

Sample Questions SEM-I

1. Integrate: $\int \text{—————}$.
2. If $\vec{r}_1 = \hat{i} + t\hat{j} + (2t + 1)\hat{k}$; $\vec{r}_2 = (2t - 3)\hat{i} + \hat{j} - t\hat{k}$.
Then find (i) $\frac{(\vec{r}_1 \cdot \vec{r}_2)}{|\vec{r}_1| |\vec{r}_2|}$ (ii) $\frac{d(\vec{r}_1 \times \vec{r}_2)}{dt}$ when $t = 1$.
3. Show that: $4x^2 + \text{—————} - 8x + 2y + 1 = 0$ represent an ellipse. Find its eccentricity.
4. If $\text{—————} = m$ and $\text{—————} = n$, then prove that $\text{—————} = m + n$.
5. Prove that every bounded sequence has a limit point.
6. Prove that every monotonic increasing sequence tends to its least upper Bound.
7. Prove that: $[\vec{a}, \vec{b}, \vec{c}] = 2[\vec{a}, \vec{b}, \vec{c}]$.
8. If $y = \text{—————}$, Prove that $(1 - x^2) \text{—————} - (2n + 1)x \text{—————} = 0$.
9. Find the n^{th} differential coefficient of —————).
10. Integrate: $\int \text{—————}$
11. Prove that limit of a sequence, if it exists, is unique.
12. Prove that $\text{—————} + \text{—————} = 1$ touches the curve $y = b \text{—————}$ at the point where the curve crosses the axis of y.
13. State and prove Taylor's Theorem.
14. Evaluate: $\int \text{—————} dx$.
15. Integrate: $\int \text{—————} \sqrt{2}$
16. Find the volume of a parallelepiped whose concurrent edges are represented by the vectors: $\hat{i} + 2\hat{j} + 3\hat{k}$; $3\hat{i} + 7\hat{j} - 4\hat{k}$ and $\hat{i} - 5\hat{j} + 3\hat{k}$.
17. A particle moves along the curve $x = 4\cos t$, $y = 4\sin t$, $z = 6t$. Find the velocity and acceleration at time $t = 0$ and $t = \text{—————}$.
18. Show that the equation: $12x^2 + 2 \text{—————} - 10xy + 11x - 5y + 2 = 0$ can be reduced to a homogeneous equation of the second degree by transferring the origin to a properly chosen point.
19. To find the co-ordinates of a point in a plane when the origin is shifted to a new point (h, k) , the new axes remaining parallel to the original axes.
20. What conic section is represented by $2x^2 + 3y^2 - 4x - 12y + 13 = 0$? Find the centre, axes and eccentricity.

Sample Questions. SEM-3

- 1) Find the condition that the most general equation of the second degree represent a parabola, an ellipse and a hyperbola.
- 2) Find the equation of tangent to the curve $y^2 = 4ax$. At the point (x_1, y_1) .

3) Prove that
$$\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} dx = \frac{\pi}{4}.$$

4) Prove that
$$\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx = \frac{\pi}{4}$$

5) Find reduction formula for $\int_0^{\frac{\pi}{4}} \tan^n x dx$.

6) Find the area of circle $x^2 + y^2 = a^2$ using integration.

7) Prove that $\text{grad}(a + \beta) = \text{grad } a + \text{grad } \beta$.

8) If $\vec{V} = x^2 yz \vec{i} + xy^2 z \vec{j} + xyz^2 \vec{k}$. Find $\text{Div } \vec{V}$.

9) Prove that $\text{Div}(\vec{a} + \vec{\beta}) = \text{Div } \vec{a} + \text{Div } \vec{\beta}$.

10) State and Prove D'Alembert's ratio test.

11) State and Prove Cauchy's root test.

12) State and Prove Leibnitz test for alternating series.

13) State and Prove Pringsheim's theorem.

14) Find the maxima and minima of the function $x^3 + y^3 - 12x - 3y + 20$.

15) Find the radius of curvature at the point (0,1) of the parabola $x^2 = 4ay$.

16) Find the equation of tangent to the curve $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$. At the point (x_1, y_1) .

17) Prove that
$$\int_0^{\frac{\pi}{4}} \log(1 + \tan x) dx = \frac{\pi}{8} \log 2.$$

18) Find the equation of the chord of contact of tangent drawn from an external point (x_1, y_1) to the conic

$$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0.$$

19) Find the equation of normal to the curve $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$. At the point (x_1, y_1) .

20) Prove that $\text{grad}(a\beta) = \beta \text{grad } a + a \text{grad } \beta$.

Course Contents

UGEMATH 101 (6 CREDITS)

DIFFERENTIAL CALCULUS I (3 Questions)

Successive differentiation, n^{th} order derivative of some standard functions. Leibnitz's theorem. n^{th} derivative of rational functions. Taylor's and Maclaurin's series expansions of functions. Applications of Taylor's and Maclaurin's series. Tangent and Normal, their equations in the Cartesian form, parametric form, Tangents at the origin. Angle between two curves. Length of tangent, normal, sub tangent, subnormal in Cartesian forms.

INTEGRAL CALCULUS I (3 questions)

Integration of rational and irrational functions. Integration by partial fractions, Integration by transformations, Integration by substitution, Integration parts etc.

VECTORS I (2 questions)

Scalar and Vector point functions, vector function of a scalar variables, Continuity of a vector function. differentiation of a vector with respect to the scalar variable "t". Differentiation of a vector function. Derivatives of a sum of vectors, derivatives of a product of vectors (both scalar and vector products.)

COORDINATE GEOMETRY OF TWO DIMENSION I (2 questions)

Change of rectangular axes, Rotation and Shifting of origin. Transformation of the general equation of the second degree. Conditions for the general equation of second degree to represent a parabola, ellipse and hyperbola. Equations of the tangent and normal to a given curve using calculus.

