಳೆಲ್ಲ ಹರಳಾಗಿ ಬಿಟ್ಟಿರುತ್ತವೆ
4) "ಜಗತ್ತಿನಲ್ಲಿ ನಾವು ಹೇಗೆ ನಡೆದುಕೊಳ್ಳಬೇಕು"
5) ಸ್ವಾಮಿ ನೀವು ದೇವರನ್ನು ನೋಡಿದ್ದೀರಾ"?

5x3=15 ಅಂಕಗಳು

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(ಪು.ತಿ.ನೋ.)

ಪ್ರ. 5. ಒಂದೇ ವಾಕ್ಯದಲ್ಲಿ ಉತ್ತರಿಸಿರಿ.

1) ಶಿವ ಶಿವ ಎಂದರೆ ಯಾವುದು ಬಯಲಾಯಿತು.

2) 'ಮಧುರ ಚೆನ್ನ' ಈ ಕಾವ್ಯನಾಮ ಯಾರದು?

3) ಅಲ್ಲಮ ಪ್ರಭುದೇವರ ಹುಟ್ಟೂರು ಯಾವುದು?

4) ಐದು ಮಂತ್ರಗಳನ್ನು ಪಡೆದ ಲಲನೆಯ ಹೆಸರೇನು?

5) ಭಾನುವಂಶ ಲಲಾಮ ಯಾರು?

6) ಜಿ.ಎಸ್.ಎಸ್ ಇವರ ಪೂರ್ಣ ಹೆಸರೇನು?

7) 'ಪ್ರೀತಿ ಇಲ್ಲದ ಮೇಲೆ' ಕವನವನ್ನು ಯಾವ ಕವನ ಸಂಕಲನದಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?

8) ಮುದೇನೂರು ಸಂಗಣ್ಣ ಅವರ ಜನ್ಮಸ್ಥಳ ಯಾವುದು?

9) ಜಕ್ಕವ್ವ ಎಂಟಾಣೆ ಕೊಟ್ಟು ಏನು ಮಾಡಿಕೊಂಡಳು?

10) ಪ್ರತಿಭಾ ನಂದಕುಮಾರ ಅವರು ಬರೆದ ಕವಿತೆ ಯಾವದು?

11) ಸ್ವಾಮಿ ವಿವೇಕಾನಂದರ ತಂದೆ ತಾಯಿ ಹೆಸರೇನು?

12) ರಾಜಾ ರಾಮ ಮೋಹನರಾಯ ಸ್ಥಾಪಿಸಿದ ಸಮಾಜ ಯಾವುದು?

13) ಗದಾಧರ ಈ ಮೂಲ ಹೆಸರು ಯಾವುದು?

14) ಪ್ರಥಮ ವಿಶ್ವಧರ್ಮ ಸಮ್ಮೇಳ ಯಾವ ದೇಶದಲ್ಲಿ ಜರುಗಿತು?

15) ರವಿಂದ್ರನಾಥ ಠಾಕೂರರ ತಂದೆಯ ಹೆಸರೇನು? **1x15=15 ಅಂಕಗಳು**

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous)

Belagavi.

First Semester B.Sc. Degree Examination December - 2016

A03: HINDI

Duration : 3 Hrs **Max Marks : 70**

पाठ्य क्रम

"सदा गद्य-वाटिका

अनुवाद

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

प्र.I. सही उत्तर लिखिए (कोई दस) **1 X10=10**

1. 'ठाकुर का कुआँ' कहानी के कहानीकार कौन हैं?

   अ) प्रेमचंद ब) प्रसाद क) प्रभाकर

2. 'हरिहर' नामक स्थान कौनसे नदी के किनारे हैं?

   अ) कृष्णा ब) कावेरी क) तुंगभद्रा

3. जयशंकर प्रसाद जी की कहानी हैं?

   अ) मधुआ ब) दुर्मुख क) आरती साहा

4. जीनत उन्निसा बेगम के पिता है?

   अ) बाबर ब) अकबर क) औरंगजेब

5. कौनसी नदी के बाड में लेखक फँस गये?

   अ) डिखू नदी ब) गंगा नदी क) यमूना नदी

6. 'गेंहूँ बनाम गुलाब' निंबध के लेखक कौन का है?

   अ) महादेवी वर्मा ब) अज्ञेय क) श्रीरामवृक्ष बेनीपुरी

7. पुलिस का भेदिया कौन था?

