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F – 1800

Reg. No. : .....

Name : .....

**First Semester B.A./B.Sc./B.Com. Degree Examination, November 2018**  
**First Degree Programme under CBCSS**  
**Language Course – 1**  
**EN 1111.1/EN 1111.2/EN1111.3 : LISTENING, SPEAKING AND READING**  
**(Common for B.A./B.Sc. EN 1111.1, B.Com. EN 1111.2 and Career Related**  
**2(a) EN 1111.3)**  
**(2016 Admission onwards)**

Time : 3 Hours

Max. Marks : 80

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

- 1) How many syllables are there in the word 'teacher' ?
- 2) Write down two common expressions for polite request.
- 3) What is a voiced sound ?
- 4) Write a word where /l/ is silent.
- 5) Write the pronunciation of 'cc' in the word 'occasion'.
- 6) Write a word where /a:/ occurs initially.
- 7) Write the syllabic structure of the word 'cat'.
- 8) Write the phonetic symbol that stands for the letters 'ay' in the word 'day'.
- 9) Name the Queen's ladies-in-waiting in "Under Fire".
- 10) Who is Abel Merryweather going to marry ? **(10×1=10 Marks)**

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

- 11) What are the advantages of reading ?
- 12) What is phonics ?
- 13) What is scanning ? Give two examples.
- 14) You are seeking information about a tourist centre. Write a dialogue between you and the information officer.
- 15) You are in a theatre to watch a movie. You meet one of your old schoolmates there. Construct a dialogue between you and your schoolmate.

P.T.O.



16) Write polite requests for the following situations :

- 1) Open the door
- 2) Observe silence.

17) Transcribe the following words :

- 1) Sound
- 2) Mother.

18) What is Received Pronunciation ?

19) What is the difference between listening and hearing ?

20) Why does Macready want to go back to England ?

21) How do Gaultier and Marion respond when Jean and Pierre beg for food ?

22) What advice does the Chief Inspector of Police give to the royal couple ?

**(8x2=16 Marks)**

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

23) Illustrate the greed of two sisters in "The Dear Departed".

24) What is the difference between intensive reading and extensive reading ?

25) Transcribe the following words : tour, break, woman, sugar, doctor, colour, earth, journey.

26) Complete the conversation given below :

Rohit : Hello, Benny ! How are you ?

Benny : I am fine, thank you. How about you ?

Rohit : \_\_\_\_\_

Benny : Oh, I've been busy \_\_\_\_\_ next week ?

Rohit : \_\_\_\_\_ ?

Benny : We're going to attend an inter-school competition there.

Rohit : \_\_\_\_\_ ?

Benny : It is a national chess competition.

Rohit : \_\_\_\_\_ ?

Benny : Three of us, \_\_\_\_\_

Rohit : \_\_\_\_\_ ?

Benny : We're leaving on Friday evening.



Rohit : \_\_\_\_\_ ? By air ?

Benny : No. \_\_\_\_\_

Rohit : When is the tournament ?

Benny : \_\_\_\_\_

Rohit : \_\_\_\_\_ ?

Benny : We'll be back on Thursday.

Rohit : All the best ! Hope you win the tournament.

- 27) You are Neeraja. You are an official at a Railway Station. A traveller has come to enquire about the departure of a train. Construct a dialogue between you and the customer.
- 28) What are the barriers to listening ?
- 29) Imagine the following roles viz. those of a Customer and Bank Official and do as directed.

Customer	Bank Official
Enters the Bank, meets the bank official	Greet the customer, welcomes him into his cabin and offers him a seat
States the purpose of his visit; he needs a vehicle loan	Makes enquires about income proof, ID proof, security etc., gives him the application form
Collects the papers	Asks the customer to come with all the relevant documents soon
Expresses gratitude	Closes conversation

- 30) Scan the following poem and find answer to the following questions.

"Nature" is what we see –  
 The Hill – the Afternoon –  
 Squirrel – Eclipse – the Bumble bee –  
 Nay – Nature is Heaven –  
 Nature is what we hear –  
 The Bobolink – the Sea –  
 Thunder – the Cricket –  
 Nay – Nature is Harmony –



Nature is what we know –  
 Yet have no art to say –  
 So impotent Our Wisdom is  
 To her Simplicity.

- 1) Discuss the theme of the poem.
- 2) Give an appropriate title to the poem.
- 3) Comment on the use of punctuation marks in the poem.
- 4) Comment on the last two lines of the poem.

31) Read the passage intensively and answer the following questions.