REAL ANALYSIS I (2 questions)

Sequence: Definition, Bounds, Limit of a sequence, Monotonic Sequences and their Convergence, Algebraic operations and limits, Cauchy Sequence, General principle of convergence of a sequence.

BOOKS RECOMMENDED

1. Differential Calculus : A Das Gupta & S B Prasad
2. Integral Calculus : A Das Gupta
3. Vector Analysis : Lalji Prasad/ A Das Gupta & S B Prasad
4. Coordinate Geometry : A Das Gupta
5. Real Analysis : Lalji Prasad

QUESTION PATTERN :

* Maximum Marks - 75

* Maximum Time - 3 Hours

* Total number of questions to be asked - 13

* 1st question is compulsory , which is objective type question having 5 questions. Each question is of 1 mark. From rest 12 questions, one has to answer 7 questions . Each of these questions will have two parts. Each part of 5 marks.

* Distribution of marks is as follows:

1st question = $1 \times 5 = 5$ marks

7 questions = $10 \times 7 = 70$ marks

Total = 75 marks

UGEMATH 202 (6 CREDITS)**Differential Calculus II (2 Questions)**

Partial Differentiation, Curvature, Asymptotes, Maxima and Minima of functions of two variables.

Integral Calculus II (3 Questions)

Evaluation of definite integrals, reduction formulae, curve tracing, length and area, Surface area and volume of solids of revolution.

Vector II (2 Questions)

Gradient, Divergence and curl and second order vector differential operators in Cartesian coordinates systems.

Co- ordinate geometry of two dimensions II (2 Questions)

Reduction of the general equation of second degree to the standard forms, Chord of Contact, Polar and pair of tangents in reference to general equation of conic, Polar equation.

Real Analysis II (3 Questions)

Series: Definition, Convergent Series, Divergent Series, Pringsheim's theorem, Comparison tests, Cauchy,s root test , D'Alembert's ratio test, Alternating series and Leibnitz test, Absolutely convergent series.

QUESTION PATTERN :

* Maximum Marks - 75

* Maximum Time - 3 Hours

* Total number of questions to be asked - 13

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1st question = $1 \times 5 = 5$ marks

7 questions = $10 \times 7 = 70$ marks

Total = 75 marks

UGEMATH 303 (6 CREDITS)**REAL ANALYSIS III** (3 Questions)

Continuity & Derivability of function of one variable, relationship with continuity, Rolle's theorem, Lagrange's Mean Value theorem, Taylor's and Maclaurin's theorem with R_n .

SET THEORY I (2 Questions)

Indexed family of sets, Generalised set of operations & Demorgan laws, Set mapping. Equivalence relation and related fundamental theorem of partition.

COMPLEX VARIABLE I (2 Questions)

Real functions of two variables: Simultaneous and iterated limits: Continuity, partial derivatives, Differentiability and related necessary and sufficient conditions.

ABSTRACT ALGEBRA I (3 Questions)

Binary operations, Notion of group, Abelian group and non-Abelian group with examples. Uniqueness of identity element and inverse elements in a group, different ways of defining a group, concept of Subgroup and cyclic group, Cosets, Lagrange's theorem.

DIFFERENTIAL EQUATIONS (2 Questions)

Differential equations of first order and higher degree, Clairaut's form, singular solution, orthogonal trajectories.

QUESTION PATTERN :

* Maximum Marks - 75

* Maximum Time - 3 Hours

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7 questions = $10 \times 7 = 70$ marks

Total = 75 marks

UGEMATH 404 (6 CREDITS)**REAL ANALYSIS IV (2 Questions)**

Riemann Integration, definition, Oscillatory sum and integrability condition. Integrability of monotonic and continuous functions. Fundamental theorem of integral calculus.

SET THEORY II (1 Question)

Partial order relation and relate concepts of u.b., l.b., inf., sup, maximal element, minimal element and lattice (definition and examples only), statement of Zorn's lemma.

COMPLEX VARIABLE II (4 Questions)

Functions of complex variables limit, Continuity, derivative, Cauchy-Riemann Equations, Analytic function, Harmonic function. (2 Questions)

Import of some standard transformations e.g., $w=z+c$, $w=cz$, $w=1/z$, $w=(az+b)/(cz+d)$ (bilinear). Conformal transformation as transformation effected by analytic function. Special conformal transformation $w=z^2$, $w=e^z$, $w=\sin z$. (2 Questions)

ABSTRACT ALGEBRA II (2 Questions)

Matrices, operations on matrices, matrix algebra, kinds of matrices, Transpose, adjoint and inverse of a matrix, solution of system of linear equations.

DIFFERENTIAL EQUATIONS II (3 Questions)

Linear Equation with constant co-efficients, Homogenous linear equations with variable coefficients. Simultaneous equation $s \frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ and total differential equation $P dx + Q dy + R dz = 0$ together with their geometric significance.

QUESTION PATTERN :

* Maximum Marks - 75

* Maximum Time - 3 Hours

* Total number of questions to be asked - 13

* 1st question is compulsory, which is objective type question having 5 questions. Each question is of 1 marks. From rest 12 questions, one has to answer 7 questions. Each of these questions will have two parts. Each part of 5 marks.

* Distribution of marks is as follows:

1st question = $1 \times 5 = 5$ marks

7 questions = $10 \times 7 = 70$ marks

Total = 75 marks

DEPARTMENT OF ENGLISH

ST. XAVIER'S COLLEGE, RANCHI.

SYLLABUS FOR ADDITIONAL GE, ENGLISH, 2021

SEMESTER –I (GE-1): Reading and Writing Skills

Unit- I – Writing Skills

1. Paragraph writing
2. Descriptive writing
3. Remedial grammar

Unit –II Reading Prose

Prescribed Text: *Modern Masters*, Board of Editors, Orient Longman.