   अ) फर्णीद्र मुखर्जी ब) रविंद्र मुखर्जी क) कविंद्र मुखर्जी

8. कौनसी नदी में आरती साहा ने तैरना सिखा?

   अ) हुगली ब) वापी क) तापी

9. त्यागवीर लिंगराज के सहपाठी थे?

   अ) शाहु महाराज ब) संभाजी महाराज क) शिवाजी महाराज

10. 'हिंदी दिवस' कब मनाया जाता है?

    अ) 14 जून ब) 14 सिंतबर क) 14 जुलै

11. 'गेरुसोप्पा जलप्रपात' कितनी ऊँचाई से गिरता हैं?

    अ) एक हजार फूट ब) दो हजार फूट क) तीन हजार फूट

12. 'दुर्मुख' कौन हैं?

    अ) कुत्ता ब) खरगोश क) बिल्ली

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प्र. II. किन्हीं दो की सप्रसंग व्याख्या कीजिए: **5X2=10**

1. "तुम झूठे हो! अभी तो तुम्हारे कपडे से महक आ रही हैं"।
2. "मैं उन लोगों तक आप के ये मुहब्बत भरे अल्फाज जरूर पहुँचा दुँगी"।
3. 'करो या मरो', घबराओ मत, जीत निश्चित हैं"।

प्र. III. किन्हीं दो प्रश्नों के सही उत्तर लिखिए: **10X2=20**

1. 'ठाकुर का कुआँ ' कहानी का सारांश लिखिए।
2. 'दुर्मुख' रेखाचित्र का सारांश लिखिए।
3. 'अपूर्व मूर्तिकला' पर अपने विचार स्पष्ट कीजिए ।
4. 'मधुआ' कथा पर अपने विचार बताइए।

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प्र.IV. किन्हीं तीन पर टिप्पणी लिखिए: **5X3=15**

1. त्यागवीर लिंगराज
2. आरती साहा
3. औरंगजेब
4. गंगी

प्र. V. हिन्दी में अनुवाद कीजिए: **15 X1=15**

The Taj Mahal 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 Shah Jahan. He built it in the memory of his wife mumtaz.

ತಾಜಮಹಲ ಒಂದು ಪ್ರಸಿದ್ಧ ಕಟ್ಟಡವಾಗಿದೆ. ಇದು ಜಗತ್ತಿನ ಅದ್ಭುತಗಳಲ್ಲೊಂದಾಗಿದೆ. ಇದು ಆಗ್ರಾದ ಯಮುನೆಯ ಬಲದಡದಲ್ಲಿದೆ. ಶಹಾಜಾನನು ಇದನ್ನು ಕಟ್ಟಿಸಿದ್ದಾನೆ. ಅವನು ತನ್ನ ಪತ್ನಿ ಮುಮತಾಜಳ ನೆನಪಿನಲ್ಲಿ ಇದನ್ನು ಕಟ್ಟಿಸಿದ್ದಾನೆ.

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Reg. No.

KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec - 2016

A04: ADDITIONAL ENGLISH

Duration: 3 Hrs **Max Marks: 70**

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
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I. Answer the following questions in a word, a phrase or a sentence each: **1x10=10**

1. Who is Georgina?
2. Who publishes the poems?
3. What was reason for demolishing the apartment?
4. How much compensation was offered to leave the apartment?
5. Who gives Jill 10 pound cheque?
6. What is the theme of 'The Never – Never Nest'?
7. Who is Keith?
8. What is meaning of title 'The First and The Last'?
9. What kind of comedy is Lord Byron's Love Letters?
10. Who had the letters of Byron?

II. Explain with reference to the context (any two) of the following **5x2=10**

1. What shall we call the volume? To Aurora or something like that, eh?
2. A ghoul who can rob a dead body ought to be in prison.
3. They're only too glad to loan you any amount you like, on note of hand alone.
4. He says he doesn't believe in life insurance.

III. **10x1=10**

a. Comment on the title How He Lied to Her Husband

OR

b. Sketch character of Wanda.

IV. **10x1=10**

a. How does the husband justify his wrecking operation?

OR

b. Explain how Jack and Jill manage to live a life.