A beaver family makes its own pond by building a dam. First the beavers use their teeth to chop down the trees. They take bites from the trunk until the tree falls over. Then the beavers drag branches and small logs to the spot where they want to make their dam. They pile them up. The dam slows the stream's flow. The backed-up stream becomes a pond. The beavers make their home, called a lodge, in the middle of the pond. Inside their lodge, beavers build a floor above the water. The busy beavers can rest at home – safe, warm and dry. The entrance to the beavers' lodge is underwater. Beavers are expert swimmers. They dive and swim to get inside.

- 1) What is the passage about ?
- 2) What is a lodge ?
- 3) How do beavers make their own pond ?
- 4) How do beavers get inside their home ?

**(6×4=24 Marks)**

IV. Answer **any two each** in about **300** words :

- 32) What is reading ? What are the sub-skills of reading ?
  - 33) Write an appropriation to the poem "Greater Love" by Wilfred Owen.
  - 34) Transcribe the following words : happy, length, language, phonetics, remember, crash, tooth, brother, room, teacher, river, wing, machine, chemical, finger.
  - 35) You are a parent. You are asked to meet the class teacher of your child. You visit the school. You see the peon and ask about the location of the staffroom. You are meeting the class teacher and talk about your child. The teacher is mentioning about the special talents of your child in clay modeling. You are advised to meet the art teacher. You meet the teacher and talk with her. Construct three sets of dialogues. **(15×2=30 Marks)**
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Reg. No. : .....

Name : .....

**First Semester B.Sc. Degree Examination, November 2018**  
**First Degree Programme Under CBCSS**  
**PY 1131.3 : MECHANICS AND PROPERTIES OF MATTER**  
**Complementary Course for Statistics**  
**(2018 Admission)**

Time : 3 Hours

Max. Marks : 80

PART – A

Answer **all** questions. **Each** question carries **one** mark.

1. Define radius of gyration.
2. Write the relation between angular momentum and moment of inertia.
3. Define Simple Harmonic Motion.
4. What are standing waves ?
5. Distinguish between longitudinal and transverse waves.
6. What do you mean by a cantilever ?
7. What is compressibility ?
8. A spring is made of steel and not of copper. Why ?
9. Define Surface tension. Give its unit and dimension.
10. Define terminal velocity.

PART – B

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

11. State and prove parallel axis theorem.
12. Define moment of inertia of a rigid body. Give the MI for an annular disc about an axis passing through its centre and perpendicular to its plane.

P.T.O.



13. What are torsional oscillations ? Write the equation for  $g$  by torsional oscillations.
14. Show that the total energy of a simple harmonic oscillator is a constant.
15. When a wave travels from one medium to another, does the wavelength or frequency change ? Explain.
16. Explain the factors on which the frequency of a stretched string depends ?
17. Define Bending moment. Obtain the equation.
18. Draw and explain the stress-strain graph.
19. Define Young's modulus of the material of a uniform bar and obtain its general formula.
20. Distinguish between adhesive force and cohesive force.
21. Define surface tension. How it is related to Surface Energy ?
22. Derive Stokes law using the method of dimensions.

#### PART – C

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

23. A solid cylinder of mass 20 kg rotates about its axis with an angular speed of 100/s. The radius of the cylinder is 0.25 m. What is the KE associated with the rotation of the cylinder ?
24. A uniform ring of radius 0.5 m has a mass of 10 kg and a circular disc of the same radius has a mass of 5 kg. Which body will have greater moment of inertia about its axis perpendicular to its plane ?
25. A block of mass 680 g is tied to a spring whose spring constant  $k$  is 65 N/m. The block is pulled a distance of 11 cm from the equilibrium position at  $x = 0$  on a frictionless surface and released from rest at  $t = 0$ . What are the angular frequency, the frequency and the period of the resulting motion ?
26. A mass of 12 kg suspended by a spring oscillates with amplitude 3 cm and frequency 2 Hz. What is the elastic restoring force when the mass is at the lowest position ?
27. A steel rod, 1 m long is clamped at the middle. Fundamental frequency of longitudinal vibration is 2.53 KHz. Calculate the speed of sound in steel.