Prescribed pieces:

1. Bertrand Russell: Ideas that have Helped Mankind
2. J B S Haldane: The Scientific Point of View
3. Mahatma Gandhi: The Way to Equal Distribution

End-semester Examination:

There will be eight essay-type questions out of which five will have to be answered.	20x5=100
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SYLLABUS FOR ADDITIONAL GE, ENGLISH, 2021

SEMESTER –II (GE-2):Language through Literature

Prescribed text: *Modern Masters*, Board of Editors, Orient Longman.

Pieces prescribed:

1. Pearl S. Buck – *India Through a Traveller's Eyes*.
2. Winston Churchill – *An Escape*
3. Rabindranath Tagore - *A Journey with My Father*
4. Khushwant Singh - *Mano Majra*

End-semester Examination:

There will be eight essay-type questions out of which five will have to be answered.	20x5=100
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MODEL QUESTIONS

Generic Elective (GE) – 1

1. Write a paragraph on :
 - a. Rome was not built in a day.
 - b. A friend in need is a friend indeed.
 - c. A bird in hand is worth two in the bush.
 - d. Time and tide wait for no man.
 - e. Failures are pillars of success.
 - f. A rolling stone gathers no moss.
 - g. A stitch in time saves nine.
 - h. All that glitters is not gold.
 - i. Slow and steady wins the race.
2. Describe a village fair/ a visit to a tourist place/ a visit to a place of historical importance.
3. Write about a memorable experience/ a journey/your ambition/ your meeting with an interesting person or your role model/ my neighbour.
4. Correct the errors in the sentences given.
5. Summarise the ideas contained in the essay **Ideas that Have Helped Mankind**.
6. According to the writer, what ideas have been helpful to mankind?
7. How has mankind used the moral and intellectual qualities to his advantage?
8. Why does the writer think that happiness and the pursuit of pleasures have not been very helpful to mankind?
9. Bring out the main ideas contained in the essay **The Scientific Point of View**.
10. What according to the writer is the scientific viewpoint?
11. What is the difference between a scientific approach and a conventional approach?
12. What are the characteristics of the scientific viewpoint?
13. Why does the writer say that our approach to the problem of disease is not rational?
14. What does Mahatma Gandhi say in his essay **The Way to Equal Distribution**?
15. Explain what the writer means by 'trusteeship of wealth'?
16. How can equal distribution of wealth in society be brought about through non-violence?

MODEL QUESTIONS

Generic Elective (GE) – 2

1. Describe Winston Churchill's escape during the Boer War.
2. In **An Escape** why does the writer say that he felt like one who has won the Derby?
3. Describe how Churchill managed to reach the frontier during the war.
4. What memories does Tagore have of his father?
5. Describe Tagore's journey with his father.
6. Show how **A Journey with My Father** is autobiographical.
7. How has Khushwant Singh described Mano Majra?
8. What are the writer's impressions of Mano Majra?
9. Summarise the ideas contained in the piece **Mano Majra**.
10. According to the writer, what accounted for the significance of Mano Majra?
11. Describe the life as presented in **Mano Majra**.
12. What are Pearl Buck's impressions of India?
13. How has Pearl Buck presented India in her essay?
14. Why does Pearl Buck say that the villages in India presented the real indictment against colonialism?
15. What qualities of the Indian way of life impressed Pearl Buck the most?
16. How has Indian culture been presented by Pearl Buck in her essay?

**Generic Elective (Interdisciplinary Any Four) CREDITS-6
Each, 5 Classes, 1 Tutorial**

Paper-1: Environmental Issues In India

I. The importance of Environment.

2. Geography, Ecology and Cultures in Pre-Colonial India

-Land, Forests, Dams, Water, Pastures, Ecology of Hills and Mountains

3. Colonialism and developments in the Environment

-New Regimes of land, Forests, Water and Irrigation

-Resistance: Peasants, Tribals and Pastoralists.

4. Environmental Issues in Independent India

-Forests, Dams, Displacement, Pollution, Degradation.

5. Environmental Movements in Independent India

-Forests, Dams, Displacement, Pollution.

6. Environmental concerns in a Globalizing World.

Suggested Readings

Mahesh Rangarajan, et al, Environmental Issues in India

Anil Agarwal, et al, The State of India's Environment, The Second Citizens' Report, Delhi, 1985

Madhav Gadgil & Ramchandran Guha, This Fissured Land, An Ecological History of India, Delhi, OUP, 1990

-----Ecology and Equity, the use & abuse of nature in contemporary India, 1995

David Arnold & Ramchandran Guha, eds, Nature, Culture, Imperialism, Delhi, OUP, 1995

Salim Ali, The Fall of a Sparrow, 1985

1. **Towards Independence and Emergence of the New State** _Government of India Act 1935_ Working of the GOI Act_ Negotiations for Independence and Popular Movements
Partition: Riots and Rehabilitation
2. **Making of the Republic _The Constituent Assembly;**
Drafting of the Constitution Integration of Princely States
- 3 **Indian Democracy at Work c1950- 1970s Language, Region,** Caste and Religion_ Electoral Politics and the Changing Party System; Regional Experiences India and the World; Non-Aligned Movement

4. Economy Society and Culture c 1950-1970s

The Land Question, Planned Economy, Industry and Labour Science and Education_ The Women's Question: Movements and Legislation_ Cultural Trends: Institutions and Ideas, Literature, Media, Arts

ESSENTIAL READINGS

Granville Austin, Indian Constitution: Cornerstone of a Nation, New Edition, OUP, 2011_ Francine Frankel, India's Political Economy, 1947-2004, New Delhi: Oxford University Press, 2006.

Paul Brass, The Politics of India Since Independence, Cambridge: Cambridge University Press, 1994. Ram Chandra Guha, India after Gandhi: The History of the World's Largest Democracy, New Delhi: Picador, 2007

SUGGESTED READINGS

Bipan Chandra, et al (ed) India after Independence, New Delhi: Penguin Books, 1999

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972. New Delhi: Oxford University Press,

1979. _Rajni Kothari, Politics in India, New Delhi: Orient Longman, 1970.