V. Read the following passage carefully and match the words with their meanings given in the chart below **1x10=10**

Whether it's Marie Curie for her ground breaking research on radioactivity or Bill Gates for building a gaint of software that is lanparalleled to this day, being an innovator can also be more than creating something new. The word innovation conjures up images of a cool gadget or a quirkly creation. So on what terms can you break new ground and when is that supposed to happen? If your answer to that is today and every day, then you are absolutely, right. Innovation isn't just implemented for generation of a new product, but also for birthing a new process, a thought, a bit of knowledge and even packing of all these entities. Innovators are essentially explorer of countless opportunities and possibilities. If the mere spark of an idea can lead to the creation of a timeless software, so can a humdrum procedure, be redesigned and modified into a new approach.

Sl. No.	Word	Meaning
1	Conjures	To modify
2	Quirky	Click of idea
3	Birthing	Finder of new
4	Humdrum procedure	Something new
5	Software	Programming within structures
6	Radioactivity	Nuclear decay
7	Innovation	To make something appear
8	Spark	Something unconventional
9	Explorers	Having to do with it
10	Redesigned	Lacking excitement

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VI. a) Every summer there is a power cut in the city. Students face many difficulties as without they cannot study at night. Hence, it light has difficult for many people too. Give a suitable title for the same. **(5 marks)**

b) Prepare a slogan for Make in India. **(5 marks)**

VII. Assume that Mercedes Benz call the Post of Manager in your region. Hence, prepare a resume to apply for it. **(10 marks)**

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KLE Society's
Raja Lakhamagouda Science Institute
(Autonomous)
Belgaum
First Smester B.Sc. Degree Examination Dec-2016
A05: URDU

Max Marks: 70 **Duration: 3 Hrs**

نصابی کتاب: کاروان ادب (حصہ نثر و نظم)

ہدایات : تمام سوالات لازمی ہیں۔ ہر سوال کے نشانات بائیں جانب درج ہیں

سوال نمبر۱: کوئی پانچ سوالات کے جوابات دو یا تین جملوں میں لکھیے۔ **5×2= 10**

۱) کلثوم زمانی بیگم اور اس کے شوہر نے حیدرآباد پہنچ کر پیٹ بھرنے کا کیا حیلہ کیا؟

۲) مکہ معظمہ پہنچنے پر کلثوم زمانی بیگم اور ان کے شوہر کے ٹھہرنے کا کیا انتظام ہوا؟

۳) غالب کے خطوط کی دو اہم خصوصیات بیان کیجیے؟

۴) غالب نے میر مہدی کے نام خط میں دلی میں برسات کا حال مجملاً کن الفاظ میں بیان کیا ہے؟

۵) گیسو اور مادھو کیا کام کرتے تھے؟

۶) ایک انگریز لڑکی فیض احمد فیض کو کس حوالے سے جانتی تھی؟

۷) احمد شاہ پطرس بخاری کو صبح سویرے کون جگایا کرتے اور کیوں؟

سوال نمبر۲: مندرجہ ذیل سے کسی ایک پر تبصرہ کیجیے۔ **1×10= 10**

۱) کفن

۲) فیض احمد فیض

سوال نمبر۳: بحوالہ متن کسی چار کی وضاحت کیجیے۔ **3×4= 12**

۱) ''اب ہم ایک بڑے سلطان کے دربار میں آئے ہیں۔ ہم کو کسی دوسرے سلطان کی پرواہ نہیں۔''

۲) ''آج سے تو میری بہن اور میں تیرا بھائی''

۳) ''برسات کا حال نہ پوچھو خدا کا قہر ہے۔ قاسم خاں کی گلی سعادت خاں کی نہر ہے۔''

۴) ''کیسا برا رواج ہے کہ جسے جیتے جی تن ڈھانکنے کو چیتھڑا نہ ملے، اسے مرنے پر نیا کفن چاہیے۔''

۵) ''میں ادب کی طالبہ ہوں وکٹر کیرنن نے فیض کی شاعری کا جو ترجمہ کیا ہے وہ میری نظر سے گذر چکا ہے۔ فیض کی شاعری مجھے بہت پسند ہے۔''

۶) ''علی باقر کا گھر نہ صرف ایرپورٹ سے قریب ہے بلکہ بھوپال سے بھی قریب ہے۔''

۷) صبح اُٹھنا تو محض ذرا سی بات ہے۔ ہم تو یوں ہی اس سے ڈرا کرتے تھے۔''