28. A stationary wave is represented in SI by  $y = 0.12 \sin(\pi/3) \times \cos 40\pi t$ . Find its wavelength, frequency and speed. Also calculate its amplitude at  $x = 0.75$  and  $12$  m.
29. A cube of soft rubber of face area  $0.02 \text{ m}^2$ , whose lower face is sheared through an angle of  $20^\circ$  by a force of  $104 \text{ N}$  acting tangential to its upper face. Calculate the rigidity modulus.
30. The excess pressure inside a bubble is double that in another. Find the ratio of their volumes.
31. A flat plate is separated from a large plate with a layer of glycerine of thickness  $3 \times 10^{-3} \text{ m}$ . If the coefficient of viscosity of glycerine is  $2 \text{ Nm}^{-2}$ , what is the force required to keep the plate moving with a velocity  $6 \times 10^{-2} \text{ m/s}$ ? Area of the plate is  $4.8 \times 10^{-3} \text{ m}^2$ .

PART – D

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

32. What do you mean by moment of inertia of a rotating body? Derive the expression for determination of moment of inertia of a flywheel.
  33. What is a compound pendulum? Explain the expression for the time period of a compound pendulum. Show that the centre of oscillation and centre of suspension of a compound pendulum are interchangeable.
  34. Define Bending moment. Obtain the expression for bending moment of a cantilever.
  35. Distinguish between streamline flow and turbulent flow. Derivation Poiseuille's formula for coefficient of viscosity of a fluid.
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**First Semester B.A./B.Sc. Degree Examination, November 2018**  
**First Degree Programme Under CBCSS**  
**MALAYALAM LANGUAGE**  
**Language Course – II-Additional Language – I**  
**ML 1111.1 : മലയാളകവിത**  
**(2018 Admission)**

Time : 3 Hours

Max. Marks : 80

I. ഒരു വാക്കിലോ വാക്യത്തിലോ ഉത്തരമെഴുതുക.

- 1) 'ചണ്ഡാലഭിക്ഷുകി'യിലെ പ്രധാന കഥാപാത്രങ്ങൾ ?
- 2) മലയാളകവിതാ സാഹിത്യചരിത്രം എന്ന ഗ്രന്ഥത്തിന്റെ രചിയിതാവ് ?
- 3) കാച്ചിക്കുറുക്കിയ കവിതകളെന്നു വൈലോപ്പിള്ളിക്കവിതകളെ വിശേഷിപ്പിച്ചതാര് ?
- 4) 2007-ലെ ജ്ഞാനപീഠ പുരസ്കാരത്തിനുറഹനായ മലയാളകവി ആര് ?
- 5) ശക്തിയുടെ കവി എന്നറിയപ്പെടുന്നതാര് ?
- 6) 'വേനലിൽ ഒരു പുഴ' എന്ന കൃതി ആരുടേതാണ് ?
- 7) ഇടപ്പള്ളിക്കവികൾ എന്നറിയപ്പെടുന്നവർ ആരാക്കെ ?
- 8) കടമ്മനിട്ട ഒക്ടോവിയോ പാസിന്റെ 'സൺസ്റ്റോൺ' എന്ന കൃതിക്കു നടത്തിയ മലയാളപരിഭാഷയുടെ പേര് ?
- 9) ആധുനികമലയാള കവിതയുടെ ആധാരശിലയായി കണക്കാക്കപ്പെടുന്ന അയ്യപ്പപ്പണിക്കരുടെ കവിത.
- 10) കുറേക്കൂടി നീണ്ട കവിതകൾ എന്ന കാവ്യസമാഹാരം ആരുടേതാണ് ? (10x1=10 മാർക്ക്)









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Name : .....

**First Semester B.Sc. Degree Examination, November 2018**  
**First Degree Programme under CBCSS**  
**Complementary Course I for Statistics**  
**MM 1131.4 : MATHEMATICS – I – Basic Calculus for Statistics**  
**(2018 Admission)**

Time : 3 Hours

Max. Marks : 80

## SECTION – I

All the first ten questions are compulsory. Each question carries 1 mark.

1. Find the stationary points of  $f(x) = x^3 - 3x^2 + 3x$ .
2. State Mean Value theorem.
3. Find  $\frac{dy}{dx}$  if  $x^3 + y^3 = 3xy$ .
4. Find the sum of the geometric series  $5 - \frac{10}{3} + \frac{20}{9} - \frac{40}{27} + \dots$
5. Write the Maclaurin series for  $\tan^{-1} x$ .
6. Show that  $\sum_{n=1}^N n^3 = \frac{1}{4} N^2(N+1)^2$ .
7. Sum the integers between 100 and 500 inclusive.
8. Evaluate the integral  $\int x \ln x \, dx$ .
9. Evaluate the integral  $\int_0^{\infty} e^{-x} \, dx$ .
10. Find the mean value of the function  $f(x) = x^2$  between the limits  $x = 0$  and  $x = 3$ .