Joya Chatterji, The Spoils of Partition: Bengal and India, 1947-67, Cambridge: Cambridge University Press, 2007.

Sunil Khilnani, The Idea of India, Penguin Books, New Delhi, 2004T

ST. XAVIER'S COLLEGE, RANCHI

(An Autonomous College of Ranchi University)

Subject: History GE Sample Questions

1. Explain the significance of environment in human development.
मानव विकास में पर्यावरण के महत्व की व्याख्या करें
2. "Rehabilitation and resettlement" is associated with every dam controversy. Explain with examples from India
"पुनर्वास और पुनरुत्थान" हर बांध विवाद से जुड़ा हुआ है। भारत से उदाहरणों के साथ समझाइए
3. Discuss the social, environmental and economic consequences of Green revolution in India
भारत में हरित क्रांति के सामाजिक, पर्यावरण और आर्थिक परिणामों पर चर्चा करें
4. Why forest resources were important for pre historic man? Discuss forest based movements in India
प्रागैतिहासिक मनुष्य के लिए वन संसाधन क्यों महत्वपूर्ण थे? भारत में वन आधारित आन्दोलनों के बारे में चर्चा करें
5. Discuss the contribution of Salim Ali and Jim Corbett towards environment
पर्यावरण के प्रति सलीम अली और जिम कॉर्बेट के योगदान पर चर्चा करें
6. Explain the impact of Industrial revolution on environment
पर्यावरण पर औद्योगिक क्रांति के प्रभाव को स्पष्ट करें
7. Explain the "concept" and "origin" of environmentalism.
पर्यावरणवाद की "अवधारणा" और "उदगम" के बारे में समझाएं
8. Is climate a factor in rise and fall of Indus Valley Civilization? Explain. What are the other factors responsible for fall of Indus Valley Civilization?
क्या सिंधु घाटी सभ्यता की वृद्धि और पतन में जलवायु एक कारक है? चर्चा करें. सिंधु घाटी सभ्यता के पतन के लिए जिम्मेदार अन्य कारक क्या हैं
9. "British were inclined towards Indian forest for their own benefit". Considering this statement discuss the British forest policies in colonial India
"ब्रिटिश अपने स्वयं के लाभ के लिए भारतीय जंगल की ओर झुके थे"। इस कथन को ध्यान में रखते हुए औपनिवेशिक भारत में ब्रिटिश वन नीतियों पर चर्चा करें

ST. XAVIER'S COLLEGE, RANCHI

(An Autonomous College of Ranchi University)

Subject: History GE Sample Questions

10. Which event can be considered as "origin of environmental movement in India".
Explain forest based movements in India

किस घटना को "भारत में पर्यावरण आंदोलन की उत्पत्ति" के रूप में माना जा सकता है? भारत में वन आधारित आन्दोलनों के बारे में चर्चा करें

11. Discuss the issue associated with Narmada Bachaoo Andolan.

नर्मदा बचाओ आंदोलन से जुड़े मुद्दे पर चर्चा करें

12. Discuss the British forest policies in colonial India.

औपनिवेशिक भारत में ब्रिटिश वन नीतियों पर चर्चा करें

13. Write a note on Environmental movement in Jharkhand

झारखंड में पर्यावरण आंदोलन पर चर्चा करें

14. Give a historical analysis of forest resources in post independent India

स्वतंत्र भारत में वन संसाधनों का ऐतिहासिक विश्लेषण करें

15. "Environmentalism played an important role in the process of environmental developments" Justify this statement by describing the wave of environmentalism in India.

"पर्यावरणवाद ने पर्यावरण के विकास में महत्वपूर्ण भूमिका निभाई है." भारत में पर्यावरणवाद की लहर का वर्णन करके इस कथन को सही ठहराएं।

Reference books:

1. Environmentalism By Ramchandran Guha

2. Ecology and Equity, the use & abuse of nature in contemporary India, 1995

Hindi

G.E. 2 / G.E-4

पाठ्यक्रम

- हिन्दी साहित्य का ऐतिहासिक काल
- हिन्दी साहित्य का आधुनिक काल
- इतिहास दर्शन एवं साहित्य का इतिहास
- साहित्य के इतिहास लेखन की समस्या -
- त्यागपत्र / निर्मला उपन्यास (निर्मला)
- भाषा की अवधारणा
- भाषा की विशेषताएँ
- भाषा-विज्ञान एवं भाषा-विज्ञान की उपयोगिता
- कला की अवधारणा एवं कला के भेद
- कला और साहित्य का सम्बन्ध -

Hindi

G.E I / G.E-3

पाठ्यक्रम

- हिन्दी साहित्य का आरम्भिक काल
- हिन्दी साहित्य का भक्तिकाल -
- शतरंज के खिलाड़ी, सद्गति, बड़े घर की बेटी, पूस की रात, हाकुर का कुआँ - कहानियों की समीक्षा
- नाटक - अंधेरे नगरी
- भारतखण्ड पर केन्द्रित हिन्दी लेखन

St. Xavier's College, Ranchi

Generic

Sample Questions

Model Questions for Additional GE for semester 1 and 3

Economics

1. a) Describe various methods of collecting primary data and comment on their relative advantages.
b) Calculate Median for the following:-

Marks	0 -10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	4	6	25	15	12	10	8

2. a) Define a Statistical Table and discuss the requisites of a good Table.
b) Discuss the general rules to be followed in tabulation of a statistical data with an example. State various types of Table.
3. a) Discuss the various properties of Arithmetic mean.
b) Calculate Arithmetic Mean for the following:-

Class in Rs.	0 -15	15-30	30-45	45-60	60-75	75-90
No. of Persons	8	12	20	35	15	10

4. Define Statistics. What is meant by Statistical enquiry? Describe different stages of statistical enquiry?
5. a) Discuss briefly the purpose served by diagrammatic representation of statistical data.
b) Define and illustrate all one-Dimensional diagrams.
6. Calculate Fisher's Ideal Index for the following:

Commodities	A	B	C	D
P0	20	50	40	20
Q0	8	10	15	20
P1	40	60	50	20
Q1	6	5	10	15

7. a) Prove that $A.M. \geq G.M. \geq H.M.$
 b) Calculate Mean Deviation about Median:-

Marks	0-5	5-10	10-15	15-20	20-25
Frequency	5	8	15	16	6

8. Calculate Mode by grouping Method:-

Height in inches	58	59	60	61	62	63	64	65	66	67
No. of Persons	4	6	5	10	20	22	24	6	2	1

9. a) What is a Questionnaire as used in statistical enquiry? Describe the important consideration in the framing of a questionnaire?
 b) Distinguish between complete enumeration and sample Survey.