سوال نمبر ۴: کسی چار اشعار کی تشریح کیجئے۔ 4×4= 16

۱) نازکی اس کے لب کی کیا کہئے پنکھڑی ایک گلاب کی سی ہے

۲) تم میرے پاس ہوتے ہو گویا جب کوئی دوسرا نہیں ہوتا

۳) ہو عمر خضر بھی تو ہو معلوم وقت مرگ ہم کیا رہے یہاں ابھی آئے ابھی چلے

۴) نازاں نہ ہو خرد پر جو ہونا ہے ہو وہی دانش تری، نہ کچھ مری دانش وری چلے

۵) نکالو نہ رخنے نسب میں کسی کہ نہیں اس سے کوئی رذالت زیادہ

۶) فرشتے سے بہتر ہے انسان بننا مگر اس میں پڑتی ہے محنت زیادہ

۷) نہ ایمائے خواہش نہ اظہار مطلب مرے منہ کو اہل کرم دیکھتے ہیں

۸) آبادی بھی دیکھی ہے ویرانے بھی دیکھے ہیں جو اُجڑے اور پھر نہ بسے، دل وہ نرالی بستی ہے

سوال نمبر ۵: کسی ایک نظم کا خلاصہ لکھئے۔ 10×1= 10

۱) آنا دال

۲) جدید ترقیات

۳) قید خانے کی رات

سوال نمبر ۶: کسی دو پر نوٹ لکھئے۔ 2×6= 12

۱) کلثوم زمانی بیگم

۲) مرزا غالبؔ

۳) مادھو

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous)

Belagavi

First Semester B.Sc. Degree Examination Dec - 2016

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.

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
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I. Answer any FIVE of the following **2X5=10**

1. Distinguish between finite and infinite population.
2. Specify the types of diagrams.
3. What do you mean by raw data and grouped data?
4. What do you mean by quartiles? Write the formula for Q_2.
5. What is the HM of 2, 5 and 1?
6. Define moments about mean and origin.
7. If a = 4, b = 2 and V(x) = 4, find V(ax + b).

II. Answer any SIX of the following **5X6=30**

8. What are the general rules used in the construction of frequency distribution?
9. What is diagrammatic presentation of the data? Explain the construction of pie diagrams.
10. Find the AM and Variance of the first 'n' natural numbers.
11. What are the various measures of dispersion? Distinguish between absolute and relative measures of dispersion.
12. For a distribution, Bowley's coefficient of skewness is -0.13, Q_3 = 13.42 and Median (Q_2) = 12.3. What is the value of first quartile (Q_1) and Quartile deviation?
13. Define: i) Axiomatic probability
    ii) Equally likely events
    iii) Independent events
14. State and prove addition theorem of Expectation for two random variables and generalize the theorem.
15. State the properties of MGF and prove any one of them.

III. Answer any THREE of the following **10X3=30**

16. State and prove the properties of AM.

17. **a)** What are the tests of skewness? Mention the various measures of skewness.

    b) Define the terms: **i)** Symmetry

    ii) Harmonic mean

    iii) Coefficient of variation.

18. With usual notations show that

    i) $P(\phi) = 0$

    ii) $0 \leq P(A) \leq 1$

    iii) $P(\overline{A}) = 1 - P(A)$

19. **a)** Define covariance between two random variables X and Y, then show that $cov(aX, bY) = ab\ cov(XY)$.

    b) If X and Y are the two random variables, then show that $V(X-Y) = V(X) + V(Y) - 2\ cov(X\ Y)$

20. A continuous random variable X has the following pdf $f(x) = k(2x+1)$; $1 \leq x \leq 3$ determine k and hence find mean and variance.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc. Degree Examination Dec– 2016

A12: 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: **2 x 5 = 10**

1. If $\mathbf{a} \cdot \mathbf{b} = 0$ then prove that either $\mathbf{a} = 0$ or $\mathbf{b} = 0$.
2. Discuss the continuity of the the function

$$f(x) = \begin{cases} \sin\frac{1}{x} & \text{when } x \neq 0 \\ 0 & \text{when } x = 0 \end{cases}$$

3. Define removable continuity and give example.
4. Find the n^{th} derivative of $\cos(ax+b)$
5. Find the n^{th} derivative of $\sin^2 x$
6. State Cauchy's Mean Value theorem.
7. Evaluate $\lim_{x \to \frac{\pi}{2}} (\sec x - \tan x)$