## SECTION – II

Answer **any eight** questions from among the questions 11 to 22. Each question carries 2 marks.

11. Find the positions and natures of the stationary points of the function  $f(x) = x^3 - 3x + 1$ .
12. Use Leibnitz' theorem to find the fourth derivative of  $(2x^3 + 3x^2 + x + 2) e^{2x}$ .
13. What semi-quantitative result can be deduced by applying Rolle's theorem to the function  $x^2 + 7x + 3$  with  $a$  and  $c$  chosen so that  $f(a) = f(c) = 0$  ?
14. Find all numbers  $b$  that satisfy the conclusion of the Mean value theorem for the function  $f(x) = 2x^2 - 3x + 1$  in the interval  $[0, 2]$ .

15. Let  $S = \sum_{n=1}^{\infty} \frac{1}{n^2}$ . By grouping and rearranging the terms, show that

$$S_o = \sum_{n \text{ odd}} \frac{1}{n^2} = \frac{3S}{4}.$$

16. Test whether the series  $\sum_{n=1}^{\infty} \frac{n^2 - 1}{n^2 + 1}$  is convergent or divergent.

17. Sum the series  $\sum_{n=1}^N (n-1)(n+2)$ .

18. Test the alternating series  $\sum_{n=0}^{\infty} \frac{(-1)^n n}{1+n^2}$  for convergence.

19. Sum the series  $S = 2 + \frac{5}{2} + \frac{8}{2^2} + \frac{11}{2^3} + \dots$

20. Evaluate  $\int e^x \cos x \, dx$ .

21. Evaluate  $\int e^{\sqrt{x}} \, dx$  by making a substitution and then integrating by parts.

22. Evaluate  $\int_1^3 \frac{dx}{(x-1)^{2/3}}$ .



## SECTION - III

Answer **any six** questions from among the questions **23** to **31**. **Each** question carries **4** marks.

23. Show that the radius of curvature at the point  $(x, y)$  on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  has magnitude  $(a^4y^2 + b^4x^2)^{3/2}/(a^4b^4)$ .
24. Determine whether the series  $\sum_{n=1}^{\infty} \frac{n^2 + 3n + 4}{n^4 + 7n^3 + 6n - 3}$  converges or diverges, if it is known that  $\sum_{n=1}^{\infty} n^{-2}$  is a convergent series.
25. Determine the range of values of  $x$  for which the series  $\sum_{n=0}^{\infty} (2x)^n$  converges.
26. Show that  $\sum_{n=1}^{\infty} \frac{1}{n^p}$  converges for  $p > 1$  and diverges for  $p < 1$ .
27. Find the Maclaurin series for  $\ln \left( \frac{1+x}{1-x} \right)$ .
28. Use integration by parts to find a relationship between  $I_n$  and  $I_{n-2}$  where  $I_n = \int_0^{\pi/2} x^n \cos x dx$  and  $n$  is any nonnegative integer.
29. Find the length of the curve  $y = (4 - x^{2/3})^{3/2}$  over the interval  $[0, 8]$ .
30. Find the volume of the solid generated by revolving the region between the  $y$ -axis and the curve  $x = \frac{2}{y}$ ,  $1 \leq y \leq 4$  about the  $y$ -axis.
31. The line segment  $x = 1 - y$ ,  $0 \leq y \leq 1$  is revolved about the  $y$ -axis to generate a cone. Find the area of its surface excluding its base.

## SECTION - IV

Answer **any two** questions from among the questions **32** to **35**. **Each** question carries **15** marks.

32. a) Use the difference method to sum the series  $\sum_{n=2}^N \frac{2n-1}{2n^2(n-1)^2}$ .
- b) Expand  $f(x) = \cos x$  as a Taylor series about  $x = \frac{\pi}{3}$ .



33. a) Starting from the Maclaurin series for  $\cos x$ , show that

$$(\cos x)^{-2} = 1 + x^2 + \frac{2x^4}{3} + \dots$$

- b) Find the range of values of  $z$  for which the complex power series

$$P(z) = 1 - \frac{z}{2} + \frac{z^2}{4} - \frac{z^3}{8} + \dots \text{converges.}$$

34. a) Show that the value of the integral  $I = \int_0^1 \frac{1}{(1+x^2+x^3)^{1/2}} dx$  lies between 0.810 and 0.882.