10. Calculate: a) Inter Quartile Range
 b) Quartile Deviation, and
 c) Coefficient of Q.D.

Variables	5-10	10-15	15-20	20-25	25-30	30-35
Frequency	2	9	29	54	11	6

11. a) Define Secondary data. State the chief sources of secondary data.
 b) Compute Standard Deviation and Variance for the Following:-

Marks	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	16	6

12. a) What do you understand by classification of data? What are its advantages?
 b) Discuss Graphical representation of a frequency distribution.

13. Compute Laspeyer's and Paasche's Index number:-

Commodities	A	B	C	D
P0	2	3	8	1.50
Q0	5	7	6	2
P1	4	3.20	4.50	2
Q1	7	10	6	9

14. Prove that Fisher's Ideal Index Satisfies Factor Reversal and Time Reversal test.

15. Discuss the Probability and non-Probability sampling techniques and also throw light on their merits and demerits.

16. a) The Mean marks was of 100 students was found to be 40, later on it was discovered that a mark 53 was misread as 83. Find the corrected Mean Mark.

b) Find Geometric Mean for the following 2,9,12?

17. a) In an asymmetric distribution the Mode and Mean are respectively Rs. 12.30 and Rs. 18.48. Find the Median of the distribution?

b) An airplane covers four sides of the square at speeds of 100kmph, 200kmph, 300kmph and 400kmph respectively. What is the average speed of the plane in its flight around the square?

18. Show how Q2 (second Quartile), D5 (Fifth Decile), P50 (Fiftieth Percentile) and Median are equal with the help of their discrete series formulae.

19. Calculate Mode for the following Distribution:-

Marks	0-10	10-20	20-30	30-40	40-50
Frequency	2	4	10	8	6

20. Write short notes on any *two* of the following:-

- Skewness
- Kurtosis
- Pictograms and pie-chart
- Census

Suggested Readings:-

1) statistical Methods by S.P. Gupta

2) Fundamentals of Mathematical Statistics by S.C. Gupta

Generic Elective in Economics I: Descriptive Statistics (GE101)

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It then develops the notion of probability, followed by probability distributions of discrete and continuous random variables.

Course Outline

1. Statistical Methods

Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample, Data: quantitative and qualitative. Presentation: tabular and graphical, including histogram and ogive.

2. Measures of Central Tendency and Variation

Measures of Central Tendency: mathematical and positional. Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation, coefficient of variation,

Readings:

1. Statistical Method, S.P. Gupta, (Sultan Chand & Sons New Delhi.)
2. Fundamentals of Mathematical Statistics: - S.C. Gupta & V.K. Kapoor (Sultan Chand and sons) New Delhi.

Economics Model Questions for Additional GE for semester 2 and 4

Section - A

1. a) What is classical probability?
 b) A bag contains 6 white and 4 black balls. One ball is drawn. What is probability that it is white?
2. a) Differentiate between probability mass function and density function.
 b) The following information is probability distribution of success

<i>No. of success</i>	0	1	2
<i>Probability</i>	$\frac{6}{11}$	$\frac{9}{22}$	$\frac{1}{22}$

Determine the expected number of success.

3. a) Explain the properties of binomial distribution.
 b) A random variable has following probability distribution:

<i>X</i>	4	5	6	8
<i>Probability</i>	0.1	0.3	0.4	0.2

Find the expectation and the standard deviation of the random variable.

4. a) Explain the properties of poisson distribution.
 b) Find the mean and variance of poisson distribution.

- 5. a)** Show that poisson distribution is the limiting case of binomial distribution.
- b) In turning out certain toys in a manufacturing process in a factory, the average number of defective is 10%. What is the probability of getting exactly 3 defectives in a sample of 10 toys chosen at random, by using the poisson approximation to the binomial distribution? (*Take $e = 2.72$*).
- 6. a)** Explain Normal distribution and its properties.
- b) The mean of normal distribution is 50 and 5% of the value are greater than 60. Find the standard deviation of distribution (Given that the area under standard normal curve between $Z = 0$ and $Z = 1.64$ is 0.45).
- 7. a)** State and prove the Addition and Multiplication theorem of probability.
- b) Prove that $P(A + B) = P(A) + P(B) - P(AB)$
- 8. a)** What is simple random sampling? Explain the two ways of drawing simple random sample.
- b) Distinguish between statistic and parameter, give examples.
- 9. a)** What is correlation? Write the properties of correlation coefficient.
- b) What is scatter diagram? Explain how this can be used to indicate the degree of association between two variables.
- 10. a)** What is regression? Write the properties of linear regression.
- b) Prove that the coefficient of correlation is the geometric mean of the coefficients of regression.