II. Answer any SIX of the following: **5 x 6 = 30**

8. Prove that $|x + y| \leq |x| + |y| \quad \forall x, y \in \mathbb{R}$.
9. If $\lim_{x \to a} f(x) = l$ then prove $\lim_{x \to a} \frac{1}{f(x)} = \frac{1}{l}$
10. State and prove Intermediate Value theorem.
11. If $y = e^{m\sin^{-1}x}$ then prove that $(1 - x^2)\, y_{n+2} - (2n + 1)xy_{n+1} - (n^2 + m^2)\, y_n = 0$.
12. Find the n^{th} derivative of $e^{ax} \sin(bx + c)$
13. State and prove Rolle's Theorem.
14. Find the Maclaurin's series for $\tan^{-1} x$.
15. Evaluate $\lim_{x \to 0} \left[\frac{a}{x} - \cot\frac{x}{a}\right]$

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III. Answer any THREE of the following: 10 x 3 = 30

16. a) State and prove Archimedean property of real numbers.

b) Evaluate $\lim\limits_{x \to a} \left[2 - \frac{x}{a}\right]^{\tan\frac{\pi}{2a}}$

17. a) State and prove Leibnitz's theorem for the n^{th} derivative of product of two functions.

b) Find the n^{th} derivative of $x^3 \cos 3x$ by using Leibnitz's theorem.

18. a) State and prove Lagrange's Mean Value theorem

b) Verify Lagrange's Mean Value theorem for the function $\log x$ in $[1,e]$.

19. a) Verify Cauchy's Mean Value theorem for the function e^x and e^{-x} in $[a,b]$.

b) If $f(x)$ is continuous in a closed interval $[a,b]$ then for a given $\varepsilon > 0$ the interval can be divided into finite number of sub intervals such that $|f(x_1) - f(x_2)| < \varepsilon$, whenever x_1 and x_2 are any two points in the same sub interval.

20. a) Prove that if f is continuous at c **then** $|f|$ is also continuous at **c.** Is the converse true? Justify your answer.

b) Find **A, if** $f(x)$ is continuous at $x = 6$

$$f(x) = \frac{x^3+2x^2+x+2}{x^2+x-2}, \quad \text{when } x \neq -2$$

$$= A, \quad \text{when } x = -2$$

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc. Degree Examination Dec – 2016

A12: 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: **2 x 5 = 10**

1. Define 'Partition' of a set.

2. State 'Fundamental Theorem of Algebra'.

3. Find the quotient and remainder when $\mathbf{x^4 - 4x^3 + 2x + 1}$ **is divided by** $\mathbf{x + 2}$.

4. Find the minor of -4 and co –factor of 6 of $\begin{vmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{vmatrix}$.

5. Define skew – symmetric determinant and give an example.

6. Find the rank of matrix $\mathbf{A} = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ by elementary transformations.

7. Separate into real and imaginary parts of $\mathbf{e^{\cosh(x+iy)}}$.

II. Answer Any SIX of the following: **5 x 6 = 30**

8. Prove that the unit interval **[0, 1]** is not countable.

9. State and prove Rational Root Theorem.

10. Use synthetic division to express the polynomial $\mathbf{x^4 + 2x^3 + 6x^2 - 8x + 4}$ in powers of $\mathbf{x - 2}$.

11. Show that $\Delta = \begin{vmatrix} 1 & a & a^2 & 0 \\ 0 & 1 & a & a^2 \\ a^2 & 0 & 1 & a \\ a & a^2 & 0 & 1 \end{vmatrix} = \mathbf{1 + a^4 + a^8}$.

12. Find the rank of the matrix $\begin{bmatrix} 1 & 1 & 1 & 2 \\ 2 & 1 & -3 & -6 \\ 2 & 3 & 1 & 4 \\ 3 & 0 & 2 & 1 \end{bmatrix}$ by elementary transformations.

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 PTO

13. Find the inverse of $A = \begin{bmatrix} 3 & 5 & 7 \\ 2 & -3 & 1 \\ 1 & 1 & 2 \end{bmatrix}$

14. Prove that $-256 \sin^7\theta \cos^2\theta = \sin 9\theta - 5\sin 7\theta + 8\sin 5\theta - 14\sin\theta$

15. If $x + iy = \cosh(u+iv)$, show that

i) $\dfrac{x^2}{\cosh^2 u} + \dfrac{y^2}{\sinh^2 u} = 1$ ii) $x^2\sec^2 v - y^2\operatorname{cosec}^2 v = 1$.