- b) The equation in polar coordinates of an ellipse with semi-axes  $a$  and  $b$  is

$$\frac{1}{p^2} = \frac{\cos^2 \phi}{a^2} + \frac{\sin^2 \phi}{b^2}. \text{ Find the area of the ellipse.}$$

35. a) The region between the curve  $y = \sqrt{x}$ ,  $0 \leq x \leq 4$  and the  $x$ -axis is revolved about the  $x$ -axis to generate a solid. Find its volume.

- b) Find the area of the surface generated by revolving the curve

$$y = 2\sqrt{x}, 1 \leq x \leq 2, \text{ about the } x\text{-axis.}$$



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Reg. No. : .....

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**First Semester B.Sc. Degree Examination, November 2018**  
**First Degree Programme Under CBCSS**  
**Statistics**  
**Core Course 1**  
**ST 1141 : STATISTICAL METHODS – I**  
**(2018 Admission)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**

Answer **all** questions. **Each** question carries **one** mark.

1. What is meant by tabulation ?
2. What do you mean by primary data ?
3. Name the graph that can be used to find Mode of a frequency distribution.
4. What is a line diagram ?
5. Find the geometric mean of 4 and 9.
6. State the empirical relation between Mean, Median and Mode.
7. Which measure of dispersion can be calculated in the case of open end class intervals ?
8. Define coefficient of variation.
9. Define the  $r^{\text{th}}$  central moment.
10. What is meant by kurtosis ?

**(10×1=10 Marks)**

P.T.O.



## SECTION – B

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

11. Distinguish between grouped and ungrouped frequency distributions.
12. Which are the important sources of secondary data ?
13. Distinguish between Diagrams and Graphs.
14. Explain histogram.
15. Obtain the arithmetic mean of first 'n' natural numbers.
16. What do you mean by partition values ? Explain.
17. If  $x_1$  and  $x_2$  are two observations, then show that  $A.H. = G^2$ , where A, H and G are the Arithmetic Mean, Harmonic Mean and Geometric Mean of  $x_1$  and  $x_2$  respectively.
18. Define Range. Give a relative measure of dispersion based on range.
19. In a data if each observation is multiplied by 5 and 2 is added, how do they affect
  - i) mean
  - ii) variance and
  - iii) mean deviation
20. Prove that for any discrete distribution standard deviation is not less than mean Deviation from mean.
21. The first two moments of a distribution about the value 5 of a variable are 2 and 20. Find the mean and variance.
22. What are the different methods to measure kurtosis ? **(8x2=16 Marks)**

## SECTION – C

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

23. Explain the methods of collecting primary data.
24. Briefly explain multiple bar diagram and deviation bar diagram.





25. Draw the ogives of the following distribution and find the median :

<b>Class</b>	0-20	20-40	40-60	60-80
<b>Frequency</b>	7	16	13	4

26. You can take a trip which entails travelling 900 km by train at an average speed of 60 km/hour, 3000 km by boat at an average speed of 25 km/hour, 400 km by plane at 350 km/hour and finally 15 km by taxi at 25 km/hour. What is your average speed for the entire distance ?

27. The mean marks obtained by 300 students in the subject of Statistics is 45. The mean of the top 100 of them was found to be 70 and the mean of the last 100 was known to be 20. What is the mean of the remaining 100 students ?

28. Find the standard deviation of  $a, a + d, a + 2d, a + 3d, \dots, a + 2nd$ .

29. The mean of 5 items is 4 and the variance is 5.2. If 3 of the 5 items are 1, 2 and 6, find the other two.

30. The first four moments of a distribution about the value 4 of a variable are  $-1.5, 17, -30$  and  $108$ . Find the moments about mean,  $\beta_1$  and  $\beta_2$ .

31. Show that for a discrete distribution  $\beta_2 > 1$ . (6×4=24 Marks)

SECTION – D

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

32. Explain the concept and significance of Pie diagram. Draw a pie diagram for the following data :

<b>Blood Group</b>	<b>No. of students</b>
A	35
B	43
AB	16
O	38

33. From the following table, find the mean deviation about median.

<b>Weight in kg.</b>	56-58	58-60	60-62	62-64	64-69	69-75	75-80
<b>No. of people</b>	5	18	42	27	14	8	3



34. Two models of radio were subjected to a durability test and the results are as follows :

Life in years	Number of sets	
	Model A	Model B
0-2	5	2
2-4	16	7
4-6	13	12
6-8	7	19
8-10	5	9
10-12	4	1

Which model shows more uniformity ?

35. Find the coefficient of kurtosis of the data given below :

Class	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

(2×15=30 Marks)

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