11. a) Explain chi-square distribution.
b) Write the uses of chi-square distribution.
12. a) What is F distribution.
b) Write the uses of F distribution.
13. a) What is conditional probability?
b) If A and B are mutually exclusive events and $P(A \cup B) \neq 0$, Then prove that

$$P\left(\frac{A}{A \cup B}\right) = \frac{P(A)}{P(A) + P(B)}$$

Section – B

- Five persons A, B, C, D, E occupy seats in a row at random. What is the probability that A and B sit next to each other?
- Given $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(AB) = \frac{1}{4}$. Find the values of the following probabilities: $P(\overline{A})$, $P(A + B)$, $P\frac{A}{B}$.
- A fair coin is tossed 3 times in succession. Show that the events ‘first toss gives a head’ and ‘second toss gives a head’ are independent.
- Arithmetic mean and standard deviation of binomial distribution are respectively 4 and $\sqrt{\frac{8}{3}}$. Find the values of q and p .
- Find the coefficient of correlation (r) from the following data:

X	65	63	67	64	68	62	70	66
Y	68	66	68	65	69	66	68	65

6. From the following results, obtain the two regression equations and estimate the yield of crops when the rainfall is 22 cms, and the rainfall when the yield is 600 kg:

	y (Yield in kg.)	x (Rainfall in cm.)
Mean	508.4	26.7
Standard deviation	36.8	4.6

7. Find the coefficient of correlation (r) from the following data:

Study hours	2	4	6	8	10
Sleeping hours	10	9	8	7	6

8. Find the coefficient of correlation (r) from the following data:

	X series	Y series
Number of items	15	15
Arithmetic Mean	25	18
Standard Deviation	136	138

Suggested Readings

1) Statistical Methods by S.P. Gupta

2) Fundamentals of Mathematical Statistics by S.C.Gupta.

Generic Elective in Economics II: Statistical Techniques (GE202)

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It then develops the notion of probability, followed by probability distributions of discrete and continuous random variables.

Instructions for Question setter

There will be at least 8 Questions comprising at least 1 Question of short notes type, out of which 5 Questions to be attempted. Full Marks allotted is 70. Care should be taken to ensure that entire paper is covered. The questions should be based on prescribed books in the syllabus.

Course Outline

1. Probability Theory

Probability: Basic concepts and definitions (Classical and Axiomatic definition), random variable, probability density function, probability mass function, distribution function and their properties, mathematical expectation, conditional expectation, moment generating function, Characteristic Function; conditional probability and Bayes' rule.

2. Probability Distribution

Various discrete and continuous probability distributions: Uniform (continuous and discrete), Binomial, Poisson, Normal, t- distribution and F- distribution, Bivariate normal distribution (Marginal and Conditional distributions), Central Limit Theorem. Simple random sampling with and without replacement

3. Correlation and Regression Analysis

Correlation and Regression: Least square method for curve fitting, multiple regression (three variables only), Partial and multiple Correlation (for three variables only).

Readings:

1. Statistical Method, S.P. Gupta, (Sultan Chand & Sons New Delhi.)
2. **Fundamentals of Mathematical Statistics:** - S.C. Gupta & V.K. Kapoor (Sultan Chand and sons New Delhi.

B. A. I (H) Paper GE 1 / GE 3

SUSTAINABLE DEVELOPMENT

Full Marks: 100

End- Sem: 100

Pass Marks: 40

Objectives:

The objective of this paper is to provide an overview of development and its interface with environment. The course aims to provide an understanding of the existing reality of resource utilization and depletion, further aims to sensitize the students to the concept of sustainable resource use.

To understand prevalent issues in environment, society, economy and to provide a geographical interpretation with special reference to India.

Sr. No.	TOPICS.....
UNIT I	Sustainable Development: Definition, History and emergence of the Concept of Sustainable Development.
UNIT II	Sustainable Development Yardsticks: Stockholm Conference, Bruntland Commission, The Earth Summit / Agenda 21 - Rio Principle, Sustainable Development Goals at Rio+20, Johannesburg Summit, Paris Agreement.
UNIT III	The role of higher education in sustainable development. Indices of development- Human Development Index. Global Environment Facility.
UNIT IV	Issues and challenges of Sustainable development. Regional Issues and Global Issues. Principles of Good Governance- National Environmental Policy.

Selected References:

Baker, Susan (2006) Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, "The concept of sustainable development").

Global Environmental challenges : Transition To A Sustainable World -By James Gustave Speth.

FUNDAMENTALS OF SUSTAINABLE DEVELOPMENT 2ND EDITION by NIKO ROORDA with PETER BLAZE CORCORAN & JOSEPH P. WEAKLAND, T&F INDIA

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14/2/21

Model Questions for Additional GE for Semester 1 and 3

1. Define sustainable development and discuss the concept and its development in detail?

सतत विकास अवधारणा को परिभाषित करें तथा अवधारणा के विकास का विस्तार में वर्णन करें ?

2. Discuss the major regional issues of sustainable development in south Asia.

दक्षिण एशिया में सतत विकास के लिए प्रादेशिक चुनौतियों का वर्णन करें ।

3. Discuss the role of UN agencies in promoting sustainable development with example.

उदाहरण के साथ सतत विकास को प्रोत्साहित करने में संयुक्त राष्ट्र संस्थाओं की भूमिका पर चर्चा करें ।

4. What is Global Environment Facility? Explain its structure.

वैश्विक पर्यावरण सुविधा क्या है ? इसकी संरचना को समझाएं ।

5. What do you understand by development? Explain the development indicators.

विकास से आप क्या समझते हैं? विकास के सूचकांकों का वर्णन करें ।

6. Discuss the global issues and challenges of sustainable development.

सतत विकास के वैश्विक चिंताओं और चुनौतियों का वर्णन करें ।

7. Explain the role of United nation in promoting sustainable development.

सतत विकास को बढ़ावा देने में संयुक्त राष्ट्र की भूमिका का वर्णन करें ।

8. Discuss the South Asian issues and challenges of sustainable development.

सतत विकास के लिए दक्षिण एशियाई मुद्दों और चुनौतियों की चर्चा करें ।

9. What do you understand by Human Development Index (HDI)? List down and explain the indicators of HDI.

मानव विकास सूचकांक (HDI) से आप क्या समझते हैं? HDI के संकेतकों का वर्णन करें ।

10. Discuss the importance of Bruntland Commission in sustainable development policies and programmes.

सतत विकास की नीतियों और कार्यक्रमों में ब्रुन्टलैंड आयोग के महत्व पर चर्चा करें।

11. Briefly explain the outcomes of "Earth Summit 1992".

१९९२ विश्व सम्मलेन के परिणामों का संक्षेप में वर्णन करें ।

12. Examine the important objectives of sustainable development.

सतत विकास के महत्वपूर्ण उद्देश्यों का विश्लेषण करें ।

13. Describe the importance and contribution of Stockholm conference of 1972.

1972 के स्टॉकहोल्म सम्मलेन के महत्व एवं योगदान का वर्णन करें ।

14. How Climate Change is major challenge for sustainable development.

सतत विकास के लिए जलवायु परिवर्तन किस प्रकार एक चुनौती है ?