III Answer Any THREE of the following: **10 x 3 = 30**

16. a) Define union of indexed family of sets and prove that $\left(\bigcup_{\alpha\in I} A_\alpha\right)' = \bigcap_{\alpha\in I} A'_\alpha$ for an indexed family of sets $\{A_\alpha\}_{\alpha\in I}$

b) Prove that an equivalence relation on a set A partitions it into equivalence classes.

17. a) Prove that every polynomial equation of n^{th} degree has exactly n rooms, upto multiplicity of roots.

b) Solve the equation $6x^3 - 11x^2 - 3x + 2 = 0$, if the roots are in **H.P.**

18. a) "A skew symmetric determinant of

i) Even order is a perfect square

ii) Odd order vanishes. Prove these.

b) Find the rank of $A = \begin{bmatrix} 1 & 2 & 0 & -1 \\ 3 & 4 & 1 & 2 \\ -2 & 3 & 2 & 5 \end{bmatrix}$ by reducing it to normal form.

19. a) Prove that the rank of a matrix is unaltered by multiplying the elements of a row by a non – **zero** scalar.

b) Prove that the system of equations: $x + y - z = 7$, $3x - 5y + 2z = 8$, $kx - 4y + z = 15$ has infinitely many solutions for $k = 4$ and a unique solution for any other value of '**k**'.

20. a) Sum to infinity: $\cos\theta + \dfrac{\sin\theta}{1!}\cos 2\theta + \dfrac{\sin^2\theta}{2!}\cos 3\theta + \ldots$

b) If $\cos(\theta + i\phi) = R(\cos\alpha + i\sin\alpha)$, prove that $2\phi = \log\dfrac{\sin(\theta-\alpha)}{\sin(\theta+\alpha)}$

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec - 2016

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: 2X5=10

1. What are inertial and non inertial frames of reference?
2. What is coriolis force?
3. What are forced vibrations?
4. State Newton's law of gravitation.
5. Write the relation connecting K,η and Y, where symbols have their usual meaning.
6. Find the excess of pressure inside a spherical drop of water of radius 1 mm. Surface tension of water is 73×10^{-3} N/m.
7. Calculate the moment of inertia of a flywheel of mass 72 k.g and radius 0.5 m.

II. Answer any SIX of the following : 5X6=30

8. Write a note on centre of mass.
9. Derive an expression for bending moment of a beam.
10. Obtain the differential equation for damped vibrations.
11. Obtain an expression for moment of inertia of an solid cylinder about an axis passing through its centre and perpendicular to its own axis of cylindrical symmetry.
12. Explain the effect of temperature and impurity on the surface tension.
13. Calculate the viscosity of given liquid when a steel ball of radius 5×10^{-4} m falls through it with a terminal velocity 30 m s^{-1}.
14. In Helmholtz resonator, the resonating volume is 90×10^{-5} m^3 when the frequency of the tuning fork is 512 H_2. Calculate the resonating volume for a tuning fork of frequency 480 Hz.
15. Calculate the young's modulus of the material if rigidity modulus is 4.2×10^{10} N/m^2 and bulk modulus is 1.4×10^{10} N/m^2.

III. Answer any THREE of the following: 10X3=30

16. Derive the Galilean transformation equations of position and length.
17. Write the theory of Helmholtz resonator.
18. What is compound pendulum? Derive an expression for the periodic time of a compound pendulum.
19. State and prove Kepler's second law of planetary motion.
20. Derive Poiseuille's formula for the flow of viscous fluid through a narrow tube.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec - 2016

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***

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
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I. Answer any FIVE of the Following. **2X5=10**

1. Calculate the oxidation number of S in H_2SO_4.
2. Define mole fraction.
3. What are addition reactions? Give an example.
4. Write the IUPAC name of the following compounds.

i) $CH_3-\overset{Br}{\overset{|}{CH}}-CH_2-\overset{O}{\overset{\|}{C}}-H$ ii) $CH_3-\overset{CN}{\overset{|}{CH}}-CH_2-CH_2-\overset{O}{\overset{\|}{C}}-OH$

5. Calculate the degree of hydrolysis of 0.01M NH_4Cl at 25 ^0C, given that the dissociation constant of Ammonium hydroxide is $1.8x10^{-5}$ and ionic product of water is 10^{-14}.
6. Define collision diameter.
7. Define Critical volume.