15. Briefly explain "Earth Summit" and "Rio Principle"?

संक्षेप में "पृथ्वी शिखर सम्मेलन" और "रियो सिद्धांत" की व्याख्या करें ?

16. What is the salient features of India's National Environmental policy.

भारत की राष्ट्रीय पर्यावरण नीति की मुख्य विशेषताएं क्या हैं ।

17. Discuss the principles of Good governance.

सुशासन के सिद्धांतों पर चर्चा करें ।

18. Discuss the role of higher education in promoting sustainable development.

सतत विकास को बढ़ावा देने में उच्च शिक्षा की भूमिका का वर्णन करें ।

CLIMATE CHANGE: VULNERABILITY AND ADAPTATION

Sr. No.	TOPICS.....
UNIT I	Climate Change: Vulnerability and Adaptation; Physical Vulnerability; Economic Vulnerability; Social Vulnerability
UNIT II	Science of Climate Change: Global Climatic Assessment- IPCC. Green House Effects, Ozone Depletion and Global Warming.
UNIT III	Impact of Climate Change: Human Health, Agriculture, Water, Soil, Flora and Fauna, Biodiversity, Major Ecosystems etc.
UNIT IV	Adaptation and Mitigation: Global Initiatives and with particular reference to South Asia. National Action Plan on Climate Change. Role of Local Institutions (Urban Local Bodies, Panchayats).

Selected References:

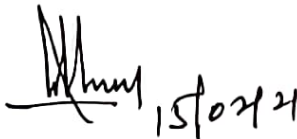
1. IPCC. (2007) Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

2. भारत में पर्यावरण के मुद्दे - महेश रंगराजन

3. <https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf>

4. Environmental Geography Book by Savindra Singh / पर्यावरण भूगोल – Savindra Singh




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Model Questions for Additional GE for Semester 2 and 4

दीर्घ उत्तरीय प्रश्न: किन्हीं पांच प्रश्नों का उत्तर दें। सभी प्रश्नों का अंक समान है।
20 X 5 = 100

1. What do you understand by 'Global Warming'? How does it relate to Greenhouse Effect?

भूमंडलीय उष्मन (ग्लोबल वार्मिंग) से आप क्या समझते हैं? यह ग्रीनहाउस प्रभाव से कैसे संबंधित है?

2. Give a geographical account of "Global Warming" impact on human environment.

मानव पर्यावरण पर "ग्लोबल वार्मिंग" के प्रभाव का भौगोलिक वर्णन दें।

3. What is climate Change? Briefly mention the global initiatives taken to adapt and mitigate climate change.

जलवायु परिवर्तन क्या है? जलवायु परिवर्तन में अनुकूलन और निवारण के लिए किये गए वैश्विक पहलों की व्याख्या करें।

4. What do you understand by "green house"? Write its evidences and processes.

"ग्रीन हाउस" से आप क्या समझते हैं? इसके साक्ष्य और प्रक्रिया के बारे में लिखें।

5. Explain functions of "IPCC" ?

"आईपीसीसी" के कार्यों को समझाएं ?

6. Write a note on climate change adaptation and mitigation measures.

जलवायु परिवर्तन अनुकूलन तथा निवारण पर टिप्पणी दें ।

7. Write short note on / संक्षिप्त टिप्पणी लिखें

A. “ Green house effect ” / “ ग्रीन हाउस

B. “Ozone depletion” / "ओजोन हास प्रभाव "

8. What is physical vulnerability, discuss with suitable example.

भौतिक बेधयता / भेद्यता क्या है, उपयुक्त उदाहरण के साथ चर्चा करें।

9. What is National Action Plan on Climate Change? Explain its missions.

जलवायु परिवर्तन पर राष्ट्रीय कार्य योजना क्या है? इसके अंतर्गत प्रारंभ किये गए मिशनों की व्याख्या करें ।

10. Briefly describe who is most vulnerable and who is least vulnerable in our society and how.

संक्षिप्त टिप्पणी दें कि कौन सबसे कमजोर है और कौन हमारे समाज कम से कम कमजोर है तथा कैसे।

11. Write a note on mitigation measures of Global warming.

भूमंडलीय उष्मन के निवारण उपायों का उल्लेख करें ।

12. What do you understand by “Ozone depletion”?

आप "ओजोन हास" से क्या समझते हैं ?

13. What do you understand by “vulnerability”, what are its major components.

“बेधयता / भेद्यता” से आप क्या समझते हैं, इसके प्रमुख घटक क्या हैं।

14. Discuss the role of Urban local bodies in combating climate change.

जलवायु परिवर्तन से जूझने में शहरी स्थानीय निकायों की भूमिका का वर्णन करें ।

15. What is economic vulnerability, discuss with suitable example.

आर्थिक बेधयता / भेद्यता क्या है, उपयुक्त उदाहरण के साथ चर्चा करें।

16. Discuss the role of Panchayats in combating climate change.

जलवायु परिवर्तन से जूझने में पंचायतों की भूमिका का वर्णन करें ।

GENERIC ELECTIVE
Political science

1. Nationalism in India

Course objective: The purpose of this course is to help students understand the struggle of Indian people against colonialism. It seeks to achieve this understanding by looking at this struggle from different theoretical perspectives that highlight its different dimensions. The course begins with the nineteenth century Indian responses to colonial dominance in the form of reformism and its criticism and continues through various phases up to the events leading to the Partition and Independence. In the process, the course tries to highlight its various conflicts and contradictions by focusing on its different dimensions: communalism, class struggle, caste and gender questions.

I. Reformism and Anti-Reformism in the Nineteenth Century

Major Social and Religious Movements in 19th century

II. Nationalist Politics and Expansion of its Social Base

- a. Phases of Nationalist Movement: Liberal Constitutionalists, Swadeshi and the Radicals; Beginning of Constitutionalism in India
- b. Gandhi and Mass Mobilisation: Non-Cooperation Movement, Civil Disobedience Movement, and Quit India Movement
- c. Socialist Alternatives: Congress Socialists, Communists

III. Partition and Independence (6 lectures)

- a. Communalism in Indian Politics
- b. The Two-Nation Theory, Negotiations over Partition

Reading List

1. From Plassey to Partition: A History of Modern India – Shekhar Bandopadhyay, Orient Longman Publication.
2. प्लासी से विभाजन तक : आधुनिक भारत का इतिहास– शेखर बांगोपाध्याय, Orient Longman Publication.
3. Raj to Swaraj,- Ramchandra Pradhan, Macmillan Publication.
4. राज से स्वराज तक – रामचंद्र प्रधान, Macmillan Publication.

GENERIC ELECTIVE

Political science

2. Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

I. Gandhi on Modern Civilization and Ethics of Development

- a. Conception of Modern Civilisation and Alternative Modernity
- b. Critique of Development: Narmada Bachao Andolan

II. Gandhian Thought: Theory and Action

- a. Theory of Satyagraha
- b. Satyagraha in Action
 - i. Peasant Satyagraha: Kheda and the Idea of Trusteeship
 - ii. Temple Entry and Critique of Caste
 - iii. Social Harmony: 1947 and Communal Unity

III. Gandhi's Legacy

- a) Tolerance: Anti - Racism Movements (Anti - Apartheid and Martin Luther King)
- b) The Pacifist Movement
- c) Women's Movements
- d) *Gandhigiri*: Perceptions in Popular Culture

READINGS

1. Reading Gandhi - Anil Dutta Mishra, Pearson Publication
2. गांधी – एक अध्ययन , Anil Dutta Mishra, Pearson Publication
3. Modern Indian Political thought- V.P Verma, Laxmi Narain Agarwal publication.
4. आधुनिक भारतीय राजनीतिक चिंतन– V.P Verma, Laxmi Narain Agarwal publication.

GE Political Science

2. Gandhi In the Contemporary World

Model Questions

1. Describe the Gandhi's views on Modern Civilization.

आधुनिक सभ्यता पर गांधी के विचारों का वर्णन कीजिए।

2. Explain the Ethics of Development as suggested by Mahatma Gandhi.

महात्मा गांधी के द्वारा सुझाए गए विकास के नैतिक मूल्यों की व्याख्या कीजिए।

3. What is alternative modernity? Explain the main points of the Gandhian alternative model of development.

वैकल्पिक आधुनिकता क्या है? विकास के वैकल्पिक गांधीवादी प्रारूप के मुख्य बिन्दुओं की व्याख्या कीजिए।

4. Explain the major issues associated with Narmada Bachao Andolan.

नर्मदा बचाओ आंदोलन से जुड़े प्रमुख मुद्दों की व्याख्या कीजिए।

5. Describe the theory of Satyagrah.

सत्याग्रह के सिद्धांत का वर्णन कीजिए।

6. Analyse contemporary relevance of Satyagrah.

सत्याग्रह की समकालीन प्रासंगिकता का विश्लेषण कीजिए।

7. Critically examine the relevance of Gandhi's view on communal unity in today's context.

वर्तमान के संदर्भ में सांप्रदायिक एकता के गांधी के विचार की प्रासंगिकता की आलोचनात्मक मूल्यांकन कीजिए।

8. Gandhiji develops an alternative conception of modernity in Hind Swaraj. Explain.

हिन्द स्वराज में गांधी जी ने आधुनिकता की वैकल्पिक संकल्पना विकसित किया है। व्याख्या कीजिए।

9. Why does Gandhiji consider untouchability as the greatest curse on Hinduism? Explain.

गांधी जी अस्पृश्यता को हिन्दु धर्म का एक बड़ा अभिशाप मानते थे। व्याख्या कीजिए।

10. Discuss Gandhi's views on nationalism.

राष्ट्रवाद पर गांधी के विचारों की विवेचना कीजिए।

11. Discuss in brief about Gandhian Environmentalism.

गांधीवादी पर्यावरणवाद के बारे में संक्षेप में विवेचना कीजिए।

12. What do you mean by the term Passive resistance? Explain in detail.

निष्क्रिय प्रतिरोध से आप क्या समझते हैं? विस्तार में व्याख्या कीजिए।

13. Explain the Gandhi's Idea of Trusteeship.

गांधी के न्यास संबंधी विचार की व्याख्या कीजिए।

14. Write an essay on Peasant Satyagraha.

किसान सत्याग्रह पर एक लेख लिखिए।

15. What is Gandhigiri? Explain the relevance of Gandhian Idea in the contemporary world.

गांधीगिरी क्या है? समकालीन विश्व में गांधीवादी विचार की प्रासंगिकता की व्याख्या कीजिए।

16. Write a note on the Pacifist Movement.

शांतिवादी आंदोलन पर एक टिप्पणी कीजिए।

17. Discuss Gandhi's views on women.

महिला पर गांधी के विचारों की विवेचना कीजिए।

18. Write in brief about Anti - Racism Movements in different parts of world.

विश्व के विभिन्न भागों के नस्ल-विरोधी आंदोलनों के बारे में संक्षेप में लिखिए।