II. Answer any SIX of the Following. **5X6=30**

8. What are quantum numbers? Explain the significance of principal and magnetic quantum numbers.
9. Write a note on s and d block elements.
10. Write the postulates of Bohr's model of an atom.
11. What are carbocations? Explain the structure of carbocation?
12. Explain Homolytic and Heterolytic fission with examples.
13. Explain Epimers and Enantiomers with examples.
14. Define solubility of a solid. Explain the factors influencing the solubility.
15. How are critical Pressure and critical temperature determined experimentally?

III. Answer any THREE of the Following. **10X3=30**

16. **a)** Explain Hund's rule and Pauli's Exclusion Principle with an example each.

    b) How is zinc estimated by complexometric titration using standard EDTA?

17. **a)** Explain the stability of carbanions based on Inductive effect and Resonance effect.

    b) Explain SP^3 hybridization taking ethane as an example.

18. **a)** Derive an expression for hydrolysis constant and degree of hydrolysis of salt of weak acid and strong base.

    b) Define Critical Solution Temperature. Explain application of CST to "Phenol –Water system".

19. **a)** Derive the expressions for critical constants V_c, P_c and T_c from Vander Waals equation.

    b) Derive Nernst Distribution Law thermodynamically. **[6+4]**

20. **a)** Explain the Anomalous Behaviour of Lithium and Beryllium.

    b) Write a note on Walden Inversion.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec- 2016

A15: 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: **2X5=10**

1. Meristems.
2. Chlorenchyma
3. Cystolith
4. Tapetum
5. MGU
6. Endosperm
7. Bast fibres.

II. Answer any SIX of the following : **5X6=30**

8. Explain phloem with neat labeled diagram.
9. Explain Dicot Root with neat labeled diagram.
10. What is Anatropous ovule? Draw a neat labeled diagram.
11. Describe Dicot Embryo.
12. Describe anomalous secondary growth in Boerhaavia.
13. Explain Glandular and Amoeboid tapetum with neat labeled diagram.
14. Explain Heart wood and sap wood with diagram.
15. Explain structure and functions of sclerenchyma.

III. Answer any THREE of the following: **10X3=30**

16. Describe the types of vascular bundles.
17. Describe the dermal tissue systems.
18. Describe megasporogenesis.
19. Give an accound of development of Male Gametophyte.
20. Describe the secondary growth in Dicot stem.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc Degree Examination Dec- 2016

A16: ZOOLOGY

Duration: **3 Hrs** Max Marks: **70**

Instruction to Candidates

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

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.

I. Answer any Five of the following. **2x5=10**

1. What is taxonomy?
2. Mention the types of Nephridia.
3. What are acoelomate aminals? Mention examples.
4. Sketch and label flame cells.
5. What is cephalisation?
6. Name the classes of phylum platyhelminthes.
7. What is parthenogenesis?

II. Answer any Six of the following. **5x6=30**

8. Explain the externals of hydra with a neat labeled diagram.
9. Explain nutrition in protozoans.
10. Sketch and label digestive system of liverfluke.
11. Explain gemmules in sponges.
12. Write a note on shell in mollusca.
13. Write the general characters of phylum Annelida.
14. Explain digestive system in star fish with a neat labeled diagram.
15. Explain the structure of Ascaris with a neat labeled diagram.

III. Answer any Three of the following. **10x3=30**

16. Sketch and label Reproductive system in earthworm with a neat labeled diagram.
17. Explain Nervous system of unio with a neat labeled diagram.
18. Explain the life history of sycon with diagram.
19. Write the general characters of phylum echinodermata and classify upto classes with suitable examples.
20. Explain circulatory system in cockroach with a neat labeled diagram.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous), Belagavi.

First Semester B.Sc. Degree Examination Dec – 2016

A17: ELECTRONICS

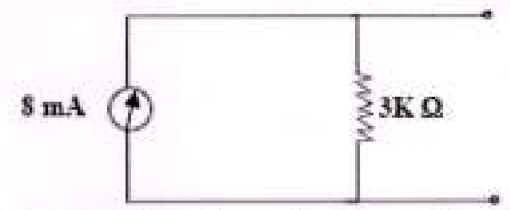
Duration: **3 Hrs** Max Marks: **70**

Instructions to candidates:

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

I. Answer any FIVE of the following **2x5=10**

1. Convert the constant current source into equivalent voltage source.



2. Define PIV. Mention its value for Half Wave Rectifier.

3. Prove that $\beta=\alpha/(1-\alpha)$.

4. Draw schematic symbol of an N-channel and P-channel Depletion Mode MOSFET.

5. What is a relay? Mention its uses.

6. What is a transducer? Write different types.

7. What are Ultrasonic Waves? Give any two applications of Ultrasound scan.

II. Answer any SIX of the following. **5x6=30**

8. State and prove Reciprocity Theorem.

9. A generator develops 250volts and has an internal resistance of 100Ω, find the power delivered to a load of **i)** 150 Ω **ii)** 300 Ω.

10. With a neat circuit diagram and wave forms explain Positive Unbiased Clipper.

11. Following current readings are obtained in a transistor circuit, I_E=2mA and I_B=20μA.Compute the values of I_C, α and β.

12. Explain the construction and working of N-channel FET.

13. With a neat diagram describe the construction and working of Photodiode.

14. A metallic strain gauge with K=3 is bonded to a steel member which is subjected to a stress of 11×10^9 N/m^2 .If modulus of elasticity for steel is 21×10^{12} N/m^2, calculate the fractional change in the resistance of the gauge to the applied stress.

15. Write a short note on Thermistor.

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III. **Answer any THREE of the following.** **10x3=30**

16. State and prove Superposition Theorem.

17. **a)** Describe the working of Half Wave Rectifier.

b) Show that Ripple Factor of HWR is 1.21. **(5+5)**

18. Explain Input and Output characteristics of CE configuration with neat circuit diagram and nature of graphs

19. Describe the construction and working of the following.

a) Photovoltaic Cell

b) LED. **(5+5)**

20. Draw and explain the block diagram of CRO.

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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B. Sc Degree Examination Dec – 2016

A18: BIOTECHNOLOGY

Duration: 3 Hrs | Max Marks: 7

Instruction to candidates
1) Attempt all questions.
2) Draw neat labeled diagrams wherever necessary

I Answer any FIVE of the following. **2X5=10**

1. Define chromatography.
2. State Beer Lambert's law.
3. What is embedding?
4. What is cell signalling?
5. Define cell senescence.
6. Define cell division.
7. Expand SDS-PAGE & NMR.

II Answer any SIX of the following. **5X6=30**

8. Explain gel filtration chromatography.
9. Write a note on Na^+ and K^+ transport.
10. Write a note on Giant chromosomes.
11. Write a note on principle and applications of GLC.
12. Explain the features of active transport mechanism.
13. Explain the functions Meiosis and Mitosis.
14. Write a note on agarose gel electrophoresis.
15. Explain ultra centrifugation in brief and mention its applications.

III Answer any THREE of the following. **10X3=30**

16. Explain the technique of paper chromatography. Add a note on its applications.
17. Explain the types and applications of electron microscope.
18. With neat labelled diagrams explain the process of mitosis.
19. Write a note on scope and branches of biotechnology.
20. **(i)** Define Radioisotopes.
    (ii) Explain the following
    a) Flame photometry.
    b) Atomic absorption.

Important Note: 1. On completing answers, compulsorily draw diagonal lines on the remaining blank pages.
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KLE Society's

Raja Lakhamagouda Science Institute (Autonomous),

Belagavi.

First Semester B.Sc. Degree Examination Dec- 2016

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: **2X5=10**

1. Expand ANSI and ASCII.
2. Define Compiler and assembler.
3. What are data types in C? Mention basic data types.
4. What is associatively and precedence of the operators?
5. Define array. How do you declare 1Dimensional array?
6. Write syntax and example for If Else statement.
7. Write any four built in mathematical function with purpose.

II. Answer any SIX of the following : **5X6=30**

8. Explain any five input devices.
9. Subtract using 2's compliment $1581_{(10)}$-$1023_{(10)}$
10. Explain different symbols used in flowchart.
11. What is a variable? And what are the rules to declare a variable?
12. Explain different constants available in C.
13. Differentiate while and do while statement.
14. Explain any five string handling functions with an example for each.
15. Distinguish structure and union.

III. Answer any THREE of the following: **10X3=30.**

16. Explain the characteristics of computer.
17. Explain different operators available in C language.
18. Explain basic structure of C program with an example program.
19. Write C program to find the sum of two compatible matrices.
20. Explain different categories of functions available in C.

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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.

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